

**START**



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**Date:** AUGUST 1-8, 1995

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U.S.  
DEPARTMENT  
OF COMMERCE

Patent  
and  
Trademark  
Office

# OFFICIAL GAZETTE

of the  
UNITED STATES PATENT AND TRADEMARK OFFICE



# OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 1, 1995

Volume 1177

Number 1

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## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1175 O.G. 52, on June 20, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1174 O.G. 57, on May 9, 1995.

International fees were changed, effective on January 1, 1995, due to a change in the exchange rate of the U. S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1168 O.G. 99, on Nov. 29, 1994.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective Oct. 1, 1994, and were announced in the *Official Gazette* at 1165 O.G. 132, on Aug. 30, 1994.

The schedule of PCT fees (in U.S. dollars), effective June 20, 1995, is as follows:

#### International Application (PCT Chapter I) fees:

Transmittal fee.....	210.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed.....	640.00
—Corresponding prior U.S. national application filed.....	420.00
—Supplemental search fee, per additional invention (payable only upon invitation).....	180.00
European Patent Office as ISA.....	1722.00

#### International fees

Basic fee.....	604.00
Basic Supplemental fee (for each page over 30).....	12.00
Designation fee per country or region	
—For the first 10 national or regional offices designated.....	147.00
—For each designation in excess of 10 offices.....	No Charge

Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
—Designation fee.....	147.00
—Confirmation fee.....	73.50

#### International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:

Handling fee.....	185.00
Preliminary examination fee	

#### USPTO as International Preliminary Examining Authority (IPEA)

—USPTO was ISA in PCT Chapter I.....	460.00
—Additional examination fee, per additional invention (payable only upon invitation).....	140.00
—USPTO was not ISA in PCT Chapter I....	690.00
—Additional examination fee, per additional invention (payable only upon invitation).....	240.00

#### U.S. National Stage Fees

##### Basic National fee

USPTO was IPEA		
—All claims presented satisfied provisions of PCT Article 33(2) to (4).....	46.00	92.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4).....	330.00	660.00
USPTO was ISA but not IPEA.....	365.00	730.00
USPTO was neither ISA nor IPEA		
—Filed without a search report from the European Patent Office or the Japanese Patent Office.....	490.00	980.00
—Filed with a search report from the European Patent Office or the Japanese Patent Office.....	425.00	850.00

##### Other National fees

—For each independent claim in excess of 3.....	38.00	76.00
—For each claim in excess of 20..	11.00	22.00
—For each application containing a multiple dependent claim.....	120.00	240.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1).....	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1).....	130.00	130.00

May 30, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

#### Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 28, 1992 for which maintenance fees due at 3 years and six



months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,133,084 through 5,134,724  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on July 26, 1988 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,759,082 through 4,760,609  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on July 24, 1984 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,461,043 through 4,462,114  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

#### 37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$480.00  
By other than a small entity .....\$960.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$965.00  
By other than a small entity .....\$1,930.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,450.00  
By other than a small entity .....\$2,900.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) .....\$65.00  
By other than a small entity .....\$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable .....\$640.00  
(2) unintentional .....\$1,500.00

#### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

#### PATENTS WHICH EXPIRED May 24, 1995 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,839	07/135,442	01/24/89
(4,666,028)	(06/797,470)	(05/19/87)
4,384,370	06/283,200	05/24/83
4,384,373	06/243,789	05/24/83
4,384,376	06/287,419	05/24/83
4,384,386	06/220,305	05/24/83
4,384,394	06/263,218	05/24/83
4,384,405	06/282,527	05/24/83
4,384,426	06/245,101	05/24/83
4,384,428	06/217,087	05/24/83
4,384,433	06/306,513	05/24/83
4,384,434	06/306,828	05/24/83
4,384,435	06/281,515	05/24/83
4,384,436	06/300,894	05/24/83
4,384,443	06/285,678	05/24/83
4,384,445	06/340,599	05/24/83
4,384,447	06/336,370	05/24/83
4,384,466	06/238,285	05/24/83
4,384,469	06/249,255	05/24/83
4,384,472	06/242,425	05/24/83
4,384,480	06/228,313	05/24/83
4,384,482	06/311,354	05/24/83
4,384,483	06/292,061	05/24/83
4,384,492	06/240,768	05/24/83
4,384,494	06/295,310	05/24/83
4,384,496	06/256,030	05/24/83
4,384,501	06/233,163	05/24/83
4,384,502	06/296,396	05/24/83
4,394,503	06/266,436	05/24/83
4,384,508	06/280,177	05/24/83
4,394,512	06/262,608	05/24/83
4,384,530	06/266,694	05/24/83
4,384,536	06/249,566	05/24/83
4,384,540	06/310,982	05/24/83
4,384,541	06/261,660	05/24/83
4,384,546	06/325,332	05/24/83
4,384,550	06/218,398	05/24/83
4,394,553	06/219,105	05/24/83
4,384,556	06/264,708	05/24/83
4,384,559	06/270,566	05/24/83
4,384,561	06/242,904	05/24/83
4,384,563	06/277,775	05/24/83
4,384,575	06/268,993	05/24/83
4,384,579	06/253,516	05/24/83
4,384,585	06/241,314	05/24/83
4,384,590	06/269,776	05/24/83
4,384,593	06/229,540	05/24/83
4,384,596	06/223,226	05/24/83
4,384,597	06/235,422	05/24/83
4,384,605	06/293,906	05/24/83
4,384,609	06/365,318	05/24/83
4,384,614	06/262,192	05/24/83
4,384,615	06/259,727	05/24/83
4,384,618	06/281,419	05/24/83
4,384,619	06/322,795	05/24/83

Patent Number	Serial Number	Issue Date	4,385,031	06/391,360	05/24/83
4,384,621	06/232,588	05/24/83	4,385,032	06/391,414	05/24/83
4,384,627	06/241,473	05/24/83	4,385,044	06/300,085	05/24/83
4,384,628	06/256,408	05/24/83	4,385,045	06/238,371	05/24/83
4,384,629	06/257,927	05/24/83	4,385,046	06/216,585	05/24/83
4,384,631	06/218,679	05/24/83	4,385,058	06/302,941	05/24/83
4,384,632	06/222,809	05/24/83	4,385,062	06/239,941	05/24/83
4,384,638	06/224,303	05/24/83	4,385,064	06/244,286	05/24/83
4,384,645	06/248,077	05/24/83	4,385,065	06/308,294	05/24/83
4,384,646	06/243,861	05/24/83	4,385,073	06/362,234	05/24/83
4,384,648	06/365,179	05/24/83	4,385,074	06/298,676	05/24/83
4,384,658	06/243,397	05/24/83	4,386,075	06/342,305	05/24/83
4,394,674	06/271,706	05/24/83	4,385,082	06/220,332	05/24/83
4,384,688	06/266,726	05/24/83	4,385,085	06/316,242	05/24/83
4,384,692	06/233,485	05/24/83	4,385,095	06/382,016	05/24/83
4,384,697	06/273,261	05/24/83	4,385,100	06/369,877	05/24/83
4,384,709	06/277,995	05/24/83	4,385,106	06/235,375	05/24/83
4,384,718	06/290,691	05/24/83	4,385,110	06/296,097	05/24/83
4,384,725	06/381,845	05/24/83	4,385,117	06/317,702	05/24/83
4,384,726	06/317,705	05/24/83	4,385,118	06/313,550	05/24/83
4,384,735	06/232,760	05/24/83	4,385,120	06/284,115	05/24/83
4,384,739	06/217,593	05/24/83	4,385,121	06/309,483	05/24/83
4,384,740	06/268,786	05/24/83	4,385,128	06/335,647	05/24/83
4,384,742	06/242,804	05/24/83	4,385,130	06/216,676	05/24/83
4,384,745	06/231,837	05/24/83	4,385,131	06/274,726	05/24/83
4,384,749	06/277,489	05/24/83	4,385,133	06/385,930	05/24/83
4,384,768	06/335,193	05/24/83	4,385,144	06/397,624	05/24/83
4,384,778	06/319,342	05/24/83	4,385,146	06/312,963	05/24/83
4,384,789	06/313,955	05/24/83	4,385,147	06/300,365	05/24/83
4,384,793	06/219,130	05/24/83	4,385,148	06/278,433	05/24/83
4,384,798	06/273,557	05/24/83	4,385,150	06/309,775	05/24/83
4,384,802	06/272,602	05/24/83	4,385,156	06/364,297	05/24/83
4,384,803	06/233,740	05/24/83	4,385,159	06/355,128	05/24/83
4,384,826	06/259,927	05/24/83	4,385,166	06/319,641	05/24/83
4,384,840	06/250,250	05/24/83	4,385,169	06/265,924	05/24/83
4,384,844	06/222,407	05/24/83	4,385,175	06/360,557	05/24/83
4,384,849	06/267,755	05/24/83	4,385,179	06/332,272	05/24/83
4,384,850	06/274,436	05/24/83	4,385,180	06/306,014	05/24/83
4,384,852	06/338,212	05/24/83	4,385,187	06/279,024	05/24/83
4,384,854	06/312,872	05/24/83	4,385,190	06/262,127	05/24/83
4,384,865	06/267,882	05/24/83	4,385,196	06/264,310	05/24/83
4,384,871	06/347,415	05/24/83	4,385,198	06/281,437	05/24/83
4,384,873	06/347,638	05/24/83	4,385,201	06/345,650	05/24/83
4,384,876	06/296,152	05/24/83	4,385,205	06/260,360	05/24/83
4,384,878	06/372,212	05/24/83	4,385,215	06/319,555	05/24/83
4,384,887	06/267,124	05/24/83	4,385,216	06/290,811	05/24/83
4,384,896	06/335,847	05/24/83	4,385,217	06/254,999	05/24/83
4,384,904	06/295,692	05/24/83	4,385,222	06/233,567	05/24/83
4,384,906	06/300,522	05/24/83	4,385,230	06/220,482	05/24/83
4,384,908	06/371,929	05/24/83	4,385,240	06/247,751	05/24/83
4,384,909	06/322,099	05/24/83	4,385,242	06/217,341	05/24/83
4,384,914	06/271,843	05/24/83	4,385,250	06/224,263	05/24/83
4,394,916	06/308,873	05/24/83	4,385,264	06/261,361	05/24/83
4,384,936	06/237,668	05/24/83	4,385,267	06/229,412	05/24/83
4,384,941	06/345,528	05/24/83	4,385,268	06/229,413	05/24/83
4,384,944	06/299,038	05/24/83	4,385,278	06/266,823	05/24/83
4,384,948	06/263,397	05/24/83	4,385,281	06/245,265	05/24/83
4,384,949	06/257,849	05/24/83	4,385,285	06/250,370	05/24/83
4,384,954	06/250,630	05/24/83	4,385,290	06/296,064	05/24/83
4,384,962	06/241,076	05/24/83	4,385,298	06/227,083	05/24/83
4,384,969	06/362,205	05/24/83	4,385,302	06/311,813	05/24/83
4,384,976	06/246,109	05/24/83	4,385,312	06/246,177	05/24/83
4,384,981	06/295,341	05/24/83	4,385,313	06/238,861	05/24/83
4,384,983	06/266,640	05/24/83	4,385,316	06/217,418	05/24/83
4,384,984	06/307,036	05/24/83	4,385,321	06/298,781	05/24/83
4,384,985	06/345,033	05/24/83	4,385,348	06/292,824	05/24/83
4,384,987	06/288,840	05/24/83	4,385,352	06/253,879	05/24/83
4,384,988	06/221,823	05/24/83	4,385,379	06/289,954	05/24/83
4,384,989	06/373,817	05/24/83	4,385,383	06/254,335	05/24/83
4,384,994	06/309,854	05/24/83	4,385,385	06/221,471	05/24/83
4,385,002	06/282,378	05/24/83	4,385,394	06/227,862	05/24/83
4,385,005	06/282,653	05/24/83	4,665,564	06/921,400	05/19/87
4,385,006	06/367,125	05/24/83	4,665,570	06/796,691	05/19/87
4,385,011	06/302,149	05/24/83	4,665,580	06/722,025	05/19/87
4,385,013	06/271,554	05/24/83	4,665,586	06/793,230	05/19/87
4,385,016	06/218,229	05/24/83	4,665,593	06/777,822	05/19/87
4,385,017	06/273,306	05/24/83	4,665,594	06/834,195	05/19/87
4,385,021	06/283,246	05/24/83	4,665,596	06/801,622	05/19/87
			4,665,600	06/561,522	05/19/87



Patent Number	Serial Number	Issue Date	4,665,877
4,665,607	06/738,247	05/19/87	4,665,881
4,665,610	06/725,984	05/19/87	4,665,885
4,665,612	06/849,239	05/19/87	4,665,886
4,665,615	06/835,343	05/19/87	4,665,891
4,665,616	06/783,382	05/19/87	4,665,901
4,665,617	06/738,680	05/19/87	4,665,903
4,665,618	06/826,256	05/19/87	4,665,904
4,665,624	06/673,526	05/19/87	4,665,905
4,665,626	06/793,691	05/19/87	4,665,907
4,665,627	06/794,107	05/19/87	4,665,912
4,665,629	06/832,964	05/19/87	4,665,914
4,665,630	06/895,095	05/19/87	4,665,918
4,665,631	06/842,126	05/19/87	4,665,920
4,665,644	06/838,325	05/19/87	4,665,921
4,665,645	06/759,451	05/19/87	4,665,928
4,665,646	06/764,212	05/19/87	4,665,930
4,665,652	06/252,814	05/19/87	4,665,931
4,665,658	06/766,146	05/19/87	4,665,934
4,665,662	06/746,761	05/19/87	4,665,935
4,665,665	06/714,397	05/19/87	4,665,936
4,665,678	06/704,343	05/19/87	4,665,940
4,665,680	06/837,637	05/19/87	4,665,950
4,665,681	06/664,789	05/19/87	4,665,953
4,665,684	06/789,132	05/19/87	4,665,954
4,665,688	06/614,325	05/19/87	4,665,955
4,665,689	06/795,162	05/19/87	4,665,958
4,665,690	06/817,618	05/19/87	4,665,963
4,665,691	06/843,260	05/19/87	4,665,965
4,665,694	06/790,355	05/19/87	4,665,966
4,665,702	06/637,407	05/19/87	4,665,968
4,665,703	06/866,946	05/19/87	4,665,969
4,665,706	06/767,672	05/19/87	4,665,971
4,665,709	06/700,409	05/19/87	4,665,973
4,665,712	06/807,322	05/19/87	4,665,974
4,665,717	06/833,844	05/19/87	4,665,977
4,665,719	06/894,563	05/19/87	4,665,978
4,665,721	06/894,627	05/19/87	4,665,982
4,665,722	06/782,038	05/19/87	4,665,984
4,665,728	06/860,897	05/19/87	4,665,988
4,665,738	06/775,082	05/19/87	4,665,989
4,665,741	06/842,736	05/19/87	4,665,990
4,665,746	06/755,918	05/19/87	4,665,993
4,665,747	06/725,226	05/19/87	4,665,999
4,665,757	06/841,987	05/19/87	4,666,000
4,665,758	06/776,508	05/19/87	4,666,005
4,665,760	06/828,479	05/19/87	4,666,006
4,665,761	06/713,680	05/19/87	4,666,010
4,665,765	06/728,878	05/19/87	4,666,015
4,665,770	06/906,643	05/19/87	4,666,016
4,665,772	06/762,499	05/19/87	4,666,020
4,665,783	06/723,623	05/19/87	4,666,032
4,665,784	06/823,417	05/19/87	4,666,033
4,665,786	06/728,581	05/19/87	4,666,039
4,665,787	06/766,841	05/19/87	4,666,041
4,665,791	06/892,725	05/19/87	4,666,044
4,665,792	06/762,888	05/19/87	4,666,047
4,665,794	06/557,177	05/19/87	4,666,051
4,665,800	06/772,063	05/19/87	4,666,052
4,665,801	06/887,589	05/19/87	4,666,060
4,665,802	06/709,084	05/19/87	4,666,062
4,665,803	06/726,642	05/19/87	4,666,071
4,665,807	06/714,707	05/19/87	4,666,077
4,665,808	06/808,534	05/19/87	4,666,079
4,665,811	06/750,312	05/19/87	4,666,083
4,665,812	06/782,960	05/19/87	4,666,084
4,665,817	06/861,936	05/19/87	4,666,085
4,665,818	06/783,416	05/19/87	4,666,086
4,665,819	06/731,477	05/19/87	4,666,091
4,665,822	06/861,806	05/19/87	4,666,095
4,665,823	06/794,181	05/19/87	4,666,096
4,665,835	06/703,891	05/19/87	4,666,102
4,665,837	06/798,487	05/19/87	4,666,104
4,665,840	06/885,024	05/19/87	4,666,107
4,665,842	06/784,841	05/19/87	4,666,112
4,665,857	06/845,487	05/19/87	4,666,115
4,665,872	06/375,415	05/19/87	4,666,116
4,665,875	06/802,307	05/19/87	4,666,117

06/789,020	05/19/87
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06/814,223	05/19/87
06/816,399	05/19/87
06/675,725	05/19/87
06/734,653	05/19/87
06/748,230	05/19/87
06/655,440	05/19/87
06/562,178	05/19/87
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06/896,218	05/19/87
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06/882,659	05/19/87
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06/744,119	05/19/87
06/819,030	05/19/87
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06/854,100	05/19/87
06/774,073	05/19/87
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06/865,649	05/19/87
06/802,241	05/19/87
06/786,902	05/19/87
06/809,322	05/19/87
06/757,441	05/19/87
06/737,819	05/19/87
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06/689,704	05/19/87
06/822,772	05/19/87
06/804,274	05/19/87
06/838,331	05/19/87
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06/874,310	05/19/87
06/817,424	05/19/87
06/852,466	05/19/87
06/850,422	05/19/87
06/707,097	05/19/87
06/790,060	05/19/87
06/778,949	05/19/87
06/757,387	05/19/87
06/582,815	05/19/87
06/753,186	05/19/87
06/826,237	05/19/87
06/846,196	05/19/87
06/785,865	05/19/87
06/818,341	05/19/87
06/802,180	05/19/87

Patent Number	Serial Number	Issue Date	4,666,423	06/798,514	05/19/87
4,666,124	06/857,070		4,666,425	06/809,949	05/19/87
4,666,134	06/833,071	05/19/87	4,666,427	06/810,138	05/19/87
4,666,138	06/773,024	05/19/87	4,666,428	06/663,858	05/19/87
4,666,150	06/803,476	05/19/87	4,666,434	06/692,990	05/19/87
4,666,153	06/718,236	05/19/87	4,666,445	06/782,751	05/19/87
4,666,157	06/794,781	05/19/87	4,666,449	06/584,889	05/19/87
4,666,165	06/826,044	05/19/87	4,666,454	06/773,765	05/19/87
4,666,166	06/670,452	05/19/87	4,666,464	06/855,037	05/19/87
4,666,172	06/848,805	05/19/87	4,666,467	06/719,151	05/19/87
4,666,173	06/808,212	05/19/87	4,666,469	06/740,468	05/19/87
4,666,175	06/866,794	05/19/87	4,666,473	06/744,262	05/19/87
4,666,177	06/863,042	05/19/87	4,666,474	06/895,556	05/19/87
4,666,179	06/660,471	05/19/87	4,666,475	06/817,609	05/19/87
4,666,192	06/847,141	05/19/87	4,666,480	06/716,124	05/19/87
4,666,194	06/854,166	05/19/87	4,666,490	06/828,857	05/19/87
4,666,196	06/801,135	05/19/87	4,666,498	06/554,713	05/19/87
4,666,198	06/823,011	05/19/87	4,666,501	06/769,691	05/19/87
4,666,202	06/883,917	05/19/87	4,666,504	06/762,732	05/19/87
4,666,205	06/754,942	05/19/87	4,666,506	06/753,117	05/19/87
4,666,210	06/875,897	05/19/87	4,666,513	06/593,863	05/19/87
4,666,213	06/780,945	05/19/87	4,666,514	06/819,158	05/19/87
4,666,215	06/809,271	05/19/87	4,666,517	06/870,598	05/19/87
4,666,216	06/799,307	05/19/87	4,666,520	06/777,324	05/19/87
4,666,225	06/830,742	05/19/87	4,666,521	06/783,868	05/19/87
4,666,226	06/795,073	05/19/87	4,666,522	06/701,121	05/19/87
4,666,229	06/707,264	05/19/87	4,666,524	06/783,191	05/19/87
4,666,236	06/521,644	05/19/87	4,666,525	06/719,133	05/19/87
4,666,238	06/689,637	05/19/87	4,666,531	06/683,253	05/19/87
4,666,248	06/862,062	05/19/87	4,666,538	06/734,874	05/19/87
4,666,251	06/729,606	05/19/87	4,666,539	06/843,241	05/19/87
4,666,255	06/873,488	05/19/87	4,666,544	06/776,685	05/19/87
4,666,261	06/724,617	05/19/87	4,666,546	06/788,792	05/19/87
4,666,272	06/785,959	05/19/87	4,666,547	06/718,060	05/19/87
4,666,276	06/774,325	05/19/87	4,666,549	06/770,488	05/19/87
4,666,287	06/857,129	05/19/87	4,666,553	06/770,275	05/19/87
4,666,294	06/813,728	05/19/87	4,666,554	06/696,817	05/19/87
4,666,295	06/627,704	05/19/87	4,666,561	06/761,310	05/19/87
4,666,298	06/722,128	05/19/87	4,666,567	06/663,711	05/19/87
4,666,301	06/731,782	05/19/87	4,666,568	06/917,428	05/19/87
4,666,302	06/717,396	05/19/87	4,666,575	06/886,153	05/19/87
4,666,304	06/744,057	05/19/87	4,666,577	06/826,991	05/19/87
4,666,309	06/510,461	05/19/87	4,666,578	06/832,221	05/19/87
4,666,310	06/851,534	05/19/87	4,666,587	06/754,529	05/19/87
4,666,313	06/846,806	05/19/87	4,666,589	06/829,904	05/19/87
4,666,319	06/753,781	05/19/87	4,666,593	06/887,243	05/19/87
4,666,322	06/767,407	05/19/87	4,666,595	06/776,699	05/19/87
4,666,323	06/478,062	05/19/87	4,666,601	06/808,153	05/19/87
4,666,325	06/657,403	05/19/87	4,666,604	06/780,126	05/19/87
4,666,329	06/830,660	05/19/87	4,666,614	06/658,128	05/19/87
4,666,335	06/658,430	05/19/87	4,666,615	06/766,610	05/19/87
4,666,336	06/780,254	05/19/87	4,666,619	06/785,726	05/19/87
4,666,338	06/873,156	05/19/87	4,666,624	06/797,781	05/19/87
4,666,339	06/617,954	05/19/87	4,666,625	06/675,114	05/19/87
4,666,342	06/881,530	05/19/87	4,666,629	06/894,964	05/19/87
4,666,347	06/741,675	05/19/87	4,666,631	06/819,953	05/19/87
4,666,349	06/892,136	05/19/87	4,666,632	06/883,229	05/19/87
4,666,351	06/763,541	05/19/87	4,666,637	06/788,671	05/19/87
4,666,355	06/892,562	05/19/87	4,666,641	06/741,190	05/19/87
4,666,358	06/696,694	05/19/87	4,666,642	06/762,791	05/19/87
4,666,359	06/783,006	05/19/87	4,666,648	06/561,600	05/19/87
4,666,361	06/708,864	05/19/87	4,666,650	06/521,761	05/19/87
4,666,367	06/880,350	05/19/87	4,666,652	06/703,422	05/19/87
4,666,375	06/733,127	05/19/87	4,666,654	06/702,752	05/19/87
4,666,378	06/873,484	05/19/87	4,666,655	06/641,735	05/19/87
4,666,382	06/837,312	05/19/87	4,666,657	06/623,583	05/19/87
4,666,387	06/789,248	05/19/87	4,666,659	06/545,228	05/19/87
4,666,389	06/695,004	05/19/87	4,666,661	06/644,085	05/19/87
4,666,391	06/683,274	05/19/87	4,666,662	06/629,531	05/19/87
4,666,392	06/733,212	05/19/87	4,666,664	06/794,582	05/19/87
4,666,394	06/699,153	05/19/87	4,666,676	06/770,908	05/19/87
4,666,398	06/906,087	05/19/87	4,666,677	06/791,058	05/19/87
4,666,400	06/859,415	05/19/87	4,666,683	06/800,247	05/19/87
4,666,411	06/768,481	05/19/87	4,666,687	06/831,269	05/19/87
4,666,413	06/671,345	05/19/87	4,666,688	06/825,398	05/19/87
4,666,416	06/799,908	05/19/87	4,666,690	06/811,267	05/19/87
4,666,421	06/795,411	05/19/87	4,666,693	06/801,586	05/19/87
4,666,422	06/800,151	05/19/87	4,666,695	06/742,444	05/19/87
			4,666,696	06/717,932	05/19/87



Patent Number	Serial Number	Issue Date	4,666,960	06/755,146	05/19/87
4,666,698	06/644,953	05/19/87	4,666,965	06/815,027	05/19/87
4,666,702	06/722,077	05/19/87	4,666,967	06/821,178	05/19/87
4,666,712	06/817,767	05/19/87	4,666,973	06/803,577	05/19/87
4,666,714	06/479,120	05/19/87	4,666,974	06/741,996	05/19/87
4,666,725	06/785,328	05/19/87	4,666,976	06/852,376	05/19/87
4,666,735	06/792,879	05/19/87	4,666,984	06/808,168	05/19/87
4,666,740	06/357,206	05/19/87	4,666,987	06/704,437	05/19/87
4,666,743	06/797,812	05/19/87	4,666,989	06/799,551	05/19/87
4,666,744	06/679,709	05/19/87	4,666,991	06/792,842	05/19/87
4,666,746	06/865,421	05/19/87	4,666,992	06/902,535	05/19/87
4,666,747	06/765,685	05/19/87	4,666,994	06/847,309	05/19/87
4,666,750	06/833,041	05/19/87	4,666,999	06/737,565	05/19/87
4,666,751	06/598,506	05/19/87	4,667,000	06/899,631	05/19/87
4,666,755	06/771,187	05/19/87	4,667,006	06/780,115	05/19/87
4,666,757	06/796,223	05/19/87	4,667,010	06/819,981	05/19/87
4,666,761	06/880,444	05/19/87	4,667,011	06/860,475	05/19/87
4,666,762	06/634,609	05/19/87	4,667,013	06/858,914	05/19/87
4,666,768	06/882,606	05/19/87	4,667,020	06/703,526	05/19/87
4,666,769	06/776,694	05/19/87	4,667,028	06/607,403	05/19/87
4,666,772	06/861,773	05/19/87	4,667,030	06/745,562	05/19/87
4,666,775	06/815,981	05/19/87	4,667,032	06/786,257	05/19/87
4,666,777	06/812,615	05/19/87	4,667,033	06/618,582	05/19/87
4,666,781	06/759,298	05/19/87	4,667,037	06/742,069	05/19/87
4,666,783	06/734,185	05/19/87	4,667,042	06/896,005	05/19/87
4,666,790	06/848,124	05/19/87	4,667,046	06/902,540	05/19/87
4,666,791	06/805,658	05/19/87	4,667,049	06/834,655	05/19/87
4,666,795	06/737,233	05/19/87	4,667,052	06/484,702	05/19/87
4,666,802	06/886,142	05/19/87	4,667,053	06/880,394	05/19/87
4,666,811	06/733,377	05/19/87	4,667,055	06/713,927	05/19/87
4,666,812	06/822,153	05/19/87	4,667,063	06/815,882	05/19/87
4,666,824	06/712,049	05/19/87	4,667,066	06/770,909	05/19/87
4,666,828	06/640,808	05/19/87	4,667,077	06/708,872	05/19/87
4,666,833	06/523,394	05/19/87	4,667,079	06/705,426	05/19/87
4,666,834	06/594,231	05/19/87	4,667,080	06/710,807	05/19/87
4,666,835	06/856,997	05/19/87	4,667,083	06/829,734	05/19/87
4,666,836	06/354,299	05/19/87	4,667,096	06/716,395	05/19/87
4,666,840	06/696,775	05/19/87	4,667,097	06/814,935	05/19/87
4,666,844	06/648,388	05/19/87	4,667,098	06/717,990	05/19/87
4,666,846	06/581,396	05/19/87	4,667,099	06/724,166	05/19/87
4,666,849	06/539,028	05/19/87	4,667,101	06/697,828	05/19/87
4,666,851	06/726,987	05/19/87	4,667,103	06/763,576	05/19/87
4,666,856	06/630,685	05/19/87	4,667,105	06/740,055	05/19/87
4,666,857	06/457,323	05/19/87	4,667,107	06/746,496	05/19/87
4,666,864	06/575,443	05/19/87	4,667,114	06/852,483	05/19/87
4,666,865	06/570,353	05/19/87	4,667,119	06/635,456	05/19/87
4,666,868	06/912,231	05/19/87	4,667,121	06/866,651	05/19/87
4,666,869	06/912,230	05/19/87	4,667,128	06/745,853	05/19/87
4,666,872	06/837,245	05/19/87	4,667,134	06/770,547	05/19/87
4,666,873	06/541,914	05/19/87	4,667,137	06/719,970	05/19/87
4,666,881	06/841,145	05/19/87	4,667,142	06/774,035	05/19/87
4,666,884	06/598,711	05/19/87	4,667,144	06/870,045	05/19/87
4,666,885	06/699,702	05/19/87	4,667,150	06/786,708	05/19/87
4,666,886	06/756,146	05/19/87	4,667,151	06/679,322	05/19/87
4,666,888	06/735,247	05/19/87	4,667,152	06/788,576	05/19/87
4,666,889	06/669,078	05/19/87	4,667,161	06/765,780	05/19/87
4,666,891	06/679,914	05/19/87	4,667,166	06/820,210	05/19/87
4,666,901	06/810,125	05/19/87	4,667,176	06/610,003	05/19/87
4,666,907	06/654,991	05/19/87	4,667,177	06/813,493	05/19/87
4,666,908	06/720,437	05/19/87	4,667,187	06/817,224	05/19/87
4,666,910	06/645,007	05/19/87	4,667,189	06/603,852	05/19/87
4,666,915	06/668,304	05/19/87	4,667,192	06/882,204	05/19/87
4,666,917	06/669,916	05/19/87	4,667,199	06/693,244	05/19/87
4,666,922	06/839,308	05/19/87	4,667,205	06/581,416	05/19/87
4,666,924	06/617,286	05/19/87	4,667,208	06/793,330	05/19/87
4,666,925	06/778,993	05/19/87	4,667,210	06/793,683	05/19/87
4,666,926	06/833,926	05/19/87	4,667,216	06/834,653	05/19/87
4,666,928	06/645,596	05/19/87	4,667,238	06/775,883	05/19/87
4,666,929	06/847,783	05/19/87	4,667,258	06/593,907	05/19/87
4,666,931	06/814,135	05/19/87	4,667,261	06/738,578	05/19/87
4,666,933	06/875,129	05/19/87	4,667,271	06/418,906	05/19/87
4,666,938	06/613,773	05/19/87	4,667,273	06/770,930	05/19/87
4,666,946	06/895,391	05/19/87	4,667,274	06/788,637	05/19/87
4,666,949	06/825,076	05/19/87	4,667,278	06/837,893	05/19/87
4,666,950	06/843,421	05/19/87	4,667,279	06/847,083	05/19/87
4,666,955	06/740,104	05/19/87	4,667,280	06/664,853	05/19/87
4,666,956	06/767,690	05/19/87	4,667,284	06/697,585	05/19/87
4,666,958	06/812,562	05/19/87	4,667,288	06/509,898	05/19/87
			4,667,295	06/790,782	05/19/87

Patent Number	Serial Number	Issue Date	5,016,529	07/475,220	05/21/91
4,667,298	06/559,565	05/19/87	5,016,531	07/298,988	05/21/91
4,667,301	06/504,091	05/19/87	5,016,534	07/391,452	05/21/91
4,667,302	06/549,250	05/19/87	5,016,535	07/409,663	05/21/91
4,667,306	06/545,366	05/19/87	5,016,537	07/490,378	05/21/91
4,667,317	06/504,023	05/19/87	5,016,540	07/467,416	05/21/91
4,667,318	06/543,402	05/19/87	5,016,546	07/311,734	05/21/91
4,667,320	06/716,263	05/19/87	5,016,553	07/445,361	05/21/91
4,667,322	06/733,025	05/19/87	5,016,557	07/446,656	05/21/91
4,667,329	06/445,608	05/19/87	5,016,558	07/538,434	05/21/91
4,667,337	06/770,131	05/19/87	5,016,566	07/458,674	05/21/91
5,016,290	07/528,994	05/21/91	5,016,569	07/458,672	05/21/91
5,016,291	07/498,402	05/21/91	5,016,570	07/518,879	05/21/91
5,016,292	07/448,015	05/21/91	5,016,574	07/149,386	05/21/91
5,016,293	07/557,028	05/21/91	5,016,581	07/578,785	05/21/91
5,016,294	07/531,424	05/21/91	5,016,597	07/352,874	05/21/91
5,016,295	07/553,240	05/21/91	5,016,601	07/406,272	05/21/91
5,016,301	07/598,138	05/21/91	5,016,611	07/512,404	05/21/91
5,016,302	07/449,751	05/21/91	5,016,612	07/356,869	05/21/91
5,016,303	07/364,023	05/21/91	5,016,614	07/052,138	05/21/91
5,016,306	07/419,266	05/21/91	5,016,617	07/457,260	05/21/91
5,016,309	07/228,443	05/21/91	5,016,621	07/484,897	05/21/91
5,016,314	07/413,858	05/21/91	5,016,624	07/502,976	05/21/91
5,016,317	07/547,137	05/21/91	5,016,625	07/397,399	05/21/91
5,016,319	07/509,476	05/21/91	5,016,653	06/900,015	05/21/91
5,016,322	07/439,415	05/21/91	5,016,655	07/302,284	05/21/91
5,016,330	07/497,777	05/21/91	5,016,657	06/946,988	05/21/91
5,016,333	07/452,202	05/21/91	5,016,660	07/497,918	05/21/91
5,016,344	07/531,235	05/21/91	5,016,662	07/552,344	05/21/91
5,016,348	07/418,123	05/21/91	5,016,665	07/489,519	05/21/91
5,016,351	07/493,736	05/21/91	5,016,668	07/467,901	05/21/91
5,016,354	07/395,979	05/21/91	5,016,674	07/468,004	05/21/91
5,016,360	07/493,634	05/21/91	5,016,679	07/493,963	05/21/91
5,016,367	07/536,315	05/21/91	5,016,682	07/467,955	05/21/91
5,016,368	07/465,754	05/21/91	5,016,690	07/523,267	05/21/91
5,016,369	07/600,998	05/21/91	5,016,691	07/540,095	05/21/91
5,016,370	07/519,470	05/21/91	5,016,698	07/570,560	05/21/91
5,016,372	07/450,835	05/21/91	5,016,700	07/548,074	05/21/91
5,016,375	07/361,624	05/21/91	5,016,704	07/201,896	05/21/91
5,016,377	07/459,513	05/21/91	5,016,714	07/521,815	05/21/91
5,016,378	07/529,534	05/21/91	5,016,715	07/430,597	05/21/91
5,016,380	07/477,428	05/21/91	5,016,719	07/469,356	05/21/91
5,016,383	07/486,811	05/21/91	5,016,722	07/425,646	05/21/91
5,016,385	07/514,509	05/21/91	5,016,729	07/438,408	05/21/91
5,016,388	07/309,488	05/21/91	5,016,731	07/036,009	05/21/91
5,016,389	07/335,760	05/21/91	5,016,732	07/234,738	05/21/91
5,016,390	07/432,208	05/21/91	5,016,737	07/409,965	05/21/91
5,016,393	07/516,260	05/21/91	5,016,739	07/360,057	05/21/91
5,016,397	07/498,011	05/21/91	5,016,742	07/517,321	05/21/91
5,016,400	07/500,787	05/21/91	5,016,745	07/263,153	05/21/91
5,016,408	07/218,900	05/21/91	5,016,749	07/529,604	05/21/91
5,016,409	07/445,912	05/21/91	5,016,753	07/386,355	05/21/91
5,016,410	07/347,891	05/21/91	5,016,754	07/195,390	05/21/91
5,016,420	07/449,311	05/21/91	5,016,756	07/360,145	05/21/91
5,016,422	07/307,936	05/21/91	5,016,757	07/370,387	05/21/91
5,016,428	07/460,584	05/21/91	5,016,758	07/522,646	05/21/91
5,016,432	07/350,350	05/21/91	5,016,760	07/408,645	05/21/91
5,016,434	07/405,640	05/21/91	5,016,762	07/340,364	05/21/91
5,016,437	07/402,049	05/21/91	5,016,763	07/388,526	05/21/91
5,016,441	07/308,929	05/21/91	5,016,765	07/397,115	05/21/91
5,016,444	07/448,260	05/21/91	5,016,769	07/550,044	05/21/91
5,016,446	07/467,026	05/21/91	5,016,770	07/340,559	05/21/91
5,016,456	07/330,700	05/21/91	5,016,773	07/529,701	05/21/91
5,016,464	07/442,296	05/21/91	5,016,774	07/554,565	05/21/91
5,016,466	07/427,475	05/21/91	5,016,776	07/365,270	05/21/91
5,016,467	07/362,727	05/21/91	5,016,779	07/477,421	05/21/91
5,016,468	07/333,761	05/21/91	5,016,780	07/578,947	05/21/91
5,016,472	07/491,139	05/21/91	5,016,784	07/481,448	05/21/91
5,016,473	07/553,271	05/21/91	5,016,788	07/314,906	05/21/91
5,016,475	07/406,038	05/21/91	5,016,791	07/468,767	05/21/91
5,016,489	07/425,576	05/21/91	5,016,793	07/419,842	05/21/91
5,016,499	07/579,565	05/21/91	5,016,794	07/498,559	05/21/91
5,016,500	07/508,194	05/21/91	5,016,796	07/601,344	05/21/91
5,016,504	07/528,606	05/21/91	5,016,802	07/476,121	05/21/91
5,016,512	07/459,907	05/21/91	5,016,804	07/459,946	05/21/91
5,015,515	07/604,091	05/21/91	5,016,806	07/517,238	05/21/91
5,016,524	07/491,351	05/21/91	5,016,810	07/398,575	05/21/91
5,016,528	07/540,799	05/21/91	5,016,911	07/536,582	05/21/91
			5,016,812	07/435,514	05/21/91



Patent Number	Serial Number	Issue Date	5,017,197	07/433,950	05/21/91
5,016,813	07/486,791	05/21/91	5,017,200	07/584,697	05/21/91
5,016,819	07/383,386	05/21/91	5,017,201	07/511,755	05/21/91
5,016,836	07/381,866	05/21/91	5,017,203	07/423,727	05/21/91
5,016,844	07/609,313	05/21/91	5,017,205	07/502,178	05/21/91
5,016,847	07/523,760	05/21/91	5,017,208	07/614,559	05/21/91
5,016,848	07/394,972	05/21/91	5,017,213	07/376,719	05/21/91
5,016,849	07/437,594	05/21/91	5,017,214	07/436,581	05/21/91
5,016,858	07/301,236	05/21/91	5,017,217	07/557,425	05/21/91
5,016,860	07/472,978	05/21/91	5,017,228	07/282,149	05/21/91
5,016,865	07/293,115	05/21/91	5,017,232	07/492,668	05/21/91
5,016,870	07/477,610	05/21/91	5,017,235	06/895,398	05/21/91
5,016,872	07/536,420	05/21/91	5,017,238	07/400,832	05/21/91
5,016,873	07/465,755	05/21/91	5,017,239	07/441,658	05/21/91
5,016,874	07/379,966	05/21/91	5,017,242	07/416,349	05/21/91
5,016,879	07/447,686	05/21/91	5,017,244	07/284,621	05/21/91
5,016,881	07/459,205	05/21/91	5,017,247	07/457,041	05/21/91
5,016,885	07/521,599	05/21/91	5,017,262	07/477,854	05/21/91
5,016,889	07/586,562	05/21/91	5,017,268	07/192,879	05/21/91
5,016,891	07/477,029	05/21/91	5,017,274	07/383,381	05/21/91
5,016,892	07/330,014	05/21/91	5,017,279	07/479,328	05/21/91
5,016,897	07/307,672	05/21/91	5,017,282	07/247,855	05/21/91
5,016,899	07/450,916	05/21/91	5,017,287	07/491,536	05/21/91
5,016,904	07/429,416	05/21/91	5,017,305	07/518,357	05/21/91
5,016,909	07/525,139	05/21/91	5,017,306	07/269,209	05/21/91
5,016,915	07/550,300	05/21/91	5,017,309	07/551,566	05/21/91
5,016,916	07/452,231	05/21/91	5,017,314	07/360,470	05/21/91
5,016,918	07/377,054	05/21/91	5,017,322	07/311,167	05/21/91
5,016,919	07/321,712	05/21/91	5,017,323	07/392,220	05/21/91
5,016,922	07/547,134	05/21/91	5,017,339	07/329,837	05/21/91
5,016,923	07/533,014	05/21/91	5,017,346	07/192,566	05/21/91
5,016,924	07/432,510	05/21/91	5,017,349	07/326,378	05/21/91
5,016,935	07/112,617	05/21/91	5,017,350	07/432,850	05/21/91
5,016,936	07/491,439	05/21/91	5,017,351	07/383,357	05/21/91
5,016,937	07/506,286	05/21/91	5,017,356	07/526,163	05/21/91
5,016,942	07/500,391	05/21/91	5,017,359	06/930,409	05/21/91
5,016,944	07/527,849	05/21/91	5,017,365	07/593,534	05/21/91
5,016,946	07/489,404	05/21/91	5,017,376	07/420,503	05/21/91
5,016,964	07/417,245	05/21/91	5,017,378	07/345,226	05/21/91
5,016,972	07/473,954	05/21/91	5,017,383	07/395,594	05/21/91
5,016,974	07/335,196	05/21/91	5,017,412	07/411,393	05/21/91
5,016,980	07/334,685	05/21/91	5,017,426	07/481,885	05/21/91
5,016,996	07/431,069	05/21/91	5,017,433	07/309,363	05/21/91
5,017,004	07/288,387	05/21/91	5,017,436	07/278,383	05/21/91
5,017,012	07/389,430	05/21/91	5,017,443	07/386,930	05/21/91
5,017,022	07/535,226	05/21/91	5,017,452	07/454,102	05/21/91
5,017,024	07/512,090	05/21/91	5,017,457	07/239,468	05/21/91
5,017,034	07/500,705	05/21/91	5,017,459	07/343,316	05/21/91
5,017,035	07/219,720	05/21/91	5,017,460	07/336,194	05/21/91
5,017,039	07/375,774	05/21/91	5,017,462	07/443,849	05/21/91
5,017,049	07/558,563	05/21/91	5,017,467	07/596,742	05/21/91
5,017,061	07/416,769	05/21/91	5,017,475	07/089,605	05/21/91
5,017,063	07/479,460	05/21/91	5,017,485	07/448,334	05/21/91
5,017,064	07/411,659	05/21/91	5,017,489	07/234,906	05/21/91
5,017,074	07/252,482	05/21/91	5,017,491	07/115,055	05/21/91
5,017,075	07/424,805	05/21/91	5,017,494	06/847,186	05/21/91
5,017,088	07/454,650	05/21/91	5,017,499	07/330,898	05/21/91
5,017,093	07/437,841	05/21/91	5,017,501	07/300,002	05/21/91
5,017,096	07/178,469	05/21/91	5,017,525	07/169,574	05/21/91
5,017,104	07/282,584	05/21/91	5,017,534	07/400,708	05/21/91
5,017,114	07/482,424	05/21/91	5,017,537	07/382,059	05/21/91
5,017,122	07/354,979	05/21/91	5,017,544	07/277,649	05/21/91
5,017,144	07/529,539	05/21/91	5,017,549	07/429,515	05/21/91
5,017,157	07/510,182	05/21/91	5,017,551	07/330,409	05/21/91
5,017,165	07/434,428	05/21/91	5,017,564	07/360,869	05/21/91
5,017,166	07/559,919	05/21/91	5,017,567	07/460,425	05/21/91
5,017,167	07/550,896	05/21/91	5,017,570	07/560,504	05/21/91
5,017,169	07/434,252	05/21/91	5,017,572	07/339,815	05/21/91
5,017,172	07/464,926	05/21/91	5,017,575	07/059,889	05/21/91
5,017,176	07/470,381	05/21/91	5,017,576	07/405,294	05/21/91
5,017,177	07/416,884	05/21/91	5,017,583	07/159,631	05/21/91
5,017,178	07/423,520	05/21/91	5,017,584	06/802,409	05/21/91
5,017,182	07/442,752	05/21/91	5,017,586	07/350,878	05/21/91
5,017,187	07/443,731	05/21/91	5,017,595	07/318,954	05/21/91
5,017,189	07/519,281	05/21/91	5,017,603	07/496,738	05/21/91
5,017,190	07/471,520	05/21/91	5,017,608	07/403,532	05/21/91
5,017,193	07/411,506	05/21/91	5,017,611	07/428,901	05/21/91
	07/478,289	05/21/91	5,017,616	07/443,765	05/21/91
			5,017,619	07/285,269	05/21/91

Patent Number	Serial Number	Issue Date	5,018,172	07/489,406	05/21/91
5,017,623	07/396,481	05/21/91	5,018,175	07/323,885	05/21/91
5,017,634	07/377,462	05/21/91	5,018,178	07/595,696	05/21/91
5,017,640	07/421,994	05/21/91	5,018,179	07/509,737	05/21/91
5,017,657	07/402,526	05/21/91	5,018,181	07/430,902	05/21/91
5,017,661	07/478,340	05/21/91	5,018,185	07/496,653	05/21/91
5,017,662	07/403,630	05/21/91	5,018,190	07/410,689	05/21/91
5,017,676	07/451,686	05/21/91	5,018,207	07/408,684	05/21/91
5,017,678	07/532,349	05/21/91			
5,017,682	07/394,120	05/21/91			
5,017,686	07/473,068	05/21/91			
5,017,688	07/430,898	05/21/91			
5,017,690	07/392,696	05/21/91			
5,017,694	07/128,248	05/21/91			
5,017,695	07/128,245	05/21/91			
5,017,699	07/554,681	05/21/91			
5,017,702	07/375,874	05/21/91			
5,017,705	07/348,983	05/21/91			
5,017,719	07/225,547	05/21/91			
5,017,724	07/532,341	05/21/91			
5,017,731	07/534,310	05/21/91			
5,017,739	07/549,971	05/21/91			
5,017,741	07/330,016	05/21/91			
5,017,748	07/387,624	05/21/91			
5,017,749	07/131,823	05/21/91			
5,017,759	07/363,495	05/21/91			
5,017,767	07/329,781	05/21/91			
5,017,771	07/438,072	05/21/91			
5,017,786	07/452,753	05/21/91			
5,017,791	07/437,142	05/21/91			
5,017,795	07/519,322	05/21/91			
5,017,817	07/297,034	05/21/91			
5,017,819	07/531,699	05/21/91			
5,017,821	07/313,875	05/21/91			
5,017,825	07/437,407	05/21/91			
5,017,831	07/463,800	05/21/91			
5,017,833	07/435,460	05/21/91			
5,017,855	07/164,232	05/21/91			
5,017,862	07/458,850	05/21/91			
5,017,871	07/407,180	05/21/91			
5,017,872	07/467,475	05/21/91			
5,017,874	07/141,755	05/21/91			
5,017,878	07/356,074	05/21/91			
5,017,881	07/364,304	05/21/91			
5,017,882	07/396,624	05/21/91			
5,017,891	07/433,701	05/21/91			
5,017,894	07/460,802	05/21/91			
5,017,895	07/405,714	05/21/91			
5,017,896	07/466,146	05/21/91			
5,017,906	07/418,130	05/21/91			
5,017,933	07/327,062	05/21/91			
5,017,952	07/478,454	05/21/91			
5,017,958	07/578,261	05/21/91			
5,017,960	07/476,957	05/21/91			
5,017,961	07/374,289	05/21/91			
5,017,974	07/514,691	05/21/91			
5,017,987	07/410,847	05/21/91			
5,018,007	07/389,772	05/21/91			
5,018,010	07/454,552	05/21/91			
5,018,021	07/449,980	05/21/91			
5,018,046	07/451,522	05/21/91			
5,018,047	07/556,323	05/21/91			
5,018,056	07/486,924	05/21/91			
5,018,058	07/548,686	05/21/91			
5,018,073	07/326,675	05/21/91			
5,018,074	07/267,198	05/21/91			
5,018,084	07/303,639	05/21/91			
5,018,085	07/207,724	05/21/91			
5,018,086	06/440,930	05/21/91			
5,018,089	07/319,319	05/21/91			
5,018,091	07/370,072	05/21/91			
5,018,094	07/379,269	05/21/91			
5,018,103	07/423,407	05/21/91			
5,018,112	07/527,682	05/21/91			
5,018,118	07/509,291	05/21/91			
5,018,145	07/401,228	05/21/91			
5,018,150	07/403,236	05/21/91			
5,018,151	06/645,803	05/21/91			

## Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

**5,086,311**, Re. S.N. 08/354,834, Dec. 8, 1994, Cl. 354/195.1, PANORAMIC CAMERA, Yoji Naka, et. al., Owner of Record: Fuji Photo Film Co., Ltd., Kanagawa, Japan, Attorney or Agent: Robert J. Patch, Ex. Gp.: 2101



**Notice of Expiration of Trademark Registrations  
Due To Failure to Renew**

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

**TRADEMARK REGISTRATIONS WHICH EXPIRED  
MAY 29, 1995  
DUE TO FAILURE TO RENEW**

Reg. Number	Serial Number	Reg. Date			
99,208	71/076,682	08/25/1914	594,231	71/631,996	08/24/1954
99,212	71/077,208	08/25/1914	594,238	71/644,920	08/24/1954
99,279	71/070,310	08/25/1914	594,241	71/650,287	08/24/1954
99,292	71/070,196	08/25/1914	594,255	71/624,623	08/24/1954
99,313	71/077,630	08/25/1914	594,270	71/654,521	08/24/1954
99,363	71/078,315	08/25/1914	594,272	71/656,126	08/24/1954
316,198	71/350,975	08/21/1934	594,280	71/657,313	08/24/1954
316,207	71/350,451	08/21/1934	594,282	71/638,886	08/24/1954
316,208	71/350,450	08/21/1934	594,287	71/652,442	08/24/1954
316,217	71/349,601	08/21/1934	594,294	71/656,018	08/24/1954
316,228	71/349,920	08/21/1934	594,304	71/656,042	08/24/1954
316,254	71/347,059	08/21/1934	594,307	71/658,914	08/24/1954
316,255	71/347,058	08/21/1934	594,308	71/594,725	08/24/1954
316,263	71/348,624	08/21/1934	594,310	71/618,554	08/24/1954
316,266	71/349,853	08/21/1934	594,318	71/643,650	08/24/1954
316,280	71/346,366	08/21/1934	594,321	71/645,399	08/24/1954
316,285	71/344,649	08/21/1934	594,330	71/655,567	08/24/1954
316,294	71/390,807	08/21/1934	594,341	71/652,326	08/24/1954
316,303	71/350,342	08/21/1934	594,342	71/656,095	08/24/1954
316,305	71/350,350	08/21/1934	594,350	71/628,232	08/24/1954
316,337	71/336,871	08/21/1934	594,354	71/618,969	08/24/1954
316,341	71/333,601	08/21/1934	974,418	72/440,709	12/04/1973
316,374	71/351,065	08/21/1934	991,077	73/004,492	08/20/1974
316,375	71/351,055	08/21/1934	991,085	73/000,418	08/20/1974
317,362	71/351,365	08/25/1934	991,092	73/003,609	08/20/1974
594,052	71/657,110	08/24/1954	991,095	73/003,738	08/20/1974
594,057	71/627,150	08/24/1954	991,096	73/003,741	08/20/1974
594,071	71/655,509	08/24/1954	991,097	73/003,742	08/20/1974
594,079	71/656,351	08/24/1954	991,103	73/004,051	08/20/1974
594,085	71/656,641	08/24/1954	991,105	73/004,844	08/20/1974
594,086	71/656,791	08/24/1954	991,115	73/000,474	08/20/1974
594,090	71/602,637	08/24/1954	991,119	73/000,949	08/20/1974
594,094	71/646,689	08/24/1954	991,132	73/009,061	08/20/1974
594,095	71/646,690	08/24/1954	991,134	72/425,740	08/20/1974
594,096	71/647,888	08/24/1954	991,136	72/448,537	08/20/1974
594,104	71/649,845	08/24/1954	991,138	72/350,521	08/20/1974
594,105	71/623,572	08/24/1954	991,143	72/446,936	08/20/1974
594,107	71/651,236	08/24/1954	991,146	72/455,575	08/20/1974
594,110	71/655,556	08/24/1954	991,148	72/461,437	08/20/1974
594,111	71/649,847	08/24/1954	991,149	72/441,654	08/20/1974
594,116	71/648,127	08/24/1954	991,150	72/451,608	08/20/1974
594,129	71/617,582	08/24/1954	991,152	72/443,767	08/20/1974
594,136	71/639,924	08/24/1954	991,154	72/466,274	08/20/1974
594,147	71/646,760	08/24/1954	991,160	72/428,192	08/20/1974
594,155	71/650,288	08/24/1954	991,161	72/430,838	08/20/1974
594,156	71/650,815	08/24/1954	991,165	72/443,929	08/20/1974
594,167	71/654,502	08/24/1954	991,172	72/456,249	08/20/1974
594,171	71/654,706	08/24/1954	991,183	72/464,920	08/20/1974
594,177	71/619,212	08/24/1954	991,187	72/466,478	08/20/1974
594,179	71/622,363	08/24/1954	991,188	72/466,511	08/20/1974
594,181	71/636,607	08/24/1954	991,192	72/462,721	08/20/1974
594,194	71/651,263	08/24/1954	991,193	72/437,361	08/20/1974
594,207	71/655,175	08/24/1954	991,195	72/464,583	08/20/1974
594,221	71/653,894	08/24/1954	991,199	72/449,898	08/20/1974
594,222	71/654,111	08/24/1954	991,200	72/450,524	08/20/1974
594,223	71/654,129	08/24/1954	991,201	72/453,785	08/20/1974
594,226	71/650,672	08/24/1954	991,202	72/454,085	08/20/1974
			991,203	72/454,562	08/20/1974
			991,210	72/462,148	08/20/1974
			991,212	72/369,013	08/20/1974
			991,213	72/427,155	08/20/1974
			991,215	72/435,349	08/20/1974
			991,219	72/445,954	08/20/1974
			991,221	72/449,391	08/20/1974
			991,222	72/450,164	08/20/1974
			991,223	72/457,069	08/20/1974
			991,224	72/457,182	08/20/1974
			991,228	72/443,664	08/20/1974
			991,230	72/454,800	08/20/1974
			991,234	72/440,750	08/20/1974
			991,235	72/444,340	08/20/1974
			991,236	72/455,507	08/20/1974
			991,237	72/412,401	08/20/1974
			991,242	72/429,285	08/20/1974
			991,246	72/444,343	08/20/1974
			991,247	72/447,232	08/20/1974
			991,248	72/447,675	08/20/1974
			991,249	72/458,158	08/20/1974

Reg. Number	Serial Number	Reg. Date	991,475	72/463,013	08/20/1974
991,250	72/458,237	08/20/1974	991,477	72/463,813	08/20/1974
991,251	72/461,103	08/20/1974	991,480	72/466,353	08/20/1974
991,252	72/462,318	08/20/1974	991,482	72/467,035	08/20/1974
991,259	72/465,244	08/20/1974	991,484	72/467,205	08/20/1974
991,260	72/444,055	08/20/1974	991,489	72/463,006	08/20/1974
991,263	72/424,079	08/20/1974	991,491	72/464,100	08/20/1974
991,264	72/434,090	08/20/1974	991,492	72/465,371	08/20/1974
991,269	72/449,420	08/20/1974	991,494	72/441,473	08/20/1974
991,278	72/452,463	08/20/1974	991,495	72/459,180	08/20/1974
991,284	72/457,869	08/20/1974	991,496	72/459,354	08/20/1974
991,287	72/464,252	08/20/1974	991,499	72/425,695	08/20/1974
991,291	72/347,804	08/20/1974	991,501	72/431,601	08/20/1974
991,292	72/357,973	08/20/1974	991,507	72/448,735	08/20/1974
991,293	72/397,055	08/20/1974	991,509	72/449,779	08/20/1974
991,294	72/406,945	08/20/1974	991,510	72/449,914	08/20/1974
991,297	72/423,503	08/20/1974	991,514	72/411,717	08/20/1974
991,298	72/425,886	08/20/1974	991,515	72/431,484	08/20/1974
991,300	72/431,586	08/20/1974	991,516	72/435,405	08/20/1974
991,302	72/435,176	08/20/1974	991,518	72/439,507	08/20/1974
991,312	72/444,210	08/20/1974	991,519	72/446,127	08/20/1974
991,314	72/445,434	08/20/1974	991,520	72/459,495	08/20/1974
991,316	72/448,739	08/20/1974	991,523	72/414,796	08/20/1974
991,318	72/450,896	08/20/1974	991,529	72/443,553	08/20/1974
991,321	72/422,471	08/20/1974	991,530	72/446,079	08/20/1974
991,323	72/430,047	08/20/1974	991,532	72/449,933	08/20/1974
991,327	72/437,957	08/20/1974	991,534	72/456,389	08/20/1974
991,330	72/440,949	08/20/1974	991,536	72/457,149	08/20/1974
991,332	72/443,615	08/20/1974	991,537	72/458,081	08/20/1974
991,334	72/444,994	08/20/1974	991,538	72/459,406	08/20/1974
991,337	72/446,602	08/20/1974	991,540	72/460,308	08/20/1974
991,341	72/447,515	08/20/1974	991,542	72/460,845	08/20/1974
991,342	72/448,670	08/20/1974	991,546	72/463,829	08/20/1974
991,343	72/448,672	08/20/1974	991,547	72/463,843	08/20/1974
991,344	72/455,310	08/20/1974	991,551	72/465,423	08/20/1974
991,347	72/448,595	08/20/1974	991,557	72/452,443	08/20/1974
991,351	72/457,683	08/20/1974	991,558	72/453,612	08/20/1974
991,352	72/438,123	08/20/1974	991,561	72/458,890	08/20/1974
991,355	72/426,821	08/20/1974	991,562	72/464,866	08/20/1974
991,356	72/444,167	08/20/1974	991,568	72/457,105	08/20/1974
991,359	72/423,985	08/20/1974	991,571	72/454,038	08/20/1974
991,360	72/435,307	08/20/1974	991,572	72/454,584	08/20/1974
991,364	72/465,689	08/20/1974	991,577	72/460,945	08/20/1974
991,368	72/448,473	08/20/1974	991,581	72/466,941	08/20/1974
991,373	72/465,543	08/20/1974	991,591	72/428,672	08/20/1974
991,378	72/462,424	08/20/1974	991,595	72/442,082	08/20/1974
991,380	72/451,882	08/20/1974	991,596	72/443,909	08/20/1974
991,381	72/464,203	08/20/1974	991,597	72/443,934	08/20/1974
991,386	72/452,746	08/20/1974	991,599	72/466,458	08/20/1974
991,387	72/454,068	08/20/1974	991,602	72/409,951	08/20/1974
991,390	72/462,848	08/20/1974	991,614	72/448,395	08/20/1974
991,402	72/429,834	08/20/1974	991,615	72/448,401	08/20/1974
991,403	72/430,580	08/20/1974	991,626	72/433,489	08/20/1974
991,406	72/437,421	08/20/1974	991,627	72/433,819	08/20/1974
991,407	72/439,305	08/20/1974	991,629	72/435,827	08/20/1974
991,412	72/448,373	08/20/1974	991,631	72/436,443	08/20/1974
991,413	72/449,027	08/20/1974	991,632	72/438,281	08/20/1974
991,414	72/449,242	08/20/1974	991,635	72/441,052	08/20/1974
991,417	72/450,563	08/20/1974	991,636	72/441,053	08/20/1974
991,420	72/455,917	08/20/1974	991,637	72/443,331	08/20/1974
991,423	72/458,177	08/20/1974	991,640	72/446,524	08/20/1974
991,425	72/458,968	08/20/1974	991,644	72/466,972	08/20/1974
991,426	72/459,205	08/20/1974	991,647	72/447,103	08/20/1974
991,429	72/460,330	08/20/1974	991,650	72/453,362	08/20/1974
991,432	72/461,055	08/20/1974	991,652	72/457,371	08/20/1974
991,434	72/462,379	08/20/1974	991,653	72/459,411	08/20/1974
991,439	72/463,505	08/20/1974	991,661	72/416,565	08/20/1974
991,441	72/466,963	08/20/1974	991,662	72/434,741	08/20/1974
991,444	72/342,051	08/20/1974	991,663	72/435,893	08/20/1974
991,445	72/423,111	08/20/1974	991,665	72/445,692	08/20/1974
991,449	72/441,668	08/20/1974	991,666	72/446,868	08/20/1974
991,450	72/442,327	08/20/1974	991,670	72/458,969	08/20/1974
991,455	72/446,253	08/20/1974	991,675	72/462,117	08/20/1974
991,456	72/448,875	08/20/1974	991,676	72/464,688	08/20/1974
991,468	72/461,328	08/20/1974	991,679	72/459,771	08/20/1974
991,471	72/461,532	08/20/1974	991,680	72/466,588	08/20/1974
991,472	72/461,533	08/20/1974	991,681	72/442,014	08/20/1974
			991,683	72/447,383	08/20/1974



## Registration To Practice

The following person successfully passed the registration examination that was held November 2, 1994, and has been provisional recognized pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until his registration certificate is mailed to him. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before September 15, 1995.

Patel, Natver J., 5170 Via Daniel, Yorba Linda, Calif. 92686

June 28, 1995

KAREN L. BOVARD, *Director*  
Office of Enrollment and Discipline

## Dedication

D. 349,563 — Richard R. Henszey, Oconomowoc; Eugene R. Rommelfaenger, Neosho, both of Wis. STEAM SAMPLE COOLER. Patent dated August 9, 1994. Dedication filed April 21, 1995, by the assignee, Sentry Equipment Corp.

Hereby dedicates to the public the entire term of said patent.

## Disclaimers

4,897,015 — Robert C. Abbe, Newton; David G. Baker, North Grafton, both of Mass. ROTARY TO LINEAR MOTION ROBOT ARM. Patent dated January 30, 1990. Disclaimer filed April 27, 1995, by the assignee, ADE Corporation.

Hereby enters this disclaimer to claims 1-11 of said patent.

5,027,785 — Robert W. Deutsch, Sugar Grove, Ill. SIMPLIFIED IGNITION SYSTEM FOR MULTI-CYLINDER ENGINES. Patent dated July 2, 1991. Disclaimer filed March 31, 1995, by the assignee, Motorola, Inc.

Hereby enters this disclaimer to claims 1, 2 and 6 of said patent.

5,194,476 — Andrea Casarini, Paullo; Giorgio della Fortuna, Milan; Aurelio De Chirico, San Donato Milanese, all of Italy. COMPOSITIONS OF POLYPHENYLENE OXIDE OR MIXTURES OF POLYPHENYLENE OXIDE WITH BETA-DIKETONES. Patent dated March 16, 1993. Disclaimer filed May 25, 1995, by the assignee, ECP ENICHEM POLIMERI S.R.L.

Hereby enters this disclaimer to all claims of said patent.

5,257,557 — Ronald W. Batten, Torrance, Calif. DRIVEN TOOL LOCKING MECHANISM. Patent dated November 2, 1993. Disclaimer filed July 15, 1994, by the assignee, VSI Corporation.

Hereby enters this disclaimer to all claims of said patent.

5,278,922 — Naruto Takasaki; Yutaka Tanaka, both of Yokohama, Japan. METHOD FOR RE-TRACING THE END POINT OF AN IMAGE. Patent dated January 11, 1994. Disclaimer filed June 1, 1995, by the assignee, Hitachi Software Engineering Co., Ltd.

Hereby enters this disclaimer to claims 1-11 of said patent.

5,339,366 — Yutaka Tanaka; Naruto Takasaki, both of Yokohama, Japan. METHOD FOR THE INPUT OF A TRACE STARTING POINT OF AN IMAGE. Patent dated August 16,

1994. Disclaimer filed June 1, 1995, by the assignee, Hitachi Software Engineering Co., Ltd.

Hereby enters this disclaimer to claims 1-2, 4-5, 11-13, 15 and 20-23 of said patent.

5,359,022 — Konrad Mautner, Burgkirchen; Richard Weidner, Burghausen; Helmut Oswaldbauer, Stubenberg, all of Fed. Rep. of Germany. PROCESS FOR THE PREPARATION OF ORGANOPOLYSILOXANE RESINS. Patent dated October 25, 1994. Disclaimer filed December 5, 1994, by the assignee, Wacker-Chemie GmbH.

Hereby enters this disclaimer to claim 8 of said patent.

5,359,832 — Donn A. Hartman, Gurnee; William N. Pearson, Highland Park, both of Ill. ACCUMULATOR AND COL-LATOR FOR PACKAGING APPARATUS. Patent dated November 1, 1994. Disclaimer filed December 12, 1994, by the assignee, Cloud Corporation.

Hereby enters this disclaimer to claims 19, 60-63 of said patent.

5,371,964 — Ronald R. Kubacki, Oak Forest; Leonard J. Kubacki, Lemont, both of Ill. DISPLAY SIGN WITH COLLAPSIBLE SUPPORT BASE. Patent dated December 13, 1994. Disclaimer filed April 3, 1995, by the assignee, K-Display Corp.

Hereby enters this disclaimer to all claims of said patent.

5,384,905 — Yutaka Tanaka; Naruto Takasaki, both of Yokohama, Japan. METHOD FOR TRACING A LINE IMAGE BY MONITORING THE DISTANCE BETWEEN TWO TRACE BASE POINTS. Patent dated January 24, 1995. Disclaimer filed June 1, 1995, by the assignee, Hitachi Software Engineering Co., Ltd.

Hereby enters this disclaimer to claims 1-6 of said patent.

5,416,894 — Yutaka Tanaka; Naruto Takasaki, both of Yokohama, Japan. METHOD FOR DETERMINING A CANDIDATE OF A BRANCHED DIRECTION OF A LINEAR IMAGE. Patent dated May 16, 1995. Disclaimer filed June 1, 1995, by the assignee, Hitachi Software Engineering Co., Ltd.

Hereby enters this disclaimer to claims 1-10 of said patent.

## Disclaimers and Dedications

5,037,654 — George S. Puritch, Saanichton; Douglas McHarg, Victoria; Roderick Bradbury, Sidney; Wenda Mason, Brentwood Bay, all of Canada. SUPERSORBENT MATERIAL AS PESTICIDE POTENTIATOR. Patent dated August 6, 1991. Disclaimer and Dedication filed March 24, 1995, by the assignee, Safer, Inc.

Hereby disclaims and dedicates to the public the remaining term of said patent.

5,376,157 — Benny S. Yam, Holmdel; Amy L. Joseph, Hope-well, both of N.J.; Keith A. Jones, Yardley, Pa. LESS AGGRESSIVE BLAST MEDIA FORMED FROM COMPACTED PARTICLES. Patent dated December 27, 1994. Disclaimer and Dedication filed March 29, 1995, by the assignee, Church & Dwight Co., Inc.

Hereby disclaims and dedicates to the public the remaining term of said patent.

## Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified

mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Legkeepers, Inc., Carrollton, Tex., Reg. No. 1,545,434, for the mark "FOR YOUR LEGS ONLY", Canc. No. 22,448.

Mr. Sign Franchising Corp., Bohemia, N.Y., Reg. No. 1,471,774 for the mark "MR. SIGN", Canc. No. 21,450.

JEAN BROWN  
*Administrator,*  
*Trademark Trial and*  
*Appeal Board,*  
for Robert M. Anderson  
*Deputy Assistant*  
*Commissioner for Trademarks*

## Errata

"All reference to Patent No. 5,428,301 to David C. McClure of Texas for 'REDUNDANT LINE DECODER MASTER ENABLE' appearing in the *Official Gazette* of June 27, 1995 should be deleted since no patent was granted."

Certificates of Correction  
For The Week of August 1, 1995

P. 8,736	5,308,721	5,366,629	5,395,004
Re. 34,752	5,313,998	5,366,711	5,395,259
D. 293,775	5,315,410	5,366,779	5,395,494
D. 335,905	5,316,074	5,367,019	5,396,296
D. 356,801	5,318,164	5,368,431	5,396,317
D. 357,240	5,321,393	5,368,703	5,397,086
4,830,920	5,324,277	5,369,323	5,397,591
4,946,773	5,324,637	5,371,689	5,397,827
4,952,174	5,328,770	5,372,587	5,398,201
4,965,204	5,330,592	5,374,752	5,398,202
4,979,124	5,330,901	5,377,955	5,398,284
4,990,080	5,333,525	5,378,793	5,398,296
5,018,140	5,334,206	5,379,112	5,398,633
5,064,275	5,335,565	5,379,141	5,398,997
5,070,194	5,338,986	5,379,236	5,399,647
5,073,167	5,339,192	5,380,653	5,399,852
5,085,078	5,339,446	5,380,831	5,399,882
5,102,665	5,341,970	5,380,963	5,400,066
5,114,307	5,342,353	5,381,163	5,400,245
5,131,154	5,343,472	5,381,172	5,400,339
5,145,674	5,344,428	5,381,254	5,400,446
5,168,068	5,346,030	5,383,532	5,400,732
5,196,839	5,346,340	5,383,728	5,401,332
5,198,148	5,349,090	5,384,706	5,401,478
5,213,779	5,351,977	5,384,827	5,401,655
5,242,385	5,352,010	5,385,192	5,401,685
5,246,919	5,352,800	5,385,709	5,402,008
5,250,976	5,353,288	5,386,229	5,402,599
5,253,899	5,354,000	5,386,559	5,403,031
5,254,633	5,355,840	5,388,461	5,403,756
5,262,162	5,356,579	5,388,681	5,403,979
5,270,154	5,356,583	5,389,763	5,403,980
5,279,943	5,358,940	5,391,589	5,404,128
5,287,529	5,359,438	5,391,901	5,404,171
5,288,109	5,359,963	5,392,226	5,404,429
5,289,466	5,360,909	5,392,275	5,404,873
5,292,896	5,361,029	5,392,505	5,405,416
5,296,442	5,361,205	5,392,736	5,405,636
5,298,156	5,361,227	5,393,521	5,406,349
5,298,986	5,361,683	5,393,536	5,406,397
5,303,126	5,362,794	5,393,906	5,406,516
5,304,923	5,362,972	5,394,209	5,407,417
5,307,257	5,364,128	5,394,868	5,407,598

Summary of Final Decisions  
Issued by the  
Trademark Trial and Appeal Board  
May 22-26, 1995

Date Issued	Type of Case <sup>(1)</sup>	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's Mark and Goods/Services	Applicant's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
5-23	EX	74/1 2,615	Fabita Foods, Inc.	whether applicant's proposed amended drawing of its mark is a material alteration of the mark shown in the drawing as originally filed; 2(d)	Refusal Affirmed (on both grounds)		"MARGARITAS" (chicharrones (deep fried pork rinds), tortillas, and tortilla chips)	"MARGARITA-ALWAYS IN GOOD TASTE" (flour and processed pepper and garlic)	No
5-23	OPP	86,778	McDonald's Corp. v. McClain	2(d)	Opposition Sustained	"MCDONALD'S" (restaurant services) and a family of "MC-" formative marks (used on a wide variety of goods and services)	"MC CLAIM'S" (and design) (legal and legal consultation services)		No
5-23	OPP	83,875	Mack Trucks, Inc. v. Masfield	2(d)	Opposition Dismissed	"MACK" (trucks and a variety of vehicle-related products and services); "MAXIDYNE" (internal combustion engines); "AERO-MAX" (trucks); et al	"MIGHTY MAX" (custom built trucks; repair services, conversions, customizing and rebuilding of new and used trucks; retail truck parts and accessory store services)		No

(1) EX=EX PARTE APPEAL; OPP=OPPOSITION; CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

## SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box \_\_\_\_\_  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Box Designations	Explanation
Box 7 Box 12 Box 313b	Reissue applications for patents involved in litigation and subsequently filed related papers. Contributions to the Examiner Education Program. Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF Box DAC	Expedited procedure for processing amendments and other responses after final rejection. Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD Box FWC Box Interference Box Issue Fee	Disclosure Documents or material related to the Disclosure Document Program. Requests for File Wrapper Continuation Applications (under 37 CFR 1.62). Communications relating to interferences and applications and patents involved in interference. All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box M Fee Box MPEP Box Non-Fee-Amendment Box PATENT APPLICATION Box Pat. Ext. Box PCT Box Provisional Patent Application Box Reconstruction Box Reexam Box Sequence Box SN	Correspondence related to a patent that is subject to the payment of a maintenance fee. Submissions concerning the Manual of Patent Examining Procedures. Non-fee amendments to patent applications. (Use Box AF for responses after final rejection). New patent application and associated papers and fees. Applications for patent term extension. Mail related to applications filed under the Patent Cooperation Treaty. The filings of all provisional patent applications and any communications relating thereto.
	Correspondence pertaining to the reconstruction of lost patent files. Requests for Reexamination for <i>original</i> request papers <i>only</i> . Submission of diskette for biotechnical application. For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications <i>prior</i> to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

## SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

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Assistant Commissioner for Trademarks  
2900 Crystal Drive  
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE Box ITU FEE Box TTAB FEE Box TTAB NO FEE Box STATUS NO FEE Box POST REG FEE Box RESPONSES NO FEE	New trademark applications and fees. Statements of Use (SOU's), and extension requests. Oppositions, Cancellation petitions, and ex parte appeals. Interferences, motions and extension requests. Written status inquiries. Affidavits, renewals, corrections, and amendments. Responses to Examining Attorneys' Office actions and Post Registration actions.



## SPECIAL BOXES APPLICABLE TO BOTH PATENT AND TRADEMARK MAIL

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Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor <i>except</i> communications relating to <i>pending litigation</i> ; papers relating to pending litigation shall be mailed only to the Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks  
Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries .....	(205) 844-1747
	Birmingham Public Library .....	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library .....	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University .....	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library .....	(501) 682-2053
California	Los Angeles Public Library .....	(213) 228-7220
	Sacramento: California State Library .....	(916) 654-0069
	San Diego Public Library .....	(619) 236-5813
	San Francisco Public Library .....	(415) 557-4488
	Sunnyvale Patent Clearinghouse .....	(408) 730-7290
Colorado	Denver Public Library .....	(303) 640-6249
Connecticut	New Haven: Science Park Library .....	(203) 786-5447
Delaware	Newark: University of Delaware Library .....	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries .....	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library .....	(305) 357-7444
	Miami-Dade Public Library .....	(305) 375-2665
	Orlando: University of Central Florida Libraries .....	(407) 823-2562
	Tampa Campus Library, University of South Florida .....	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology .....	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System .....	(808) 586-3477
Idaho	Moscow: University of Idaho Library .....	(208) 885-6235
Illinois	Chicago Public Library .....	(312) 747-4450
	Springfield: Illinois State Library .....	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library .....	(317) 269-1741
	West Lafayette: Siegesmund Engineering Library, Purdue University .....	(317) 494-2872
Iowa	Des Moines: State Library of Iowa .....	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University .....	(316) 689-3155
Kentucky	Louisville Free Public Library .....	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University .....	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine .....	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland .....	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts .....	(413) 545-1370
	Boston Public Library .....	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan .....	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University .....	(616) 592-3602
	Detroit Public Library .....	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center .....	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission .....	(601) 359-1036
Missouri	Kansas City: Linda Hall Library .....	(816) 363-4600
	St. Louis Public Library .....	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library .....	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln .....	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library .....	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library .....	(603) 862-1777
New Jersey	Newark Public Library .....	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University .....	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library .....	(505) 277-4412
New York	Albany: New York State Library .....	(518) 474-5355
	Buffalo and Erie County Public Library .....	(716) 858-7101

## Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	Name of Library	Telephone Contact
North Carolina	New York Public Library (The Research Libraries)	(212) 930-0917
	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
Ohio	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: The Free Library of	(215) 686-5331
	Pittsburgh: Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
	Mayaguez General Library, University of Puerto Rico	Not Yet Operational
Puerto Rico	Providence Public Library	(401) 455-8027
Rhode Island	Clemson University Libraries	(803) 656-3024
South Carolina	Rapid City: Devereaux Library, South Dakota	
	School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
	Seattle: Engineering Library, University of Washington	(206) 543-0740
Washington	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
West Virginia	Madison: Kurt F. Wendt Library, University of Wisconsin	
Wisconsin	Madison	(608) 262-6845
Wyoming	Milwaukee Public Library	(414) 286-3051
	Casper: Natrona County Public Library	(307) 237-4935

## PATENT EXAMINING CORPS

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 EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents  
 STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy  
 J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
<b>CHEMICAL EXAMINING GROUPS</b>		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100— JOHN E. KITTLE, Director	308-0661	03/24/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	06/14/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	08/13/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	07/07/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	01/11/94
<b>ELECTRICAL EXAMINING GROUPS</b>		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	08/30/93
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	01/11/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300— BOBBY R. GRAY, Director	305-9600	04/14/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	308-0771	03/17/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500— JANICE A. HOWELL, Director	308-0956	02/01/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	11/30/93
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	01/10/94
<b>MECHANICAL EXAMINING GROUPS</b>		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	04/25/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	02/22/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	05/30/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	04/07/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	04/11/94

\*A communication from the examiner should have been received in most applications filed prior to this date.



## TRADEMARK OPERATION

Bruce Lehman, Commissioner  
 Philip G. Hampton II, Assistant Commissioner  
 Robert M. Anderson, Deputy Assistant Commissioner  
 David E. Bucher, Director, Trademark Examining Operation  
 Condition of Trademark Applications as of July 1, 1995

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 3—Kathryn A. Erskine, Managing Attorney, (703) 308-9103 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/13/95	05/30/95
Law Office 4—Sharon Marsh, Managing Attorney, (703) 308-9104 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21, Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/24/95	05/08/95
Law Office 5—Mary Sparrow, Managing Attorney, (703) 308-9105 Cosmetics, Cleaning Preparations, Paper Products and Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/27/95	03/01/95
Law Office 6—Myra Kurzbard, Managing Attorney, (703) 308-9106 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21, Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/27/95	03/06/95
Law Office 7—David Shallant, Managing Attorney, (703) 308-9107 Lubricants, Fuels, Industrial Equipment & Materials—Int. Classes 4, 6, 11, 14, 19 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/06/95	05/01/95
Law Office 8—Thomas Lamone, Managing Attorney, (703) 308-9108 Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/13/95	05/01/95
Law Office 9—Sidney Moskowitz, Managing Attorney, (703) 308-9109 Lubricants, Industrial Equipment, Materials & Musical Instruments—Int. Classes 4, 6, 7, 8, 12, 13, 15, 16, 17, 18, 19, Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/31/95	04/12/95
Law Office 10—Jean Logan, Managing Attorney, (703) 308-9110 Cordage, Fibers, Yarns, Threads, Fabrics, Clothing & Floor Coverings— Int. Classes 22, 23, 24, 25, 26, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/08/95	04/03/95
Law Office 11—Thomas Howell, Managing Attorney, (703) 308-9111 Paints, Pharmaceuticals & Medical Apparatus—Int. Classes 2, 5, 10 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/17/95	02/27/95
Law Office 12—Deborah Cohn, Managing Attorney, (703) 308-9112 Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/27/95	04/17/95
Law Office 13—Craig Morris, Managing Attorney, (703) 308-9113 Chemicals, Food, Beverages, Wines & Spirits—Int. Classes 1, 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/01/94	04/03/95
Law Office 14—Ron Williams, Managing Attorney, (703) 308-9114 Chemicals, Food, Beverages, Wines & Spirits—Int. Classes 1, 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/21/94	05/25/95
Law Office 15—Paul Fahrenkopf, Managing Attorney, (703) 308-9115 Rubber, Leather Goods & Clothing—17, 18, 25 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/02/95	03/29/95
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Jodi Rush, Director (703) 308-9000		
Post Registration Section—Jacqueline Cole, Managing Attorney, (703) 308-9500		
Affidavits Under Sections 8 & 15 (All Classes)	08/10/94	—0—
Renewals (All Classes)	05/03/95	—0—
Section 12(C) Publications (All Classes)	—0—	—0—

1. \*\* Assigned to each law office
2. Applicants with inquiries concerning the status of their applications and a touch tone phone should call (703) 308-8747 from 6:30 a.m. to Midnight Est, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See Section 411 of the *Trademark Manual of Examining Procedure*.
3. \* These dates identify the oldest unassigned new case in each law office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examiner.

## REEXAMINATIONS

AUGUST 1, 1995

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

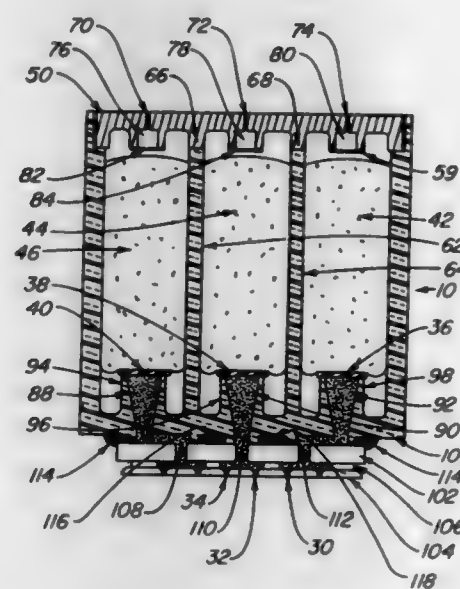
B1 4,771,295 (2642nd)

THERMAL INK JET PEN BODY CONSTRUCTION  
HAVING IMPROVED INK STORAGE AND FEED  
CAPABILITY

Jeffrey P. Baker; Duong T. La, both of San Diego, and Randy A. Coverstone, Newark, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Reexamination Request No. 90/003,559, Sep. 1, 1994.  
 Reexamination Certificate for Patent No. 4,771,295, issued Sep.  
 13, 1988, Ser. No. 880,774, Jul. 1, 1986.  
 Int. Cl.<sup>6</sup> B41J 2/05, 2/21, 2/175

U.S. Cl. 347—87



AS A RESULT OF REEXAMINATION, IT HAS BEEN  
DETERMINED THAT:

Claims 5 and 7 are cancelled.

Claims 1, 4, 6, 8, 10 and 11 are determined to be patentable  
as amended.

Claims 2, 3 and 9, dependent on an amended claim, are  
determined to be patentable.

New claims 12-23 are added and determined to be patent-  
able.

1. A process for feeding ink to an ink jet printhead which  
comprises the steps of:

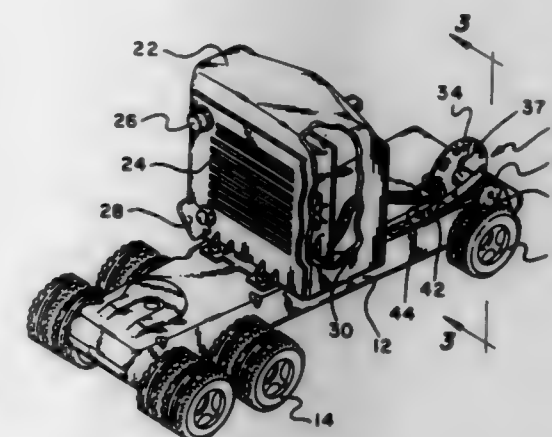
- a. storing ink in a reticulated polyurethane foam of controlled capillary force, said foam having a compressed region of increased capillarity provided by an ink pipe and mesh filter that are in compressive contact with said foam,
- b. bringing said foam into ink flow communication with said printhead, and
- c. passing ink from said foam through said compressed region of increased capillarity, through said filter and ink pipe, and through ink ejection orifices in said printhead, whereby ink is communicated from said foam to said printhead with [a] said controlled capillary force.

B1 5,045,016 (2643rd)

TOY VEHICLE WITH ELECTRONIC SOUNDER AND  
DIRECTION SENSOR

Carl M. Stern, Pennington; Richard N. Meckstroth, Princeton, and Stephen L. Hayes, East Windsor, all of N.J., assignors to Innova Development Corporation, Pennington, N.J.

Reexamination Request No. 90/002,820, Aug. 25, 1992.  
 Reexamination Certificate for Patent No. 5,045,016, issued Sep.  
 3, 1991, Ser. No. 557,638, Jul. 23, 1990.  
 Division of Ser. No. 431,020, Nov. 1, 1989, Pat. No. 4,946,416  
 Int. Cl.<sup>6</sup> A63H 5/00, 17/00, 17/26, 33/26  
 U.S. Cl. 446—409



AS A RESULT OF REEXAMINATION, IT HAS BEEN  
DETERMINED THAT:

The patentability of claims 6-11, 13, 16 and 18-24 is con-  
firmed.

Claims 12, 13, 14 and 17 are cancelled.

Claims 2, 3 and 4, dependent on an amended claim, are  
determined to be patentable.

1. In a toy wheeled vehicle including electronic sound generating means for generating a first sound when said vehicle is at rest and when said vehicle is moving but which changes when said vehicle is moved, the improvement comprising: means for determining whether said vehicle is moving in a forward or reverse direction, and said electronic sound generating means [for] generating a second sound different from said [first-mentioned] first sound when said determining means determines that said vehicle is moving in a reverse direction, said second sound being generated concurrently with said [first-mentioned] first sound.



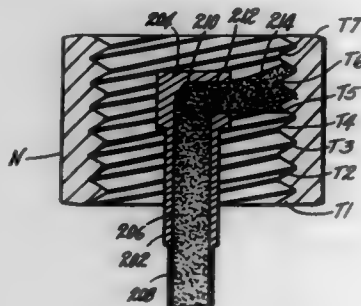
**B1 5,221,170 (2644th)  
COATED THREADED FASTENERS**

Richard J. Duffy, Utica; Joseph R. Dudley, Southfield; Gregory A. Fruche, Kalamazoo, and Max F. Dorflinger, Washington, all of Mich., assignors to Nylok Fastener Corporation, Rochester, Mich.

Reexamination Request No. 90/003,628, Nov. 9, 1994.  
Reexamination Certificate for Patent No. 5,221,170, issued Jan. 22, 1993, Ser. No. 716,761, Jan. 18, 1991.

Continuation of Ser. No. 281,633, Dec. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 907,582, Sep. 15, 1986, Pat. No. 4,775,555, and a continuation-in-part of Ser. No. 913,339, Sep. 30, 1986, Pat. No. 4,835,819

Int. Cl.<sup>6</sup> F16B 25/00, 37/00; B21D 53/20  
U.S. Cl. 411-428



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 19-27 and 30 is confirmed.

Claims 3 and 17 are cancelled.

Claims 1, 14, 18 and 28 are determined to be patentable as amended.

Claims 2, 4-13, 15, 16 and 29, dependent on an amended claim, are determined to be patentable.

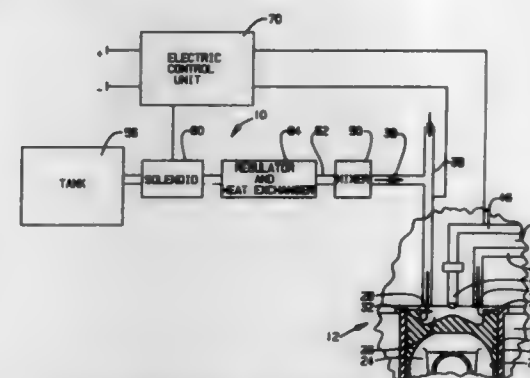
1. A threaded article having a fluoropolymer coating on its [thread] threads, comprising:
  - a fastener having a threaded portion adapted for uniform engagement with a mating fastener;
  - a fluoropolymer masking and insulating coating deposited on said fastener to form a substantially uniform layer covering [at least a part] substantially all of said threaded portion enabling the mating fastener to couple with said threaded article;
  - said fastener being heated, prior to the deposition of said coating, to a temperature sufficient to enable [said coating] a powdered form of said fluoropolymer to adhere to said threaded portion; and
  - said threaded article being capable of exhibiting substantially uniform torque-tension curve behavior during engagement with said mating fastener, and said coating being substantially resistant to the deposition of corrosion resistant materials.

## STATUTORY INVENTION REGISTRATIONS

PUBLISHED AUGUST 1, 1995

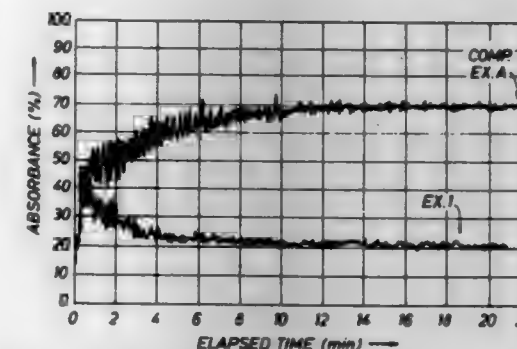
A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

**H1466  
OXYGEN INJECTION SYSTEM**  
Roger A. Stapf, Dunlap, Ill., assignor to Caterpillar Inc., Del.  
Filed Jan. 19, 1994, Ser. No. 183,616  
Int. Cl.<sup>6</sup> F02B 23/00  
U.S. Cl. 123-585



1 Claim

surfactants and alkyl-substituted phenol ethoxylate surfactants having an average of between about 3 and about 12 ethylene oxide units per ethoxylate molecule, and between about 0.1



percent by weight and about 60 percent by weight, basis the total weight of the surfactant composition, of one or more secondary alkyl sulfate compounds.

1. An oxygen injection system adapted for use with a diesel engine including a cylinder block defining a bore having a cylinder liner therein defining a cylinder bore, a cylinder head attached to the cylinder block in closing relation to the cylinder bore, a piston reciprocally mounted in the cylinder bore and defining with the cylinder block a variable volume combustion chamber, and an intake pipe fluidly connected to the combustion chamber for communicating ambient air into the combustion chamber during an intake cycle of the engine, comprising:
  - an oxygen mixer connected to the intake pipe;
  - an oxygen supply pipe connected at an end to the oxygen mixer;
  - a liquified oxygen storage tank connected to the oxygen supply pipe at an opposite end;
  - a main valve having a normally closed position and an open position disposed within the oxygen supply pipe between the oxygen storage tank and the oxygen mixer;
  - a regulator and heat exchanger disposed within the oxygen supply pipe between the main valve and the oxygen mixer; and
  - means for controllably opening the main valve under predetermined engine operating conditions so that liquid oxygen from the oxygen storage tank is converted to a gaseous state and is communicated to the oxygen mixer in order to combine with the ambient air in the intake pipe.

**H1467  
DETERGENT FORMULATIONS CONTAINING A SURFACE ACTIVE COMPOSITION CONTAINING A NONIONIC SURFACTANT COMPONENT AND A SECONDARY ALKYL SULFATE ANIONIC SURFACTANT COMPONENT**

Nelson E. Prieto, Richmond; Kirk H. Raney, Sugar Land, and Werner Lillenthal, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 16, 1993, Ser. No. 153,385  
Int. Cl.<sup>6</sup> C11D 7/18, 7/38, 7/56

U.S. Cl. 252-99

1. A detergent formulation which comprises a surfactant composition which comprises between about 0.1 percent by weight and about 56 percent by weight, basis the total weight of the surfactant composition, of one or more nonionic surfactants selected from the group consisting of alcohol ethoxylate

14 Claims

**H1468  
DETERGENT COMPOSITIONS CONTAINING CELLULASE ENZYME AND SELECTED PERFUMES FOR IMPROVED ODOR AND STABILITY**  
Jill B. Costa, and Michael S. Showell, both of The Procter & Gamble Company, Ivorydale Technical Center, 5299 Spring Grove Ave., Cincinnati, Ohio 45217  
Filed Apr. 28, 1994, Ser. No. 234,077  
Int. Cl.<sup>6</sup> C11D 17/00

U.S. Cl. 252-174.12

1. A detergent composition comprising:
  - (a) a cellulase enzyme; and
  - (b) a perfume containing at least 25% by weight of at least one fragrance material selected from the group consisting of aliphatic ketones with a molecular weight of between 200 and 350 AMU, aromatic ketones with a molecular weight of between 150 and 350 AMU, aliphatic aldehydes with a molecular weight of between 160 and 350 AMU, aromatic aldehydes with a molecular weight of between 150 and 350 AMU, condensation products of aldehydes and amines with a molecular weight between 190 and 350 AMU, aromatic and aliphatic lactones with a molecular weight between 140 and 350 AMU, aromatic and aliphatic ethers with a molecular weight between 150 and 350 AMU, aliphatic alcohols with a molecular weight between 200 and 350 AMU, aromatic and aliphatic esters with a molecular weight between 190 and 350 AMU and mixtures thereof;

wherein said perfume is substantially free of halogenated fragrance materials and nitromusks.

**H1469  
REMOTELY PILOTED VEHICLE CONTROL AND INTERFACE SYSTEM**  
Adam J. Simonoff, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 3, 1992, Ser. No. 940,159  
Int. Cl.<sup>6</sup> H04Q 9/00

U.S. Cl. 341-176

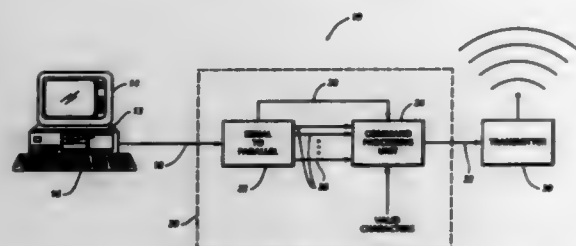
6. A remotely piloted vehicle control and interface system, comprising:
  - a computer having a serial communication port to pass a

12 Claims



character thereover, wherein said computer generates a serial data stream at said serial communication port indicative of the character;

shift register means for converting the serial data stream to a parallel data character, said shift register means continuously generating a status signal indicating one of the presence or absence of the parallel data character;



data processing means, responsive to the status signal indicating the presence of the parallel data character for comparing the parallel data character with a set of valid control characters and for generating a control signal when the parallel data character matches one character from the set of valid control characters; and

transmitter means responsive to the control signal for transmitting a radio frequency control signal to the remotely piloted vehicle.

## H1470

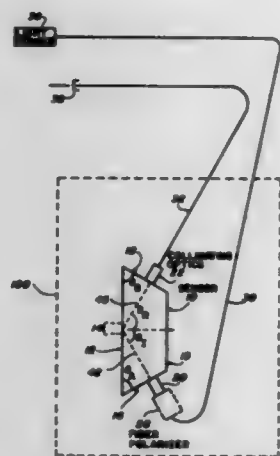
## REFRACTIVE INDEX-BASED SENSOR FOR THE DISCRIMINATION OF CHLORINATED HYDROCARBONS FROM GROUNDWATER

Kenneth J. Ewing, 13011 Victoria Hgts. Dr., Bowie, Md. 20715; Gregory Naa, 819 Church St., Alexandria, Va. 22314; Thomas Bilodeau, 408 Timber Branch Pkwy., Alexandria, Va. 22302; Irwin Schneider, 2402 Daphne La., Alexandria, Va. 22306, and Ishwar Aggarwal, 9810 View Crest Dr., Fairfax Station, Va. 22039

Filed Mar. 28, 1994, Ser. No. 219,188  
Int. Cl.<sup>6</sup> G01N 21/41

U.S. Cl. 356—128

8 Claims



1. An apparatus for detecting liquid materials, said apparatus comprising:

a light source;

a sensor selected to have a shape such that light directed into said sensor has a specific angle of incidence, said angle of incidence selected for detecting a plurality of liquids;

means for collimating light from said light source and directing said light into said sensor;

means for collecting light reflected within said sensor; and

means for detecting said collected light.

## H1471

METAL SUBSTRATE DOUBLE SIDED CIRCUIT BOARD

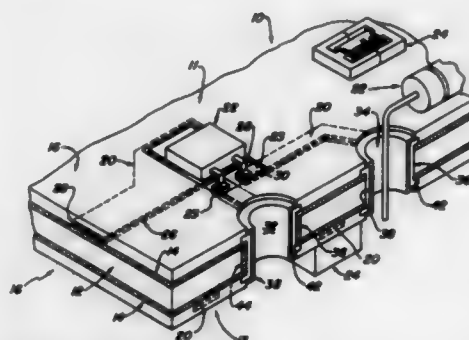
David J. Braun, 407 E. 5th St., St. Charles, Minn. 55972; Charles J. Guenther, 2605 25th St. NW., James A. Hagan, 4021 17th Ave. NW., both of Rochester, Minn. 55901; Mark K. Hoffmeyer, 2905 Shadow Dr. SE., Rochester, Minn. 55904; Steven D. Keidl, 6422 16th Ave. NW., Rochester, Minn. 55901; Timothy C. Daun-Lindberg, 3123 Crescent La. NW., Rochester, Minn. 55901; John G. Stephanie, 1117 20th St. NW., Rochester, Minn. 55901, and Vincent W. Ting, 1807-4A Greenfield La. SW., Rochester, Minn. 55902

Filed Apr. 26, 1993, Ser. No. 53,933

Int. Cl.<sup>6</sup> H02B 1/56; H05K 7/20

U.S. Cl. 361—704

6 Claims



1. A circuit board comprises:

a metal core having parallel first and second major faces and exhibiting high thermal and electrical conductivity;

dielectric layers of thermally conductive material applied to the first and second major faces of the metal core;

a plurality of insulated and grounded vias through metal core and the dielectric layers;

an electrically conductive sleeve within each insulated and grounded vias, wherein the electrically conductive sleeves in the insulated vias are electrically insulated from the metal core by dielectric material and the electrically conductive sleeves in the grounded vias are in electrical contact to the metal core for grounding; and

electrically conductive leads connected to selected ones of the electrically conductive sleeves and applied to each of the dielectric layers and spaced thereby from the metal core.

## H1472

## COMPUTER INTERFACE ADAPTER FOR SUPPORTING DATA COMMUNICATION BETWEEN A PARALLEL SIGNAL DEVICE AND A SERIAL SIGNAL DEVICE

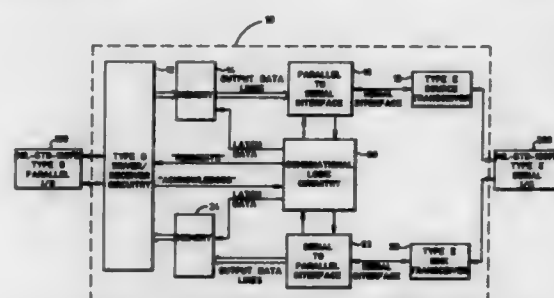
Matthew T. Tran, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 11, 1992, Ser. No. 944,155

Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 395—500

3 Claims



1. A computer interface adapter for transferring data between a parallel signal device operating at a first digital voltage

level and a serial signal device operating at a second digital voltage level, comprising:

first means for converting data between said first digital logic level and a third digital logic level;

second means for converting data between said second digital voltage level and said third digital logic level;

third means for storing data at said third digital logic level in a parallel format;

fourth means for converting between said data stored in parallel format and serial data at said third digital logic level; and

combinational logic means for controlling data transfers between said first means, said second means, said third means and said fourth means.

## H1473

## CLEAR ANTIPERSPIRANT STICKS

Steven A. Orofino, 1156 Wells Pl., Stratford, Conn. 06497, and Matthew F. Kuznitz, 144 Austin Ryer La., Branford, Conn. 06405

Filed Mar. 22, 1994, Ser. No. 216,111

Int. Cl.<sup>6</sup> A61K 7/36, 7/32

U.S. Cl. 424—67

4 Claims

1. An antiperspirant composition comprising:

(i) from about 1 to about 50% by weight of an astringent antiperspirant-active salt;

(ii) from about 5 to about 60% of a C<sub>2</sub>-C<sub>12</sub> polyhydric alcohol;

(iii) from about 0.5 to about 10% of dibenzyl monosorbitol acetal; and

(iv) from about 0.1 to about 20% of a borate salt, wherein the composition has a pH of at least 4.

## H1474

## TITANYL PHTHALOCYANINE IMAGING MEMBER AND PROCESSES

Trevor I. Martin, 502 Shannon Crescent, Burlington, Ontario, Canada L7L 2R8; Sharon E. Normandin, 4650 County Line Rd., Macedon, N.Y. 14502; Kathleen M. Carmichael, 5689 Pease Rd., Williamson, N.Y. 14589, and Donald P. Sullivan, 20 Chadwick Dr., Rochester, N.Y. 14618

Filed Aug. 13, 1993, Ser. No. 107,108

Int. Cl.<sup>6</sup> H01M 2/36

U.S. Cl. 430—78

10 Claims

1. A process for increasing the imaging cyclic stability of titanyl phthalocyanines by adding to said titanyl phthalocyanines a perylene.

## H1475

## PROCESS FOR HALOGENATING PARA-ALKYL STYRENE/ISOOLEFIN COPOLYMERS

Neil F. Newman, 21 Eagle Rd., Edison, N.J. 08820; Donald A. White, 3T Greenfield Gardens, Edison, N.J. 08837; Lawrence W. Flatley, 524 Andria Dr., Somerville, N.J. 08876, and William M. Davis, 715 Saint Marks Ave., Westfield, N.J. 07090

Filed Jul. 2, 1990, Ser. No. 547,480

Int. Cl.<sup>6</sup> C08F 12/08; C08C 19/14

U.S. Cl. 525—333.4

56 Claims

1. A process for halogenating a polymer in the melt phase, which comprises: contacting a copolymer of an isooolefin having from 4 to 7 carbon atoms and a para-alkylstyrene with a halogenating agent, in a continuous flow device, at reaction conditions, in a reaction zone, to produce a halogenated copolymer of said isooolefin and said para-alkylstyrene, said halogenated copolymer comprising a para-haloalkyl group.



## REISSUES

AUGUST 1, 1995

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,005

**REPLACEMENT SPONGE ASSEMBLY FOR MOPS**  
Bonifacio Torres, Matteson, Ill., assignor to M. B. Walton, Inc.,  
Chicago, Ill.  
Original No. 4,908,901, dated Mar. 20, 1990, Ser. No. 271,162,  
Nov. 14, 1988. Application for reissue Feb. 28, 1992, Ser. No.  
843,505

Int. Cl.<sup>6</sup> A47L 13/24

U.S. Cl. 15—119.1

15 Claims



7. A sponge assembly for use with a sponge mop comprising an elongated channel-shaped sponge carrier having secured therein a mop sponge, the elongated channel-shaped sponge carrier having on its top surface a centrally located upraised tunnel portion forming a latch hook for attachment of the sponge carrier to a mop, the upraised tunnel portion on the top surface of the sponge carrier having an opening therein for attachment of the sponge carrier to a mop, the elongated channel-shaped sponge carrier having on its top surface two spaced apart tabs bendable between a substantially vertical position and a substantially horizontal position, each of said tabs having openings therein for reception of mop connection elements.

Re. 35,006

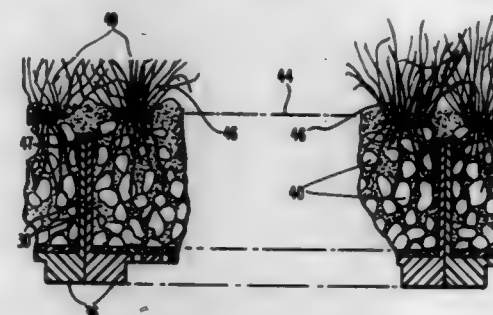
**TURFING SYSTEMS FOR STADIA**

Thomas L. Ripley, Sr., Chalfont, Pa., and Henry Indyk, Somerset, N.J., assignors to The Greenway Services, Inc., Horsham, Pa.  
Original No. 5,187,894, dated Feb. 23, 1993, Ser. No. 594,355,  
Oct. 9, 1990. Application for reissue Oct. 4, 1993, Ser. No.  
131,531

Int. Cl.<sup>6</sup> A01G 9/02

U.S. Cl. 47—66

4 Claims



6. A transportable, natural turf activity surface comprising: a plurality of transportable turf units comprising a growing pan having side walls and containing plant growing medium together with growing, substantially entire, turf plants; said growing, substantially entire turf plants being maintained at a level above said side walls, said turf units cooperating with said other turf units to provide a substantially flat, substantially continuous turf surface over said plurality of said transportable growing pans; wherein the plant growing medium comprises: at least about 48% sand;

about 10 to about 20% humus;  
up to about 7% clay;  
up to about 5% silt;

said sand fraction being blended with at least 30% by volume of shaped pieces of expanded polymer selected to be substantially inert to plant growth chemistry.

Re. 35,007

**PREPARATION OF CHEMILUMINESCENT VINYL HALIDE OR VINYLIDENE HALIDE POLYMER STRUCTURES**

Martin L. Cohen, White Plains, N.Y.; William E. Bay, Ridgefield, Conn., and Lynn E. Errigo, Port Chester, N.Y., assignors to Omniglow Corporation, Novato, Calif.  
Original No. 5,173,218, dated Dec. 22, 1992, Ser. No. 632,844,  
Dec. 24, 1990. Application for reissue Jan. 13, 1994, Ser. No.  
180,609

Int. Cl.<sup>6</sup> C09K 3/00, 11/06; F21K 2/00

U.S. Cl. 252—700

12 Claims

1. A porous, flexible structure comprising A) a non-particulate phase comprising a vinyl halide or vinylidene halide polymer having a molecular weight of about 100,000 to about 500,000 which constitutes about 0.5 to about 15.0 weight percent of [the structure] total polymer, B) an agglomerated particle phase comprising either 1) about 85.0 to about 99.5 weight percent of total polymer of vinyl halide or vinylidene halide polymer particles having a diameter of from about 25 to about 125 microns and a molecular weight of from about 50,000 to about 120,000, or mixtures of said particles, or 2) about 45 to about 98.5 weight percent of total polymer of vinyl halide or vinylidene halide polymer particles having a diameter of from about 25 to about 125 microns and a molecular weight of from about 50,000 to about 120,000, or mixtures of said particles, and about 1 to about 40 weight percent of total polymer of vinyl halide or vinylidene halide polymer particles having a diameter of from about 130 to about 225 microns and a molecular weight of from about 100,000 to about 225,000 and C) a plasticizer comprising a solvent solution of a chemiluminescent compound and, optionally, a fluorescer, dispersed throughout both said phases.

Re. 35,008

Patent Not Issued For This Number

Re. 35,009

**DIKETOPYRROLOPYRROLE PIGMENTS IN PLATELET FORM**

Philippe Bagnon, Essert; Fritz Herren, Düringen, and Bernhard Medinger, Giffers, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.  
Original No. 5,095,122, dated Mar. 10, 1992, Ser. No. 552,626,  
Jul. 13, 1990. Application for reissue Oct. 28, 1993, Ser. No.  
145,706

Claims priority, application Switzerland, Jul. 13, 1989,  
2630/89

Int. Cl.<sup>6</sup> C07D 487/04; C09B 67/20; D06P 1/64

U.S. Cl. 548—453

4 Claims

1. A diketopyrrolopyrrole organic pigment, which consists of at least 50% by weight of platelets which are from 5 to 50  $\mu\text{m}$  long, 2 to 50  $\mu\text{m}$  wide and 0.01 to 5  $\mu\text{m}$  thick, with the proviso that the ratios of length:thickness and width:thickness must be at least 3.



# PLANT PATENTS

GRANTED AUGUST 1, 1995

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,222  
**SHRUB ROSE PLANT NAMED 'LOUIS JOLLIET'**  
 Felicitas J. Svejda, Nepean, Canada, assignor to Her Majesty the Queen in Right of Canada, as represented by the Minister of Agriculture, Ottawa, Canada  
 Filed Mar. 22, 1994, Ser. No. 215,825  
 Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—1 1 Claim  
 1. A new and distinct variety of shrub rose plant characterized by the following combination of characteristics:

- (a) exhibits a spreading and trailing growth habit with glossy foliage,
  - (b) forms on a generally continuous basis in clusters attractive Roseine Purple blossoms,
  - (c) propagates well by the use of softwood cuttings,
  - (d) exhibits a good winter hardiness, and
  - (e) is particularly well suited for growing in the landscape;
- substantially as herein shown and described.

9,223  
**HYBRID TEA ROSE PLANT NAMED 'MEIGAFOR'**  
 Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.  
 Filed Sep. 28, 1994, Ser. No. 314,388  
 Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—15 1 Claim  
 1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

- (a) forms in abundance double light Creamy White blossoms that initially assume an urn-shaped configuration and are light suffused with light Chartreuse Green,
  - (b) is particularly suited for cut flower production, and
  - (c) exhibits excellent disease resistance;
- substantially as herein shown and described.

9,224  
**'LATE FRY' MUSCADINE GRAPE**  
 William G. Ison, Box 190, Brooks, Ga. 30205  
 Filed May 12, 1994, Ser. No. 241,726  
 Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—47.2 1 Claim  
 1. The new and distinct variety of grape plant as described and illustrated.

9,225  
**MUSCADINE GRAPE 'EARLY FRY'**  
 William G. Ison, 3801 Johnson Dr., Lithonia, Ga. 30058  
 Filed May 12, 1994, Ser. No. 241,750  
 Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—47.2 1 Claim  
 1. The new and distinct variety of grape plant as described and illustrated.

9,226  
**IMPATIENS PLANT NAMED BLUES**  
 Klara Dehan, Holon, Israel, assignor to Danziger - "Dan" Flower Farm, Moshav Mishmar Hashiva, Israel  
 Filed Sep. 30, 1994, Ser. No. 315,811  
 Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—87.6 1 Claim  
 1. A new and distinct cultivar of Impatiens plant named Blues, as illustrated and described.

9,227  
**IMPATIENS PLANT NAMED ROCK**  
 Klara Dehan, Holon, Israel, assignor to Danziger - "Dan" Flower Farm, Post Beit Dagan, Israel  
 Filed Sep. 30, 1994, Ser. No. 316,093  
 Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—87.6 1 Claim  
 1. A new and distinct cultivar of Impatiens plant named Rock, as illustrated and described.

9,228  
**GERANIUM PLANT NAMED BFP-445 SALMON**  
 Scott C. Trees, Arroyo Grande, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.  
 Filed Nov. 15, 1994, Ser. No. 341,911  
 Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—87.12 1 Claim  
 1. A new and distinct Geranium cultivar, substantially as herein shown and described, which:

- (a) exhibits attractive medium salmon semi-double florets,
- (b) forms attractive dark green foliage with zonation, and
- (c) exhibits a medium self-branching growth.

9,229  
**GERANIUM PLANT NAMED 'STARBURST RED'**  
 Scott C. Trees, Arroyo Grande, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.  
 Filed Nov. 15, 1994, Ser. No. 341,913  
 Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—87.12 1 Claim  
 1. A new and distinct cultivar of Geranium plant named Starburst Red substantially as herein shown and described, which:

- (a) exhibits single multi-patterned red, white, and pink florets,
- (b) forms medium green foliage with zonation, and
- (c) exhibits a medium growth habit.

9,230  
**GERANIUM PLANT NAMED 'BFP-285 PINK PARFAIT'**  
 Scott C. Trees, Arroyo Grande, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.  
 Filed Nov. 15, 1994, Ser. No. 341,914  
 Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—87.12 1 Claim  
 1. A new and distinct Geranium plant named 'BFP-285 Pink Parfait', substantially as herein shown and described, which:

- (a) exhibits attractive semi-double florets having petals with a background color of lavender pink with a large dark purple freckle on each petal which fades to white at the attachment point,
- (b) forms medium green foliage with some zonation on younger leaves, and
- (c) exhibits a medium self-branching growth habit.

9,231  
**GERANIUM PLANT NAMED 'PINK PEARL'**  
 Scott C. Trees, Arroyo Grande, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.  
 Filed Nov. 15, 1994, Ser. No. 341,915  
 Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—87.12 1 Claim  
 1. A new and distinct cultivar of Geranium plant named Pink Pearl, substantially as herein shown and described, which:



- (a) exhibits attractive perfectly formed semi-double light lavender pink florets with white eyes,  
(b) forms medium green foliage with zonation, and  
(c) exhibits a medium self-branching growth habit.

**PATENTS****GRANTED AUG. 1, 1995****ERRATA**

For CLASS	See PATENT NO.
002-414 .....	5,437,064
049-465 .....	5,437,115
451-008 .....	5,437,125
070-358 .....	5,437,176
600-217 .....	5,437,266
180-069 .....	5,437,348
180-079 .....	5,437,349
180-287 .....	5,437,350
242-356 .....	5,437,416
242-541 .....	5,437,417
472-116 .....	5,437,573
474-218 .....	5,437,577
216-085 .....	5,437,761
216-020 .....	5,437,762
216-018 .....	5,437,763
216-014 .....	5,437,764
216-051 .....	5,437,765
435-069 .....	5,437,951
435-240 .....	5,437,958
310-090 .....	5,438,038
218-118 .....	5,438,174
313-493 .....	5,438,343
346-135 .....	5,438,348
346-136 .....	5,438,349
359-075 .....	5,438,421
361-191 .....	5,438,489
369-036 .....	5,438,534
395-183 .....	5,438,574
378-082 .....	5,438,613
364-419 .....	5,438,664

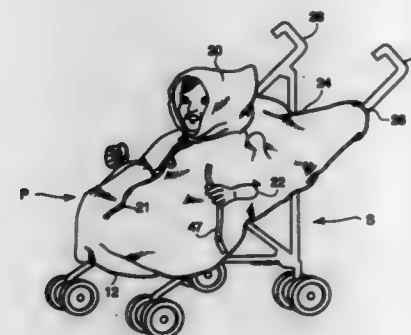
# PATENTS

GRANTED AUGUST 1, 1995

## GENERAL AND MECHANICAL

5,437,061  
**PROTECTIVE GARMENT-TYPE COVER FOR USE WITH  
 CHILD USERS AND CARRIAGES THEREFOR**  
 Michael Keener, 425 S. Catalina Ave. No. 6, Redondo Beach,  
 Calif. 90277

Filed Sep. 2, 1993, Ser. No. 116,121  
 Int. Cl.<sup>6</sup> A41D 3/08, 11/00  
 U.S. Cl. 2—69 20 Claims



1. A protective garment-type cover for disposition over a child user and for potential disposition over a carriage having a seat section with a peripheral wall and an underside for such child user, said protective garment-type cover comprising:

- a) a flexible and foldable material sheet having a partially enclosing continuous wall forming an upper section to surround a torso of a child user and a lower section;
- b) an enlarged opened lower end in said lower section for disposition over a child user and for disposition over a portion of a carriage for said child user;
- c) an opened neck region in said partially enclosing continuous wall of Said upper section to allow the head of the child user to project outwardly of the continuous wall when in use and with the continuous wall protecting the remaining portion of the child user from inclement weather when fully surrounding the child user and draped over a portion of the carriage;
- d) said lower section having an enlarged portion forming part of said partially enclosing continuous wall and which extends around and envelopingly surrounds the seat section of the carriage, said enlarged portion of said lower section having a size sufficient to cover the peripheral wall and extend beneath the underside of said seat section where, in fully isolating the seat section from rain and completely enclosing the child and seat so that only the arms and head of the child may be exposed in inclement weather; and
- e) the flexible and foldable material sheet being light in weight and capable of being folded into a small compact unit for storage and transportation and capable of being easily and rapidly opened for disposition over a child user and over a carriage therefor.

5,437,062  
**BASEBALL CAP WITH DETACHABLE VISOR**  
 Bradley D. Douglas, 416 Green St. #3, Boone, Iowa 50036  
 Filed Mar. 15, 1994, Ser. No. 213,029  
 Int. Cl.<sup>6</sup> A42B 1/20

U.S. Cl. 2—195.1 8 Claims

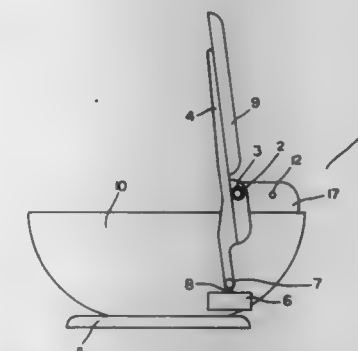
- 1. A baseball cap construction consisting of:  
 a cap body member having a reinforced front crown portion, a reinforced rear crown portion and an inner periphery encircled by an elongated strip of a first hook and loop fastening component;  
 at least one conventionally configured baseball cap visor unit comprising a generally stiff visor member having a

raised inboard lip with a front face covered by a second hook and loop fastening component; and, further provided with a discrete looped tab for facilitating the disengagement of said first and second hook and loop fastening components from their operative engagement with one another; and,



at least one additional conventionally configured baseball cap visor unit comprising a generally stiff visor member having a raised inboard lip with a front face covered by a second hook and loop fastening component.

5,437,063  
**AUTOMATIC TOILET SEAT LIFTING APPARATUS**  
 Charles E. Cotham, 1224 E. Jean St., Tampa, Fla. 33604  
 Filed Jan. 27, 1994, Ser. No. 266,477  
 Int. Cl.<sup>6</sup> A47K 13/10 2 Claims



1. An automatic toilet seat lifting apparatus for lifting a pivotal toilet seat from a downward to an upward position when a toilet flush handle is actuated, the automatic toilet seat lifting apparatus comprising:

- (a) an elongated seat lever arm adapted to be affixed at one end portion thereof to said toilet seat; and,
- (b) a housing assembly including pivot means for rotatably affixing said seat lever arm at an intermediate portion thereof to said housing assembly; and,
- (c) a counter weight affixed to an opposite end portion of said lever arm via a rotatable hinge, said counter weight having a given weight; and,
- (d) snap locking means mounted to said housing assembly for locking said toilet seat in said downward position, said snap locking means comprising:  
 (a) a rod having a given length and diameter, said rod having a rounded head at one end engaged with a cavity in said lever arm; and,  
 (b) a flat plate affixed to said rod at an end opposite said rounded head end, said flat plate being affixed to said rod in a substantially perpendicular fashion relative to the longitudinal rod axis; and,



(c) a spring engaging said flat plate; and,  
(d) cable means for affixing said rod to said toilet handle, whereby when said toilet handle is actuated, said cable means releases said rounded head from said cavity thereby allowing said toilet seat to be raised automatically.

5,437,064

## PROTECTIVE CAP APPARATUS

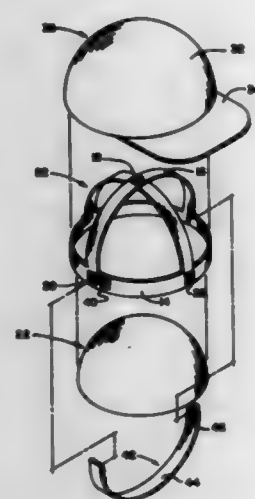
Melvin M. Hamaguchi, 5553 A Pla St., Honolulu, HI. 96821

Filed Feb. 22, 1994, Ser. No. 177,776

Int. Cl.<sup>6</sup> A42B 1/06

U.S. Cl. 2-414

3 Claims U.S. Cl. 4-342



1. A protective cap apparatus, comprising:
  - a first padding assembly adapted to fit onto a person's head, said first padding assembly including a circular padding band adapted to fit circumferentially around a person's head in a horizontal orientation, said first padding assembly including a plurality of semi-circular padding bands, wherein each respective semi-circular padding band includes a respective end portion connected to said circular padding band, such that each semi-circular padding band extends diametrically across said circular padding band forming a vertically oriented semi-circular arch,
  - a first fastener connected to one of said semi-circular padding bands, said first fastener facing outward from said semi-circular padding band,
  - a plurality of second fasteners connected to said circular padding band, said second fasteners facing outward from said circular padding band,
  - an outer hat assembly which includes a hemispherical head-covering portion and a visor portion attached to said head-covering portion, wherein said head-covering portion includes an interior surface,
  - a plurality of third fasteners connected to said interior surface of said head-covering portion, said third fasteners being located on said interior surface of said head-covering portion such that said third fasteners are placed in registration with said respective first fastener and said second fasteners when said outer hat assembly is placed on said first padding assembly, wherein said third fasteners are complementary to said respective first fastener and said second fasteners,
  - fourth fasteners connected to said circular padding band, said fourth fasteners facing outward from said circular padding band, and
  - a chin strap assembly which includes a strap member and a plurality of fifth fasteners located at respective ends of said strap member, wherein said fifth fasteners are complementary to said fourth fasteners for attaching said chin strap assembly to said first padding assembly, wherein said first fastener, said second fasteners, said third

fasteners, said fourth fasteners, and said fifth fasteners are made from hook or loop fastener materials.

5,437,065

## BOOTHS FOR TOILETS

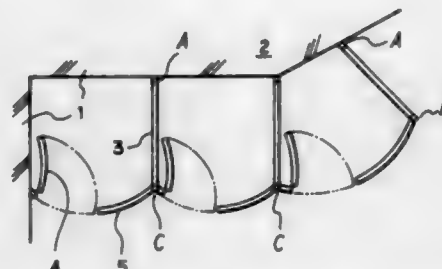
Katsuki Sakawa, Ehime, Japan, assignor to Sakawa Co., Ltd., Ehime, Japan

Continuation-in-part of Ser. No. 706,484, May 28, 1991, abandoned. This application Mar. 17, 1993, Ser. No. 32,271

Claims priority, application Japan, Jun. 1, 1990, 2-58367 U

Int. Cl.<sup>6</sup> E03D 1/22

5 Claims



1. An improvement for toilet booths for toilets in a toilet room sectioned into a plurality of said booths assembled along abutting walls of said toilet room by means of multiple doors, panels and partitions to define an interior space for each of said booths, each door being hinged to one of said panels at a front of each booth, respectively, the improvement comprising:
  - each said door having a curvature away from said front to enlarge said interior space;
  - first frame means for mounting each of said partitions, respectively, against a wall of said abutting walls, said first frame means permitting rotation of said one of said partitions about a vertical axis relative to said wall of said abutting walls; and
  - second frame means for engaging each of said partitions, respectively, said second frame means further engaging said one of said panels and a second of said panels, respectively, said second frame means permitting rotation of said one of said panels and said second of said panels about a vertical axis relative to said abutting walls.

5,437,066

## SEAT ACTUATED TOILET BOWL LIGHT

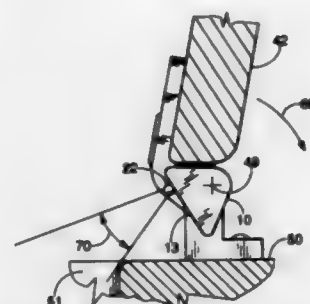
Richard Mills, 609 Jacie Ct., Burleson, Tex. 76028; William R. Bradford, 221 Haywood, Benbrook, Tex. 76126, and John F. Bryan, Jr., 3510 Woodcreek Cir., Parker, Tex. 75002

Filed Apr. 8, 1994, Ser. No. 224,267

Int. Cl.<sup>6</sup> E03D 9/00

U.S. Cl. 4-661

7 Claims



1. Apparatus for illuminating the interior of a toilet bowl comprising:
  - an electric battery;
  - a lamp;

housing means for holding said lamp and battery in assembly;  
means for pivotally mounting said housing means to the toilet bowl for rotational movement between a first, raised position wherein said lamp is directed at the interior of the toilet bowl and a second, lowered and protected position wherein said housing is displaced from exposure to the interior of the toilet bowl, said mounting means including a rear face which is proximate the pivotal axis and substantially vertical when said mounting means is in the lowered position; and  
means for operably connecting said lamp to said battery as said housing is rotated to said first position so that light from said lamp is directed into the interior of the toilet bowl.

5,437,067

## BED SIDE RAILS

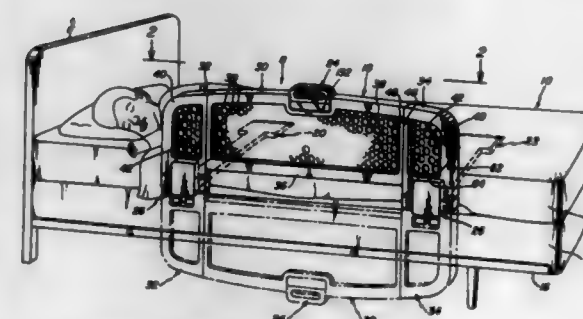
Michael S. Bernstein, Natick, Mass.; David W. Crossley, Woonsocket, R.I.; Randy L. Abrams, Leominster, Mass., and Jerry E. Johnson, Grand Junction, Tenn., assignors to Safety 1st, Inc., Chestnut Hill, Mass.

Filed Jan. 28, 1994, Ser. No. 187,846

Int. Cl.<sup>6</sup> A47C 21/08

U.S. Cl. 5-426

7 Claims



1. A bed side rail comprising
  - a panel having a center section and left and right side sections,
  - a pair of arms pivotally connected to the panel, one to the lower portion of each of the side sections, said arms intended to lie beneath a mattress in a horizontal plane and support the panel in a vertical plane selectively either above or below the arms,
  - a pocket in the panel and a flashlight removably mounted in the pocket, and
  - a latch interconnecting the pocket and flashlight for retaining the flashlight in the pocket regardless of the position of the panel.

5,437,068

## BODY-CONFORMING, MULTI-FOLDABLE, INFLATABLE MATTRESS HAVING PHASE-SHIFTED SINUSOIDAL SEALS

David R. Fisher, Rancho Palos Verdes, Calif., assignor to Intex Recreation Corp., Long Beach, Calif.

Continuation-in-part of Ser. No. 896,469, Jun. 10, 1992, abandoned. This application Jul. 31, 1992, Ser. No. 923,224

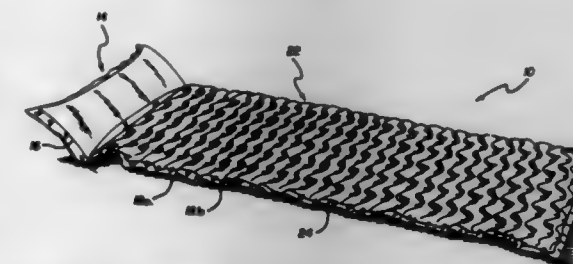
Int. Cl.<sup>6</sup> A47C 27/08

U.S. Cl. 5-449

11 Claims

1. An inflatable air mattress comprising:
  - an inflatable mat portion formed by sealing together an edge of each of two layers of flexible sheet material;
  - a first plurality of generally sinusoidal seals for bonding the two layers of flexible sheet material together, said first plurality of generally sinusoidal seals extending transversely across the mat portion; and
  - a second plurality of generally sinusoidal seals for bonding the two layers of flexible sheet material together, said

second plurality of generally sinusoidal seals being spaced apart from said first plurality of generally sinusoidal seals and extending transversely across the mat portion interspersed between and alternating with said first plurality of generally sinusoidal seals, said first and second plurality of generally sinusoidal seals each formed to include the shape of a plurality of sine waves having a repeating period of  $2\pi$  radians, and said second plurality of generally sinusoidal seals being uniformly phase shifted by from about  $\pi/4$  radians to about  $3\pi/4$  radians with respect to the first plurality of generally sinusoidal seals, said sine waves of said first and second plurality of generally sinusoidal seals form a plurality of alternating rows of first and second non-tortuous continuous, transverse inflation chambers, said first and second non-tortuous continuous



transverse inflation chambers each having a plurality of enlarged body portions and a plurality of narrowed neck portions interconnecting said enlarged body portions wherein each enlarged body portion in the alternating rows of non-tortuous continuous, transverse inflation chambers is sinusoidal-shaped and oriented in symmetrically opposing directions to the enlarged body portions in adjacent rows so as to balance the expansion of said non-tortuous continuous transverse inflation chambers having different orientations to prevent distortion of said mat portion when inflated, and each narrowed neck portion and said first and second plurality of generally sinusoidal seals form folding lines to enable said mat portion to be bendable longitudinally, transversely and diagonally when inflated for folding and rolling and for cradling a body reclining thereon in water.

5,437,069

## PORTABLE FOLDING PILLOW PROP APPARATUS

Norman H. Bates, 1182 Hyde Park, Santa Ana, Calif. 92705

Filed Mar. 7, 1994, Ser. No. 206,662

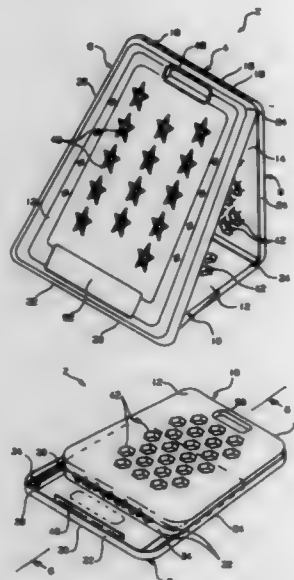
Int. Cl.<sup>6</sup> A47C 21/00

U.S. Cl. 5-633

29 Claims

1. A pillow prop apparatus for providing back and head support, comprising:
  - a. a longitudinal elongated foldable body having a front panel, a rear panel, and a base panel, each panel having an upper side, a lower side, a top end with a transverse top wall, a bottom end with a transverse bottom wall, and two longitudinal opposite exterior sidewalls, the front and rear panels having tapered top ends such that the bottom ends are wider than the top ends, where the top, the bottom, and the two opposite exterior sidewalls of each panel surrounding the lower side;
  - b. said base panel further having a transverse step-down section located adjacent to said top end such that said transverse top wall is curved inwardly towards said upper side for engaging with said transverse bottom wall of said front panel, and the transverse step-down section having two opposite interior sidewalls located adjacent and parallel to said two longitudinal opposite exterior sidewalls of said base panel;
  - c. two opposite tabs protruding outwardly from said two opposite interior sidewalls of said base panel and located adjacent to said top end of said base panel;

- d. two longitudinal opposite interior sidewalls located on said lower side of said front panel and adjacent to said two longitudinal opposite exterior sidewalls of said front panel, each having a longitudinal guide rail which engages with a respective one of said two opposite tabs for allowing said base panel to slide back and forth from a folded condition to an unfolded condition;
- e. a transverse elongated interior shelf located on said lower side and adjacent to said bottom end of said front panel for preventing said transverse top wall of said base panel from moving in a longitudinal direction;
- f. means for hingeably attaching said top end of said front panel to said top end of said rear panel, such that said lower sides of said front and rear panels are adjacent and facing each other when said pillow prop apparatus is in its folded condition, and for permitting pivotal movement between said front and rear panels;
- g. means for hingeably attaching said bottom end of said rear panel to said bottom end of said base panel, such that said upper side of said base panel is adjacent and in parallel to said lower side of said rear panel when said pillow prop apparatus is in its folded condition, and for permitting pivotal movement between said rear and base panels;

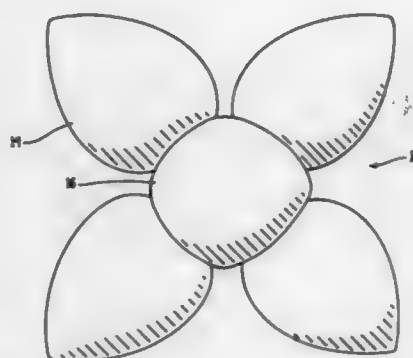


- h. said panels of said elongated foldable body each having a multiplicity of rib openings therethrough which extend downwardly toward said lower sides, where the multiplicity of rib openings are located alternatively to each other for providing stability;
- i. said front and rear panels each having a rectangular shaped opening therethrough and located adjacent to said top ends of said front and rear panels respectively, where the rectangular shaped openings are aligned to each other once said pillow prop apparatus is in its folded condition for carrying said pillow prop apparatus; and
- j. said rear panel having a length less than a length of said front panel but greater than a length of said base panel;
- k. whereby when said pillow prop apparatus is to be used, said foldable elongated body can be unfolded by sliding said top end of said base panel away from said top ends of said front and rear panels, thereby interlocking said transverse top wall of said base panel to said transverse bottom wall of said front panel, when said pillow prop apparatus is not in use, said foldable elongated body can be folded by lifting said top end of said base panel over said transverse interior shelf of said front panel and sliding said top end towards said top ends of said front and rear panels.

5,437,070  
**MULTIPLE USE PILLOW**  
 Carla Rempp, 1521 Shattuck, Berkeley, Calif. 94709  
 Filed Jan. 15, 1993, Ser. No. 17,706  
 Int. Cl.<sup>6</sup> A47G 9/02

U.S. Cl. 5-636

3 Claims

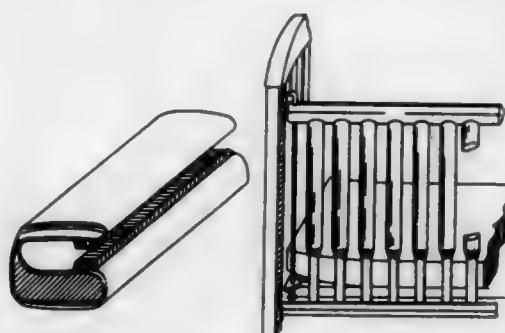


1. A pillow comprising:
- a) a central section having a plurality of petal sections radiating from said central section, forming recesses between any two adjacent said petal sections, said petal sections being spaced in relation to each other such that at least one recess formed is substantially opposite said central portion from another recess, said petal sections and said central section being of different resilience and;
- b) said central section being small enough to fit between the side of a person's tilted head and shoulder region, allowing the head to be held by two petal sections, supporting the jaw line and temple, while the shoulder region is cradled in the opposite recess between adjacent petal sections, thereby preventing movement of the pillow.

5,437,071  
**INDIVIDUAL PROTECTIVE PADS FOR CRIB BALUSTERS**  
 Jeffery J. Feigenbaum, 7339 N. Karlov Ave., Chicago, Ill. 60646  
 Filed Apr. 22, 1994, Ser. No. 231,278  
 Int. Cl.<sup>6</sup> A47D 15/00

U.S. Cl. 5-663

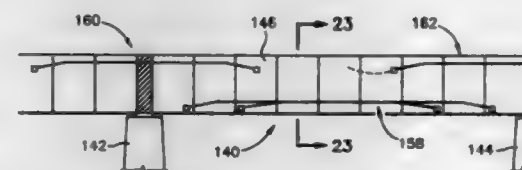
4 Claims



2. A protective pad for a crib baluster, comprising:
- a) a flexible material sufficient in length to extend from approximately the top of said crib baluster to approximately the bottom of said crib baluster and having an internal surface and an external surface, said internal surface defining an entirely enclosed internal cavity;
- b) cushioning material contained within said internal cavity, such that the entirety of said flexible material and said cushioning material may be wrapped around said crib baluster; and
- c) connecting means for securing said protective pad to one, two, or three sides of said crib baluster.

5,437,072  
**RAPID TRANSIT VIADUCT WITH POST-TENSIONING CABLE SYSTEM**  
 Antonio Dinis, La Jolla, and Gerard Sauvageot, Poway, both of Calif., assignors to J. Muller International, San Diego, Calif.  
 Continuation-in-part of Ser. No. 839,858, Feb. 21, 1992, Pat. No. 5,231,931, which is a continuation-in-part of Ser. No. 824,502, Jan. 23, 1992, abandoned. This application Aug. 2, 1993, Ser. No. 100,687  
 Int. Cl.<sup>6</sup> E01B 26/00; E01D 21/10  
 U.S. Cl. 14-73

11 Claims



11. A rapid transit viaduct system, said system comprising:
- a) a plurality of precast viaduct segments each having an upper portion and a lower portion, said viaduct segments being configured to be arranged end-to-end and tied together to form a viaduct span for supporting one or more rapid transit vehicles;
- b) a plurality of upright piers for supporting said viaduct segments;
- c) a first group of said precast viaduct segments arranged end-to-end over a first one of said upright piers, said first group of precast segments being secured together with one or more substantially horizontal first cables extending through the upper portion of the segments in said first precast segment group, for providing segment continuity;
- d) a second group of said precast viaduct segments arranged end-to-end adjacent an end of said first precast segment group, said second group of precast segments being secured together with one or more substantially horizontal second cables extending through the lower portion of the segments in said second precast segment group, for reacting positive moments;
- e) a third group of said precast viaduct segments arranged end-to-end adjacent an end of said second precast segment group and over a second upright pier, said third group of precast segments being secured together with one or more substantially horizontal third cables extending through the upper portions of the segments in said third precast segment group, for providing segment continuity; and
- f) wherein said first cables extend through at least one, but not all of the segments in said second precast segment group, and wherein said third cables extend through at least one, but not all of the segments in said second precast segment group.

5,437,073  
**TUBE CLEANER**  
 Graham H. Smith, 15 Randall Court, Collaroy Beach, New South Wales 2097, Australia  
 PCT No. PCT/AU91/00216, § 371 Date Dec. 15, 1992, § 102(e) Date Dec. 15, 1992, PCT Pub. No. WO91/17843, PCT Pub. Date Nov. 28, 1991  
 PCT Filed May 17, 1991, Ser. No. 955,898  
 Claims priority, application Australia, May 18, 1990, PK0205  
 Int. Cl.<sup>6</sup> B08B 9/04

U.S. Cl. 15-104.061

13 Claims

1. A tube cleaner comprising a central core having a longitudinal axis, and at least two radially extending scraper means for contacting an inner wall of a tube, each said scraper means being mounted on said central core and having a distal portion adapted to contact the inner tube wall in a non-sealing manner, wherein said central core has a hollow bore extending at least partially therethrough substantially parallel to said longitudinal axis, said hollow bore opening onto one end of said central

core, said hollow bore further communicating with at least one aperture extending in a generally radial direction from said hollow bore, said at least one aperture opening onto a peripheral surface of said central core for the emission of a fluid, wherein when the tube cleaner travels through the tube, said scraper means forms a forwardly directed angle greater than 90 degrees with the tube wall forward of said scraper means, wherein each said scraper means is replaceable without damaging said core, said distal portion of each said scraper means having a leading edge which faces the front of the tube cleaner when in use, wherein at least two circumferential channels are formed at intervals in said central core, wherein between two and four said scraper means are mounted in a respective circumferential channel.

5,437,074  
**CAULKING TOOL**  
 William White, and Julie White, both of Indian Harbor Beach, Fla., assignors to Myro, Inc., Milwaukee, Wis.  
 Filed Jul. 25, 1994, Ser. No. 280,045  
 Int. Cl.<sup>6</sup> A47L 13/02

U.S. Cl. 15-105

11 Claims



1. A tool for removing caulk which tool comprises:
- a) a handle portion for being grasped by a user's hand; and
- b) a blade attached to an end of said handle portion and having first and second major surfaces and an edge surface extending between the first and second major surfaces, said blade having a straight projection having a substantially straight first side, and straight projection tapers to a first tip with a first edge formed along a second side of the straight projection where the first major surface intersects the edge surface and a second edge formed along the a second side of the straight projection where the second major surface intersects the edge surface wherein the second edge lies outward beyond the first edge with the edge surface being curved from the first edge the first and second sides of the straight projection defining an acute angle therebetween, to the second edge, and said blade also having a curved projection defined by first and second curved sides which extend in a direction substantially transverse to the straight projection, said curved projection tapers to a point with a third edge formed along the first curved side of the curved projection where the first major surface intersects the edge surface and a fourth edge formed along the first curved side of the curved projection where the second major surface intersects the edge surface wherein the fourth edge lies outward beyond the third edge with the edge surface being curved from the third edge to the fourth edge.

5,437,075  
**SELF-STORING SHOE CLEANING BRUSH**  
 Charles D. Peake, Kalamazoo, Mich., assignor to PVM Enterprises, L.L.C., Kalamazoo, Mich.  
 Filed Sep. 22, 1994, Ser. No. 310,660  
 Int. Cl.<sup>6</sup> A47L 23/00, 23/22

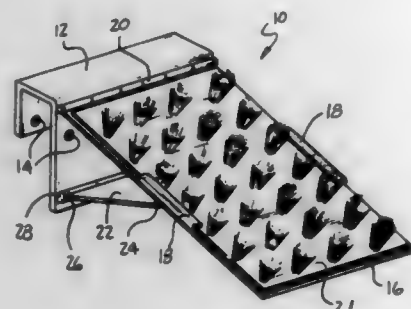
U.S. Cl. 15-161

12 Claims

1. A golf cart mounted cleat cleaner comprising:
- a) an attachment bracket configured to engage a portion of a golf cart;



a brush plate configured as a generally planar member which is operable to support a brush upon a top surface thereof; a hinge which pivotally connects a first end of the brush plate to the attachment bracket; a brace having a first end thereof which is pivotally attached to a bottom surface of the brush plate at an attachment point, and a second end thereof which is a free end, said brace being deployable from a use position in which the free end engages the golf cart or the attachment bracket so as to rigidly support the brush plate, to a storage position in which the free end does not engage the golf cart or the attachment bracket and the brush plate is not rigidly supported.



ment point, and a second end thereof which is a free end, said brace being deployable from a use position in which the free end engages the golf cart or the attachment bracket so as to rigidly support the brush plate, to a storage position in which the free end does not engage the golf cart or the attachment bracket and the brush plate is not rigidly supported.

5,437,076

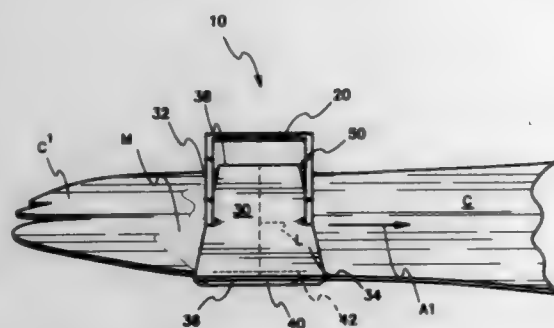
## TAMALE MASA SPREADER

Sandra P. Vasquez, 1205 Sixth St., Corpus Christi, Tex. 78404  
Filed Jan. 26, 1994, Ser. No. 186,530

Int. Cl.<sup>6</sup> A47L 13/022

U.S. Cl. 15—236.05

7 Claims



1. A spreader for masa comprising:  
a substantially flat base having two generally parallel edges, a top side, a bottom side, and with a transverse axis extending between said parallel edges proximate the midpoint of each of said parallel edges;  
handle means attached to said top side of said base;  
a pair of depending protrusions disposed on said bottom side of said base, said depending protrusions being located proximate each of said parallel edges, each of said protrusions having two distal ends, and each of said distal ends of each of said depending protrusions being downwardly tapered toward said transverse axis, and further where each said depending protrusion is substantially the same height as the other said depending protrusion.

5,437,077

## WINDSHIELD WIPER ASSEMBLY INCLUDING AN ARM AND PIVOTALLY MOUNTED BLADE

Lester R. O'Donnell, 5107 Lawrence Ave., Chillicothe, Ill. 61523

Filed Mar. 21, 1994, Ser. No. 210,493

Int. Cl.<sup>6</sup> B60S 1/40

U.S. Cl. 15—250.33

1 Claim



1. A windshield wiper assembly comprising:  
a rotatable windshield wiper arm having a free end,  
a pair of elongated cylindrical elements defined by a first cylindrical element and a second cylindrical element, said fast cylindrical element being fixed to said rotatable windshield wiper arm and said second cylindrical element being rotatably mounted on said rotatable windshield wiper arm such that said fast cylindrical element and said second cylindrical element are relatively rotatable, said fast cylindrical element and said second cylindrical element being mounted at the free end of said windshield wiper arm and said second cylindrical element pivotally connecting a windshield wiper blade to said windshield wiper, each said cylindrical element having an axial projection extending longitudinally from an end thereof towards an end of the other cylindrical element, each of said projections including a surface thereon adapted to engage said surface of the other during relative rotation, said surfaces together defining rotation stop means for limiting relative rotation of said first cylindrical element and said second cylindrical element to less than 90 degrees.

5,437,078

## DUST PAN FOR USE WITH A VACUUM

J. A. Denis Courcelles, 1356 des Mouettes Street, Longueuil, Québec, Canada J4J 5K2

Filed Jan. 12, 1994, Ser. No. 180,315

Claims priority, application Canada, Jan. 18, 1993, 2087474

Int. Cl.<sup>6</sup> A47L 5/36

U.S. Cl. 15—328

6 Claims



1. A dust pan for use with a vacuum comprising, a pan unit adapted to collect dust having a bottom wall including a front end and a rear end, side walls oppositely disposed between said front end and said rear end, said front end downwardly extend-

ing to substantially evenly rest on a floor surface, a top wall spaced from said bottom wall and disposed between said side walls at the rear end of said bottom wall to define an inner space, and a rear wall disposed between the rear end of said bottom wall and said top wall having an opening therein, conduit means comprising a nozzle adapted to receive the collected dust and a hollow sleeve adapted to be engaged with a vacuum source allowing for collected dust in said dust pan to be drawn up by said vacuum, and means for connecting said nozzle to the rear end of said bottom wall, and attachment means mounted on said conduit means for releasably attaching said dust pan to a broom.

5,437,079

## DOOR HINGE

Kabil Park, 47-22, Ogim-Dong, Chongro-Gu, Seoul, Rep. of Korea 110-035

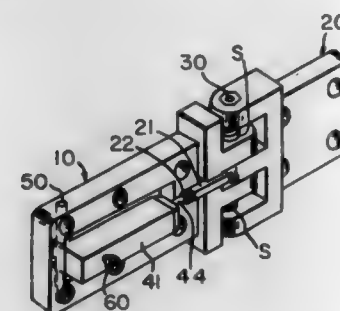
Continuation-in-part of Ser. No. 72,559, Jun. 7, 1993, abandoned. This application Sep. 28, 1994, Ser. No. 328,200

Claims priority, application Rep. of Korea, Jun. 10, 1992, 92-10282 U

Int. Cl.<sup>6</sup> E05F 3/08, 3/10

U.S. Cl. 16—54

6 Claims



1. A door hinge comprising, a first hinge part, a second hinge part, a hinge shaft, said first and second parts being pivotally mounted on said hinge shaft, a torsion spring disposed in surrounding relationship to said shaft and having two ends, one of said ends engaging said first hinge part, the other of said ends engaging said second hinge part, buffer means including a cylinder filled with working fluid and a piston movably mounted in said cylinder, a piston rod connected to said piston and having an outer end extending outwardly of one end of said cylinder, said first hinge part defining a recess, said cylinder having an opposite end pivotally mounted on said first hinge part so that the cylinder can swing into and out of said recess, said second hinge part having an extended part pivotally connected to the outer end of said piston rod, said first hinge part having a slot formed therein for receiving said extended part when the hinge is in closed position.

5,437,080

## DEVICE FOR OPENING FLOCCULENT FIBROUS MATERIAL

Josef Stummer, Schulstrasse 3, D-55595 Roxheim, Germany  
PCT No. PCT/DE92/00119, § 371 Date Aug. 20, 1993, § 102(e)

Date Aug. 20, 1993, PCT Pub. No. WO92/14872, PCT Pub. Date/Sep. 3, 1992

PCT Filed Aug. 20, 1993, Ser. No. 117,056

Claims priority, application Germany, Feb. 20, 1991, 41 05 189.0

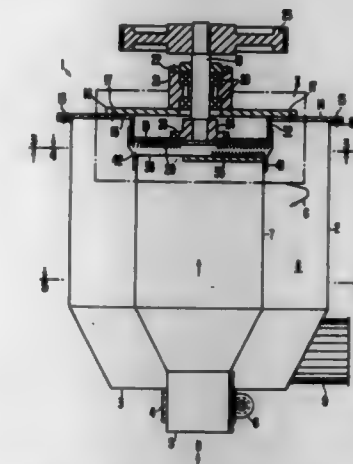
Int. Cl.<sup>6</sup> D01G 9/06

U.S. Cl. 19—26

16 Claims

1. A device for opening flocculent fibrous materials, comprising:  
a housing;  
a supply connection pipe having an end extending into a lower portion of said housing for introducing a suction

created transport air current into said housing and for conveying fiber flocks;  
a hollow cylinder having: one end connected to the end of said supply connection pipe, an open end opposite to the one end and a diameter larger than a diameter of the end of said supply connection pipe, the hollow cylinder forming an annular chamber within said housing;  
a discharge connection pipe connectable to said housing for discharging the fibrous material, said housing, supply



connection pipe, hollow cylinder and discharge connection pipe collectively defining a pneumatic conveying path for the fibrous material; and  
a drivable opening disc disposed within said housing and positioned at a distance from and parallel to the open end of the hollow cylinder and extending across the open end, said disc including a plurality of pointed spikes each projecting towards the hollow cylinder for processing material as the material is conveyed along the pneumatic conveying path.

5,437,081

## HOSE CLAMP

Hans Oetiker, Horgen, Switzerland, assignor to Hans Oetiker AG Maschinen- und Apparate-Fabrik, Switzerland

Continuation-in-part of Ser. No. 409,798, Sep. 20, 1989, Pat. No. 4,987,651, and Ser. No. 922,473, Oct. 23, 1986, abandoned,

which is a continuation of Ser. No. 622,765, Jun. 20, 1984, abandoned. This application Dec. 6, 1989, Ser. No. 446,729

Int. Cl.<sup>6</sup> F16L 33/02

U.S. Cl. 24—20 R

49 Claims

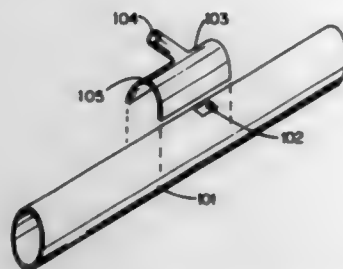


1. A clamp structure which comprises clamping band means and tightening means to enable installation of the clamp structure about an object to be fastened thereby, said clamping band means having a center area and side surfaces and being made from a material substantially devoid of any significant elastic stretchability in its longitudinal direction, and further means to impart elastic stretchability to the clamping band means in its longitudinal direction, said further means including separate non-rectilinear lateral band portions at least approximately symmetrically arranged on opposite sides of the center longitudinal plane of the clamping band means, each of said lateral band portions being substantially concavely shaped with respect to and as viewed from the center longitudinal plane of the clamping band means so as to increase the distance of each





pressing out that portion of said duct encompassed by the groove to form an opening in said duct; attaching a saddle to said duct; and



attaching an interduct to said saddle, said interduct being aligned with said opening.

5,437,088

# **METHOD OF MAKING A GOLF CLUB THAT PROVIDES ENHANCED BACKSPIN AND REDUCED SIDESPIN**

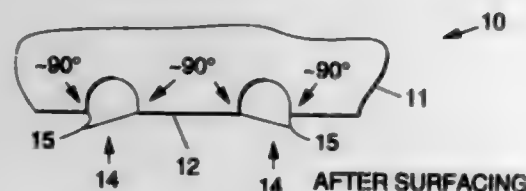
Lawrence Y. Igarashi, 30231 Tomas Rd., Rancho Santa Margarita, Calif. 92688

Continuation of Ser. No. 185,324, Jan. 21, 1994, abandoned, which is a continuation of Ser. No. 5,636, Jan. 19, 1993, abandoned. This application Sep. 29, 1994, Ser. No. 315,185

Int. Cl.<sup>6</sup> B23P 17/00

U.S. Cl. 29—527.6

19 Claims



AFTER SURFACING

1. A method of making a golf club comprising the steps of: disposing hot metal into a mold having the shape of a golf club; forging the hot metal to form a forged golf club having a desired shape; removing the forged metal golf club from the mold; grinding the forged metal golf club to produce generally finished features of the club; forming scoring lines in the ball striking face of the forged metal golf club, wherein edges are defined at each side of each line at said surface; and surfacing the ball striking face of the forged metal golf club to produce a flat ball striking face, each of said edges of said scoring lines being made sharp at the surface of the flat club face by said surfacing.

5,437,089

# **METHOD AND APPARATUS FOR CONTINUOUS PRODUCTION HOT-ROLLED STRIPS**

Viktor M. Salganik; Anatoly I. Starkov; Igor G. Gun; Alexandr V. Povarich, and Leonid B. Idelchik, all of Magnitogorsk, Russian Federation, assignors to Magnitogorsky Metallurgichesky Kombinat Imeni V.I. Lenina, Magnitogorsk, Russian Federation

PCT No. PCT/RU92/00079, § 371 Date Jan. 28, 1993, § 102(e) Date Jan. 28, 1993, PCT Pub. No. WO92/18262, PCT Pub. Date Oct. 29, 1992

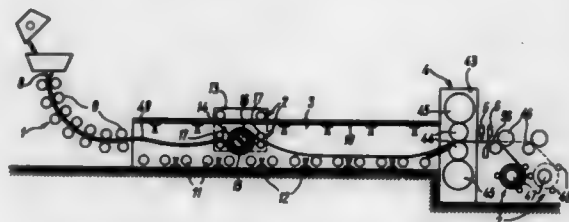
PCT Filed Apr. 16, 1992, Ser. No. 976,975

Claims priority, application Russian Federation, Apr. 17, 1991, 4927522

Int. Cl.<sup>6</sup> B21B 1/46, 13/22

U.S. Cl. 29—527.7

6 Claims



1. A method for continuous production of hot-rolled strips, comprising continuously casting metal into a thin slab, storing the slab, feeding the slab at regular intervals from a storage zone in the form of consecutive portions, heating, rolling into a strip in the form of consecutive portions in several runs with return of the rolled portion into the storage zone, cooling, cutting, and coiling, characterized by storing the slab and the returned portion of the strip by their combined coiling into at least one intermediate coil which is moved along the storage zone during coiling and uncoiling of portions of the slab and rolled strip therefrom.

5. An apparatus for continuous production of hot-rolled strips, comprising a line including a continuous metal casting means for casting metal into a thin slab, a slab storage means, a through slab soaking-pit means, a rolling for rolling the slab into a strip in the form of individual portions in several runs with return of a portion being rolled to the storage means, a strip cooler means, a cutting means, and a means for coiling the rolled strip, characterized by the fact that the through soaking-pit means comprises a roller-hearth furnace, the storage means comprises at least one carriage provided outside the roller-hearth furnace for movement therealong, and a means for forming an intermediate coil of the slab and of the returned portion of the strip, said means being installed on the carriage and having a driven roll having a diametrical slot and a pair of drawing rollers along, and on either side of the roll positioned in the soaking-pit furnace over its rollers (11), the side walls of the furnace having longitudinally extending apertures receiving the ends of shafts of the driven roll and drawing rollers.

5,437,090

# **METHOD OF MAKING A ROTOR OF AN INDUCTOR TYPE ALTERNATING CURRENT GENERATOR**

Yukio Sakane, and Yutaka Kitamura, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1994, Ser. No. 202,013

Claims priority, application Japan, Mar. 4, 1993, 5-043802

Int. Cl.<sup>6</sup> H02K 15/02

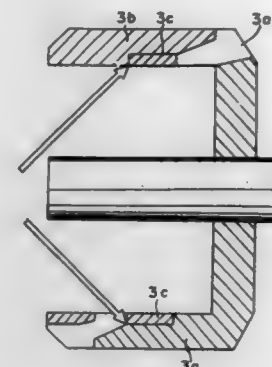
U.S. Cl. 29—598

3 Claims

1. A method of making a rotor of an alternating current generator, comprising the steps of:

a) disposing a plurality of first claws (3a) and second claws (3b) of respective first and second cylindrical inductors in an alternate, oppositely directed, interleaved orientation,

b) disposing a nonmagnetic ring (3c) in contact with inner portions of the first and second claws, and  
c) welding together contacting portions (22, 23) of the first and second claws and the nonmagnetic ring using welding



means outputting energy (24) directed at said contacting portions from inner sides of the first and second claws and in a direction inclined to an axial direction of the rotor at a predetermined angle lying in a range of 30°–70°.

5,437,091

# **HIGH CURVATURE ANTENNA FORMING PROCESS**

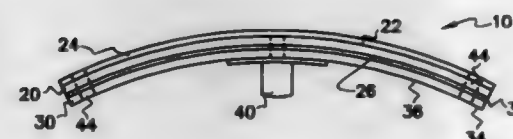
Ronald W. Norman, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 28, 1993, Ser. No. 82,111

Int. Cl.<sup>6</sup> H01P 11/00

U.S. Cl. 29—600

15 Claims



1. A process for fabricating high curvature antenna having a small radius of curvature, comprising the steps of: forming a microstrip component upon a first laminate layer; attaching a second laminate layer to the first laminate layer, the second laminate layer having an electrically conductive material attached to one surface thereof, the second laminate layer attached to first laminate layer opposite the microstrip component such that the electrically conductive material is opposite the first laminate layer, thus forming a multilayer antenna structure; attaching a radome layer to the multilayer antenna structure so as to cover the microstrip component, the radome layer attached before the multilayer antenna structure is formed into the substantially semicylindrical configuration; and pressing the multilayer antenna structure into a mold while concurrently heating the multilayer antenna structure, the mold for forming the multilayer antenna structure into a substantially semicylindrical configuration.

5,437,092

# **METHOD OF MAKING CONTACT AREAS ON AN OPTICAL WAVEGUIDE**

Davis H. Hartman, Phoenix; Michael S. Lebby; Shun-Meen Kuo, both of Chandler, and Christopher K. Y. Chun, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

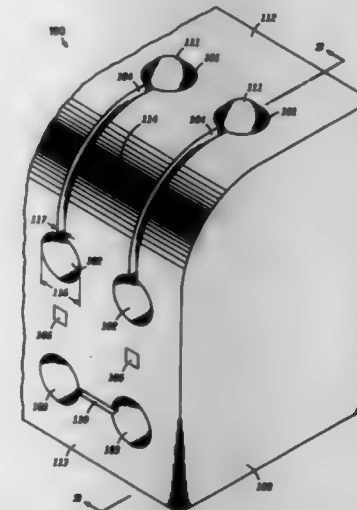
Division of Ser. No. 912,367, Jul. 13, 1992, Pat. No. 5,282,071.

This application Jan. 21, 1994, Ser. No. 184,805

Int. Cl.<sup>6</sup> H01P 11/00

U.S. Cl. 29—600

9 Claims



1. A method for making a base with a contact area comprising the steps of:

molding a base with a first surface, a second surface, a first and second indent, and a groove wherein the first indent is located on the first surface, the second indent is located on the second surface and the groove interconnects the first and the second indent;

placing an electrically conductive member formed of reflowable material in the first indent located on the first surface; and

melting the electrically conductive member, thereby flowing the electrically conductive member into the groove and into the second indent, thus forming a contact area from the first indent to the second indent.

5,437,093

# **METHOD OF MAKING AN INJECTION MOLDING NOZZLE**

Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1

Filed Oct. 11, 1994, Ser. No. 321,007

Int. Cl.<sup>6</sup> H05B 3/00

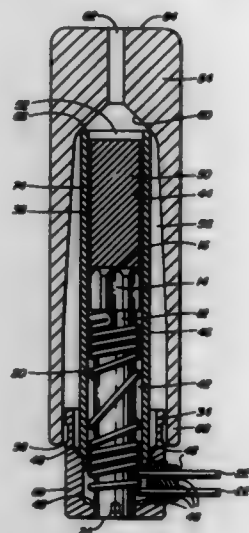
U.S. Cl. 29—611

10 Claims

1. In a method of manufacturing an integral heated injection molding nozzle having a rear end, a front end, an elongated inner core portion with a melt passage extending therethrough from the rear end, an outer collar portion encircling the inner core portion adjacent the rear end, an outer sleeve portion extending from the outer collar portion towards the front end, an electrical heating element with a helical portion wound around the inner core portion and a lead portion extending outwardly through the outer collar portion, a conductive portion extending around the helical portion of the heating element between the inner core portion and the outer sleeve portion, including the steps of forming an assembly by mounting an outer collar and the heating element onto an inner core, mounting an elongated outer sleeve in a position to form a space around the helical portion of the heating element between the outer sleeve and the inner core, applying brazing material to the joints between the inner core, the outer collar

and the outer sleeve and brazing the assembly together in a substantially oxygen free atmosphere in a vacuum furnace to seal said space against leakage when the assembly is in an upright position with the front end directly above the rear end, casting a molten conductive material into said space with the assembly in the upright position in a substantially oxygen free atmosphere in a vacuum furnace to form the conductive portion integrally bonded with the inner core portion, outer collar portion, heating element and outer sleeve portion, and machining the cast nozzle to provide a desired shape and finish, the improvement wherein;

the conductive material has a melting temperature higher than the melting temperature of the brazing material, the assembly is brazed together and the conductive material is cast into said space in a single controlled cycle of the



vacuum furnace which includes first raising the temperature in the vacuum furnace to a first predetermined temperature above the melting temperature of the brazing material and below the melting temperature of the conductive material, lowering the temperature in the vacuum furnace to a second predetermined temperature below the solidification temperature of the brazing material, holding the second temperature for a sufficient period of time to braze the assembly together, and then raising the temperature in the vacuum furnace to a third predetermined temperature sufficiently above the melting temperature of the conductive material to cast the conductive material into said space around the helical portion of the heating element between the outer sleeve and the inner core without melting the brazing material.

5,437,094

#### ELECTROMAGNETIC BOLT INSERTION AND COLLAR SWAGING SYSTEM

Peter B. Zieve; John L. Hartmann; Peter W. Janicki, all of Seattle; Michael D. Assadi, Kirkland, and Scott C. Tomchick, Seattle, all of Wash., assignors to Electroimpact, Inc., Mukilteo, Wash.

Division of Ser. No. 839,933, Feb. 21, 1992, Pat. No. 5,280,673.

This application Oct. 29, 1993, Ser. No. 145,690

Int. Cl.<sup>6</sup> B21D 19/00

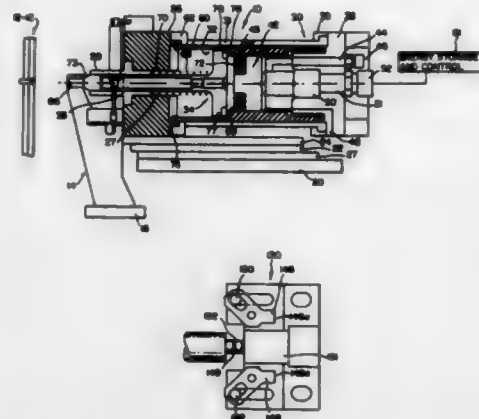
U.S. Cl. 29—827

5 Claims

1. A collar swaging die, comprising:  
a first swaging die portion mountable to a front end portion of a collar-swaging driver member which in turn is mounted for longitudinal movement in the direction of an exposed end of a bolt onto which a collar is to be loaded and then swaged; and

a second swaging die portion mounted to a forward end of the first portion for movement laterally relative to the first portion, the second portion including means for holding a

swaging tool at a forward end thereof, the swaging tool in turn including means for holding a collar at the front end thereof, the swaging tool including a member extending therefrom for contacting the bolt in such a manner that lateral movement of said second portion of the die relative to said first portion occurs to align the collar with the end of the bolt so that the collar may be conveniently loaded thereon;



wherein one of the first and second portions includes an opening in an end thereof adjacent the other of the first and second portions and wherein the other portion includes a connecting means which extends through the opening in the one portion, wherein the opening in the one portion is slightly larger than a portion of the connecting means which fits through the opening so as to permit slidable lateral movement of the second portion relative to the first portion.

5,437,095

#### METHOD OF MAKING PLASTIC ENCAPSULATED INTEGRATED CIRCUIT PACKAGE

Luu T. Nguyen, San Jose, and Hem P. Taklar, Fremont, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

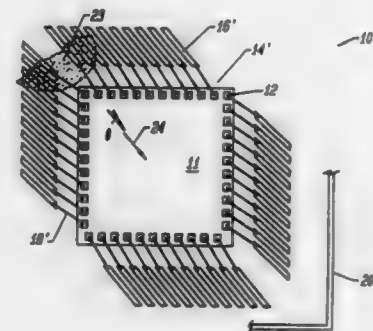
Division of Ser. No. 58,424, May 7, 1993, Pat. No. 5,296,743.

This application Dec. 21, 1993, Ser. No. 171,713

Int. Cl.<sup>6</sup> H01R 43/00

U.S. Cl. 29—827

9 Claims



1. A method of making an integrated circuit package encapsulated by plastic which during formation of the package is caused to flow over the latter in a given flow direction, said method comprising:

(a) supporting an IC chip including an array of chip output/input terminals on a support member, said IC chip having four sides and wherein said array of output/input terminals extends along at least two sides of said IC chip, said support member including an array of electrically conductive leads extending along at least two sides of said IC

chip, all of which are provided for connection with the output/input terminals of said IC chip, all of said leads extending in directions that define acute angles of less than 45° with said given flow direction;

(b) using bonding wires connecting said chip output/input terminals with respective ones of said leads such that each bonding wire extends in substantially the same direction as its connected lead, whereby all of said bonding wires define acute angles of less than 45° with said given flow direction; and

(c) encapsulating said IC chip, support member and bonding wires with plastic material by causing said plastic material to flow over the IC chip, support member and bonding wires in said given flow direction.

5,437,096

#### METHOD FOR MAKING A MULTILAYER METAL LEADFRAME

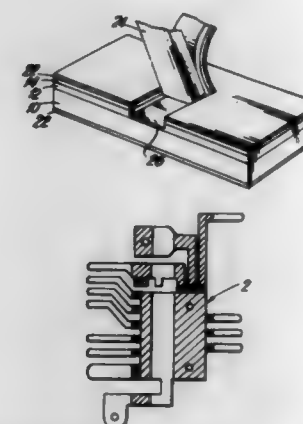
Joseph P. Mennucci, Manville, R.I., assignor to Technical Materials, Inc., Lincoln, R.I.

Filed Feb. 28, 1994, Ser. No. 203,448

Int. Cl.<sup>6</sup> C25D 7/00; H01L 23/495

U.S. Cl. 29—827

5 Claims



1. A process for fabricating a leadframe having a conducting pattern, said process comprising the steps of:  
providing a multilayer clad strip comprising a base layer, a conducting layer, and an upper layer,  
said base layer being a copper alloy, said conducting layer being aluminum or an aluminum alloy, and said upper layer being copper or a copper alloy,  
plating the upper surface of said upper layer with a layer of tin or a tin-lead alloy,  
with a skiving tool selectively cutting away portions of the overlying tin or tin-lead layer and copper or copper alloy upper layer to expose a selected pattern of the aluminum or aluminum alloy conducting layer, and  
removing a portion of the thickness of the conducting layer.

5,437,097

#### METHOD AND APPARATUS FOR MANUFACTURING A CAM SHAFT

Hiroshi Yanagawa, Hiroshima, Japan, assignor to Matsumoto Heavy Industry Co. Ltd., Hiroshima and Isuzu Motors Limited, Tokyo, both of Japan

Filed Jun. 1, 1993, Ser. No. 70,082

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29—888.1

3 Claims

1. A method of manufacturing a cam shaft comprising the steps of:

preparing a plurality of cam pieces each having a shaft hole extending therethrough in a thickness direction and a positioning pin hole for accommodating a positioning pin, defined therein;

preparing a tubular shaft member having a hollow portion defined therein;

forming a plurality of grooves extending in an axial direction of said shaft hole at predetermined positions on an inner circumferential surface of said shaft hole of said each cam piece;

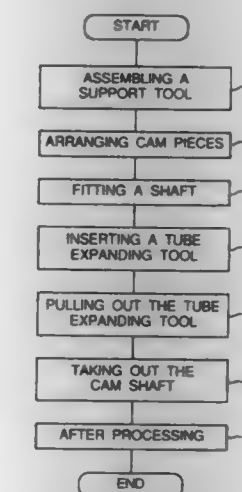
preparing a support tool, in which a plurality of upper plates, each having a circular hole having a diameter larger than a largest diametral length of said shaft member and pin holes capable of engaging with said positioning pins being located around said circular hole, are arranged at predetermined spacings in the vertical direction;

inserting said positioning pin into a predetermined one of said pin holes of said each upper plate;

arranging said cam pieces on the corresponding upper plates of said support tool so that said positioning pin holes are outwardly fitted onto the corresponding positioning pins;

fitting said shaft member onto said shaft holes and said circular holes so that said cam pieces are spontaneously arranged on predetermined positions with respect to a circumferential direction thereof; and

thereafter inserting under pressure a tube expanding tool provided with bulged portions corresponding to said grooves into said hollow portion of said shaft member to



bulge and deform said shaft member in a radial direction so that said grooves and said bulged portions confront each other, thereby bonding said cam pieces and said shaft member together.

3. A support tool for cam pieces for manufacturing a cam shaft which is manufactured by bulging and deforming a shaft member in a radial direction after fitting said shaft member onto shaft holes of cam pieces, said support tool comprising:  
a plurality of upper plates each having a circular hole having a diameter larger than a largest diametral length of said shaft member and pin holes located around said circular hole, said upper plates being arranged at predetermined spacings in the vertical direction by means of connecting rods;

said pin holes being capable of engaging with positioning pins capable of engaging with positioning pin holes provided on said cam pieces; and

a predetermined one of said pin holes of said each upper plate being capable of engaging with said positioning pin hole of said cam piece arranged thereon by means of said positioning pin, so that said cam pieces on said upper plates are spontaneously arranged on predetermined positions with respect to a circumferential direction thereof when said shaft member is fitted onto said shaft holes and said circular holes.



5,437,098

**METHOD OF MANUFACTURING VACUUM BRAKE BOOSTER**

Charles B. Horner, Jr., South Bend, Ind., assignor to AlliedSignal Inc., Morristown, N.J.

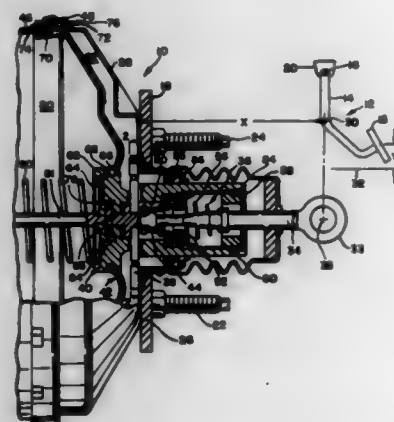
Division of Ser. No. 846,844, Mar. 6, 1992, Pat. No. 5,335,582.

This application Jan. 31, 1994, Ser. No. 189,467

Int. Cl.<sup>6</sup> B23Q 17/20

U.S. Cl. 29—888.02

3 Claims



1. In a method of manufacturing a brake booster, a step of defining a distance between a peripheral surface on a rear shell of said brake booster and an eye of a linkage member through which an input is applied to move a control valve located in a bore of a valve body associated with a movable wall in said brake booster comprising:

comparing a measured distance between said peripheral surface and eye with a desired distance therebetween to obtain a current manufacturing tolerance dimension for said control valve;

rotating said valve body with respect to said rear shell when said current manufacturing tolerance dimension exceeds a predetermined limits to selectively position said valve body with respect to a stop formed on a ramped surfaces on said rear shell and correspondingly linearly move said linkage member to bring said measured distance within said predetermined limits; and

fixing said selectively position of said valve body with respect to said rear shell to maintain said desired distance between said peripheral surface and eye of said linkage member.

5,437,099

**METHOD OF MAKING A COMBUSTION APPARATUS FOR HIGH-TEMPERATURE ENVIRONMENT**

William B. Retallick, West Chester, Pa., and William R. Alcorn, Chagrin Falls, Ohio, assignors to W. R. Grace &amp; Co.-Conn., New York, N.Y.

Division of Ser. No. 953,939, Sep. 30, 1992, Pat. No. 5,346,389, which is a division of Ser. No. 408,521, Sep. 18, 1989, Pat. No. 5,202,303, which is a continuation-in-part of Ser. No. 315,048, Feb. 24, 1989, abandoned. This application Jun. 9, 1994, Ser. No. 257,134

Int. Cl.<sup>6</sup> B23P 15/00

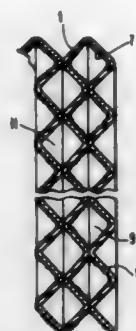
U.S. Cl. 29—890

17 Claims

1. A method of making a catalytic reactor from a strip of metal, the method comprising the steps of:

- corrugating the strip of metal;
- coating one side of the strip with catalyst, while leaving the other side of the strip uncoated;

- folding the strip once upon itself about a point near the midpoint of the strip, and



- winding the folded strip into a spiral, wherein the catalyst coating is applied in bands that are separated by uncoated bands.

5,437,100

**ADJUSTABLE CLAY CUTTER**

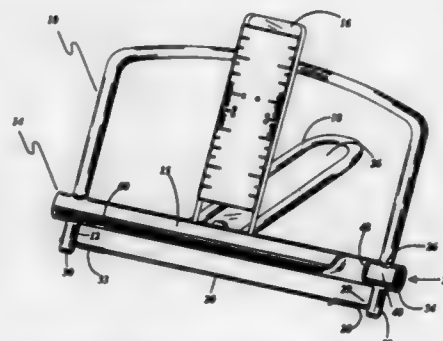
Robert J. Oberloier, and Nicole A. Oberloier, both of 5571 Quilley Ave., Rogers, Minn. 55374

Filed Aug. 4, 1994, Ser. No. 294,318

Int. Cl.<sup>6</sup> B26B 27/00

U.S. Cl. 30—116

9 Claims



1. A cutting device for slicing a desired material to a predetermined size comprising:

- a u-shaped arbor;
- a cutting means secured to said arbor for cutting a desired material;
- a guide means for guiding said cutting means through said desired material having a first set of bores extending through said guide means thereby allowing said arbor to slide through said guide means, and a second set of bores extending partially through said guide means at an angle relative to said first set of bores;
- a handle extending from said second set of bores of said guide means, in a direction away from said cutting means, for pushing or pulling said cutting means through the desired material; and
- a locking means for locking said guide means in a fixed position.

5,437,101

**FOLDING KNIFE**

Walter W. Collins, P.O. Box 100, North, S.C. 29112

Filed Apr. 6, 1994, Ser. No. 223,600

Int. Cl.<sup>6</sup> B26B 1/04

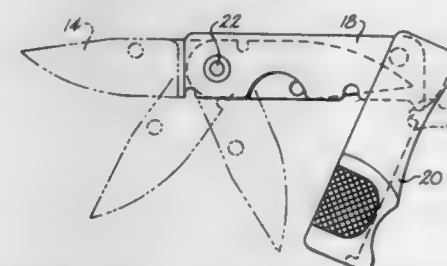
U.S. Cl. 30—153

4 Claims

1. A folding knife, comprising an elongated blade having a cutting edge;
- a longitudinally extending blade holder having a substantially U-shaped cross section, said blade holder having

spaced apart walls defining a blade cavity therebetween, said blade being pivotally connected to said blade holder for movement in a plane substantially parallel to at least one of said spaced apart walls of said blade holder; said blade being moveable from a retracted blade position, wherein said blade is received within said blade cavity of said blade holder, to an extended blade position, wherein said blade is extended from said blade holder;

- a longitudinally extending blade holder receiver having a substantially U-shaped cross section, said blade holder receiver having spaced apart walls defining a blade holder cavity therebetween, said blade holder being pivotally



connected to said blade holder receiver for movement in a plane substantially parallel to at least one of said spaced apart walls of said blade holder receiver; said blade holder being moveable from a first blade holder position, wherein said blade holder is received within said blade holder cavity of said blade holder receiver, to a second position, wherein said blade holder is extended outwardly from said blade holder receiver; and

- a restraining member provided on said blade holder receiver for preventing said blade holder receiver from pivoting beyond a substantially perpendicular angle with respect to said blade holder.

5,437,102

**SYSTEMS FOR CUTTING A SEAT BELT TO FREE A PASSENGER TRAPPED IN AN AUTOMOBILE**

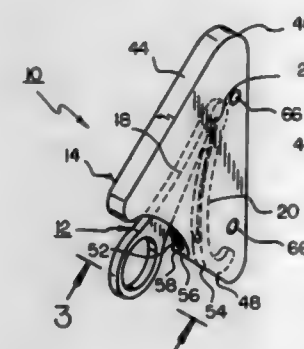
Lawrence D. Fox, and Anne M. Fox, both of Cabot Rd., Westfield, Mass. 01085

Filed Dec. 2, 1993, Ser. No. 160,663

Int. Cl.<sup>6</sup> B26B 29/02

U.S. Cl. 30—298.4

5 Claims



1. A system for use in cutting a seat belt to free a passenger trapped in an automobile accident comprising, in combination: a cutter formed in an inverted V-shaped configuration having a first leg and a second leg, each leg having a free end and a pivot end with a flexible apex therebetween, the free end of the first leg being formed with a circular thumb support, the free end of the second leg being formed with a curved finger support, the first and second legs being formed with recesses mutually facing each other;
- a first blade with a linear cutting edge secured within the recess of the first leg;

a second blade with an outwardly curved cutting edge located within the recess of the second leg; and a holster for receiving the holster, the cutter being formed in a V-shaped configuration with elongated side edges terminating in a point adjacent to which the apex of the cutter is positionable, the holster also having a short free edge adjacent to which the supports of the legs are positionable, the short free edge having an opening for the insertion of the cutter with the circular finger support located exteriorly of the recess.

5,437,103

**RADIAL GUIDE DEVICE FOR A SAW APPARATUS**

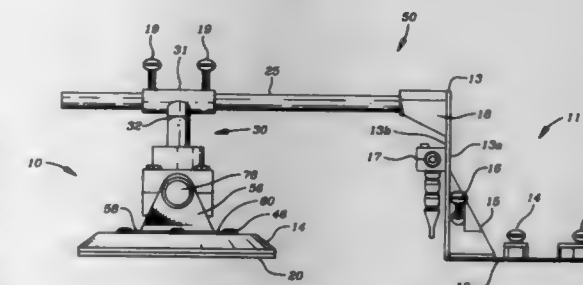
Guy Baptiste, 425 Forkedneck Rd., Indian Mills, N.J. 08088

Filed Sep. 14, 1994, Ser. No. 306,388

Int. Cl.<sup>6</sup> B27B 9/04

U.S. Cl. 30—372

15 Claims



1. A radial guide device for a power saw to provide a generally circular cut in a selected planar material having a relatively smooth surface comprising:

- a support member having a base plate and an upwardly extending plate normal to and from one side of said base plate;
- said base plate having supporting means and a releasably securing means for a power saw;
- said upwardly extending plate adjacent the upper end and on the opposite side of the base plate having a receptacle means for receiving and securing a guide arm in a horizontal position parallel with the base plate;
- a guide arm; and
- a pivot means comprising a conduit means for adjusting and securing said guide arm, a swivel and a vacuum gripping means to provide a pivot movement for the guide arm and to provide a fixed radius for the device.

5,437,104

**LASER SIGHT MOUNTING DEVICE FOR MOUNTING A LASER SIGHT ON THE FLASH ATTACHMENT OF A CAMERA**

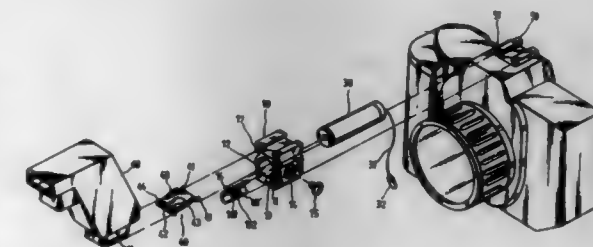
Yen-Jen Chien, Taipei, Taiwan, assignor to Simpatco Industries Co., Ltd., Taipei, Taiwan

Filed Aug. 4, 1994, Ser. No. 285,827

Int. Cl.<sup>6</sup> G03B 13/04; F21V 21/00

U.S. Cl. 33—266

3 Claims



1. A laser sight mounting device comprising: a mounting block having a mounting foot at the bottom for fastening to the flash attachment of a camera, a flash

attachment at the top for mounting the mounting foot of an electronic flash, a longitudinal center through hole located at the center of said mounting block, which receives the laser module of a laser sight, a longitudinal mounting groove located inside said longitudinal center through hole, a side screw hole perpendicularly through said longitudinal mounting groove;

a first spring plate mounted within said longitudinal mounting groove;

a second spring plate mounted within said flash attachment of said mounting block for holding down the mounting foot of the electronic flash being fastened to said mounting block; and

a tightening up screw having a threaded shank threaded into said screw hole to press said first spring plate causing said first spring plate to hold down the laser module in said longitudinal center through hole.

5,437,105

## CENTER FINDING DEVICE

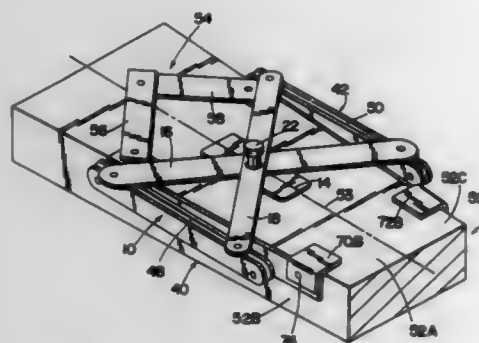
Robert H. Work, 3558 Warren Rd., Cleveland, Ohio 44111

Filed Jan. 31, 1994, Ser. No. 189,597

Int. Cl.<sup>6</sup> G01D 21/00

U.S. Cl. 33—644

6 Claims



1. A center finding assembly for locating the center of a workpiece having substantially non-parallel side surfaces, comprising:

an accessory including a pair of connecting arms pivotally connected to each other at their inner ends and pivotally connected to first and second side engaging leg members at their outer ends whereby said first and second side engaging leg members arms are movable into engaging relation with said non-parallel side surfaces of said workpiece; and

a center finding device having:

first and second crossed arm members pivotally secured to each other by a tubular member at a midpoint between opposite ends of each of said first and second arm members;

first and second side guide arms each having elongated longitudinal slots; and

means for securing one end of each of said first and second arm members to said longitudinal slot of said first guide arm in slidable-pivotal relation thereto and for securing an opposite end of each of said first and second arm members to said longitudinal slot of said second guide arm in slidable-pivotal relation thereto whereby when said first and second side guide arms are movable into engaging relation with said first and second side engaging leg members, said first and second crossed arm members are automatically slidable into a position with said tubular member being in a geometrically centered position with respect to said upper surface of said workpiece.

# 5,437,106 CLOTHES DRYER UTILIZING AIR CONDITIONING WASTE HEAT

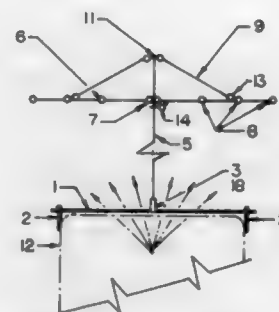
Fred W. Pardoe, 13700 Windlo Cir., Ocean Springs, Miss. 39564

Filed Feb. 19, 1993, Ser. No. 985,025

Int. Cl.<sup>6</sup> F26B 19/00

U.S. Cl. 34—90

1 Claim



1. A clothes drying rack utilizing air conditioning waste heat, comprising:

a residential condensing unit and a collapsible drying rack removably clamped above the top of said condenser unit in the waste heat air stream;

said drying rack further comprises:

a main vertical center support post mounted in a movable post socket to the condenser unit, collapsible and removable clothes line beams hinged to a sliding fitting which fitting is mounted around said center support post,

flexible wire beam supports attached, at one end, to a cover plate fastened to the top of said center support post and, at an opposite end, to said clothes line beams, clothes line eyelets along the length of each clothes line beam for threading of clothes line in a square shape for hanging garments over the waste heat air stream for drying.

5,437,107

# LIMITING ORIFICE DRYING OF CELLULOSIC FIBROUS STRUCTURES, APPARATUS THEREFOR, AND CELLULOSIC FIBROUS STRUCTURES PRODUCED THEREBY

Donald E. Ensign; Wilbur R. Knight, both of Cincinnati, and Paul D. Trokhan, Hamilton, all of Ohio, assignors to The Procter &amp; Gamble Company, Cincinnati, Ohio

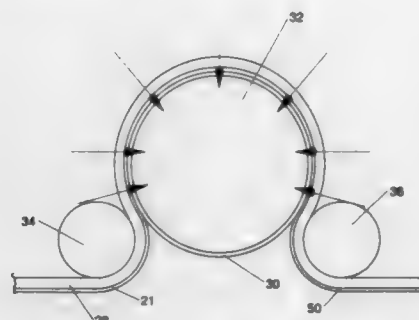
Continuation of Ser. No. 906,962, Jun. 30, 1992, Pat. No. 5,274,930. This application Nov. 15, 1993, Ser. No. 151,691

The portion of the term of this patent subsequent to Jan. 4, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> F26B 19/00

U.S. Cl. 34—117

1 Claim



1. A micropore medium for use with a limiting-orifice-through-air-drying papermaking apparatus in combination with an embryonic web of cellulosic fibers having moisture distributed therein, said micropore medium comprising a limit-

ing orifice for air flow through said embryonic web, so that said moisture distribution is equally or more uniform after air flow therethrough.

5,437,108

# FOOD DEHYDRATOR AND TRAY FOR A DEHYDRATOR

Steven Alseth, Cologne, Minn., assignor to American Harvest, Inc., Chaska, Minn.

Filed Oct. 5, 1992, Ser. No. 956,395

Int. Cl.<sup>6</sup> F26B 25/18

U.S. Cl. 34—196

20 Claims



17. A two-piece stackable tray adapted to stack upon other like trays, comprising a platform having an outer edge and a wall structure which circumscribes said platform, said wall structure being shaped to securely stack upon the wall structure of a like tray, said platform being removably supported by the wall structure along the outer edge of the platform such that the platform is removable without tools from the wall structure for enlarging the vertical size of the space above the like platform, wherein the platform is circular, wherein the wall structure comprises means for supporting the platform, and wherein the platform is removably attached to the supporting means along the outer edge of the platform.

5,437,109

# AERODYNAMIC SURFACING FOR IMPROVED AIR CIRCULATION THROUGH A KILN FOR DRYING LUMBER

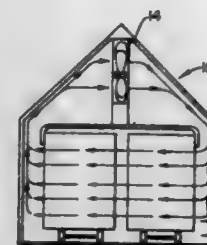
George Culp, 318 S. Main St., New London, Stanley County, N.C. 28127

Filed Sep. 23, 1993, Ser. No. 126,090

Int. Cl.<sup>6</sup> F26B 21/06

U.S. Cl. 34—231

33 Claims



1. A kiln system for drying green lumber to a predetermined moisture content, said kiln system comprising:

a kiln chamber, lower portions of which define a generally rectangular solid space for enclosing a charge of lumber

therein for drying, the charge of lumber comprising at least one rectangular solid stack of lumber;

a fan in upper portions of said kiln chamber and above said generally rectangular solid space for circulating air through said chamber and through lumber in said chamber to thereby dry the lumber; and

a first elongate fairing in the upper portions of said kiln chamber for overlying and partially surrounding an upper corner of a rectangular stack of lumber placed in said chamber for drying, said first fairing forming a continuous concave curve, in lateral cross-section, relative to the rectangular stack of lumber for smoothing the airflow in said upper portions of said chamber and around the upper corner of the stack of lumber to thereby increase the efficiency of the airflow about the upper corner of the rectangular stack of lumber and to thereby correspondingly increase the efficiency of the drying process.

5,437,110

# ADJUSTABLE SHOE HEEL SPRING AND STABILIZER

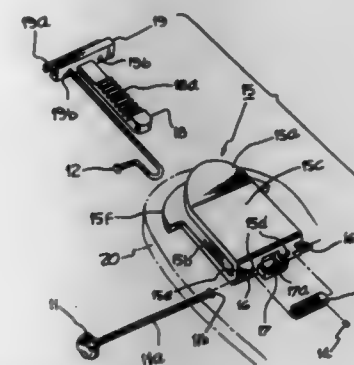
Mark R. Goldston, Santa Monica; Jon Bemis, Rancho Palos Verdes, and Alan Crawford, Burbank, all of Calif., assignors to L.A. Gear, Inc., Santa Monica, Calif.

Filed Feb. 4, 1993, Ser. No. 13,700

Int. Cl.<sup>6</sup> A43B 21/30, 13/28

U.S. Cl. 36—38

15 Claims



1. An athletic shoe comprising:

an upper;

a resilient mid-sole attached to the upper;

an out-sole attached to the mid-sole;

absorbing means, disposed in the mid-sole, for absorbing shock energy and returning at least a portion of the absorbed shock energy to the foot of the wearer; and

means, operatively connected with the absorbing means, for adjusting an amount of shock energy absorbed and returned by the absorbing means, wherein the absorbing means is disposed in the mid-sole below the wearer's heel and comprises a spring mechanism having a spring member connected in a cantilevered position relative to a lower plate.

5,437,111

# ELEVATING SHOE PROVIDED WITH A DECEPTIVE INNER MEMBER

Sachiko Kousaka; Mitsuko Kousaka, both of Sakai, and Kumiko Isaka, Izumi, all of Japan, assignors to Yungen Kaisha Frontier, Osaka, Japan

Continuation of Ser. No. 28,679, Mar. 10, 1993, abandoned. This application Sep. 13, 1994, Ser. No. 305,501

Claims priority, application Japan, Mar. 13, 1992, 4-89871; Mar. 23, 1992, 4-95898; Apr. 4, 1992, 4-112279; Apr. 8, 1992, 4-116887; Apr. 20, 1992, 4-126872; Aug. 11, 1992, 4-236477; Jan. 22, 1993, 5-272693

Int. Cl.<sup>6</sup> A43B 13/38

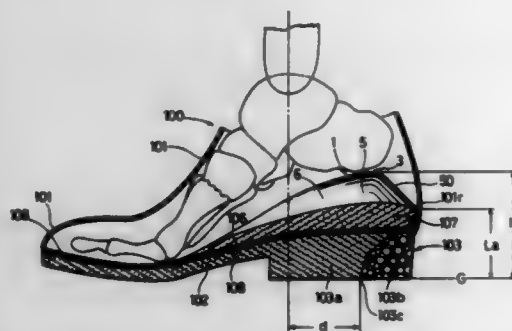
U.S. Cl. 36—81

24 Claims

1. An elevating shoe comprising a shoe body having an



upper, a sole and a heel, and deceptive elevating means for elevating the heel of a person wearing the shoe comprising a deceptive resilient elevating member having a heel-bearing top surface on which the heel of a person wearing the shoes bears, said heel-bearing top surface having a rear arcuate border and two side borders, said rear arcuate border having a rearmost end, said deceptive elevating member having a rising surface having an outer peripheral edge juxtaposed to said shoe body, said rising surface extending upwardly from said outer peripheral edge to said heel-bearing top surface with a substantially straight gradient, said outer peripheral edge having a rear arcuate portion and two side portions, said rising surface having a rear part which extends upwardly from said rear arcuate portion of said peripheral edge to said rear arcuate border of said heel-bearing top surface, said rising surface having two side parts which extend upwardly from said two side edge portions of said peripheral edge to said respective two side borders of said heel-bearing top surface, said heel-bearing top surface having a front end, said deceptive elevating member having a forward sloping section extending forwardly of said front end, said forward sloping section sloping downwardly



and forwardly from said front end, said rising surface further including two forward parts disposed forwardly of the respective side parts of said rising surface, said peripheral edge having two forward portions disposed forwardly of the respective side portions of said peripheral edge, said two forward parts of said rising surface extending with a substantially straight gradient from said respective two forward portions of said peripheral edge to said forward sloping section of said deceptive elevating member, said two forward parts of said rising surface having a substantially straight gradient and having a slope angle which is the same as the slope angle of said arcuate rear part and the same as the two side parts of said rising surface, said peripheral edge having a rearmost point and two intermediate points where the rear arcuate portion joins the respective two side portions, said peripheral edge sloping downwardly and rearwardly from said intermediate points to said rearmost point, said heel comprising a heel body for supporting the wearer, said heel body having a rear end which is positioned forwardly of said rearmost end of said rear arcuate border of said heel-bearing top surface of said deceptive elevating member.

5,437,112

# SPORTS SHOE FOR ACTIVITIES WHICH INVOLVE KICKING A BALL

Craig Johnston, Dublin, Ireland, assignor to Zermatt Holdings Ltd., London, Great Britain

PCT No. PCT/GB91/02134, § 371 Date Feb. 16, 1993, § 102(e) Date Feb. 16, 1993, PCT Pub. No. WO92/22224, PCT Pub. Date Dec. 23, 1992

PCT Filed Dec. 2, 1991, Ser. No. 969,196

Claims priority, application United Kingdom, Jun. 19, 1991, 9113172

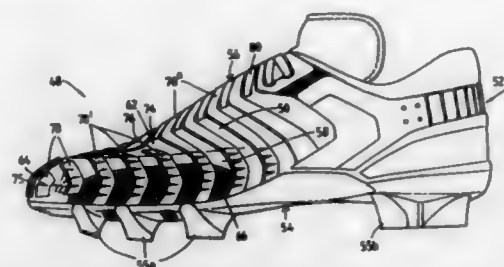
Int. Cl. A43B 5/02, 5/00

U.S. Cl. 36—128

17 Claims

1. A sports shoe for activities which involve kicking a ball, the sports shoe having an upper and a sole both having a longitudinal extension, wherein at least one preferred ball

contact surface region of an outer surface of said upper is provided with a plurality of resiliently deformable strip formations spaced longitudinally apart from each other and arranged in a substantially parallel relation to each other and extending over said upper transversely with respect to said longitudinal extension, each strip formation having a free edge forming a crest of the strip formation and a lower edge extending oppositely therefrom so as to merge into the upper of the shoe



thereby providing a strip formation having a substantially triangular cross-section over substantially the entire length of said strip formation and wherein at least one of the strip formations includes a plurality of slits therein which extend substantially in parallel to said longitudinal extension and which divide said crest of each strip formation into separately deformable strip formation portions, thereby providing an improved gripping surface when contacting a ball.

5,437,113

# SNOW PLOW TRIP CUTTING EDGE

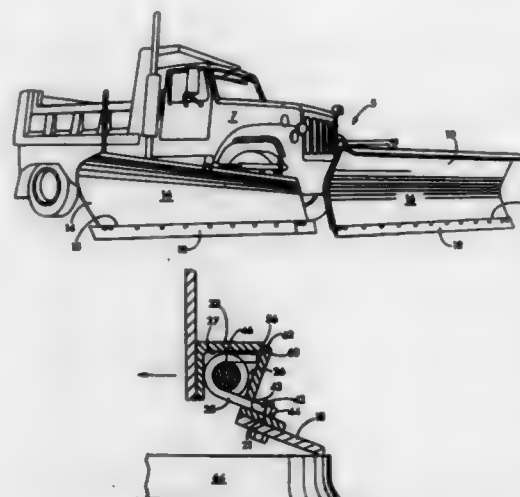
Daniel K. Jones, 5337 Reiner Rd., Madison, Wis. 53704

Filed Jan. 12, 1994, Ser. No. 180,365

Int. Cl. E01H 5/04

U.S. Cl. 37—233

11 Claims



1. In a snowplow system including a moldboard having a first upper end and a second attachment end, and a trip cutting edge having a first lower end and a second attachment end, wherein the trip cutting edge is connected to and rotationally displaced with respect to the moldboard, a trip cutting edge attachment comprising:

- a first planar section perpendicularly placed on the second attachment end of the moldboard, the first planar section including a first impact surface area for receiving the impact of the trip cutting edge when the trip cutting edge is rotationally displaced, wherein the first planar section substantially extends the length of the second attachment end of the moldboard;
- a second planar section perpendicularly placed on the second attachment end of the trip cutting edge, the second

- a planar section including a second impact surface area for receiving the impact of the first impact surface area when the trip cutting edge is rotationally displaced, wherein the second planar section substantially extends the length of the second attachment end of the trip cutting edge;
- a plurality of moldboard connection ears attached to the first planar section of the moldboard, wherein each of the connection ears include a channel;
- a plurality of trip cutting edge connection ears attached to the second planar section of the trip cutting edge, wherein each of the connection ears include a channel, such that the channels of the moldboard connection ears align with the channels of the trip cutting edge connection ears, and one trip cutting edge connection ear forms a connection ear pair with one moldboard connection ear;
- a shaft extending through the channels of the plurality of moldboard and trip cutting edge connection ears to rotationally engage the connection ears thereby rotationally attaching the moldboard and the trip cutting edge; and
- a plurality of torsion springs, each spring being positioned between each connection ear pair, wherein each spring has a first end biased against the moldboard and spaced from the first impact surface area, and a second end biased against the trip cutting edge and spaced from the second impact surface area, so that the first ends and second ends are not pinched between the first impact surface area and the second impact surface area when the trip cutting edge is rotationally displaced.

5,437,114

# APPARATUS FOR RECEIVING AND PASSING THROUGH LAUNDRY

Gerardus H. M. Kuipers, Berlicum, Netherlands, assignor to AMKO International B.V., Kerkrade, Netherlands

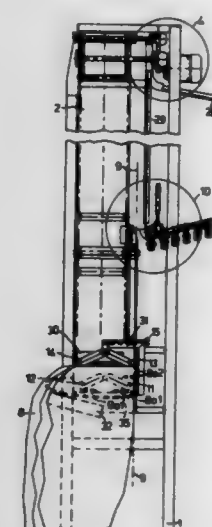
Filed Feb. 4, 1994, Ser. No. 192,019

Claims priority, application Netherlands, Feb. 5, 1993, 9300238

Int. Cl. D06F 67/04

U.S. Cl. 38—143

30 Claims



1. Apparatus for receiving and passing through pieces of laundry, a piece of laundry being rectangular and comprising a leading edge, a rear edge and two lateral edges, the apparatus comprising a frame and intake means on said frame for engaging a sole corner portion of the leading edge of the piece of laundry which is fed by hand, and conveyor means arranged downstream of said intake means for clamping and conveying said corner portion and the lateral edge portion following said corner portion in a smooth and straightened out condition, independent of the other lateral edge.

5,437,115

# SECURITY GATE APPARATUS

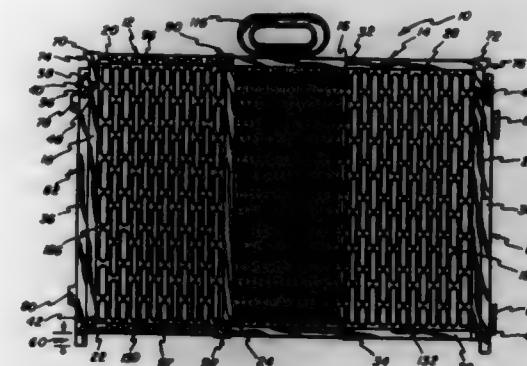
T. Brent Fresse, Westminster, and Robert M. Parker, Aurora, both of Colo., assignors to Gerry Baby Products Company, Thornton, Colo.

Filed May 5, 1994, Ser. No. 238,367

Int. Cl. E05C 21/02

U.S. Cl. 49—465

17 Claims



1. A security gate apparatus for attachment across an opening defined by first and second vertical surfaces, said apparatus comprising:

- a first gate panel having top and bottom horizontal members and inner and outer vertical members;
  - a second gate panel having top and bottom horizontal members and inner and outer vertical members, said second gate panel being slidably connected to said first gate panel so as to permit horizontal extension and retraction of said gate apparatus to a desired horizontal dimension;
  - a first vertical leg pivotably attached to said outer vertical member of said first gate panel by a first link means;
  - a second vertical leg pivotably attached to said outer vertical member of said second gate panel by a second link means;
  - means for locking said first and second gate panels at said desired horizontal dimension; and
  - at least one contact pad on a surface of said first and second vertical legs opposite said outer vertical members of said first and second gate panels, respectively;
- wherein said security gate apparatus is installed between said first and second vertical surfaces by pivoting said first and second link means to provide a vertical movement between said first and second gate panels and said first and second vertical legs and a corresponding horizontal spacing therebetween, whereby said contact pads frictionally engage said first and second vertical surfaces.

5,437,116

# MODULAR SIGN SYSTEM

Stephen N. Hardy, Copley, Ohio, assignor to RTC Industries, Inc., Chicago, Ill.

Filed Jun. 3, 1993, Ser. No. 71,442

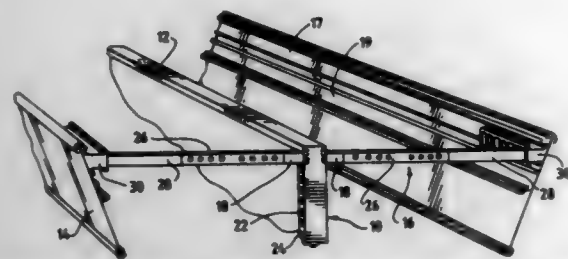
Int. Cl. G09F 7/00

U.S. Cl. 40—605

26 Claims

1. A sign display system for a shelving structure comprising a sign support assembly adapted to be connected to the shelving structure, said support assembly comprising a bracket constructed and arranged to be connected to the shelving structure, a support arm, means interconnecting said bracket to one end of said support arm, a support clip comprising an elongated box-like member for receiving a sign support, means

interconnecting said support clip and the other end of said support arm, said support clip and said sign support defining



interengaging means for connecting the sign support to the support clip for supporting the sign relative thereto.

5,437,117

**BULLET ALARM**

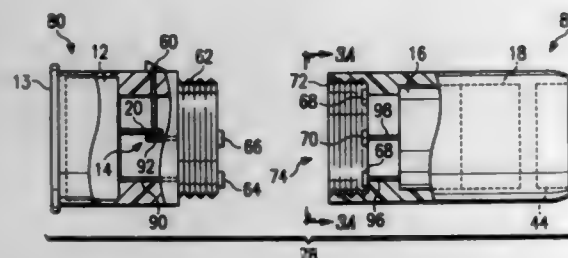
Earl H. Mackey, III, P.O. Box 5351, Abilene, Tex. 79608

Filed Jul. 1, 1994, Ser. No. 269,660

Int. Cl.<sup>6</sup> F41A 17/06

U.S. Cl. 42-1.01

13 Claims



6. A safety device for insertion into a chamber of a firearm, comprising:

- a power source;
- a power switch connected to said power source, said power switch being activated when the safety device is inserted into the chamber of the firearm;
- an actuator switch activated in response to movement of the firearm and connected to said power switch; and
- an alarm circuit for producing an audio alarm signal when said power switch and said actuator switch are both activated thereby connecting said power source to said alarm circuit.

5,437,118

**FRAME PLUG FOR SEMI-AUTOMATIC HANDGUNS**

Gary A. Sniezak, Windsor, Conn., and Edward P. Schmitter, Easthampton, Mass., assignors to Smith &amp; Wesson Corp., Springfield, Mass.

Filed Mar. 7, 1994, Ser. No. 207,349

Int. Cl.<sup>6</sup> F41C 23/10

U.S. Cl. 42-7

10 Claims

1. A closure member for a cavity in the handgrip of a polymeric frame of a semi-automatic handgun, the cavity being open at its lower end and defined in part by a rear wall of a magazine receiving chamber, said wall including a first coupling means located at a predetermined distance above the lower end of the handgrip, said closure member comprising at its lower end a plug dimensioned and shaped to close the lower end opening of the cavity, and an elongated retainer extending upwardly from said plug a distance approximately the same as said predetermined distance and including a second coupling means at its upper end for interengagement with said first coupling means when said closure member is fitted into said cavity, said elongated retainer being resiliently flexible for



assembled relation in said cavity and means for stabilizing the closure member relative to said handgrip.

5,437,119

**GUN TRIGGER BLOCKING STRUCTURE**

Robert C. Womack, Dallas, Tex., assignor to Weinraub Enterprises, Inc., Orange, Calif.

Filed Aug. 16, 1994, Ser. No. 291,198

Int. Cl.<sup>6</sup> F41A 17/54

U.S. Cl. 42-70.07

31 Claims



21. A gun trigger blocking structure comprising:

- first and second block halves adapted to be mounted on opposite sides of a gun trigger guard;
- a locking member mounted on one of the block halves and arranged to extend into an opening in the other block half;
- locking member engaging means including a pseudo key lock mounted in the other block half, the pseudo key lock being moveable between first and second positions, the locking member engaging means being arranged to engage the locking member and prevent separation of the block halves when the pseudo key lock is in the first position and to disengage the locking member and allow the block halves to be separated when the pseudo key lock is in the second position;
- means for selectively preventing the pseudo key lock from moving from the first to the second position; and
- means extending from at least one of the block halves for blocking movement of a trigger of a gun on which the trigger blocking structure is mounted.

5,437,120

**FIREARM HAVING IMPROVED SAFETY AND ACCURACY FEATURES**

Thomas F. Dornaus, Norwalk, Calif., assignor to Richard A. Voit, Ketchum, Id.

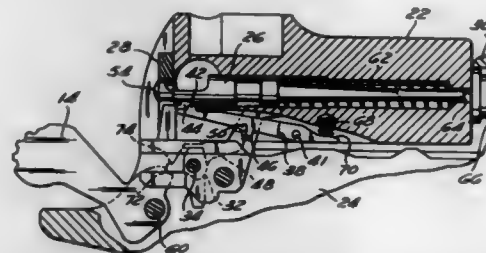
Division of Ser. No. 79,339, Jun. 16, 1993, abandoned, which is a division of Ser. No. 537,064, Jun. 12, 1990, Pat. No. 5,245,776.

This application Dec. 10, 1993, Ser. No. 165,267

Int. Cl.<sup>6</sup> F41A 17/64

U.S. Cl. 42-70.06

7 Claims



1. A passive firing pin lock for a firearm, the firearm having a receiver, a slide, a firing pin disposed within the slide, a sear disposed within the receiver, and a trigger, the trigger having unactuated and actuated positions, the passive firing pin lock comprising:

- means having a tab formed thereon, said tab being responsive to a pawl formed upon the sear, said means engaging the firing pin when the trigger is in the unactuated position, said means disengaging said firing pin when the trigger is in the actuated position;
- wherein engagement of said firing pin by said means locks said firing pin in place to prevent accidental discharge of the firearm and disengagement of said firing pin by said means permits said firing pin to translate reciprocally to discharge the firearm; and
- wherein said tab and said pawl are formed and positioned to permit relative motion therebetween as the slide moves relative to the receiver.

5,437,121

**DEVICE FOR SUPPORTING A FISHING ROD AND FOR PROVIDING A PERIODIC LIFTING MOTION TO THE ROD TO EFFECT JIGGING**

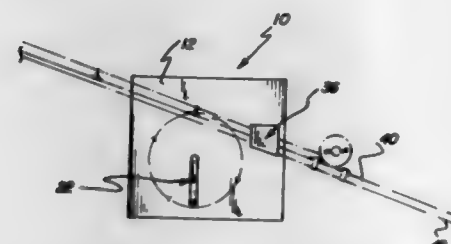
Eugene O. Chacon, Jr., 1660 Ross Ave., and Rodney D. David, 208 White Pine, both of Alamosa, Colo. 81101

Filed Apr. 7, 1994, Ser. No. 224,570

Int. Cl.<sup>6</sup> A01K 97/10

U.S. Cl. 43-19.2

2 Claims



1. A new and improved device for supporting a fishing rod and for providing a periodic lifting motion to the rod to effect jigging comprising, in combination:

- a box-like housing in a generally rectangular configuration with a lower bottom wall with front, rear and side edges, upstanding rectangular front and rear walls parallel with each other and extending upwardly from the front and rear edges of the bottom wall and with rectangular side walls parallel with each other and extending upwardly from the side edges of the bottom wall and coupled at their vertical side edges to the vertical edges of the front and rear walls and a rectangular top removably coupled at

its periphery to the upper edges of the front, rear and side walls;

screws to removably couple the top wall from the upper edges of the front, rear and side walls;

a fishing rod holder secured to one side wall of the housing at a location adjacent to the back wall, the holder having a lower planar surface in an angular orientation with respect to the top and bottom walls for supporting a central extent of a fishing rod at an angle with its lower most end on the ground, the holder also having a vertically extending wall located outwardly from the supporting side wall of the housings;

a motor mounted within the housing with a battery for providing a source of potential to drive the motor, a power switch located within the housing with a toggle extending exteriorly of the housing through the adjacent side wall thereof opposite from the holder, the toggle movable between an on position wherein the power is provided to the motor and an off position where power to the motor is stopped;

a speed switch mounted in the side wall of the housing adjacent to the switch;

electrical wires coupling the motor, battery and power switch as well as the speed control switch; and

a drive rod extending horizontally from the motor through the side wall supporting the holder, the drive rod having an L-shaped member with a long vertical leg coupled at the first end to the rod of the motor and with the second end extending horizontally at a right angle from the first end, the L-shaped member adapted to rotate with the activation of the motor and rotation of the drive shaft, the L-shaped member adapted to periodically contact the fishing rod at a location above and forwardly of the holder to affect its jiggling.

5,437,122

**FISHING ROD HOLDER**

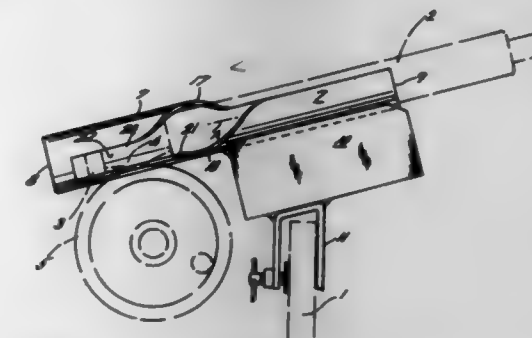
Darrell E. Wilson, 3576 Wood Ave., Eugene, Oreg. 97402

Filed Apr. 22, 1994, Ser. No. 231,511

Int. Cl.<sup>6</sup> A01K 97/10

U.S. Cl. 43-21.2

7 Claims



1. A fishing rod and reel holder for attachment to a support and comprising,

- an elongate tubular member open at one end to receive the handle and fishing reel thereon and including wall structure having a first set of edges extending lengthwise of the tubular member and defining a first elongate open area and a second set of edges also extending lengthwise of the tubular member and defining a second elongate open area, said first elongate open area and said second elongate open area extending in an axial direction along the tubular member and rotationally offset from one another about the major axis of the tubular member, said wall structure having a third set of edges defining a third open area in communication with said first and second open areas and through which a portion of the reel may pass, and



mounting means for attaching said tubular member to a support.

5,437,123

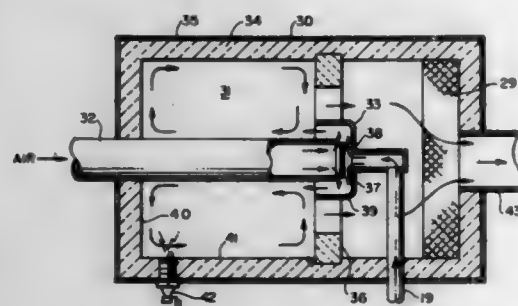
# UNDEROXIDIZED BURNER UTILIZING IMPROVED INJECTORS

Leonard Greiner, 1310 Logan Ave., Suite E, Costa Mesa, Calif. 92626; David M. Moard, 1545 S. El Molino Ave., Pasadena, Calif. 91106, and Bharat Bhatt, 1454 Roberts Ave., Fullerton, Calif. 92633

Continuation-in-part of Ser. No. 148,472, Nov. 8, 1993. This application Sep. 20, 1994, Ser. No. 309,041  
Int. Cl.<sup>6</sup> C10G 9/04

U.S. Cl. 48—107

9 Claims



1. In an internal combustion apparatus, the combination which comprises:

- a burner means having at least one internal combustion chamber for combusting air and hydrocarbon fuels at fuel-rich stoichiometric air/fuel ratios within the range from 0.25 to 1.0 to provide air/fuel vapors;
- injector means disposed in said burner means for separately introducing air and fuel into said combustion chamber;
- said injector means includes an air inlet tube and a fuel inlet tube having open ends terminating in close proximity with respect to each other;
- a cup-like thimble disposed about said open ends of said air inlet tube and said fuel inlet tube for simultaneously receiving introduced air and fuel;
- said thimble incorporating a flat barrier wall within a continuous sidewall terminating in an edge about said open ends for receiving said introduced air and fuel in forced impingement relationship to create an air/fuel mixture in said combustion chamber.

5,437,124

# RIGID BACKBONE ENHANCEMENT FOR EXTRUDED PROFILES

Michael D. Ahlfeld, and David C. Froehlich, both of Maryville, Tenn., assignors to Schlegel Corporation, Rochester, N.Y.

Continuation of Ser. No. 93,053, Jul. 16, 1993, abandoned. This application Jan. 26, 1995, Ser. No. 378,101

Int. Cl.<sup>6</sup> E06B 7/16

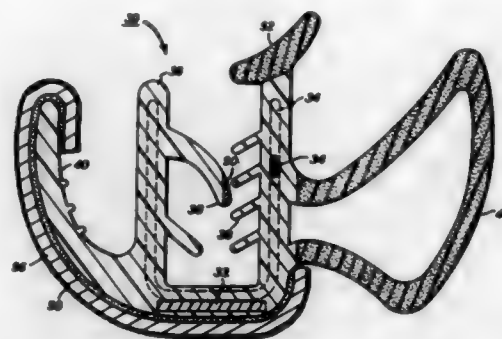
U.S. Cl. 49—479.1

13 Claims

1. A weatherseal comprising a supporting carrier; a body of elastomeric material formed on the carrier; a layer of decorative material on a surface of the body;

- a backbone strip of longitudinally incompressible material

disposed between the decorative layer and the carrier for reducing wrinkling of the decorative layer when the



weatherstrip is bent on a radius with the decorative layer inside.

5,437,125

# SURFACE POLISHING ASSEMBLY

Kenneth A. Barton, II, 1413 Airway Dr., Waterford, Mich. 48327

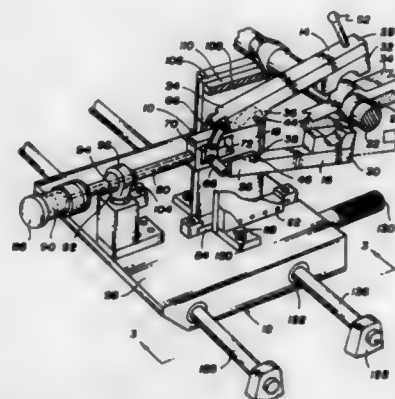
Continuation of Ser. No. 851,871, Mar. 16, 1992, abandoned.

This application Nov. 8, 1993, Ser. No. 149,012

Int. Cl.<sup>6</sup> B24B 5/00

U.S. Cl. 451—8

11 Claims



1. A surface polishing tool for attachment to various power means for rotating a workpiece about an axis in a finishing process, said workpiece having at least one process surface, said polishing tool comprising:

- a body defining a track adapted to be positioned adjacent said workpiece, said body including first and second pivot means for supporting a pair of spaced apart polishing arms, said first and second pivot means located adjacent said track;
- a first polishing arm pivotable on said first pivot means, said first arm having a first end adapted to receive a surface grinding means for finishing said process surface of said workpiece and a second end;
- a second polishing arm pivotable on said second pivot means, said second arm having a first end adapted to receive said surface grinding means for finishing said process surface of said workpiece and a second end;
- a slide block disposed within said track and movable in a controlled first direction towards said workpiece between a first starting position and a second ending position, said slide having a first side and a second side;
- a first push type toggle means for pivotally connecting said second end of said first polishing arm to said first side of said slide;
- a second push type toggle means for pivotally connecting said second end of said second polishing arm to said second side of slide wherein movement of said slide from said

first starting position to said second ending position within said track moves said polishing arms about said first and second pivot means from a respective treatment enabling position spaced from said workpiece to a respective treatment position wherein said surface grinding means engages said workpiece;

actuating means for movably engaging the slide to move the polishing arms between said respective treatment enabling position and said respective treatment position, said actuating means including a tie rod connected to said slide and a sleeve affixed at one end to said body for guiding said tie rod, wherein said tie rod has a first end affixable to a regulated fluid cylinder and a second end affixable to the slide for operatively reciprocating said tie rod in said first direction, thereby moving said slide and correspondingly moving said polishing arms about said first and second pivot means;

a sliding base affixable to said body and manually movable linearly with respect to said workpiece along and adjacent to said axis of rotation of said workpiece, thereby allowing said polishing arms to be located with respect to said process surface disposed on said workpiece and allowing said polishing arms to be manually oscillated along a predetermined length of the process surface during said finishing process;

a pair of rigid, stabilizing plates mounted directly to the base independently of said polishing arms or said body, said plates disposed adjacent to and on opposite sides of the body, said plates disposed in abutting engagement with said body but sufficiently spaced apart a minimum running clearance to allow movement of the arms in a vertical plane substantially perpendicular to said axis, said plates encompassing a sufficient portion of the polishing arms to maintain a minimum of angular and lateral movement of the polishing arms with respect to said stabilizing plates; and

a bearing means for slidably supporting said sleeve, wherein said bearing means allows movement of said sleeve and first and second polishing arms in said first direction toward said workpiece and away from workpiece in an opposite second direction thereby affording manual movement of said polishing arms in said first and second directions to assist in locating the polishing arms in said treat enabling position.

5,437,126

# INFLATABLE AND FOLDABLE OUTDOOR BED

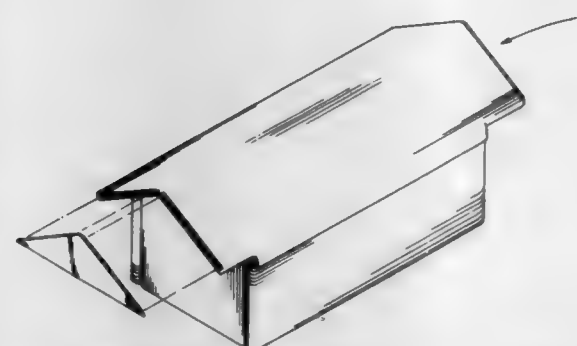
Apolar Z. Ramiro, 993 N. Wilson Ave., Pasadena, Calif. 91104

Filed Oct. 11, 1994, Ser. No. 320,323

Int. Cl.<sup>6</sup> E04H 15/20

U.S. Cl. 52—2.22

4 Claims



1. An inflatable and foldable outdoor bed for providing a shelter for the outdoors comprising, in combination:

- a bed portion;
- a left wall foldably secured to the bed portion, the left wall folding upwards perpendicular to the bed portion;
- a right wall foldably secured to the bed portion, the right wall folding upwards perpendicular to the bed portion;
- a roof portion having a right portion and a left portion, the

right portion foldably secured to the left wall, the left portion of the roof portion folding over to the right wall and secured thereto with end portions extending outwardly therefrom;

a back portion foldably secured to the bed portion, the back portion folding upwards perpendicular to the bed portion coupling with a top edge of the right wall and a top edge of the left wall;

a front portion foldably secured to the bed portion, the front portion folding upwards perpendicular to the bed portion coupling with a bottom edge of the right wall and a bottom edge of the left wall;

a plurality of inflatable mattresses, one of the plurality of mattresses secured within the bed portion, the left wall, the right wall, the roof portion, the back portion, and the front portion, each of the inflatable mattresses having an inflation tube secured thereto.

5,437,127

# STONE SURROUND FOR DEFINING A GRAVE SITE

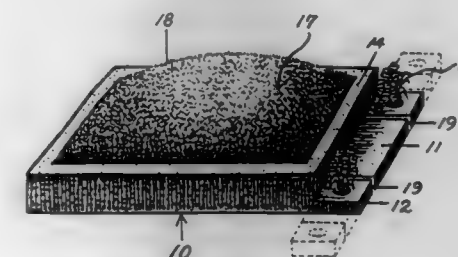
Jang P. Ha, 8459 Brass Knob Ct., Annandale, Va. 22003

Filed Apr. 29, 1994, Ser. No. 235,514

Int. Cl.<sup>6</sup> E04H 13/00

U.S. Cl. 52—103

3 Claims



1. A stone surround and grave site assembly for defining a grave site, which comprises:

- a rectangular stone wall structure including at least four rectangular cross section stones arranged in a rectangular configuration;
- a rectangular front stone plate disposed on a front side of said rectangular stone wall structure, and
- a pair of stone plates each having a hole, respectively, and said stone plates are disposed at two ends of said rectangular front stone plate, wherein a bulging grass tomb is formed on the rectangular stone wall structure and the holes in said pair of stone plates are adapted to have a pair of plants planted therethrough.

5,437,128

# GROUND ANCHOR

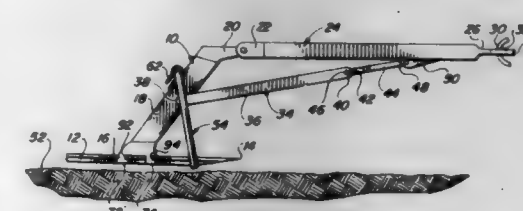
Max K. Gremillion, Canyon Country, Calif., assignor to Patrick N. Gremillion and Janice L. Gremillion, both of Carbondale, Calif.

Filed Jan. 25, 1993, Ser. No. 8,639

Int. Cl.<sup>6</sup> F02D 5/80

U.S. Cl. 52—162

19 Claims



1. An improved ground anchor comprising, in combination: a) a blade having a ground-penetrating point;

- b) a cantilever post releasably connected to and extending from the approximate center of said blade;
- c) an elongated tongue pivotally connected to the end of said post which is remote from said blade and extending in the same direction as said point of said blade, said tongue bearing means on the remote end thereof for connection to a winch cable;
- d) tension linkage pivotally connected to a mid portion of said post and pivotally connected to a portion of said tongue adjacent said remote end thereof and extending generally in the same direction as said point, said linkage comprising a plurality of longitudinally extending links pivotally connected together at their adjoining ends; and
- e) a support brace pivotally connected to said cantilever post and depending therefrom, said brace including a pair of depending support legs adapted to contact the ground and position said blade for engagement with the ground.

5,437,129

## FIRE RESISTANT SKYLIGHT STRUCTURE

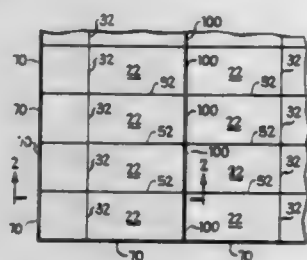
Moshe Konstantin, Highland Park, Ill., assignor to Clear Plastics International, Inc., Mundelein, Ill.

Filed Jan. 13, 1993, Ser. No. 3,772

Int. Cl.<sup>6</sup> E04B 7/18

U.S. Cl. 52—200

18 Claims



1. A sloped plastic glazing panel structure having fire resisting capability, comprising:

- a skylight framework disposed at an angle to the vertical;
- a first polymeric panel of thermoplastic material having light transmitting characteristics and held by the framework at an angle to the vertical to transmit light downwardly;
- a second polymeric panel having light transmitting characteristics for transmitting light downwardly and held by the framework to be substantially parallel to the first polymeric panel;

means on the framework for maintaining said second panel in spaced relation to said first polymeric panel with a space being defined between said first and second panels;

a light transmitting, insulating layer having an upper surface for receiving embers from a burning brand and melted plastic from the first polymeric panel of thermoplastic material and disposed in said space and beneath the first polymeric panel for reducing thermal transmission from a burning brand on the first polymeric panel downwardly across the space to the second polymeric panel to burn through the second polymeric panel; and

a light transmitting, supporting means disposed beneath the first panel and above the second panel, and in said space for holding burning particles from a burning brand from falling downwardly onto the second panel and burning through the second panel and passing through the second panel.

5,437,130  
SYSTEM AND METHOD FOR PREFABRICATING A  
FREE STANDING WOODEN SPLIT-JAMB, DOOR AND  
TRIM ASSEMBLY

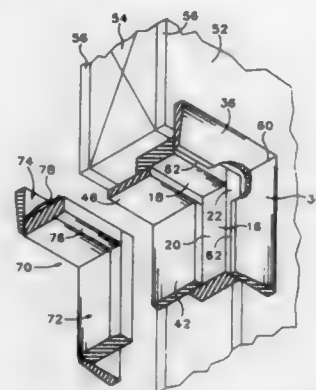
Gene A. Raynak, 2021 NE, 22nd, Portland, Oreg. 97214

Filed May 10, 1993, Ser. No. 59,821

Int. Cl.<sup>6</sup> F06B 1/06, 1/08

U.S. Cl. 52—210

11 Claims



1. A prefabricated free standing wooden door, jamb and trim assembly for installation in a doorway comprising:

- a wooden door jamb including a first leg, a second leg and a first header, each of the first and second legs forming a square butt-end joint with the first header, the door jamb having an inner side and a front side;
- a wooden front trim frame including a first side piece, a second side piece and a first top piece dimensioned to frame the sides and top of the doorway, the first top piece being mitered at both ends, and each of the first and second side pieces being mitered at an upper end which is joined to one of the ends of the top piece by a continuous layer of wood glue so that the first and second side pieces are securely maintained in a parallel relationship to each other and in a perpendicular relationship to the first top piece;

wherein the front trim frame is joined to the front side of the door jamb by a continuous layer of wood glue so that the front trim frame provides substantial support to maintain the square orientation of the door jamb;

a door hingedly attached to the first leg on the inner side of the jamb; and

a door stop having a horizontal piece and two vertical pieces, each vertical piece forming a butt-end joint with the horizontal piece to form a right angle;

wherein the assembly has two corner joints, each joint having a trim-joint interface in a first plane, a jamb-joint interface in a second plane, and a stop-joint interface in a third plane, no one of the planes being parallel with any other one of the planes.

5,437,131

WINDOW MOLDING MEMBERS AND METHOD OF  
MANUFACTURING SAME

Tatsuya Tamura, Yokohama, Japan, assignor to Hashimoto Forming Industry Co., Ltd., Japan

Division of Ser. No. 48,952, Apr. 15, 1993, Pat. No. 5,332,541, which is a continuation of Ser. No. 789,962, Nov. 12, 1991, which is a division of Ser. No. 233,049, Aug. 17, 1988, Pat. No. 5,107,646. This application Apr. 19, 1994, Ser. No. 229,663

Claims priority, application Japan, Sep. 29, 1987, 62-245371

The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.

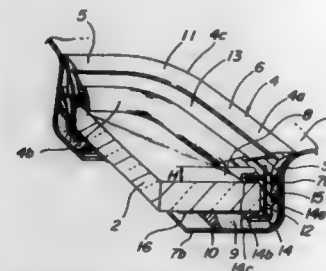
Int. Cl.<sup>6</sup> E04B 1/62

U.S. Cl. 52—716.6

20 Claims

1. A window molding member adapted to be mounted on an exterior portion of an automobile, comprising:

a main body composed at least partly of a continuous elongate member, including an upper portion to extend along an upper edge of a window plate, at least one side portion to extend along a side edge of the window plate, and at least one corner portion integrally joining said upper and side portions with each other to provide a one-piece structure, the main body being further provided with an integral ridge extending in the longitudinal direction of the main body;



said molding member having different cross-sections in said upper and side portions and gradually changing in cross-section substantially through said corner portion so that, when said molding member is mounted in place, said ridge defines at least one weir along either said upper or said side portion to guide rain water along the weir and prevent said rain water from flowing across the molding member;

said molding member further comprising a tension bearing member which is integral with, and less extensible than said main body.

5,437,132

ROOF AND WALL PANEL TIEDOWN BRACKET AND  
METHOD

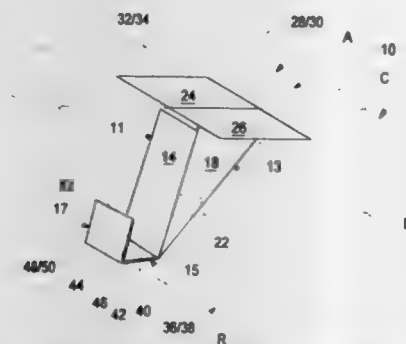
Robert D. Meyers, 6100 Palmer Blvd., Sarasota, Fla. 34232

Filed Nov. 12, 1993, Ser. No. 150,836

Int. Cl.<sup>6</sup> E04B 5/00

U.S. Cl. 52—410

5 Claims



1. A roof and wall panel tiedown bracket for connecting two roof or wall panels abutted together edge to edge along a common joint line therebetween against an edge surface of a supporting rafter or wall stud, respectively, the joint line being orthogonal to a length of the rafter or wall stud, comprising:

an elongated main body formed of first and second flat plates connected orthogonally one to another along a longitudinal margin therebetween;

said first plate having a length generally equal to, and being positionable for nailing attachment against, a width of one side of the rafter or wall stud;

one end of said second plate extending beyond an adjacent end of said first plate a distance equal to a thickness of the roof or wall panel;

two flat securing plates extending orthogonally in either direction from one end of said second plate, said securing plates also being orthogonal to said first plate; each said securing plate being positioned for nailing attachment

ment against a surface of each roof or wall panel adjacent the joint line when said first plate is positioned for nailing attachment against one side of the rafter or wall stud, respectively.

5,437,133

GRILLE FASTENER ASSEMBLY

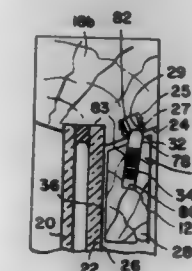
Frank V. Pliml, Arlington Heights, Ill., assignor to Illinois Tool Works, Inc., Glenview, Ill.

Filed Dec. 3, 1992, Ser. No. 984,960

Int. Cl.<sup>6</sup> E06B 3/70

U.S. Cl. 52—456

19 Claims



1. A grille fastener assembly for releasably securing a wooden grille to a window sash having a generally rectangular-shaped frame with a single pane structure fixed therein, comprising:

said wooden grille being formed of a plurality of grille bars interconnected to each other in a right angular relationship, each of said plurality of grille bars having a bottom surface engaging an innermost surface of said single pane structure for simulating division of said single pane structure into a plurality of smaller panes;

each one of said plurality of grille bars having a terminal end portion which is contoured so as to mate with a chamfered surface extending substantially about the interior periphery of said sash frame, said terminal end portion of each one of said grille bars having a longitudinally extending opening defined therein;

a plurality of grille strikes disposed within said sash frame and being aligned with said terminal end portions of said plurality of grille bars; and

spring-loaded plunger assembly means telescopically received within said longitudinally extending openings formed within said terminal end portions of said plurality of grille bars and having enlarged ends biased outwardly from said longitudinally extending openings and into respective central openings defined within said grille strikes for releasably securing said grille to said sash frame,

wherein each one of said spring-loaded plunger assemblies, having an axial extent, comprises a base portion having a first, axially outer end portion and a second, axially inner end portion; a plunger member having a first axially outer end portion and a second axially inner end portion for engagement with said second axially inner end portion of said base portion whereby said base portion and said plunger member are secured together such that said base portion and said plunger member are axially movable with respect to each other; and a compression means interposed between said first axially outer end portions of said base portion and said plunger member for biasing said first axially outer end portions of said base portion and said plunger member away from each other.



5,437,134

## COLLAPSIBLE SECURITY GRILLE

Francis M. Donnelly, c/o FAS, Baldoye Industrial Estate, Baldoye, Dublin 13, Ireland

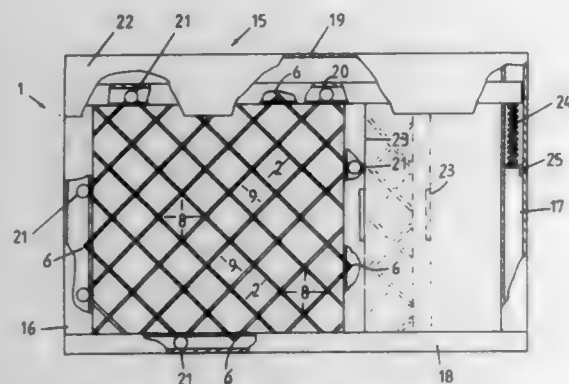
Filed Jul. 29, 1993, Ser. No. 99,172

Claims priority, application Australia, Jul. 29, 1992, PL3826

Int. Cl.<sup>6</sup> E06B 9/06

U.S. Cl. 52—507

8 Claims



1. In a collapsible security grille comprising
- (a) a frame,
  - (b) a grille array supported in said frame comprising two sets of rigid elongate parallel spaced-apart grille bars, said two sets being disposed with respect to each other so as to meet at the periphery of said frame and so as to meet and cross each other within the periphery of said frame, and
  - (c) spaced-apart pivotal connectors pivotally connecting said two sets at those points where they meet and cross each other,
- the improvement comprising
- (d) said two sets of said grille bars each having a retainer channel for receiving said spaced-apart pivotal connectors, said retainer channels including flanges for slidably retaining said spaced-apart pivotal connectors between said two sets of grille bars at those points where they meet and cross each other.

5,437,135

## DIAGONAL STRUT FOR A SYSTEM FOR THE CONSTRUCTION OF ARRANGEMENTS USED FOR MOUNTING WORKPIECES

Horst Witte, Nahrendorf, Germany, assignor to Horst Witte Entwicklungen und Vertriebs-KG, Nahrendorf, Germany

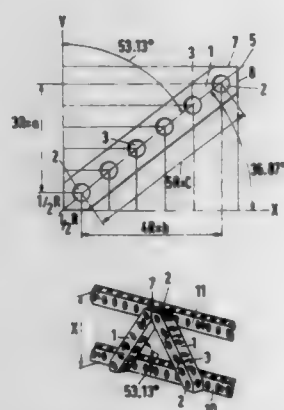
Filed Jun. 22, 1993, Ser. No. 80,961

Claims priority, application European Pat. Off., Jul. 2, 1992, 92111207

Int. Cl.<sup>6</sup> E04C 3/02; B23Q 3/02

U.S. Cl. 52—693

9 Claims



1. A system for mounting workpieces in a defined and reproducible position, the system comprising at least two receiving

members on which a workpiece can be mounted, each receiving member having connecting bores, the connecting bores having axes, the axes of the connecting bores being arranged spaced apart from each other at unit spacings, and a plurality of diagonal struts for connecting the receiving members, each diagonal strut having ends and sides, each diagonal strut comprising transverse connecting bores having axes, the axes of the transverse connecting bores being spaced apart from each other at a distance which corresponds to five times, or a multiple thereof, the unit spacing between the axes of the connecting bores, the axis of each transverse connecting bore extending parallel to the sides of each diagonal strut, two end faces at each end of each diagonal strut, wherein the end faces extend at a right angle relative to each other, wherein one of the end faces defines an angle of 36.87° with a centerline extending through the axes of the transverse connecting bores and the other end face defines an angle of 53.13° with the centerline, and wherein the two end faces at the ends of each diagonal strut defining the angle of 36.87° with the centerline are arranged on opposite sides of each diagonal strut, each end face being spaced from the axis of the adjacent transverse connecting bore by half a unit spacing, and end connecting bores extending perpendicularly to each end face and through the axis of the adjacent transverse connecting bore.

5,437,136

## LATTICE GIRDERS, IN PARTICULAR FOR TRUSSES

Thomas Triebel, Darmstadt, Germany, assignor to MERO-Raumstruktur GmbH &amp; Co, Würzburg, Germany

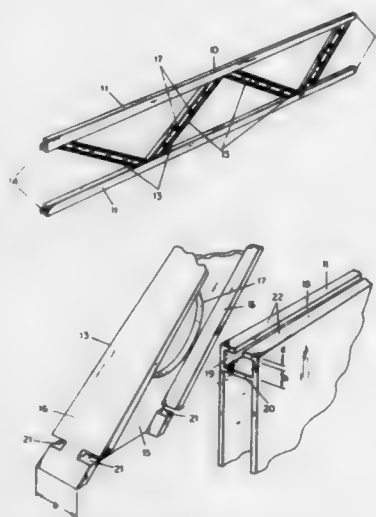
Filed Jun. 30, 1993, Ser. No. 83,762

Claims priority, application Germany, Jun. 30, 1992, 42 21 387.8

Int. Cl.<sup>6</sup> E04C 3/02

U.S. Cl. 52—693

5 Claims



1. A lattice girder comprising:
- (a) a pair of structural chord members, each chord member having a longitudinal slot in a face thereof which opens into a longitudinal chamber; and
  - (b) a plurality of struts arranged in a zig-zagging relationship to join said pair of structural chord members together, each strut further comprising an I-shaped section having a web and opposing flanges, each flange having slots at both ends of said strut, the slots parallel to end faces of the strut and located along said strut from a respective said end face so that end portions of the struts can be snugly inserted into said longitudinal slots and chambers of the pair of structural chord members;
  - (c) wherein the end faces of each strut are acutely angled with respect to a strut longitudinal axis to form a predeter-

mined slope with said chord member pair and to permit sequential insertion of the plurality of struts to form said zig-zagging relationship with each strut end portion abutting an adjacent strut end portion.

5,437,137

## ROOF EDGE ANCHOR

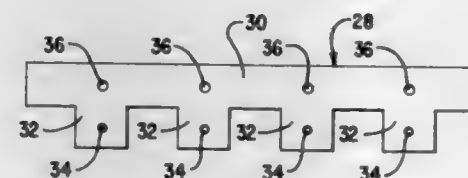
James K. Allen, Coral Springs, Fla., assignor to Land and Seas Business Corp., Inc., Ft. Lauderdale, Fla.

Filed Oct. 1, 1993, Ser. No. 130,384

Int. Cl.<sup>6</sup> E04B 1/38

U.S. Cl. 52—712

13 Claims



1. A roof edge anchor for anchoring a roof edge to a building structure comprising:
- a strapping plate;
  - multiple clamping means extending from said strapping plate; and
  - fastening means for fastening said clamping means and said strapping plate to an eave drip extending from said building structure;
- wherein said fastening means is adapted to extend through said multiple clamping means, said eave drip, and said strapping plate.

5,437,138

## METHOD OF MAKING AND INSTALLING A RAIN GUTTER

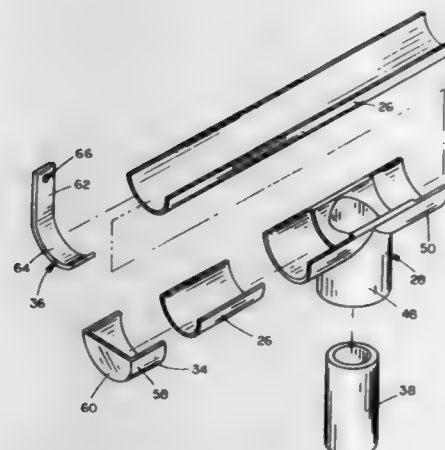
Michael E. Tuohy, 604 6th St., Onawa, Iowa 51040, and Carl J. Moore, 2934 Avenue B, Council Bluffs, Iowa 51501

Continuation-in-part of Ser. No. 929,800, Aug. 13, 1992, abandoned. This application Jan. 31, 1994, Ser. No. 189,414

Int. Cl.<sup>6</sup> E04B 1/00

U.S. Cl. 52—741.1

5 Claims



1. A method of making and installing a rain gutter for collecting and funneling water away from the roof of a structure, comprising the steps of:
- providing polyvinyl chloride (PVC) pipe of a predetermined inner diameter and length;
  - cutting said pipe lengthwise in half to form two identical gutter lengths having semi-annular cross-sections, said gutter lengths having an inner surface, an outer surface, and two opposing ends;
  - providing generally J-shaped brackets of PVC for support-

ing said gutter lengths, said brackets having a vertical stem portion and an arcuate leg portion with an upper support surface;

chemically welding a plurality of brackets to the gutter lengths at spaced-apart locations with the stem portion projecting vertically upwardly from the gutter lengths; and

attaching the stem portions of said brackets to the roof eaves with the inner surface of the gutter lengths directed upwardly, for collecting water draining from the roof.

5,437,139

## CAPPING MACHINE HEAD WITH CAP ALIGNING CHUCK

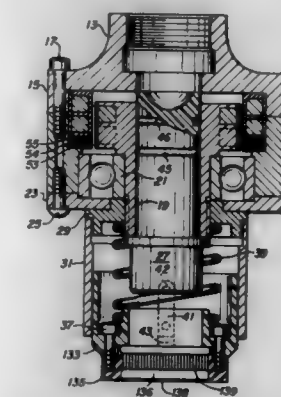
Wendell S. Martin, Fort Smith, Ark., assignor to Anderson-Martin Machine Co., Fort Smith, Ark.

Continuation-in-part of Ser. No. 787,011, Nov. 4, 1991, Pat. No. 5,313,765. This application Sep. 21, 1993, Ser. No. 126,704

Int. Cl.<sup>6</sup> B67B 3/20

U.S. Cl. 53—317

14 Claims



1. A capper head for a screw closure capping machine comprising:
- a body;
  - means for securing said body to a capper machine spindle having an axis;
  - a chuck driving element rotatably mounted in a low friction bearing in said body with its axis of rotation coaxial with said spindle axis;
  - a clutch member secured in rotationally fixed position in said body having a means for coupling said chuck driving element to rotate with said body;
  - a cap chuck with a cap receiver and being affixed to said chuck driving element with limited freedom of axial movement relative thereto, said chuck and cap receiver having a generally cylindrical opening for receiving a serrated screw cap, a single, continuous internally toothed peripheral wall portion of said opening for rotationally engaging said cap and a generally annular shoulder to limit the depth of intrusion of said cap in said receiver, said toothed peripheral wall portion being substantially untapered.

5,437,140

## AUTO ROTATION CAPPING CHUCK IMPROVEMENT

Luca Molinaro, New Castle, Pa., assignor to Portola Packaging, Inc., San Jose, Calif.

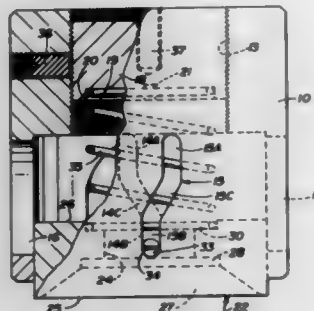
Filed Jan. 3, 1994, Ser. No. 176,653

U.S. Cl. 53—331.5

10 Claims

1. A device for engaging the exterior of an interiorly threaded tamper evident bottle cap pre-positioned on a bottle and selectively tightening said cap comprising a support and guide housing; a cap chuck axially movable relative to said support and guide housing positioned within said support and guide housing, said cap chuck having a fusto-conical guide recessed area for initial engagement with said cap, an annular

cap engagement recess inwardly of said fusto-conical recess for rotational registration with said cap, adjustable resilient means engageable on said chuck, access openings in said support and guide housing defining a first and second cavity



within, and cooperating means on said chuck and said housing to cause limited relative rotational movement of said chuck and said housing upon vertical movement of said chuck relative of said housing.

5,437,141

# BROAD TAPE BINDING OF STACKED PACKED PRODUCTS

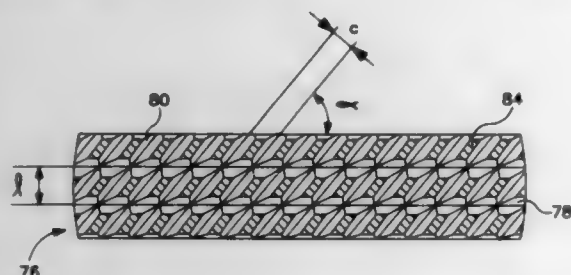
Kurt Baumann, Villmergen, Switzerland, assignor to ATS Automatic Taping Systems Ltd., Zug, Switzerland  
Filed Jan. 8, 1993, Ser. No. 2,339

Claims priority, application Switzerland, Jan. 9, 1992, 00040/92

Int. Cl.<sup>6</sup> B65B 13/04

U.S. Cl. 53—399

16 Claims



10. A tape banding machine comprising:  
loop forming means for forming a loop from a composite laminate tape having a first substrate layer of paper and a second laminate layer of a material selected from the group consisting of plastic and lacquer;  
a welding plate; and  
sonotrode means for producing ultrasonic waves spaced from said welding plate for bonding a free end of said composite laminate tape to a surface of said composite laminate tape by ultrasonic cold welding so as to form a closed loop, said sonotrode means having a flat working surface facing toward said welding plate, said flat working surface having at least one recess means for dividing said working surface into a plurality of sections wherein a plurality of diagonal and longitudinal recesses intersect on said working surface for dividing said working surface into a plurality of grid surfaces and wherein the diagonal recesses form an angle  $\alpha$  with an edge of the working surface of the sonotrode means and with the longitudinal recesses, said angle  $\alpha$  being between about 30° to 60°.

5,437,142

# METHOD FOR PACKAGING CONTENTS AND PACKAGING DEVICE

Heiemon Akiyama, and Minoru Sato, both of Chiba, Japan, assignors to Toyko Automatic Machinery Works, Ltd., Toyko, Japan

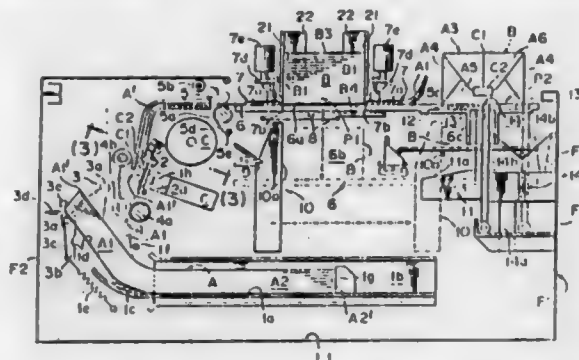
Filed Sep. 30, 1993, Ser. No. 128,668

Claims priority, application Japan, Oct. 30, 1992, 4-293388; Nov. 4, 1992, 4-295296; Dec. 22, 1992, 4-342134

Int. Cl.<sup>6</sup> B65B 11/22, 51/06

U.S. Cl. 53—415

20 Claims



1. A packaging apparatus, for supplying a packaging sheet that covers an outer surface of the contents to be packaged, said apparatus comprising:  
an elevator for supporting said contents and said sheet while said sheet is disposed between said contents and said elevator;  
a tape feeding-out mechanism for feeding-out adhering tape toward the packaging sheet before the packaging sheet is supplied and supported;  
an adhering mechanism, movable toward and away from the fed-out adhering tape, and capable of adhering the adhering tape to a corresponding sealing position of the packaging sheet, with one part of the adhering tape being projected, while the packaging sheet and said contents are placed on said elevator and transported in a vertical direction during the raising or lowering of the elevator from a packaging start position at which said packaging sheet is in a substantially extended condition;  
a sheet feeding-out passage positioned toward the packaging start position;  
a sheet feeding-out mechanism, for supplying the packaging sheet, adhered with the adhering tape, above said elevator and along said sheet feeding-out passage.

5,437,143

# METHOD OF FORMING A PACKAGE OF BEVERAGE CANS

Will L. Culpepper, Covington, and James R. Oliff, Austell, both of Ga., assignors to The Mead Corporation, Dayton, Ohio  
Filed Sep. 20, 1993, Ser. No. 123,549

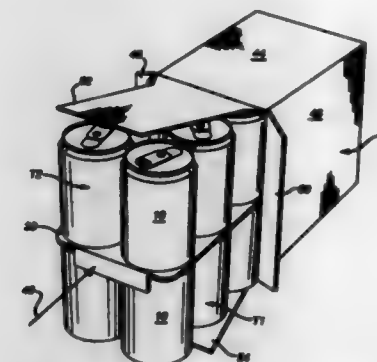
Int. Cl.<sup>6</sup> B65B 35/50, 61/20, 5/06

U.S. Cl. 53—445

7 Claims

1. A method of forming a package of beverage cans, each of said cans having a can body defining a substantially circular bottom therefor having a bottom diameter, and a substantially circular can lid having a top diameter, said bottom diameter being less than said top diameter, the method comprising the steps of:  
forming a predetermined number of said cans into a rectangular array to define a first tier of said cans;  
placing an insert panel onto said first tier, said insert panel having an area generally equal to the cross-sectional area of said rectangular array, said panel having formed therein said predetermined number of substantially circular debossments, each of said debossments having a debossment diameter not greater than said top diameter and not less than said bottom diameter and arranged on said insert

panel so that one of said debossments is positioned to extend downwardly toward and concentrically on top of each of said cans of said lower tier;  
placing onto said insert panel a second tier of said predetermined number of said cans, said cans of said second tier being placed onto said insert panel by sliding movement of each of said cans along said insert panel until said can is



positioned with said bottom seated within one of said debossments, whereby said second tier is axially aligned with said first tier; and  
sliding said first tier of said cans, said insert panel and said second tier of said cans together as a unit into a carton having interconnected top, bottom and side walls, whereby said bottoms of said cans of said first tier are slid across said bottom wall of said carton into position.

5,437,144

# PACKAGING DEVICE

Heiemon Akiyama, and Minoru Sato, both of Chiba, Japan, assignors to Toyko Automatic Machinery Works, Ltd., Toyko, Japan

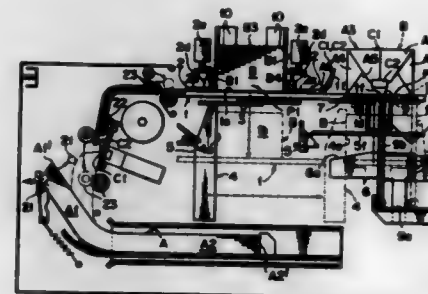
Filed Sep. 30, 1993, Ser. No. 128,702

Claims priority, application Japan, Oct. 30, 1992, 4-293389; Oct. 30, 1992, 4-293391; Dec. 24, 1992, 4-344583

Int. Cl.<sup>6</sup> B65B 11/20, 63/02

U.S. Cl. 53—466

19 Claims



1. A method for packaging comprising the steps of:  
supplying a packaging sheet onto a mounting surface of an elevator at a packaging start position;  
placing contents on the packaging sheet at the packaging start position;  
lowering the elevator;  
moving a plurality of compressive receiving plates above said contents;  
winding the packaging sheet, with a pair of winding guides by moving said winding guides toward each other and toward a central axis of said contents, said central axis being located between said winding guides, in a tubular form around the contents whereby the ends of the packaging sheet project in a rectangular cylindrical form from the side surfaces of the contents;

transporting the contents horizontally to a packaging completing position; and  
folding the projected ends of the packaging sheet along the side surfaces.

5,437,145

# FEEDER ASSEMBLY COUPLING STRUCTURE FOR AN AGRICULTURAL HARVESTER

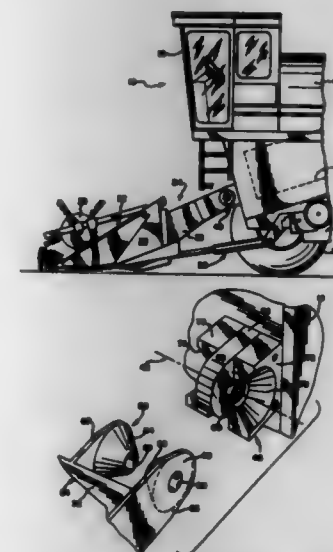
Herb M. Farley, Braidwood, and Richard A. Hardisty, Palatine, both of Ill., assignors to Case Corporation, Racine, Wis.

Filed Aug. 19, 1993, Ser. No. 108,917

Int. Cl.<sup>6</sup> A01D 41/06

U.S. Cl. 56—15.6

14 Claims



1. An agricultural harvester including a main body, a feeder assembly with a header assembly connected to a forward end thereof, and a self-aligning coupling assembly for releasably connecting a rear end of the feeder assembly to the main body of the harvester for vertical movement about a fixed axis, said coupling assembly comprising:

at least two support trunnions which are laterally spaced apart a predetermined distance from each other and which are fixed to and project from opposite sides of the main body of the harvester, each support trunnion defining an aperture arranged a predetermined distance from the main body, each support trunnion further including guide surfaces provided on opposite lateral sides of each trunnion, each guide surface having a profiled configuration extending partially above, partially below and rearwardly of a pivot axis defined by said aperture; and  
at least two bearing clevises which are laterally spaced apart a distance complementary to the lateral spacing of said support trunnions, said bearing clevises being affixed to and projecting rearwardly from opposite sides of the feeder housing, with each bearing clevis defining an aperture and guide surfaces provided on opposite lateral sides thereof, and wherein each guide surface on the bearing clevises has a profiled configuration which is complementary to and cooperates with the respective guide surface on the support trunnions upon assembly of the feeder assembly to the main body to self-align the apertures of the respective trunnions and bearing clevises thereby facilitating passage of a pivot pin therethrough so as to pivotally interconnect the feeder assembly and the main frame of the harvester.



5,437,146

## FRUIT STRIPPING RAKES

Merritt C. Erickson, P.O. Box 32, Orland, Calif. 95963

Filed Sep. 15, 1993, Ser. No. 120,776

Int. Cl.<sup>6</sup> A01D 46/24

U.S. Cl. 56—330

2 Claims



1. A fruit harvesting apparatus, comprising, an elongated rod having a first end and an oppositely disposed second end, a first rake member movably attached to said rod adjacent said first end of said rod, said first rake member having a plurality of tines extending therefrom, an extension arm affixed to said rod adjacent said first end of said rod, a second rake member movably attached to said extension arm, said second rake member having a plurality of tines extending therefrom and in the general direction of the tines of said first rake member, a moveable joint in said extension arm providing means for said extension arm and thus said second rake member to be moved toward and away of said first rake member for allowing placement of fruit bearing branches between said first and second rake members, controllable means for causing movement of said extension arm for moving said first and second rake members relative to one another, powering means connected to said first and second rake members for causing movement in said rake members and thus the tines relative to said rod and said extension arm for stripping fruit from branches positioned and stabilized between said first and second rake members.

5,437,147

## OPEN END SPINNING DEVICE

Robert D. Mackey, and George C. Edwards, both of Greensboro, N.C., assignors to Burkhardt America, Inc., Greensboro, N.C.

Filed Aug. 20, 1992, Ser. No. 932,973

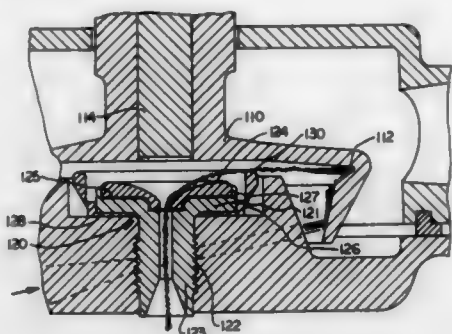
Int. Cl.<sup>6</sup> D01H 4/40

U.S. Cl. 57—417

4 Claims

1. A navel member for open end spinning devices having a driven spinning chamber and a relatively stationary face plate, said navel member having a curvilinear inner surface and comprising a tubular body portion having an upstream end and an annular portion extending outwardly from the upstream end thereof, said annular portion including a peripheral lip forming with said annular portion a seat for a ceramic cap mounted therein over which a yarn passes, wherein the improvement comprises at least one outer ring having a peripheral rim with an arcuate upper surface extending upwardly above the inner

surface of said navel member in the path of said yarn, said outer ring separate from said annular portion and having an annular base portion interposed between said annular portion of said navel member and said face plate and held in position thereby, said peripheral rim being located in such proximity to the periphery of said navel member that the yarn being formed and



lifted from the wall of said spinning chamber engages said peripheral rim prior to engaging the surface of the navel member, and thereby limits the length of surface contact between the yarn and the inner surface of the navel, whereby the resulting yarn is produced at a lower twist level and a higher break strength is achieved.

5,437,148

## IMPROVEMENT IN ROLLER CHAINS

Stefan Karp, 37 Glenfield Road, Luton, Bedfordshire, Great Britain LU3 2HZ

PCT No. PCT/GB92/01863, § 371 Date Mar. 15, 1994, § 102(e)

Date Mar. 15, 1994, PCT Pub. No. WO93/08417, PCT Pub.

Date Apr. 29, 1993

PCT Filed Oct. 12, 1992, Ser. No. 204,384

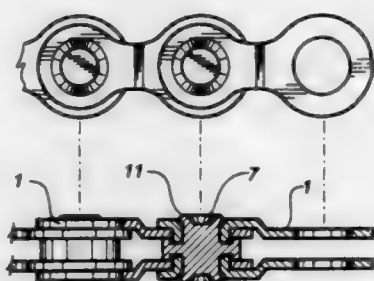
Claims priority, application United Kingdom, Oct. 16, 1991,

9121909

Int. Cl.<sup>6</sup> F16G 13/02

U.S. Cl. 59—78

7 Claims



1. A chain comprising: a first inner link plate and a second inner link plate, said first inner link plate having an aperture coaxially aligned with an aperture of said second inner link plate; a first outer link plate and a second outer link plate, said first outer link plate adjoining an outer surface of said first inner link plate, said second outer link plate adjoining an outer surface of said second inner link plate, said first outer link plate having an aperture coaxially aligned with the apertures of said inner link plates and with an aperture of said second outer link plate, each of the apertures of said outer link plates having an inwardly extending tubular protrusion, the protrusion of said first outer link plate received by the aperture of said first inner link plate, the protrusion of said second outer link plate received by the aperture of the said second inner link plate, said tubular protrusion directly receiving a portion of an axial force applied to said inner link plates; a pivot pin extending through the apertures of said first and

second inner link plates and the apertures of said first and second outer link plates; and a roller surrounding said pivot pin between said first and second inner link plates, said roller being integrally formed with said pivot pin, said roller rotatable relative to said plates.

5,437,149

## HOLLOW DIAMOND CUT ROPE CHAIN WITH MULTI-FACETED SURFACES

Kalman Strobel, New York, N.Y., assignor to OroAmerica, Inc., Burbank, Calif.

Continuation of Ser. No. 903,894, Jun. 25, 1992, Pat. No. 5,353,584, which is a continuation-in-part of Ser. No. 792,291,

Nov. 14, 1991, Pat. No. 5,129,220, and a continuation-in-part of Ser. No. 792,002, Nov. 14, 1991, Pat. No. 5,125,225. This

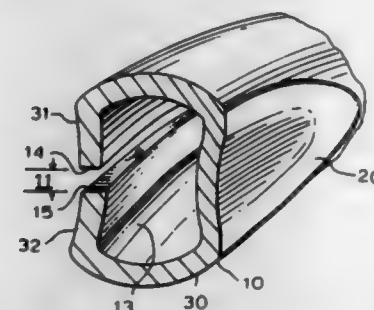
application Aug. 25, 1994, Ser. No. 295,597

The portion of the term of this patent subsequent to Jun. 30, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> B21L 5/02

U.S. Cl. 59—80

21 Claims



1. A jewelry rope chain made of a number of intertwined links forming a double helix and resembling a rope, comprising:

a plurality of segmented hollow links, said links having a toroid annular configuration interrupted by an inner gap extending along an inner circumference of said hollow links, each of said hollow links having an outer surface wall portion generally curved in cross section which is spaced apart from, and has a center opposite, said inner gap, and, each of said hollow links having further at least one flattened portion formed in said curved outer surface wall portion, said at least one flattened portion extending inwardly toward said inner gap with respect to said outer surface wall portion, said at least one flattened portion adjacent to at least one further flattened portion.

5,437,150

## FLUID PRODUCTION METHOD AND APPARATUS

Paul M. Latham, Maidenhead, and John T. Lavin, Guildford, both of England, assignors to The BOC Group, plc, Surrey, England

Continuation of Ser. No. 182,305, Jan. 13, 1994, abandoned, and a continuation of Ser. No. 883,627, May 13, 1992, abandoned.

This application Sep. 14, 1994, Ser. No. 306,845

Claims priority, application United Kingdom, May 23, 1991, 9111157

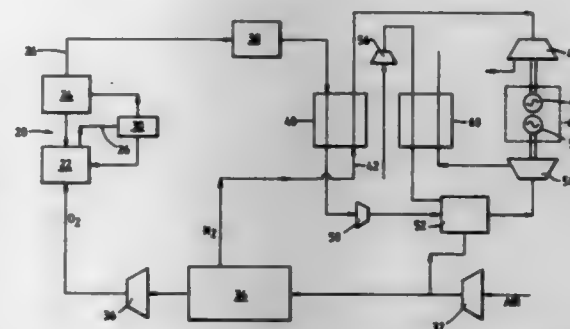
Int. Cl.<sup>6</sup> F02G 3/00; F02C 6/00

U.S. Cl. 60—39.02

7 Claims

1. A method of producing a hot fluid stream from which power can be recovered comprising performing at elevated temperature at least one chemical reaction in which pure oxygen or oxygen-enriched air is employed to form a fuel gas; filtering the fuel gas at a temperature of at least 200° C. to remove particulates therefrom; heat exchanging the hot filtered gas with a stream of heat exchange fluid comprising gaseous nitrogen so as to raise the temperature of said stream of heat exchange fluid and thereby provide it as the hot fluid

stream; expanding the hot fluid stream in a first expansion turbine without mixing said hot fluid stream with any other gaseous stream to enable power to be generated; downstream of the heat exchange of the fuel gas with the heat exchange fluid, subjecting said fuel gas to combustion to produce a gas



stream from which work is recovered by expansion in a second expansion turbine used in generating electrical power; and separating an air stream to produce both said nitrogen and said pure oxygen or oxygen-enriched air, a same compressor acting as the source of air for said separation and for supporting combustion of the fuel gas.

5,437,151

## DETECTING AND CONTROLLING SUPERSONIC AIRFLOW NORMAL SHOCK PATTERN POSITION IN AN AIRCRAFT JET ENGINE ASSEMBLY

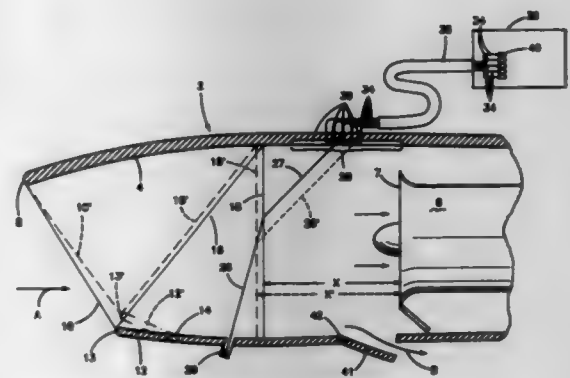
Anthony N. Martin, Simsbury, Conn., assignor to United Technologies Corporation, Windsor Locks, Conn.

Filed Aug. 20, 1993, Ser. No. 109,878

Int. Cl.<sup>6</sup> F02C 7/042, 7/057

U.S. Cl. 60—233

10 Claims



1. An aircraft jet engine assembly comprising:
  - a) a power section for utilizing ambient airflow to create thrust;
  - b) an air inlet section which receives an ambient airstream and directs the airstream to said power section; and
  - c) means for determining the location of a normal shock in the airstream within said air inlet section when the aircraft is in supersonic flight said means for determining comprising a narrow beam energy emitter which directs a narrow linear energy beam obliquely across said air inlet section, said energy beam having a path of travel which is oblique to the plane of the shock and which will be deflected out of its linear course as it passes through the shock within said air inlet section.

5,437,152

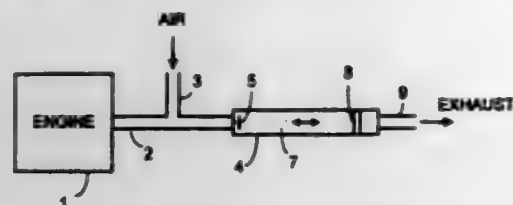
## CATALYTIC METHOD

William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748  
Continuation-in-part of Ser. No. 22,767, Feb. 23, 1993,  
abandoned, which is a continuation of Ser. No. 639,012, Jan. 9,  
1991, abandoned. This application Feb. 17, 1994, Ser. No.  
197,890

Int. Cl.<sup>6</sup> F01N 3/20

U.S. Cl. 60—274

4 Claims



4. The method of combusting fuel containing exhaust gas comprising the steps of:

- obtaining a gaseous admixture of air and said exhaust gas, said admixture having an adiabatic flame temperature below about 1400° Kelvin;
  - contacting at least a portion of said admixture with a catalytic surface, producing heat and reactive intermediates for continuous stabilization of combustion in a thermal reaction zone at temperatures below a temperature resulting in significant formation of nitrogen oxides from molecular nitrogen and oxygen; and
  - passing said reaction products to the thermal reaction chamber;
- thereby igniting and stabilizing combustion in said thermal reaction chamber at a temperature below 1400° Kelvin.

5,437,153

## EXHAUST PURIFICATION DEVICE OF INTERNAL COMBUSTION ENGINE

Shimichi Takenhima; Toshiaki Tanaka; Satoshi Iguchi; Yasuaki Arai; Shinya Hirota, all of Shizuoka; Tomohiro Oda, Aichi, and Fumitada Murakami, Shizuoka, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan  
PCT No. PCT/JP93/00778, § 371 Date Feb. 14, 1994, § 102(e)  
Date Feb. 14, 1994, PCT Pub. No. WO93/25806, PCT Pub.  
Date Dec. 23, 1993

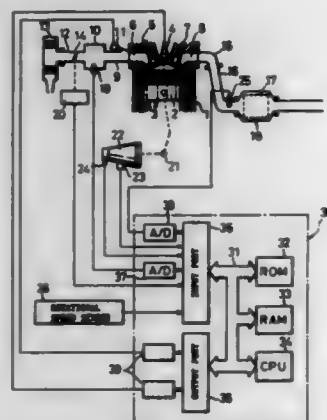
PCT Filed Jun. 10, 1993, Ser. No. 193,143

Claims priority, application Japan, Jun. 12, 1992, 4-177666;  
Jun. 25, 1992, 4-190213; Dec. 29, 1992, 4-361575

Int. Cl.<sup>6</sup> F01N 3/20

U.S. Cl. 60—276

37 Claims



1. An exhaust purification device of an internal combustion engine which has in an engine exhaust passage a NO<sub>x</sub> absorbent which absorbs NO<sub>x</sub> when the air-fuel ratio of the inflowing exhaust gas is lean and which releases the absorbed NO<sub>x</sub> when the oxygen concentration in the inflowing exhaust gas is re-

duced and which is provided with a NO<sub>x</sub> estimating means for estimating the amount of the NO<sub>x</sub> absorbed by the NO<sub>x</sub> absorbent and a NO<sub>x</sub> releasing means for reducing the oxygen concentration in the exhaust gas flowing into the NO<sub>x</sub> absorbent and releasing NO<sub>x</sub> from the NO<sub>x</sub> absorbent when the amount of the NO<sub>x</sub> estimated to be absorbed in the NO<sub>x</sub> absorbent by the NO<sub>x</sub> estimating means exceeds a predetermined allowable value.

5,437,154

## MISFIRE-DETECTING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Toshihiko Sato; Tsuyoshi Takizawa; Yoichi Iwata; Hiroshi Ito, all of Wako, and Takayoshi Nakayama, Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

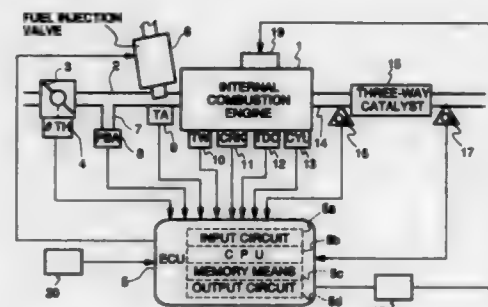
Filed Mar. 9, 1994, Ser. No. 207,668

Claims priority, application Japan, Mar. 19, 1993, 5-085324

Int. Cl.<sup>6</sup> F01N 3/20

U.S. Cl. 60—276

9 Claims



1. A misfire-detecting system for an internal combustion engine having an exhaust system, and a catalytic converter arranged in said exhaust system, comprising:  
misfire parameter-detecting means for detecting a value of a parameter representative of a misfiring state of said engine;  
catalyst deterioration degree-detecting means for detecting a deterioration degree of said catalytic converter;  
misfire-determining reference value-setting means for setting a misfire-determining reference value, based on the deterioration degree of said catalytic converter detected by said catalyst deterioration degree-detecting means; and  
misfire-determining means for comparing between the value of said parameter detected by said misfire parameter-detecting means and said misfire-determining reference value, and for determining whether said engine is in a misfiring state, based on a result of said comparison.

5,437,155

## OUTBOARD MOTOR EXHAUST SYSTEM

Stephen J. Towner, Libertyville, Ill.; Joel C. Jahnke, Kenosha, Wis.; John A. Pierman, and Robert L. Turk, both of Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 13, 1993, Ser. No. 136,413

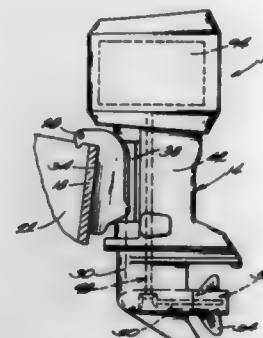
Int. Cl.<sup>6</sup> F02B 27/02

U.S. Cl. 60—313

22 Claims

15. A two-stroke internal combustion engine assembly comprising an engine block including an outer surface, first and second cylinders having respective first and second exhaust ports, first and second exhaust gas ducts having respective first ends communicating respectively with said first and second exhaust ports and having respective second ends located in said outer surface, and a housing member connected to said outer surface and including a first exhaust pipe having a first end communicating with said second end of said first duct and having a second end communicating with the atmosphere, a second exhaust pipe having a first end communicating with

said second end of said second duct and having a second end communicating with the atmosphere, and a connecting exhaust pipe having opposite first and second ends respectively communicating with said second ends of said first and second ducts and respectively communicating with said first ends of said



first and second pipes, said first and second exhaust pipes and said connecting pipe being formed independently of each other such that only one of said first and second exhaust pipes and said connecting pipe can be reconfigured without changing the others of said first and second exhaust pipes and said connecting pipe.

5,437,156

## APPARATUS FOR SELECTIVELY LOWERING INTAKE MANIFOLD PRESSURE OF TURBOCHARGED ENGINE DURING OPERATION OF ASSOCIATED COMPRESSION RELEASE ENGINE BRAKE

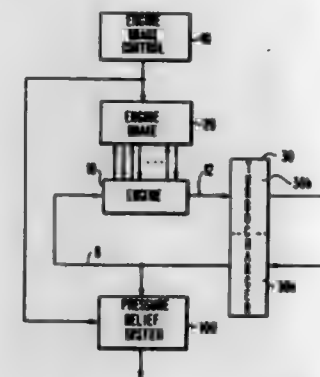
Dennis R. Custer, West Granby, Conn., assignor to Jacobs Brake Technology Corporation, Wilmington, Del.

Filed Nov. 16, 1993, Ser. No. 153,603

Int. Cl.<sup>6</sup> F02B 37/00

U.S. Cl. 60—611

17 Claims



1. Apparatus for selectively lowering gas pressure in an intake manifold of a turbocharged internal combustion engine that is equipped with a compression release engine brake during operation of the engine brake comprising:

- a first valve for selectively allowing some gas to escape from the intake manifold;
  - a pneumatic actuator for opening said first valve;
  - a second valve for selectively allowing gas to flow from said intake manifold to said actuator when the pressure of the gas in said intake manifold exceeds a predetermined threshold level, said actuator having a volume which is large in comparison to the rate at which gas flows into said actuator, and said second valve allowing gas to flow from said actuator when the pressure of the gas in said intake manifold is less than said predetermined threshold level; and
- means responsive to enablement of said engine brake for enabling said second valve to allow gas to flow from said intake manifold to said actuator when the pressure of the

gas in said intake manifold exceeds said predetermined value.

5,437,157

## METHOD OF AND APPARATUS FOR COOLING HOT FLUIDS

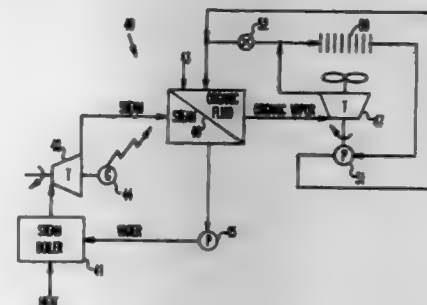
Lucien Bronicki, Yavne, Israel, assignor to Ormat Industries Ltd., Yavne, Israel

Continuation-in-part of Ser. No. 955,686, Oct. 2, 1992, abandoned, and a continuation-in-part of Ser. No. 955,454, Oct. 2, 1992, abandoned, and a continuation-in-part of Ser. No. 989,918, Dec. 11, 1992, abandoned, which is a continuation of Ser. No. 730,526, Jul. 15, 1991, abandoned, which is a continuation of Ser. No. 444,565, Jul. 1, 1989, abandoned, and a continuation of Ser. No. 952,156, Sep. 28, 1992, which is a continuation of Ser. No. 658,303, Feb. 20, 1991, abandoned. This application Feb. 12, 1993, Ser. No. 17,302

Int. Cl.<sup>6</sup> F01K 23/04

U.S. Cl. 60—655

15 Claims



1. Apparatus for cooling a hot fluid comprising:

- a heat exchanger containing an organic fluid and responsive to said hot fluid for cooling the hot fluid and producing vaporized organic fluid;
- an organic vapor turbine having an output shaft connected to a fan, and responsive to said vaporized organic fluid for driving the fan which blows ambient air, and for producing expanded organic vapor which exits the turbine;
- a condenser for receiving said expanded organic vapor, and responsive to air blown by the fan for condensing said expanded organic vapor into organic fluid condensate; and
- means for returning organic fluid condensate to said heat exchanger.

5,437,158

## LOW-EMISSION COMBUSTOR HAVING PERFORATED PLATE FOR LEAN DIRECT INJECTION

Thomas F. Fric, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 80,548, Jun. 24, 1993, abandoned. This application May 16, 1994, Ser. No. 243,609

Int. Cl.<sup>6</sup> F23R 3/34

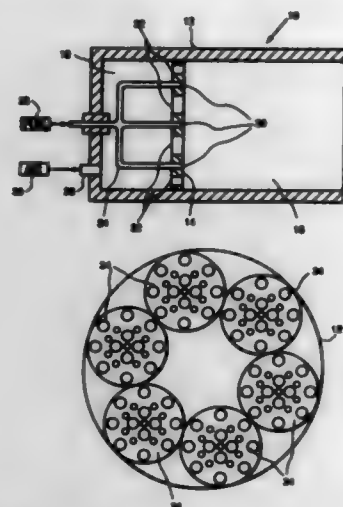
U.S. Cl. 60—739

9 Claims

1. A combustor comprising:  
a housing having an longitudinal axis;  
a plate disposed inside said housing at an intermediate location along said longitudinal axis, said plate having a plurality of fuel jets and a plurality of air jets formed therein;  
a combustion chamber formed in said housing on one side of said plate;  
an air plenum chamber formed in said housing on another side of said plate;  
a fuel manifold disposed in said air plenum chamber, said fuel manifold comprising a main trunk tube which is con-



connected to an external source of fuel and a plurality of branch tubes extending from said main trunk tube, each



one of said branch tubes being connected to one of said fuel jets; and  
an air inlet formed in said air plenum chamber.

5,437,159

# FUEL INJECTION SYSTEM FOR A GAS TURBINE COMBUSTOR INCLUDING RADIAL FUEL SPRAY ARMS AND V-GUTTER FLAMEHOLDERS

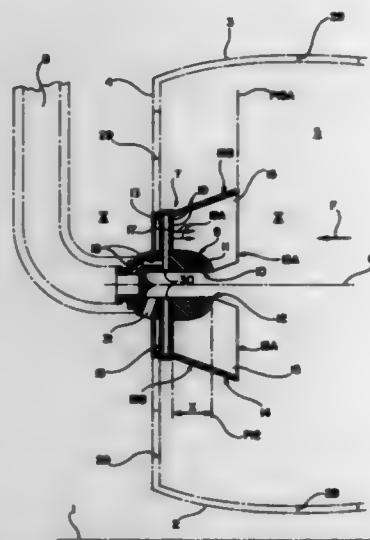
Denis R. H. Ansart, Bois le Roi, and Jacques L. M. Maunand, St. Forget, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.-M.A.), Valin, France

Filed Jun. 15, 1994, Ser. No. 260,727

Claims priority, application France, Jun. 16, 1993, 93 07235 Int. Cl.<sup>6</sup> F23R 3/28

U.S. Cl. 60—746

12 Claims



1. A fuel injection system for a combustion chamber for a gas turbine engine, the combustion chamber having an end wall extending transversely with respect to a central axis of the combustion chamber and defining a combustion zone having a longitudinal axis extending substantially parallel to the central axis, the system comprising:

a) a sleeve defining a passageway extending along the longitudinal axis of the combustion chamber, the sleeve having an outer surface and a downstream end extending into the combustion chamber;

b) first fuel injection means to inject fuel into the passageway;

c) second fuel injection means to inject fuel into the combustion chamber, the second fuel injection means comprising means defining a plurality of fuel injection arms, each having at least one substantially linear array of fuel injection holes, the arms extending radially away from the outer surface of the sleeve so as to be substantially angularly equidistant from each other, and located in a plane extending substantially perpendicular to the longitudinal axis of the combustion zone, the plane located axially between the end wall and the downstream end of the sleeve; and,

d) a flameholder apparatus comprising a plurality of flameholder arms, each flameholder arm extending axially from the second fuel injection means to at least the downstream end of the sleeve, the flameholder arms extending radially away from the outer surface of the sleeve and circumferentially located between the angularly spaced apart fuel injection arms, wherein each flameholder arm comprises a generally "V"-shaped cross-sectional configuration with the apex of the "V"-shape facing toward and located adjacent to a plane of the end wall of the combustion chamber.

5,437,160

# PROCESS AND INSTALLATION FOR THE SEPARATION OF AIR

Bernard Darredeau, Sartrouville; Jean-Yves Lehman, Maisons-Alfort, and Jean-Marc Peyron, Creteil, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude, Paris, France

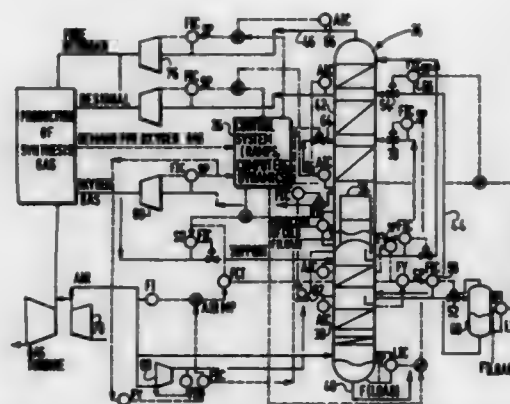
Filed Apr. 20, 1994, Ser. No. 230,521

Claims priority, application France, Apr. 29, 1993, 93 05062; Sep. 28, 1993, 93 11509

U.S. Cl. 62—24

Int. Cl.<sup>6</sup> F25J 3/04, 3/02

31 Claims



1. A process for the separation of air in a cryogenic distillation apparatus comprising a distillation column and in which air is separated to produce a fraction rich in oxygen and a fraction rich in nitrogen as products, comprising maintaining the purities of said products substantially constant during variations of demand for a said product or of the flow rate or of the pressure of the supplied air by

a) introducing an excess of liquid rich in nitrogen into the distillation apparatus when the demand for the product or the flow rate of the supplied air increases, and

b) withdrawing an excess of liquid rich in nitrogen from the distillation apparatus, and storing this liquid, when the demand for the product or the flow rate of the supplied air decreases.

5,437,161

# PROCESS AND INSTALLATION FOR THE PRODUCTION OF OXYGEN AND/OR NITROGEN UNDER PRESSURE AT VARIABLE FLOW RATE

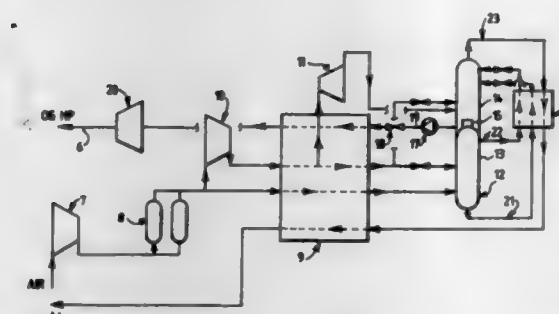
Denis Chretien, Saint Mande, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude, Paris, France

Filed Jun. 6, 1994, Ser. No. 257,691

Claims priority, application France, Jun. 18, 1993, 93 07395 Int. Cl.<sup>6</sup> F25J 3/00

U.S. Cl. 62—37

14 Claims



1. In a process for the production of a variable flow rate of at least one principal constituent of air under pressure, wherein a said constituent is withdrawn in liquid phase from an air distillation apparatus, this liquid is brought to a vaporization pressure, and the liquid is vaporized under this vaporization pressure by heat exchange with a caloric fluid under high pressure; the improvement comprising adjusting the flow rate of said constituent by modifying the flow rate of the liquid to be vaporized and said vaporization pressure.

5,437,162

# CLOSED LOOP OIL SERVICE SYSTEM FOR AC OR REFRIGERANT COMPRESSOR UNITS

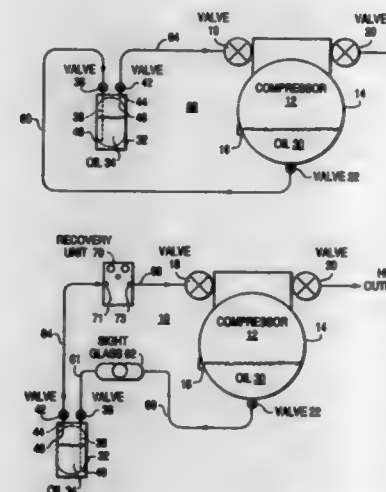
Herbert R. Eden, 421 SW. 124 Ave., Miami, Fla. 33184

Filed Jul. 21, 1993, Ser. No. 94,947

Int. Cl.<sup>6</sup> F25B 49/00

U.S. Cl. 62—125

7 Claims



1. A closed loop oil system in combination with an operating air conditioner or refrigerant compressor, said operating compressor having lubricating oil therein, a submerged oil drain port, an oil view port, a refrigerant inlet port and refrigerant outlet port, the closed loop oil removal system comprising: a sealed canister for containment of said compressor lubricating oil, said canister having a first and second valve, said first valve having a long stem with port located near

bottom of said canister and said second valve having short stem with port located near top of said canister; a first coupler hose fluidly connects said oil drain port to said first valve and a second coupler hose gaseously connects said refrigerant inlet port to said second valve; whereby a closed gaseous and fluid loop is established between said compressor, said canister and said first and second coupler hoses, while said oil is withdrawn from said compressor.

5,437,163

# METHOD OF LOGGING DATA IN A TRANSPORT REFRIGERATION UNIT

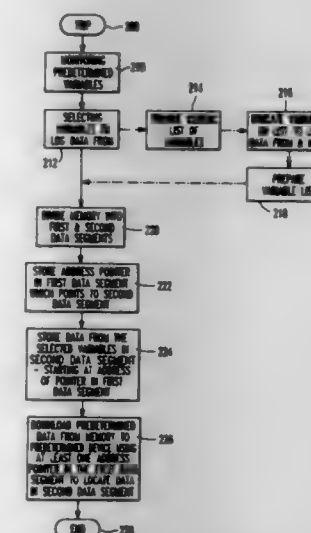
Romuald M. Jurewicz, St. Louis Park, Minn., and Arthur A. Anderson, Vandegrift, Pa., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Aug. 22, 1994, Ser. No. 293,616

Int. Cl.<sup>6</sup> F25B 49/02

U.S. Cl. 62—126

17 Claims



1. A method of logging data relative to the operation of a transport refrigeration unit, during each trip of the transport refrigeration unit, with the transport refrigeration unit including control means and non-volatile memory means, comprising the steps of:

monitoring a plurality of predetermined variables of the transport refrigeration unit to provide data,

selecting those variables of the plurality of monitored variables whose data is to be logged in the memory means during a trip of the transport refrigeration unit,

dividing the non-volatile memory means into at least first and second data segments for storing data from the selected variables,

storing an address pointer in the first data segment which points to an address in the second data segment, for each trip of the transport refrigeration unit,

storing data from the selected variables in the second data segment, during each trip of the transport refrigeration unit,

said step of storing data including the step of starting the data stored in the second data segment at the address of the second data segment pointed to by the address pointer in the first data segment which is associated with the current trip of the transport refrigeration unit,

and downloading data stored in the non-volatile memory means to a predetermined device,

said downloading step including the step of using at least one address pointer stored in the first data segment to download associated data stored in the second data segment.

# 5,437,164 SET FOR ATTACHING AIR-CONDITIONING COMPONENTS

Ettore S. Consiglio, Joinville - SC, Brazil, assignor to Consul S.A., Joinville - SC, Brazil

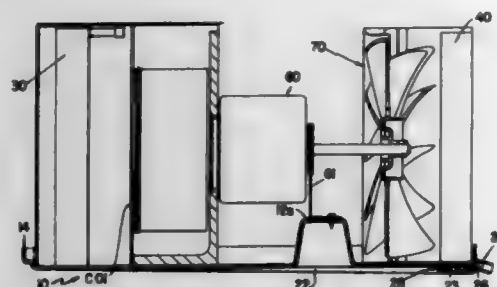
Filed Feb. 16, 1994, Ser. No. 197,349

Claims priority, application Brazil, Feb. 17, 1993, 9300416

Int. Cl.<sup>6</sup> F25D 23/12

U.S. Cl. 62-259.1

15 Claims



1. Set for attaching air conditioner components comprising: a single piece molded plastic base having integrally formed thereon a plurality of raised ribs disposed on the surface of said base to which air conditioner components are to be attached; component seating means of solid construction including a motor-fan support of a substantially rectangular frusto-pyramidal body, the motor-fan to be seated and attached onto the smaller base of said frusto-pyramidal support, and a ventilating chamber support of a substantially parallelepiped body with a longitudinally concave upper face forming a curved arch and provided at each longitudinal end with a ring fitting means for the fitting of a respective end of a ventilating chamber ring; water draining means; a single piece means for positioning and mounting a condenser; and a compressor spacing means disposed to receive and retain a compressor attaching element.

# 5,437,165 FOOD ORGANIZER INSERT FOR PORTABLE ICE CHEST

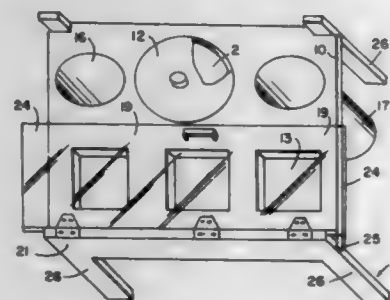
Richard W. White, 3006 French Ave., Lake Worth, Fla. 33461, and Robert J. White, 340 1/2 Princeton Ave., Lake Worth, Fla. 33460

Filed Sep. 13, 1993, Ser. No. 119,569

Int. Cl.<sup>6</sup> F25D 25/00

U.S. Cl. 62-465

12 Claims



1. A food organizing and protecting insert adapted to be used removably within a portable ice chest, said ice chest having an inner liner with vertical sides extending upward from a horizontal bottom and a shoulder at the upper portion of the vertical sides, said insert comprising: a substantially planar shelf means arranged to substantially

occlude said inner liner when mounted therein parallel to said bottom;

- a plurality of receptacle receiving apertures in said shelf means, said apertures arranged for removably receiving food containing receptacles of the type which have an upper flange extending above said shelf means to thereby support said receptacles upon said shelf means;
- a plurality of downwardly extending support members attached to said shelf means at the perimeter thereof, said support members constructed for engaging said inner liner and supporting said shelf means parallel to, and above, said bottom to provide space for ice therebetween, said shelf means being supported below said shoulder; and at least one transparent cover hingedly connected to said perimeter of said shelf means and arranged to cover at least one of said food receiving receptacles when closed.

# 5,437,166 EAR PIERCING STUDS

William J. Gardner, 16 Beaumaris Road, Newport, Shropshire TF10 7BN, United Kingdom

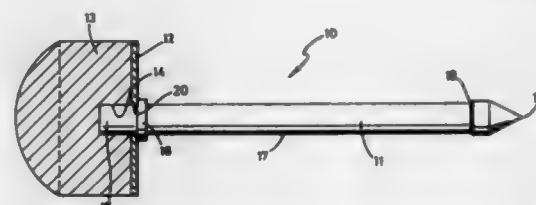
Filed Oct. 13, 1993, Ser. No. 135,674

Claims priority, application United Kingdom, Oct. 16, 1992, 9221736

Int. Cl.<sup>6</sup> A44C 7/00

U.S. Cl. 63-12

6 Claims



1. An ear piercing stud comprising a precision machined and polished piercing post of surgical grade titanium, a stud head of a material capable of being gold plated, and an annular shield of a material suitable for being in contact with pierced flesh, the post having a pointed end remote from the stud head to facilitate flesh piercing when the stud is driven through flesh in a piercing operation, the stud head and the post having coincident longitudinal axes, the shield lying against the stud head where the post meets the stud head to shield flesh from contact with the stud head in use, said stud head having a closed recess therein, the post, the annular shield and the stud head being made separately and assembled with a shoulder defining a spigot end portion of reduced diameter with respect to the shoulder which through the annular shield and engaged in the recess in the stud head such that the shoulder holds the annular shield and the stud head permanently together.

# 5,437,167 INVISIBLE SETTING FOR ROUND DIAMOND STONE

Betzalel Ambar, 4359 Ponca Ave., Los Angeles, Calif. 91602

Filed May 12, 1994, Ser. No. 241,596

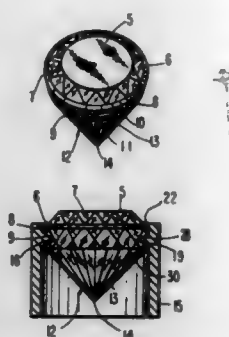
Int. Cl.<sup>6</sup> A44C 17/02, 17/00

U.S. Cl. 63-26

6 Claims

1. Apparatus for setting a precious round stone, said round stone having a top surface forming a table, said table terminating in an annular girdle, a conical pavilion portion located below said girdle terminating in a culet at the bottom thereof, said pavilion portion forming a first acute angle with respect to said table, said round stone comprising an annular belt portion located between the girdle and pavilion, at least three coplanar groove segments formed within said belt portion and spaced circumferentially around said belt portion, said annular belt portion having an outer annular circumferential surface which forms a second angle with respect to said table, wherein the second angle is greater than said first acute angle, said setting means further comprising a cylindrical barrel within which

said round stone sits, at least three tongue members integrally formed with and projecting inwardly from said cylindrical barrel, said tongue members aligning with said groove seg-



ments in said belt, wherein said cylindrical barrel is deformable and is deformed so that said tongue members move into said groove segments to hold the precious round stone in place.

# 5,437,168 TOP LOADING HORIZONTAL AXIS AUTOMATIC WASHER

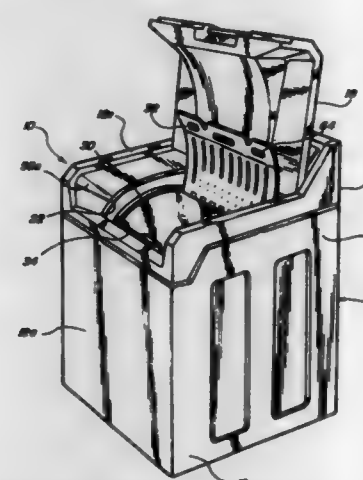
Anthony Mason, Lincoln Township, Berrien County; Brenner M. Sharp, St. Joseph, and Victor W. Cuthbert, Sodus Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 2, 1994, Ser. No. 235,999

Int. Cl.<sup>6</sup> D06F 37/26

U.S. Cl. 68-3.00 R

15 Claims



10. An automatic washer comprising: an enclosure including: a cabinet having a front panel, a back panel, and opposing side panels, a top member interconnected with and disposed above said cabinet defining a top surface of said enclosure, said top member further having a downwardly extending front portion, said front panel and said downwardly extending front portion defining a front surface of said enclosure, said top member further including an access opening for accessing the interior of said enclosure, said access opening having a front edge disposed on said front surface of said enclosure and a rear edge disposed on said top top surface, said front edge being positioned at a lower height than said rear edge such that said access opening extends along said top surface and partially down said front surface; a lid hingedly connected to said top member for selectively closing and opening said access opening, said lid extend-

ing along said top surface and partially down said front surface in the closed position; a tub disposed within said enclosure, said tub having an interior, and an opening for accessing said interior of said tub; and a basket rotatably mounted within said tub for rotation about a horizontal axis, said basket further having an interior, and a door for accessing said interior of said basket, and a basket opening having opposite front and rear edges, said door of said basket being provided for selectively closing and opening said basket opening and further comprising: a first door flap hingedly mounted on said rear edge of said basket opening and having an arc length substantially equal to the arc length of said basket opening; a second door flap hingedly mounted opposite said first door flap on said front edge of said basket opening and having an arc length less than 1/2 the arc length of said first door flap; wherein said first door flap is positioned adjacent said rear edge of said access opening in its open position and said second door flap is positioned adjacent said front edge of said access opening in its open position such that both said first and second door flaps are positioned out of the path of loading and unloading clothes items into said wash basket; and said first door flap includes a front edge portion opposite said hinged connection with said rear edge of said basket opening; said second door flap includes a front edge portion opposite said hinged connection with said front edge of said basket opening; said second door flap is positioned in its open position at a predetermined angle such that said front edge portion of said second door flap projects into the arc traced by said front edge portion of said first door flap when said first door flap moves from an open position to a closed position such that said first and second door flaps may be moved from an open position to a closed position by downwardly urging said first door flap; and wherein said access opening of said enclosure and said opening of said tub are configured to provide angled access for loading and unloading clothes within said basket.

# 5,437,169 STARCH COOKING/DISPENSING APPARATUS

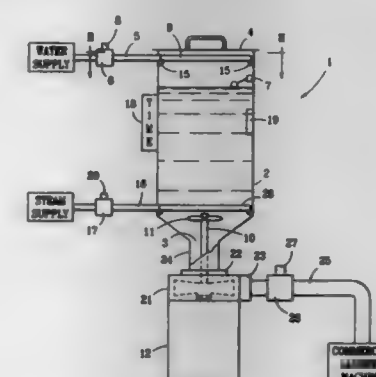
Wesley W. Mitchell, 2701 Brushy Creek Trail, Mesquite, Tex. 75181, and Wilson W. Mitchell, 3801 Hickox Rd., Rowlett, Tex. 75088

Filed Feb. 7, 1994, Ser. No. 192,559

Int. Cl.<sup>6</sup> D06F 39/02

U.S. Cl. 68-17 R

20 Claims



1. An apparatus for cooking consecutive single batches of a predetermined quantity of liquid starch solution and dispensing each entire single batch of solution into a commercial laundry machine, comprising: a reservoir having capacity for holding a single batch of



starch solution, the reservoir having sidewalls, a bottom, and a drain in communication with the laundry machine;  
 b. means for substantially filling the reservoir with water;  
 c. agitation means for agitating the water in the reservoir;  
 d. means for dispensing dry starch into the water in the reservoir to form a starch suspension;  
 e. means for heating the starch suspension to dissolve the starch to create a starch solution;  
 f. discharge means for and dispensing the entire batch of starch solution from the reservoir through the drain into the commercial laundry machine; and  
 g. spraying means inside the reservoir and in fluid flow communication with the conduit connecting the reservoir with the source of water for spraying water onto the sidewalls while the discharge means is operating, for washing the sidewalls of starch solution while the batch of starch solution is being dispensed into the laundry machine, the water being sprayed onto the sidewalls also passing through the drain to the laundry machine.

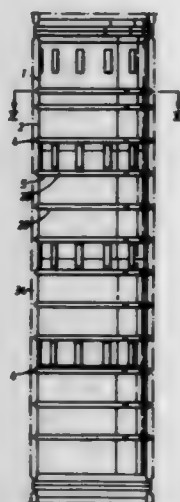
5,437,170

## WASHING APPARATUS

Mikael Nilsson, and Bo Wilke, both of Karlstad, Sweden, assignors to Kvaerner Pulping Technologies AB, Karlstad, Sweden  
 Filed Jul. 26, 1994, Ser. No. 280,825  
 Int. Cl.<sup>6</sup> D21D 5/04

U.S. Cl. 68—181 R

9 Claims



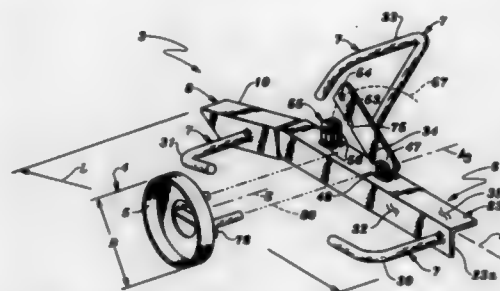
1. Apparatus for treating pulp of cellulosic fibre material with a treating liquid, said apparatus comprising a vertical vessel with rotation-symmetrical wall, screening means arranged in the vessel for withdrawing liquid from the pulp, and liquid supply means for the supply of said treating liquid to the vessel, said liquid supply means including a plurality of distributing tubes arranged concentrically on the outside of the vessel, and a plurality of inlet connections connecting each distributing tube to the vessel, each of said distributing tubes being formed of an annular section and an opposing part of the rotation-symmetrical wall, said annular section being welded directly to the rotation-symmetrical wall, said annular section and said wall part enclosing between them an endless, annular distributing channel, each of said inlet connections being provided with an opening extending through said wall part and connecting said distribution channel to the interior of the vessel.

5,437,171  
 DEVICE FOR PREVENTING FREE ROTATION OF A WHEEL OF A STATIONARY VEHICLE

Joseph L. Owen, 3224 Stuart Way, Napa, Calif. 94558  
 Filed Aug. 20, 1993, Ser. No. 109,615  
 Int. Cl.<sup>6</sup> B62H 5/14

U.S. Cl. 70—14

8 Claims



1. A wheel securing device comprising a main locking subassembly including an articulated central platform defining a longitudinal axis, and a series of L-shaped and U-shaped hooks extending from said central platform, said platform including a main segment and an end segment, said end segment being pivotally attached to said main segment coextensive with said longitudinal axis, said L-shaped hooks including first and second L-shaped hooks attached to opposite ends of said main and end segments along said longitudinal axis, said L-shaped hooks also including (i) base legs attached to and extending transversely from said main and end segments and (ii) radial legs longitudinally extending parallel to said longitudinal axis, said U-shaped hook being attached to said main segment near a mid-region and including a planar arm pivotally attached at one end to said main segment, and including a longer leg of a pair of upright legs radially extending relative to said longitudinal axis, a shorter leg parallel to said longer leg and a base leg extending transversely of said longitudinal axis, wherein movement of said planar arm carries said U-shaped hook in various working states providing convenient attachment and removal relative to a tire of a vehicle, said planar arm being rectangular in cross section and including a first end pivotally attached to said main segment for rotation about a pivot axis perpendicular to said longitudinal axis and a second end provided with an opening, said main segment also including a pair of radially extending eared supports having openings alignable with said opening in said pivot arm to define a closed working state.

5,437,172

## ANTI-THEFT DEVICE FOR EYEGLASSES

Patrick Lamy, Saillenard, France, and Arnaldo Mazzucchelli, Grumello Del Monte, Italy, assignors to Plasti-Max SpA, Grumello Del Monte, Italy

Filed Mar. 14, 1994, Ser. No. 209,477

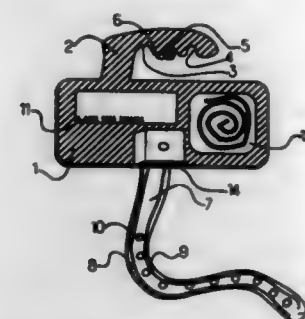
Claims priority, application France, Mar. 12, 1993, 93 02859  
 Int. Cl.<sup>6</sup> A41D 27/22; E05B 69/00

U.S. Cl. 70—57.1

8 Claims

1. Anti-theft device for removably mounting a pair of eyeglasses on a display, comprising:  
 a plate formed with aperture means adapted to receive a support;  
 link means arranged to form a closed loop over a bridge of a pair of eyeglasses, and  
 fastening means on said plate, said fastening means being engageable with said link means for locking said link means on said plate and preventing separation of said pair

of eyeglasses from said device and only releasable from said link means with a special tool;



said link means comprising an element of relatively weak flexible plastic material and reinforcement means for rendering cutting of said link means difficult.

5,437,173

## WINDOW LOCK WITH INDICATOR

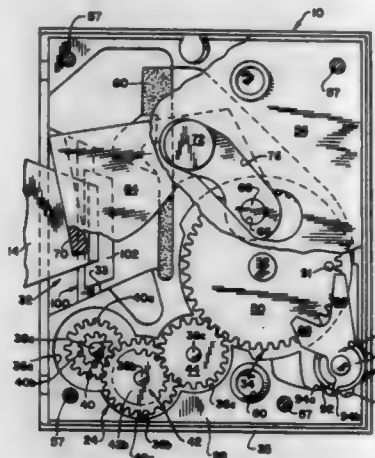
Gary L. Spinar, Faribault, Minn., assignor to Truth Division of SPX Corporation, Owatonna, Minn.

Filed Feb. 18, 1993, Ser. No. 19,099

Int. Cl.<sup>6</sup> E05B 41/00

U.S. Cl. 70—89

11 Claims



1. A lock mountable on a window jamb for selectively grasping a keeper on a window sash to secure a sash closed against a jamb, comprising:

- a lock base with an open interior space for mounting to a jamb, said base including a visible window opening therein;
- a pawl movable between an open position clear of a keeper disposed in said base open interior space and a locking position for grasping a keeper when a sash is closed against a jamb;
- an indicator having two visually different portions, one of said portions being visible through the window opening in a first position of the indicator and the other of said portions being visible through the window opening in a second position, said indicator being moved between said first and second positions when said pawl is moved between said open and locking positions;
- a drive gear connected to said pawl for moving said pawl between the open and locking positions;
- means for pivoting said drive gear about a first axis; and
- a pin on said drive gear, said pin engaging said indicator to at least partially move said indicator during at least one part of the movement of said pawl between its open and locking positions.

5,437,174

## RETROFITTABLE ELECTRONIC AND MECHANICAL DOOR LOCK SYSTEM

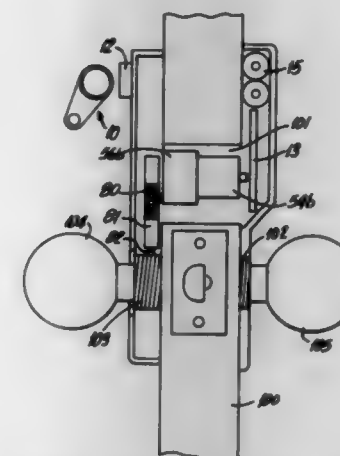
Kemal Aydin, 137 Power House Rd. - Apt. 3W, Roslyn, N.Y. 11577, assignor to David Sokol and Kemal Aydin, both of New York, N.Y., a part interest

Filed Nov. 17, 1992, Ser. No. 977,561

Int. Cl.<sup>6</sup> E05B 47/06

U.S. Cl. 70—278

12 Claims



1. A lock system adapted to be fitted onto conventional locks having a cylinder which turns to unlock a door, the cylinder having a slot therein, the lock system comprising portions of a device installable on a door;

- (a) an electronic socket adapted to read digital code from a portable electronic key means inserted therein;
- (b) an electronic circuit means to verify the code with code stored therein and produce a control signal upon the verification of the code the electronic circuit including a programmable microprocessor and being connected to the socket;
- (c) a rotary bi-directional direct current motor controlled by the electronic circuit means and having an output shaft;
- (d) a gear reduction system having a series of meshing gears and driven by the motor output shaft, the reduction system having a reduction ratio of at least 50:1 and having a rotatable output gear;
- (e) a transfer means driven by the reduction system output gear;
- (f) a battery connected to the motor and electronic circuit;
- (g) a slide means mounted for vertical sliding motion and slidable by the transfer means;
- (h) a projection fixed to the slide means and when the slide means is moved by the transfer means the projection is inserted into the slot of the cylinder thereby preventing the cylinder from turning and locking the door and when the slide means is again moved by the transfer means the projection is removed from the slot and thereby unlocks the door.

5,437,175

## DEVICE FOR BENDING COAXIAL CABLE

John Nelson, East Stroudsburg, and Emil Rolando, Cresco, both of Pa., assignors to Endeco Corporation, Allentown, Pa.

Filed May 19, 1994, Ser. No. 246,200

Int. Cl.<sup>6</sup> B21D 7/02

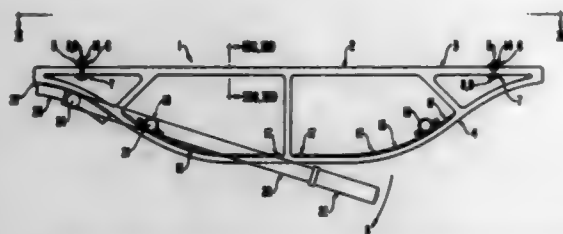
U.S. Cl. 72—215

28 Claims

1. A device for bending a cable into an arcuate form including a frame member having an arcuate form, said device comprising:

- at least one securing clamp for clamping said device to a suspended cable, said at least one securing clamp comprising:
- a securing bracket;

a pivot member for pivotally securing said securing bracket to said frame; and  
a securing member for retaining said securing bracket in a



locked position over said frame, in such a manner that a space exists between said securing bracket and said frame into which space said suspended cable fits, to thereby secure said frame to said suspended cable.

5,437,176

# KEY AND ROTARY LOCK CYLINDER FOR SAFETY LOCK

Ernst Keller, Untere Schwandenstrasse 22, CH-8805 Richterswil, Switzerland

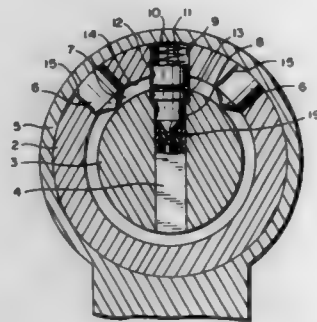
Continuation of Ser. No. 748,160, Aug. 21, 1991, abandoned.  
This application Oct. 1, 1992, Ser. No. 955,244

Claims priority, application Canada, Aug. 22, 1990, 2727/90;  
Jan. 15, 1991, 98/91

Int. Cl.<sup>6</sup> E05B 27/06

U.S. Cl. 70—358

15 Claims



1. A key and rotary lock cylinder for a safety lock, comprising, at least one control element (19; 25, 26) for aligning an additional tumbler (10) in a stator (2) surrounding a rotor (3) of said rotary lock cylinder, said control element located in a shaft (17) of said key (16), wherein, said control element (19, 25, 26) can be radially displaced against a restoring force, said restoring force being greater than a force of said additional tumbler (10), at least one blocking element (6) located in said stator (2) in a plane of rotation of said control element with said rotor and at a distance from said additional tumbler (10), said blocking element (6) extending beyond the shear line (14) between said stator (2) and said rotor (3), said blocking element displacing said control element against said restoring force when said rotor is rotated, wherein a set rotational position of the rotor (3) with said key, radially displaces said control element (19, 25, 26) with a core pin (13) of said additional tumbler (10) against said restoring force.

5,437,177

# PORTABLE COLLET CRIMPING APPARATUS

Eric D. Orcutt, Rockvale, Tenn.; George Easterday, Jr.; Duane L. Lambert, both of Columbia City, Ind., and Marlin D. Meredith, North Webster, Ind., assignors to Dana Corporation, Toledo, Ohio

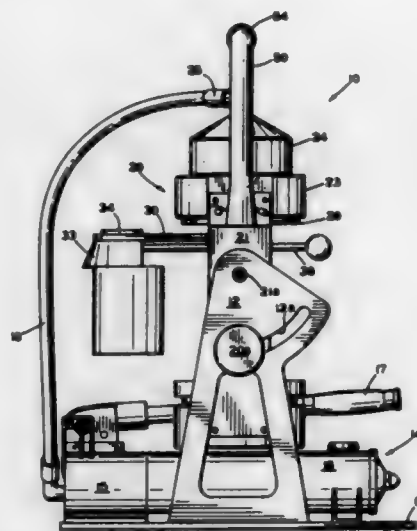
Division of Ser. No. 947,494, Sep. 18, 1992, Pat. No. 5,297,417.

This application Mar. 25, 1994, Ser. No. 217,614

Int. Cl.<sup>6</sup> B21D 41/04

U.S. Cl. 72—402

15 Claims



1. A manually operable, self contained, portable apparatus for crimping a fitting onto the end of a hose comprising:

- a base plate;
- a collet crimping machine mounted on said base plate, said collet crimping machine including a die assembly adapted to be engaged to crimp a fitting onto the end of a hose, said collet crimping machine further including a hydraulic actuator responsive to pressurized fluid to engage said die assembly, said collet crimping machine mounted on said base plate for pivoting movement relative thereto so that said die assembly and hydraulic actuator can be pivoted relative to said base plate; and
- a manually operable hydraulic pump assembly mounted on said base plate and connected to said collet crimping machine for selectively actuating said actuator to engage said die assembly, said hydraulic pump assembly including a fluid reservoir, a pump having an inlet connected to said fluid reservoir and an outlet connected to said actuator, a conduit connecting said fluid reservoir and actuator between said inlet and outlet, and a manually operable handle for actuating said pump to supply pressurized fluid to said actuator, said fluid reservoir, pump, and handle being fixedly mounted to said base so that said pivoting of said crimping machine is relative to said fluid reservoir, pump and handle.

5,437,178

# CONTROLLER FOR ULTRASONIC SENSORS

Alex Esin, Skokie; Lawrence J. Jones, Algonquin; Boris Rossel-son, Des Plaines, and Martin N. Sorenson, Buffalo Grove, all of Ill., assignors to Kay-Ray/Sensall, Inc., Mount Prospect, Ill.

Filed Jul. 6, 1992, Ser. No. 909,538

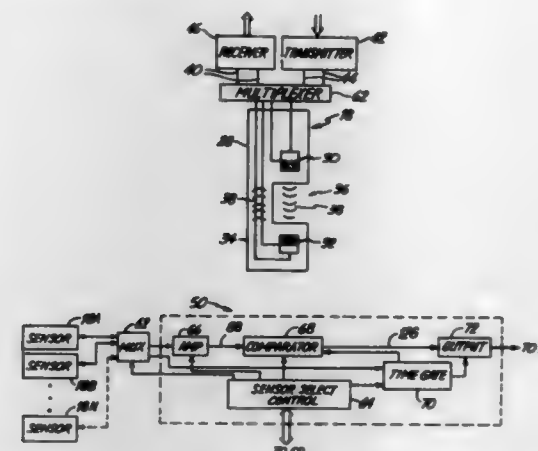
Int. Cl.<sup>6</sup> G01N 29/24; A61B 10/00

U.S. Cl. 73—1 DV

26 Claims

11. An ultrasonic transducer for measuring a property of a material, comprising:  
an ultrasonic transducing element;  
means for exciting the ultrasonic transducing element;

means for receiving a transducer output signal from the ultrasonic transducing element;  
means for decreasing strength of an excitation signal provided to the ultrasonic transducing element by the means for exciting; and



comparator means for comparing strength of the transducer output signal with a threshold level and producing an output based upon the comparison which is related to a wet self-test.

5,437,179

# FAST GAS CHROMATOGRAPHY METHOD, APPARATUS AND APPLICATIONS

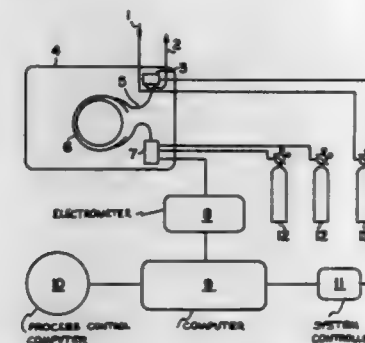
Patrick M. Wiegand, South Charleston; John F. Fisher, St. Albans; John R. Parris, Cross Lanes; Elizabeth S. Ballard, Charleston; Courtland P. Sears, III, Dunbar; George W. Schwarz, Jr., and Cloyd R. Smith, III, both of Charleston, all of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Jul. 7, 1993, Ser. No. 88,677

Int. Cl.<sup>6</sup> G01N 30/20

U.S. Cl. 73—23.35

7 Claims



1. Gas chromatographic apparatus for rapidly analyzing samples in an industrial process, said apparatus operable to rapidly detect samples, the apparatus containing an injecting means, which feeds a chromatography column, the eluting samples from the column are provided to a detecting means which converts the samples into an electrical signal, said apparatus comprising:

- a) at least one gas chromatography column capable of separating components in a gas sample, having a sample inlet port located at an upstream portion of said column and a sample elution port at an outlet of said column;
- b) means for automatically selecting a sample to be analyzed;
- c) a valve for rapidly injecting into said chromatographic column a gas mixture that has a reproducible plug flow time of less than about 50 milliseconds;

d) means for detecting said separated gas components from the outlet of the column and creating an electrical signal;  
e) means for converting said electrical signal to a digital signal at a rate of greater than 500 points per second;  
f) means for identifying sample components and calculating sample component levels from said digital signal;  
g) means for transferring said sample component identification and sample component level information to a process control computer; and  
h) means for reiterating the analysis wherein means e, f, and g are capable of being operated concurrently.

5,437,180

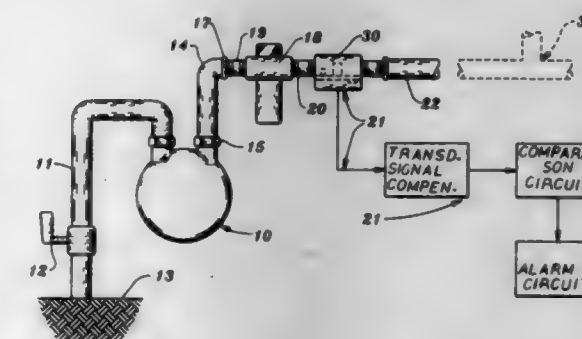
# DETECTION OF NATURAL GAS WITHIN A CUSTOMER'S DOMAIN

Richard F. Sowinski, 996 Arnold Dr., Martinez, Calif. 94553  
Filed Nov. 19, 1993, Ser. No. 155,951

Int. Cl.<sup>6</sup> G01L 27/00

U.S. Cl. 73—40.5 R

12 Claims



5. In a sensor circuit for measuring leakage in a natural gas pipe, the combination comprising  
a natural gas pipe having a side wall and a cavity therein for carrying natural gas,  
a pressure resistive sensor for sensing differential pressure within said natural gas pipe by generating first and second signals wherein a differential signal thereof is an output signal which relates the magnitude of sensed differential pressure of said natural gas and ambient air,  
an adjustment circuit connected to said pressure resistive sensor for receiving said first and second signals and providing said output signal having a desired magnitude variation characteristic as a function of pressure and temperature as well as indicating small leakages of gas from said natural gas pipe,  
said adjustment circuit including resistive means for adjusting (i) span of said output signals as a function of differential pressure, (ii) absolute offset of said output signal with respect to said first and second signals and (iii) temperature dependent resistive coefficient of variation of both of said offset and said span based on measured temperatures of both natural gas within a natural gas pipe and said gas pipe itself, said temperature dependent resistive coefficient of variation also indicative of small leakage of natural gas from said natural gas pipe within an end-user's domain.

5,437,181

# CONCRETE SLUMP TESTING

Karim W. Nasser, Saskatoon, Canada, assignor to University of Saskatchewan, Saskatchewan, Canada

Filed Feb. 22, 1994, Ser. No. 199,957

Int. Cl.<sup>6</sup> G01N 11/02

U.S. Cl. 73—54.03

12 Claims

1. A concrete slump tester comprising:  
a measuring unit comprising an elongate rod, an inductance coil mounted on the rod and means for measuring the inductance of the coil;





mass, said first waveguide layer extending from said edge of said seismic mass across said at least one web and at least a portion of the width of a surface of said fixed frame so that a light beam passing through said first light waveguide layer is deflected as a function of movement of said seismic mass; and,

at least one second light waveguide, disposed on said surface of said fixed frame opposite said end of said first light waveguide layer, for coupling the light beam to a detector for detecting deflections of the light beam as a measure of detected acceleration by the sensor, with said at least one second light waveguide comprising a further light waveguide layer extending from an inner edge of said fixed frame at least partially over said surface of said fixed frame.

5,437,187

# ULTRASOUND TEST APPARATUS FOR ELONGATED TEST SPECIMENS HAVING CROSS SECTIONS THAT ARE CONSTANT THROUGHOUT THEIR LENGTH, IN PARTICULAR PIPES AND RODS

Bernhard Karbach, Erfstadt-Friebeheim; Ottokar Patzke, Erfstadt-Liblar, and Reinhard Prause, Sankt Augustin, all of Germany, assignors to Firma Krautkramer GmbH & Co., Germany

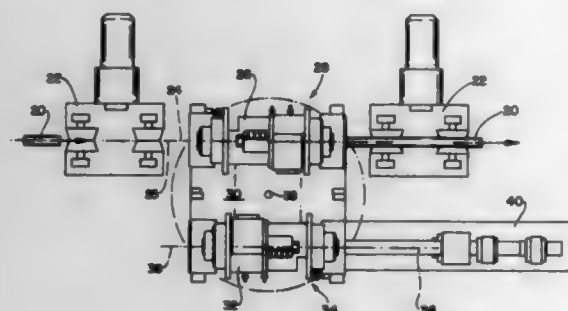
Filed Jul. 22, 1993, Ser. No. 96,486

Claims priority, application Germany, Jul. 24, 1992, 42 24 538.9

Int. Cl.<sup>6</sup> G01N 29/00, 29/26

U.S. Cl. 73—635

20 Claims



1. An ultrasound test apparatus for elongated specimens which have constant cross sections along entire lengths of the specimens, in which a specimen passes longitudinally along an axis of a test line and thereby passes through a test position arranged on the test line, said ultrasound test apparatus comprising:

- first and second test machines; and
- a pivot mount rotatable about an axis of rotation which is perpendicular to the axis of the test line and spaced therefrom, said first and second test machines mounted on said pivot mount at different angular positions about the axis of rotation, said pivot mount having a first rotational position at which said first test machine is located at the test position on the test line and the second test machine is located at a changeover position remote from the test line, and having a second rotational position at which the second test machine is located at the test position on the test line and said first test machine is located at a changeover position remote from the test line.

5,437,188

# TELL TALE DEVICE FOR A PRESSURE VESSEL

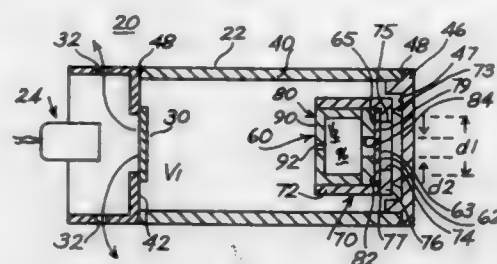
Richard Frantom, Richmond; Robert J. Bishop, Sterling Heights; Robert Kremer; Klaus F. Ocker, both of Fraser; Stephen P. McGarry, Rochester Hills, and Will E. Rogers, Rochester, all of Mich., assignors to AlliedSignal Inc., Morristown, N.J.

Filed Jan. 31, 1994, Ser. No. 189,228

Int. Cl.<sup>6</sup> G01L 7/00, 189/228

U.S. Cl. 73—709

13 Claims



1. A post depressurization device to indicate the pressure that existed within a pressure vessel just prior to opening of the pressure vessel and the pressure vessel's resulting loss of pressure, comprising:

- first means (62, 130, 160) for changing its physical state in response to a predetermined pressure differential thereacross and for providing an indication of the pressure within the pressure vessel just prior to its being opened, and support means (70), within the pressure vessel for supporting the first means including valve means for inhibiting the flow of a pressurized media into and out from the pressure storage chamber, the valve means operative to permit the pressure within the pressure storage means to equalize to approximately the pressure within the pressure vessel prior to opening to the pressure vessel.

5,437,189

# DUAL ABSOLUTE PRESSURE SENSOR AND METHOD THEREOF

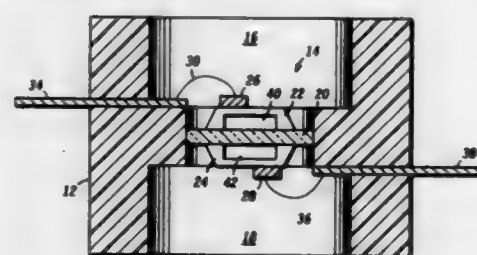
Clem H. Brown, Scottsdale, and Daniel J. Wallace, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 3, 1994, Ser. No. 237,527

Int. Cl.<sup>6</sup> G01L 9/06

U.S. Cl. 73—721

19 Claims



- 1. A dual absolute pressure sensor, comprising:
  - a glass substrate having first and second surfaces wherein said glass substrate distribute a common temperature to said first and second surfaces for increased accuracy of the dual absolute pressure sensor;
  - a first sensor die attached to said first surface of said glass substrate to form a first cavity having a first reference pressure, said first sensor die measuring a first differential pressure between said first reference pressure and an outside surface of said first sensor die at which is applied a first external pressure for providing a first electrical signal representative of said first differential pressure and
  - a second sensor die attached to said second surface of said

glass substrate to form a second cavity having a second reference pressure, said second sensor die measuring a second differential pressure between said second reference pressure and an outside surface of said second sensor die at which is applied a second external pressure for providing a second electrical signal representative of said second differential pressure.

5,437,190

# METHOD FOR DETERMINING THE EFFECTS OF STRESS

David B. Ehrenpreis, Fort Lee, N.J., and Walter E. Haisler, College Station, Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1991, Ser. No. 706,680

Int. Cl.<sup>6</sup> G01L 1/00

U.S. Cl. 73—802

3 Claims

$$[s] = \begin{bmatrix} \frac{1}{E_{aa}} & -\frac{\nu_{ab}}{E_{aa}} & -\frac{\nu_{ac}}{E_{aa}} & 0 \\ -\frac{\nu_{ba}}{E_{bb}} & \frac{1}{E_{bb}} & -\frac{\nu_{bc}}{E_{bb}} & 0 \\ -\frac{\nu_{ca}}{E_{cc}} & -\frac{\nu_{cb}}{E_{cc}} & \frac{1}{E_{cc}} & 0 \\ 0 & 0 & 0 & \frac{1}{G_{ab}} \end{bmatrix}$$

1. A method of determining the effects of stress on a non-linear orthotropic missile structure, comprising:

- (a) measuring three dimensional non-linear orthotropic strains of a non-linear orthotropic missile structure due to mechanical series of stresses on the missile structure;
- (b) determining three dimensional non-linear orthotropic strain terms from the measurements;
- (c) forming a compliance matrix from the strain terms, and
- (d) multiplying the compliance matrix by a stress vector, in order to determine a strain vector, the strain vector being an indication of the behavior of the non-linear orthotropic missile structure to a given stress.

5,437,191

# HYDRAULICALLY POWERED TEST FRAME WITH SPINDLE-ACTUATED VALVE

Manfred Dripke, Rottenacker, and Gerhard Saum, Ulm, both of Germany, assignors to Zwick GmbH & Co., Ulm, Germany

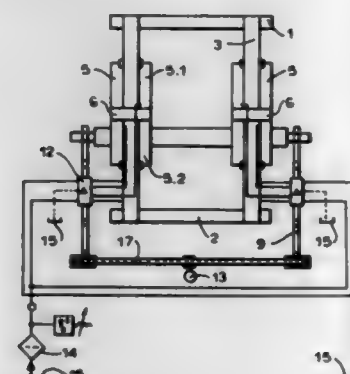
Filed Apr. 8, 1994, Ser. No. 225,159

Claims priority, application Germany, Apr. 10, 1993, 43 11 940.9

Int. Cl.<sup>6</sup> G01N 1/00

U.S. Cl. 73—816

9 Claims



1. A test frame comprising:

- an upper end traverse;
- a lower end traverse below the upper end traverse;
- a pair of parallel upright tie rods having upper ends fixed in the upper traverse and lower ends fixed in the lower traverse;
- a middle traverse between the upper and lower end traverses;
- respective cylinders fixed on the middle traverse and surrounding and vertically slidable on the tie rods and each defining with the respective tie rod a substantially closed chamber;
- a piston provided on each tie rod inside the respective cylinder subdividing the respective chamber into an upper compartment and a lower compartment;
- a source of fluid having a high-pressure side and a low-pressure side;
- a pair of respective valves connected between the cylinders and the source and actuatable to connect either of the respective compartments to either side of the source;
- respective spindles each generally parallel to and adjacent a respective one of the tie rods and each having one end threadedly engaging the middle traverse and an opposite end connected to the respective valve; and
- mechanical coupling means connected to both spindles for synchronously rotating same and for thereby synchronously pressurizing the upper compartments to lower the middle traverse and the lower compartments to raise the middle traverse in accordance with the.

5,437,192

# PHYSICAL PROPERTY MEASURING DEVICE

Takeshi Kawamoto; Toshio Hrowatari; Eiji Tahara, all of Kitakyushu, and Hiromasa Katayama, Joetsu, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

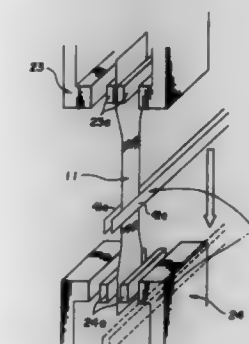
Filed Oct. 20, 1993, Ser. No. 138,070

Claims priority, application Japan, Oct. 20, 1992, 4-281970; Oct. 20, 1992, 4-281971

Int. Cl.<sup>6</sup> G01N 33/00

U.S. Cl. 73—826

9 Claims



1. A physical property measuring device for measuring physical properties of a test sample piece of a flexible sheet material, comprising:

- a measuring zone in which measurement of physical properties of the test sample piece is carried out;
- a transfer mechanism including a pair of transfer arms which transfer the test sample piece of said measuring zone while interposedly hanging and holding the test sample piece from one end thereof between said transfer arms;
- an upper clamp mechanism and a lower clamp mechanism arranged vertically opposite each other in said measuring zone;
- said upper clamp mechanism including a pair of upper clamp arms interposedly holding an upper clamped portion of the test sample piece positioned inward of an upper end of the test sample therebetween; and
- said lower clamp mechanism including a pair of lower clamp arms interposedly holding a lower clamped portion of the



test sample piece positioned inward of a lower end of the test sample piece therebetween.

5,437,193

# METHOD AND APPARATUS FOR TESTING MICROFILAMENTS

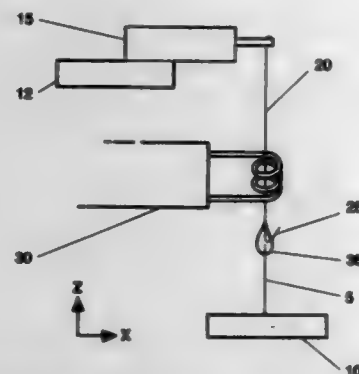
Patrick M. Schleitweller, Dayton, and Charles W. Merten, Jr., West Carrollton, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 22, 1994, Ser. No. 216,521

Int. Cl. G01N 3/00

U.S. Cl. 73-830

12 Claims



1. An apparatus for testing tensile strength of a microfilament specimen having a first and second end comprising: a load cell with an associated translation stage, a first attaching means for attaching said first end of said microfilament specimen to said load cell, said first attaching means comprising a loading wire including first and second ends, said first end of said loading wire being attached to said load cell, and resin positioned on said second end of said loading wire, said resin providing means for receiver said first end of said microfilament specimen to said loading wire, a second attaching means for attaching said second end of said microfilament specimen to a base, and a means for moving said load cell via said translation stage in a linear direction, defining a Z-axis, either toward or away from said base.

5,437,194

# ULTRASONIC TRANSDUCER SYSTEM WITH TEMPORAL CROSSTALK ISOLATION

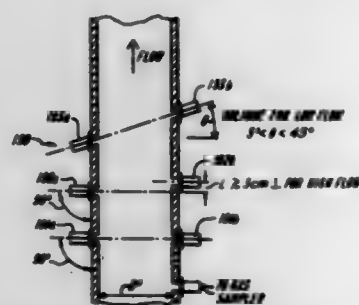
Lawrence C. Lynworth, Waltham, Mass., assignor to Panametrics, Inc., Del.

Continuation-in-part of Ser. No. 176,930, Jan. 3, 1994, which is a continuation-in-part of Ser. No. 670,702, Mar. 18, 1991, Pat. No. 5,275,060. This application Mar. 4, 1994, Ser. No. 206,861

Int. Cl. G01F 1/66

U.S. Cl. 73-861.27

16 Claims



1. A fluid measurement system comprising a single channel measurement device having transmission

means for producing a transmission signal to actuate an acoustic transducer to propagate signal energy and also having a single channel signal reception means for receiving and processing electrical signals from an acoustic transducer that receives the signal energy, means defining a region containing a fluid to be measured by propagation of said signal energy, and means mounting a plurality of transducers for acoustic interrogation of fluid in said region, said means mounting at least two of said plurality of transducers as receiving transducers in receiving paths for receiving such signal energy at separate and non-interfering time intervals when said measurement device produces a single transmission signal, such that the signal energy received by said receiving transducers is processed by said single channel reception means to perform fluid measurement.

5,437,195

# MECHANICAL SENSOR PRODUCED FROM A POLYMER FILM

Jean-marc Bureau, Palaiseau, and Gérard Cousnot, Paris, both of France, assignors to Thomson-CSF, Puteaux, France

Continuation of Ser. No. 989,655, Dec. 14, 1992, abandoned.

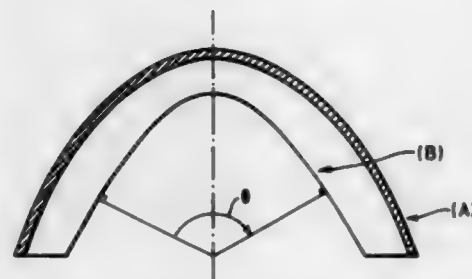
This application Sep. 15, 1994, Ser. No. 306,710

Claims priority, application France, Dec. 17, 1991, 91 15640

Int. Cl. G01L 1/00

U.S. Cl. 73-862.28

18 Claims



1. A mechanical sensor for measuring distortion, consisting of a thermostable polymer layer having a major upper surface and a major lower surface, a conductive upper part (A) that is formed in the major upper surface and an insulating lower part (B) which forms the rest of the polymer layer, wherein the resistance of the upper part (A) varies with distortion of the polymer layer.

5,437,196

# DETECTOR FOR FORCE/ACCELERATION/MAGNETISM WITH RESPECT TO COMPONENTS IN MULTI-DIMENSIONAL DIRECTIONS

Kazuhiro Okada, 73, Sugaya 4-Chome, Ago-Shi, Saitama 362, Japan

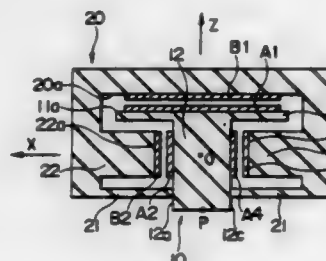
Filed Jan. 26, 1993, Ser. No. 9,288

Claims priority, application Japan, Feb. 4, 1992, 4-048055

Int. Cl. G01L 3/00

U.S. Cl. 73-862.043

7 Claims



1. A force detector for detecting components in multi-

dimensional directions of a force in an XYZ three-dimensional coordinate system, said detector comprising:

- a fixed body (20) having a flexible portion (21) deformed when a force is applied thereto;
  - a displacement body (10) supported by said flexible portion;
  - first detection means (D1 to D5, E1 to E5) for detecting a distance between a first displacement surface (11a) defined at a portion of said displacement body and a first fixed surface (20a) opposite to said first displacement surface and defined at a portion of said fixed body;
  - second detection means (D6 to D13, E6 to E13) for detecting a distance between a second displacement surface (12a, 12b, 12c, 12d) intersecting with said first displacement surface and defined at a portion of said displacement body and a second fixed surface (22a, 22b, 22c, 22d) opposite to said second displacement surface and defined at a portion of said fixed body; and
  - one of operational or arithmetic means (30 to 36) for arithmetically determining a force exerted on said displacement body every force components in the coordinate axis directions and moment components about the coordinate axes on the basis of a detection value obtained by said first detection means and a detection value obtained by said second detection means,
- wherein said first and second displacement surfaces are formed so that they are perpendicular to each other, and said first and second fixed surfaces are formed so that they are perpendicular to each other.

5,437,198

# UNIVERSAL IMPACTOR FOR PARTICLE COLLECTION WITHIN SAMPLING CRITERIA

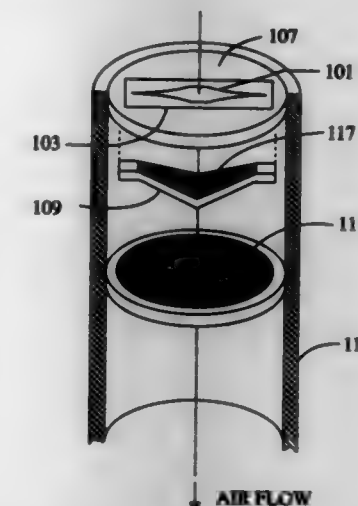
Walter John, 2329 Fourth St., Berkeley, Calif. 94710

Filed Apr. 6, 1994, Ser. No. 223,660

Int. Cl. G01N 1/00

U.S. Cl. 73-863.22

31 Claims



1. Airborne particle sampling apparatus, comprising a slit plate having a tapered slit for passing airborne particles through the slit, and an impactation plate mounted below the slit plate for collecting those particles flowing through the slit and impacting on the impactation plate, and a passage adjacent to the impactation surface allowing particles not impacting to penetrate past the impactation plate, wherein the tapered slit has a taper normal to a direction of particle flow.

5,437,197

# MAGNETOSTRICTIVE SENSOR STRUCTURES

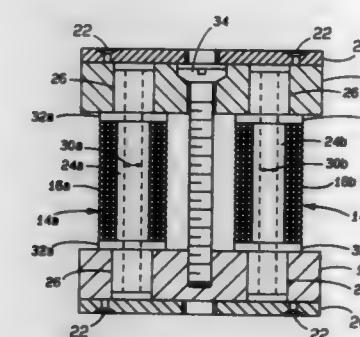
H. Mehmet Uras, Ann Arbor, and Darrell K. Kleinke, Livonia, both of Mich., assignors to The Board of Governors of Wayne State University, Detroit, Mich.

Filed Aug. 20, 1993, Ser. No. 109,840

Int. Cl. G01L 1/12

U.S. Cl. 73-862.69

27 Claims



1. A magnetostrictive force sensor comprising: a magnetic circuit having magnetically conductive end structures connected by magnetically conductive members, at least one of the magnetically conductive members being a strained element within the magnetic circuit, the strained element having magnetic properties which vary in accordance with a load applied to the strained element; means for inducing a magnetic field in the magnetic circuit; means for sensing a magnetic field within the magnetic circuit; and means for compressing the strained element to preload the strained element and initiate a magnetostrictive response in the strained element.

5,437,199

# SAMPLING KIT FOR COMPRESSED AIR/GAS SOURCES

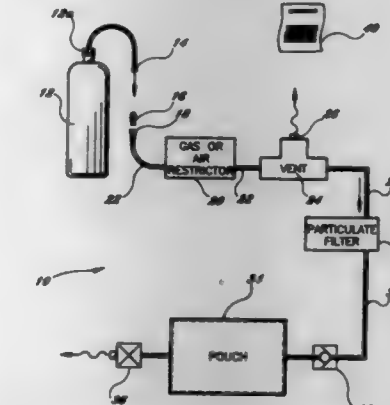
Larry Kaplan, 900 Bay Dr., Apt. No. 1001, Miami Beach, Fla. 33141

Filed Feb. 16, 1994, Ser. No. 197,207

Int. Cl. G01N 1/22

U.S. Cl. 73-863.23

4 Claims



1. A kit for sampling compressed breathing air from a source of compressed breathing air having pressure ranging from 100 psi to 6,000 psi, said kit comprising: a housing; a mounting block mounted in said housing; air sample receiving pouch for collecting and storing an air sample, said pouch mounted within said housing, said housing capped by said mounting block;

said air sample receiving pouch incorporating a pressure relief valve for relieving excess air pressure;  
 air flow conduit having an inlet and an outlet, said outlet connected in fluid communication with said air sample receiving pouch;  
 compressed breathing air source connector means connected to the inlet end of said air flow conduit, for fluidly communicating with said source of compressed breathing air, said compressed breathing air maintained under pressure in a pressure vessel;  
 air particulate filter connected in fluid communication to said air flow conduit so that air flowing through said conduit passes through said air particulate filter, said filter fluidly connected in series between said conduit inlet and said conduit outlet;  
 air flow restricting means, in fluid communication and connected to said air flow conduit in series between said conduit inlet and said air filter and in proximity to said connector means, said air flow restricting means for reducing the pressure of said compressed breathing air communicating with said air flow conduit;  
 air vent means fluidly connected in series to said conduit, between said air flow restricting means and said air filter for venting excess pressure air from said air flow conduit; and  
 an air flow connector adapter for a mating fluid communication connection to a commercial air supply yoke communicating with the source of compressed air for connecting said connector means to said source of compressed breathing air, from which the air sample is to be taken, whereby the air sample is collected from the compressed air source, said housing being transportable to an analysis location and removable for analysis of said sample.

5,437,200

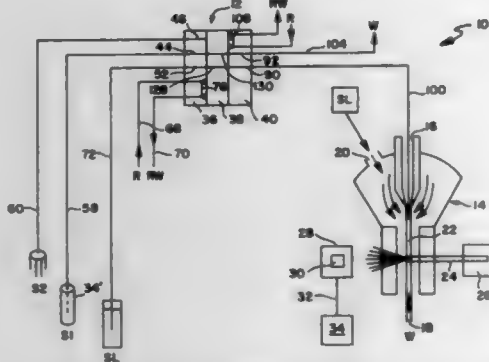
# LIQUID METERING AND TRANSFER VALVE ASSEMBLY PARTICULARLY FOR FLOW CYTOMETER

John D. Hollinger, Miami, Fla., assignor to Coulter Corporation, Miami, Fla.

Filed Jan. 15, 1993, Ser. No. 4,812  
 Int. Cl.<sup>6</sup> G01N 1/30

U.S. Cl. 73-863.73

5 Claims



1. A method of cytometrically studying the characteristics of particles in liquid suspension comprising the steps of:  
 a. providing a continuous first flow of liquid sample suspension for a predetermined duration from a source thereof;  
 b. directing said flow to flow scanning means;  
 c. isolating a precise aliquot volume of said liquid sample suspension from said continuous first flow thereof;  
 d. directing said isolated aliquot volume to said flow scanning means; and,  
 e. monitoring the passage of said isolated aliquot volume through said flow scanning means to establish an absolute count of the number of particles within said isolated aliquot volume independent of the total fluid flow through said flow scanning means.

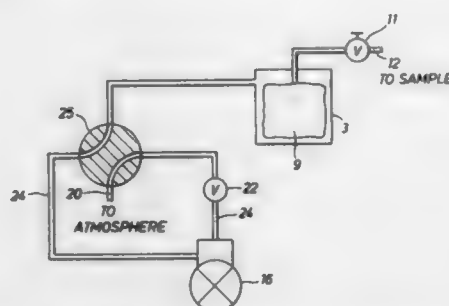
## 5,437,201 NEGATIVE PRESSURE GAS SAMPLING DEVICE

Dennis C. Krueger, Richmond, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1994, Ser. No. 221,288  
 Int. Cl.<sup>6</sup> G01N 1/24

U.S. Cl. 73-864.35

19 Claims



1. A fluid sample collecting apparatus comprising:  
 a sealable container having an opening and a cover for sealing and unsealing said opening;  
 an inlet affixed to said container, said inlet including a means for communication between the inside of said container and the environment outside said container;  
 a sample vessel within said container having an orifice, said orifice being removably fixed to said inlet; and  
 a means for repeatedly evacuating and pressurizing the space between said vessel and said container during the sampling of a single sample;  
 wherein actuation of said means for evacuating and pressurizing the space between said vessel bellows said vessel with samples of the environment outside said container.

5,437,202

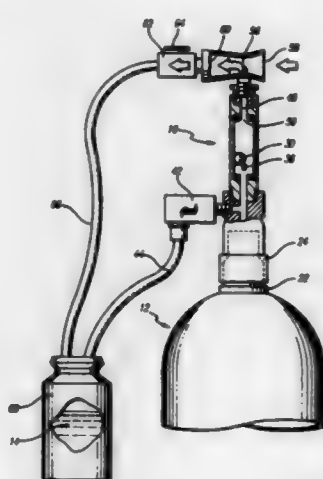
## FLUID SAMPLING DEVICE

James E. Clark, II, Ojai, Calif., assignor to Clark Technology Systems, Inc., Santa Paula, Calif.

Filed Oct. 18, 1994, Ser. No. 324,907  
 Int. Cl.<sup>6</sup> G01N 1/14

U.S. Cl. 73-864.35

19 Claims



15. A fluid sampling device for use in obtaining a precise volume of fluid to be sampled from a sealed vessel, said fluid sampling device comprising:  
 a fluid sampling float chamber with top and bottom opening with a floating ball locating therein, which ball is sealably seatable at the top opening;  
 a venturi connected to the top opening of the fluid sampling float chamber;

a pressure relief valve in fluid connection with the bottom opening of the fluid sampling float chamber; and  
 an air valve downstream of the venturi to selectively direct air flow through one of (a) the venturi to draw air out of the fluid sampling float chamber to thereby cause the float chamber to draw up and fill with fluid to be sampled, until the floating ball seals off the top opening of the float chamber and (b) into float chamber to expel the fluid in the float chamber through the pressure relief valve.

5,437,203

## SAMPLING DEVICE COMPRISING A REVOLVABLE SAMPLING WHEEL WITH A METAL WHEEL RIM

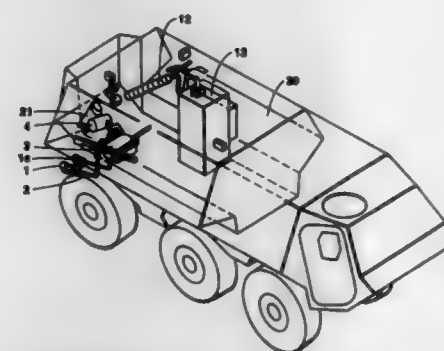
Dieter Koch, Weyhe-Leeste; Gerd Menne, Bremen; Alfred Kraft; Gerhard Weiss, both of Weyhe, and Rainer Spudich, Achim-Baden, all of Germany, assignors to Bruker-Franzen Analytik GmbH, Germany

Filed Mar. 26, 1993, Ser. No. 37,934  
 Claims priority, application Germany, Nov. 13, 1992, 42 38 399.4

Int. Cl.<sup>6</sup> G01N 1/02, 27/62; B60B 3/00, 21/02

U.S. Cl. 73-864.71

20 Claims



1. A sampling device for a mobile analysis mass spectrometer, used for the purpose of monitoring chemical substances with at least one sampling wheel revolving around an axle and comprising a silicone tire for picking up molecules of the substances to be monitored and a wheel rim upon which the silicone tire is fitted characterized in that the wheel rim consists of metal.

5,437,204

## SYSTEM FOR SELECTING THE OPERATING RANGES OF AN AUTOMATIC TRANSMISSION

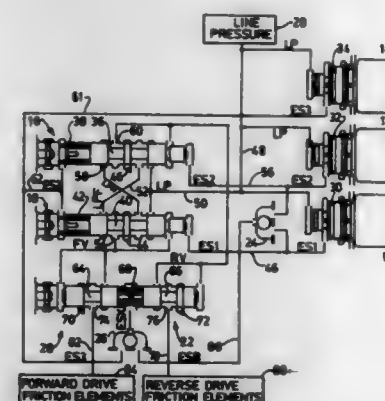
Dennis W. Person, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1993, Ser. No. 169,268

Int. Cl.<sup>6</sup> B60K 41/24

U.S. Cl. 74-335

9 Claims



1. A system for producing operating ranges of an automatic transmission having hydraulically actuated forward drive and

reverse drive friction elements engaged and released alternately to produce a forward drive range, reverse drive range and neutral range, comprising:

a range selector moveable manually among positions corresponding to the operating ranges of the transmission;  
 a fluid pressure source;  
 hydraulic circuit means including first, second and third solenoid-operated control valves, a forward select valve and reverse select valve controlled by the first, second and third solenoid-operated control valves, for opening and closing communication between the pressure source and friction elements in response to the position of the range selector;  
 an electric power source;  
 range select switch means for selectively connecting and disconnecting the electric power source and said solenoids in response to the position of the range selector;  
 pressure switch means for disconnecting the electric power source and the first solenoid when the forward drive friction elements are pressurized, and for disconnecting the electric power source and the second solenoid when the reverse drive friction elements are pressurized.

5,437,205

## WRAP SPRING CLUTCHES TYPE TRANSMISSION SYSTEM

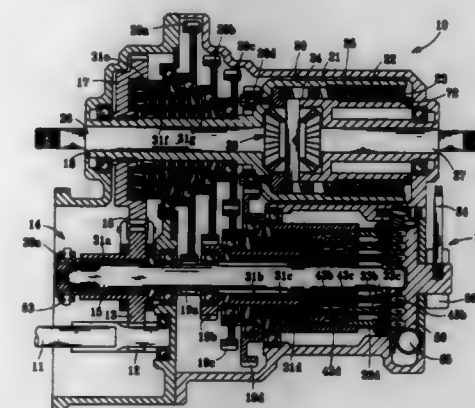
Sheng-Tsai Tseng, No. 5-3, Chia An W. Rd., Chia An Tsun, Long Tang Hsiao, Taoyuan Hsien, Taiwan

Filed Jan. 14, 1994, Ser. No. 181,585

Int. Cl.<sup>6</sup> F16H 3/08

U.S. Cl. 74-359

6 Claims



1. A transmission system, comprising:  
 a power source;  
 a transmission mechanism including a driving shaft driven by said power source, a driven shaft driven by said driving shaft at different transmission ratios, several sets of driving gears which have increasing numbers of teeth and are sequentially inter-fitted on said driving shaft from inner side to outer side at intervals, and several sets of driven gears which have decreasing numbers of teeth and are sequentially inter-fitted on said driven shaft from outer side to inner side at intervals, said driven gears being constantly engaged with said driving gears corresponding therewith, each of said driving gears and driven gears having an axially extending sleeve section, plural detachable transmission spring members being disposed between said driving shaft and said extending sleeve sections of adjacent driving gears, said transmission spring members being respectively reciprocally independently moved between an engaging position where the power is transmitted and a disengaging position where the power is not transmitted, whereby the power of the driving shaft is sequentially transmitted to the most outward driving gear or the power transmission path is interrupted at any of said driving gears, plural one-way coil spring transmission



- members being disposed between adjacent driven gears and said driven shaft for sequentially transmitting power of said driven gears to said driven shaft and allowing an inward driven gear to rotate at a speed not lower than that of an outward driven gear;
- a transmission controlling assembly which is able to respectively independently make said detachable transmission spring members move between said engaging position and said disengaging position;
- a running mode controlling device which is manually operable to switch between a forward running mode in which the power created by said power source is solely transmitted to said driving shaft, a backward running mode in which the power created by said power source is solely transmitted to said driven shaft through an idler and a backward gear, and an idling mode in which the power is not transmitted;
- a differential including a housing having an extending sleeve section which is formed with plural outer rectangular guide grooves; and
- a torque adjusting means including a housing which rotates synchronously with said driven shaft, a torque adjusting ring and a spring, said housing being substantially as long as said extending sleeve section of said differential and formed with an inner coil guide groove, said torque adjusting ring being disposed between said housing and said extending sleeve section and formed with several outer coil projections corresponding to said coil guide groove and several inner rectangular projections corresponding to said rectangular guide grooves, said spring being disposed between said housing of said torque adjusting means and said extending sleeve section, having a fixed end and a free end abutting against said torque adjusting ring, whereby when said housing of said torque adjusting means rotates along with said driven shaft and the torque value of said torque adjusting ring is unequal to the load on said housing of said differential, said torque adjusting ring is forced to linearly slide along said rectangular guide grooves, and during the linearly sliding movement, said spring abutting against said torque adjusting ring exerts a gradually increasing reaction force thereon against the linearly sliding movement until said torque adjusting ring stops linearly sliding and turns to rotate synchronously with said housing of said torque adjusting means for further driving said housing of said differential to rotate synchronously.

5,437,206

## ROTATING BRAKE ACTUATOR

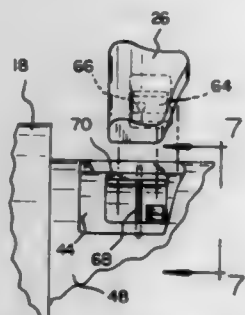
Richard G. Boor, 210 Dube, Chateaugay, Quebec, Canada J6K 2P4

Filed Dec. 23, 1993, Ser. No. 125,778

Int. Cl.<sup>6</sup> G05G 5/06

U.S. Cl. 74-489

5 Claims



1. A new rotating brake actuator for use with a bicycle having a cable operatively coupled to at least one friction brake, said actuator comprising:

- a base sleeve positionable upon an end of a handlebar of said bicycle;
- a handle grip concentrically positioned upon and spaced

from said base sleeve and rotatably supported relative thereto by at least one bearing; said handle grip and said base sleeve having spacing therebetween;

- a pulley mechanically coupled to said handle grip such that a rotation of said handle grip proportionally rotates said pulley, said pulley being operable to receive and support an end of said cable such that said at least one friction brake may be operated by a manual rotation of said handle grip; and;
- a release assembly means operable to selectively preclude a rotation of said handle grip with respect to said base sleeve, said release assembly means comprising a release button movably mounted in said handle grip and projecting into said spacing and selectively operated by a user to allow a rotation of said handle grip with respect to said base sleeve, said release assembly means further including a projection extending into said spacing and fixed to said base sleeve for selective engagement with said release button.

5,437,207

## MULTIAXIAL MANIPULATOR

Ernst Zimmer, Friedberg, Germany, assignor to Kuka Schweissanlagen &amp; Roboter GmbH, Augsburg, Germany

PCT No. PCT/EP92/00605, § 371 Date Oct. 18, 1993, § 102(e)

Date Oct. 18, 1993, PCT Pub. No. WO92/16332, PCT Pub.

Date Oct. 1, 1992

PCT Filed Mar. 19, 1992, Ser. No. 119,211

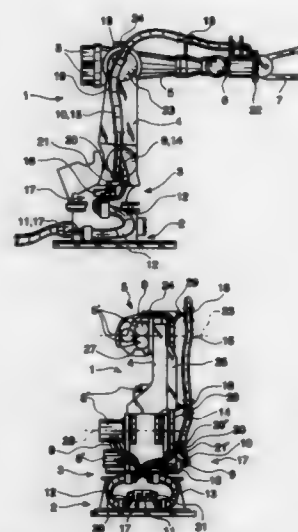
Claims priority, application Germany, Mar. 21, 1991, 9103497

U

Int. Cl.<sup>6</sup> B25J 11/00, 19/00

U.S. Cl. 74-490.02

14 Claims



1. Multi-axial manipulator, comprising:

- a relatively stationary base;
- a moving carousel connected to said base;
- movable manipulator parts connected to said carousel;
- a tool connected to said movable manipulator parts;
- manipulator drives connected to said movable manipulator parts for moving said manipulator parts;
- supply lines for said tool provided in a first bundle of lines, said first bundle of lines being connected to said stationary base and extending internally through said base and said moving carousel, said supply lines of said tool extending out of said moving carousel and being connected along said manipulator parts to said tool; and
- supply lines for said manipulator drives provided separate from said supply lines for said tool, in a second bundle of lines, said second bundle of lines being connected to said

base and being connected along said moving manipulator parts.

5,437,208

## ENGAGING DEVICE FOR SECURING A HANDLEBAR STEM OF A BICYCLE

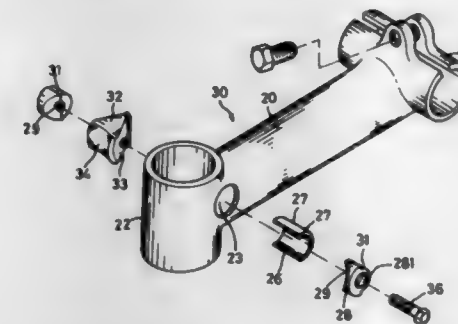
Tien-Chu Cheng, Taichung Hsien, Taiwan, assignor to Kalloy Industrial Co., Ltd., Taichung Hsien, Taiwan

Filed Feb. 10, 1994, Ser. No. 194,419

Int. Cl.<sup>6</sup> B62K 21/121; B25G 3/20

U.S. Cl. 74-551.1

3 Claims



1. An engaging device for securing a handlebar stem of a bicycle comprising a handlebar stem having vertical and level portions, said level portion having a receiving element formed on a free end thereof for securing a handlebar therein, an opening being formed in a side wall of said level portion and communicating to an interior of said vertical portion; said vertical portion being a tubular element for receiving an upper end of a front fork therein, a main tapered element and two side tapered elements being disposed in said level portion through said opening, said main tapered element having a recess formed in a rear end thereof for engaging with said front fork and having a slant formed on both lateral sides thereof, said side tapered element having a slant corresponding to that of said main tapered element, said main tapered element being forced to push toward said front fork with its recess by said side tapered elements when threading a bolt.

5,437,209

## ROCKER ARM ASSEMBLY

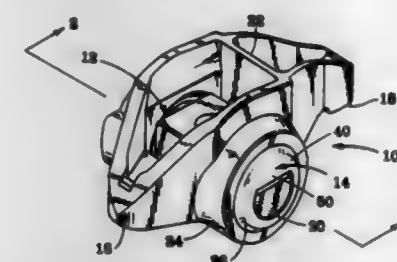
Robert V. Santoro, West Hartford, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Sep. 30, 1993, Ser. No. 129,831

Int. Cl.<sup>6</sup> G05G 1/00; F01L 1/18

U.S. Cl. 74-559

16 Claims



1. A rocker arm assembly for mounting about a stud means, the rocker arm assembly comprising:

- a rocker arm;
- a bearing support member having two support arms extending in opposite directions along an axis, the bearing support member being adapted for mounting about the stud means;
- two bearing cups, one bearing cup extending over each support arm and engaging the rocker arm;
- two bearing sleeves, one bearing sleeve mounted over each support arm between the respective bearing cup and the bearing support member to provide an inner raceway,

each bearing sleeve having radial clearance with respect to the respective support arm such that the bearing sleeve precesses relative to the respective support arm with oscillation of the rocker arm; and rolling members within an annulus formed between the bearing support member and each bearing cup, in rolling contact with the bearing cup such that the rocker arm is rotatable with respect to the bearing support member.

5,437,210

## POWER DRIVE CAM ASSEMBLY

Kenneth D. Fraser, Scarborough; Peter Taylor, Uxbridge; W. Scott Fraser, Scarborough, all of Canada, and Kenneth A. Lindblom, Shrewsbury, Mass., assignors to Coulter Corporation, Miami, Fla.

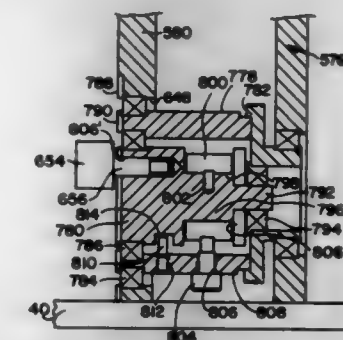
Division of Ser. No. 745,625, Aug. 14, 1991, Pat. No. 5,241,340.

This application Aug. 31, 1993, Ser. No. 114,941

Int. Cl.<sup>6</sup> F16H 53/00

U.S. Cl. 74-567

4 Claims



1. A power cam drive assembly for use in a system requiring the successive generation and transmission of two different degrees of force for serial application to a body, said power cam drive assembly comprising:

- an outer cam shell,
- drive means coupled to said outer cam shell for rotation thereof;
- a cam core arranged within said outer cam shell for eccentric rotation relative thereto during rotation of said outer cam shell;
- follower means within said cam core and rotatable therewith;
- windable spring means disposed within said cam shell between and secured to said cam shell and said cam core, said spring means having a greater rotational torque than required to rotate said cam core,
- said drive means being effective to rotate said outer cam shell, through said spring means, causing rotation of said cam core and attendant rotation of said follower means therewith;
- stop means arranged in the rotational path of said said follower means for intercepting said follower means;
- said follower means impacting on said stop means preventing further rotation of said cam core and follower means causing the first force to be transmitted to said body by way of said follower means;
- said drive means being operable thereafter causing further rotation of said outer cam shell winding said spring means, driving said follower means in a downward direction due to the axial offset of said cam core attendant on the eccentric positioning of said cam core relative said outer cam shell producing a second downward force greater than said first force for transmission to said body by way of said follower means.

5,437,211

# **APPARATUS FOR EJECTING NUTS FROM SOCKETS AND A METHOD OF INSTALLATION IN A SOCKET**

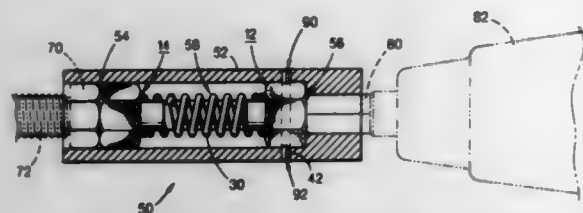
James P. Wolfe, Wallingford, Conn., assignor to Innovative Achievements, Inc., Wallingford, Conn.

Filed Mar. 3, 1994, Ser. No. 205,167

Int. Cl.<sup>6</sup> B21K 5/16; B25B 13/02

U.S. Cl. 76—114

2 Claims



1. A method of installing a nut ejection apparatus in an existing conventional wrench socket of the type including a generally elongate, hollow, cylindrical body portion having axially aligned nut receiving and shank receiving chambers defined at opposite ends thereof with an intermediate chamber axially aligned with and joining said nut receiving and shank receiving chambers, said nut receiving chamber being dimensioned to receive therein a threaded nut and said shank receiving chamber being dimensioned to receive therein a shank of a wrench, said intermediate chamber being cross-sectionally coextensive with said nut receiving chamber and being hexagonal in cross-section, comprising:

- providing first and second plugs having hexagonally shaped head portions to engage said hexagonal cross-section of said intermediate chamber, said first plug having a channel defined radially through said head portion thereof, and providing a spring attached to and extending between said first and second plugs;
- providing a channel defined through opposite wall portions of said intermediate chamber near said shank receiving chamber;
- inserting said first and second plugs with said spring attached thereto into said intermediate chamber with said first plug disposed near said shank receiving chamber; and
- aligning said channel defined through said head portion of said first plug and said channels defined through said wall portions of said intermediate chamber and inserting a pin through all said channels to fixedly position said first plug in said intermediate chamber, such that said second plug is disposed in said intermediate chamber and axially moveable back and forth therein and into said nut receiving chamber so as to eject a nut therefrom.

5,437,212

# **RATCHETING SCREWDRIVER**

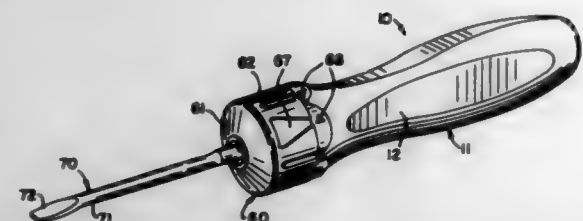
Christopher D. Thompson, Milwaukee, and Joseph R. Hoepfl, Greenfield, both of Wis., assignors to Snap-on Incorporated, Kenosha, Wis.

Filed Dec. 2, 1993, Ser. No. 160,151

Int. Cl.<sup>6</sup> B25B 13/46

U.S. Cl. 81—63.1

17 Claims



1. A ratcheting driver handle for a driver bit having a shank, said handle comprising: an elongated body having an axis and an axial recess in one end thereof, ratchet mechanism disposed

in said recess and including a gear and a pawl assembly engageable with said gear, said ratchet mechanism defining a bore for receiving the shank of the associated bit therein, means mounting said pawl assembly for movement between first and second conditions, said pawl assembly including a first tooth portion engaging said gear in the first condition of said pawl assembly so that said body rotates said gear therewith in one direction and ratchets with respect to said gear in the opposite direction, said pawl assembly including a second tooth portion engaging said gear in the second condition of said pawl assembly so that said body rotates said gear therewith in said opposite direction and ratchets with respect to said gear in said one direction, selector mechanism coupled to said one end of said body for movement with respect thereto between first and second positions respectively corresponding to said first and second conditions, and coupling means coupling said selector mechanism to said pawl assembly for movement thereof between the first and second conditions thereof in response to movement of said selector mechanism between the first and second positions thereof, said selector mechanism including a pin movable therewith between said first and second positions, and an over-center bias spring carried by said body and engageable with said pin for resiliently inhibiting movement of said selector mechanism from either of said first and second positions.

5,437,213

# **DEVICE FOR MANUFACTURING UNIFORM SHEETS FROM MATERIAL PANELS**

Helmut Schulz, Schopfheim, Germany, assignor to Grapha-Holding AG, Hergiswil, Switzerland

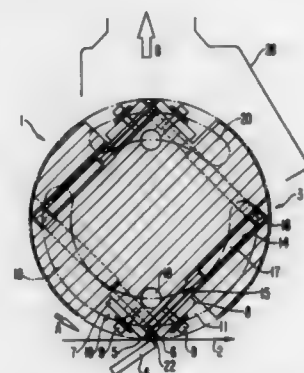
Filed Nov. 1, 1993, Ser. No. 144,025

Claims priority, application Switzerland, Oct. 30, 1992, 03393/92

Int. Cl.<sup>6</sup> B65H 35/04; B26D 7/18, 7/26

U.S. Cl. 83—98

10 Claims



1. In a device for manufacturing uniform sheets from a material panel by removing strip-shaped segments extending transversely of a direction of movement of the material panel, said device comprising:

- a rotating cutter roller which is driven to rotate through a cutting region in a direction corresponding to the direction of movement of the material panel, said cutter roller having a circumference including at least one pair of adjacent prismatic recesses, each recess presenting a mounting surface, the mounting surfaces being adjacent one another near said circumference and extending into said roller away from each other such that each mounting surface is located on an opposite side of an approximately radial plane of said cutter roller and extends at an angle away from the radial plane, at least one adjustable pair of blades mounted on said cutter roller for interacting with a counter blade, each blade of each pair being mounted on a respective one of said mounting surfaces, and a feeding member located in the cutter roller behind each said blade extending approximately perpendicularly in relation to the

mounting surface to which said blade is fastened for acting on said blade to adjust the position of said blade; wherein said cutter roller has respective bores accommodating said feeding members, each said bore extending from the circumference of said cutter roller to one of said mounting surfaces, each said feeding member penetrating a respective one of said bores.

5,437,214

# **MITER SAW**

Katsuhiko Sasaki; Mitsuyoshi Ninomi, and Yoshinori Shibata, all of Anjo, Japan, assignors to Makita Corporation, Anjo, Japan

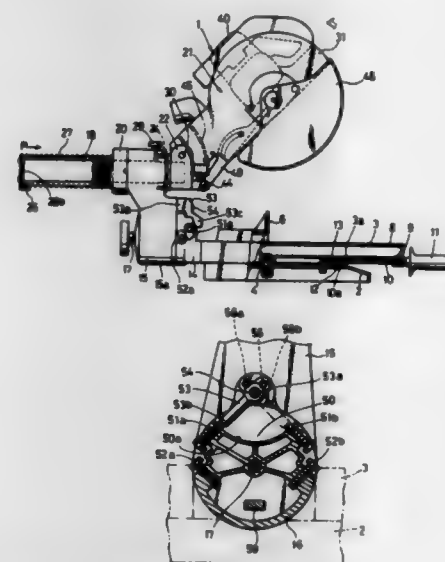
Filed May 18, 1993, Ser. No. 63,291

Claims priority, application Japan, May 22, 1992, 4-156010; Aug. 27, 1992, 4-252214

Int. Cl.<sup>6</sup> B27B 5/36

U.S. Cl. 83—471.3

7 Claims



- A miter saw comprising:
  - a base on which a work is placed;
  - a miter saw unit supporting a saw blade and having a motor for rotatably driving said saw blade;
  - a support mechanism pivotally supporting said miter saw unit relative to said base in such a manner that said miter saw unit is both vertically and laterally pivotable;
  - a position determining mechanism for selectively determining the lateral position of said saw unit at any of a plurality of positions including a vertical position where said saw blade is positioned substantially vertically relative to said base, and leftward and rightward pivoted positions where said saw blade is inclined laterally leftwardly and laterally rightwardly from said vertical position by a predetermined angle, respectively;

said position determining mechanism including movable side stopper members and fixed side stopper members on which said movable side stopper members abut, respectively, said movable side stopper members being mounted on a movable member which pivots laterally about an axis with said miter saw unit, said fixed side stopper members being mounted on a fixed member which is mounted on said base, said movable side stopper members abutting on their corresponding said fixed side stopper members to define abutting positions when said miter saw unit is at said vertical position and at each of said leftward and rightward pivoted positions, respectively; said position determining mechanism including means for adjusting the abutting positions at which said movable side stopper members abut the said corresponding fixed side stopper members; one of said movable side stopper members defining said

abutting position when said saw unit is at said vertical position being operable to move between a first position and a second position, said one of said movable side stopper members at said first position being in abutment with a corresponding one of said fixed side stopper members when said miter saw unit is at said vertical position, and said one of said movable stopper members at said second position does not abut on said corresponding one of said fixed side stopper members so as to permit the lateral pivotal movement of said miter saw unit toward said corresponding one of said fixed side stopper members; said fixed side stopper members being spaced from each other in a circumferential direction around the lateral pivoting axis, and said movable side stopper members abutting on their corresponding said fixed side stopper members in the circumferential direction, respectively; and

the rest of said movable side stopper members defining abutting positions for said laterally leftwardly and rightwardly pivoted positions being integrally formed as one lateral stopper, said lateral stopper is positioned at a middle position between corresponding said fixed side stopper members in the circumferential direction when said miter saw unit is at said vertical position, and said lateral stopper includes abutting surfaces on end portions in the circumferential direction for defining the corresponding movable side stopper members for abutting on said corresponding fixed side stopper members, respectively.

5,437,215

# **ULTRASONIC CUTTING DEVICE**

Francis F. Hamilton, Leicester, Great Britain, assignor to Nestec S.A., Vevey, Switzerland

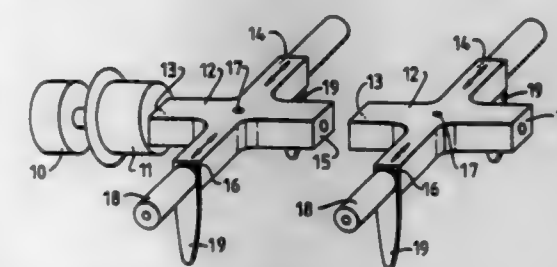
Filed Aug. 11, 1993, Ser. No. 105,374

Claims priority, application United Kingdom, Aug. 28, 1992, 9218354

Int. Cl.<sup>6</sup> B26D 1/45, 7/08

U.S. Cl. 83—701

11 Claims



- An ultrasonic cutting device comprising:
  - a transducer which, in operation, generates ultrasonic vibrations in a direction having a longitudinal axis;
  - a first ultrasonic horn having a nodal point and at least three projections extending, respectively, equidistantly away from and symmetrically about the nodal point, each projection having a vibrating face one quarter wavelength away from the nodal point, one of the vibrating faces being connected to the transducer so that, in operation, the ultrasonic horn is vibrated; and
  - a first cutting blade connected to one of the vibrating faces of the ultrasonic horn which is not connected to the transducer, the cutting blade being positioned in a plane transverse to the longitudinal axis of vibrations generated by the transducer so that, in operation, the blade is vibrated.



5,437,216

## UNIVERSAL HYDRAULIC VALVE

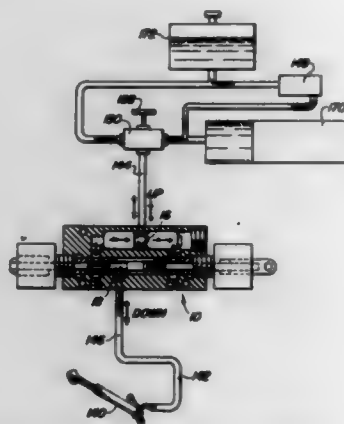
Leonard T. Chapman, North Hollywood, Calif., assignor to Leonard Studio Equipment, Inc., North Hollywood, Calif.

Filed May 3, 1994, Ser. No. 237,447

Int. Cl.<sup>6</sup> F15B 11/08, 13/04

U.S. Cl. 91—446

16 Claims



1. A universal hydraulic valve comprising:
  - a housing;
  - a needle substantially within a needle bore in the housing, the needle having a center section including a first end and a second end, with the first end and second end of the center section each having a conical retainer and a soft seal;
  - a first seat facing the first end and a second seat facing the second end, the first seat and second seat longitudinally adjustable within the housing to increase or decrease the spacing between the first seat and the first end of the center section and the second seat and the second end of the center section;
  - a supply port and a return port, connecting to the needle bore; and
  - a check valve in between the supply port and the return port.

5,437,217

## PNEUMATIC BOOSTER

Philippe Castel, Paris, and Guy Meynier, Aulnay-Sous-Bois, both of France, assignors to AlliedSignal Europe Services Techniques, Drancy, France

PCT No. PCT/FR93/01068, § 371 Date Nov. 4, 1993, § 102(e) Date Nov. 4, 1993, PCT Pub. No. WO94/12378, PCT Pub. Date Jun. 9, 1994

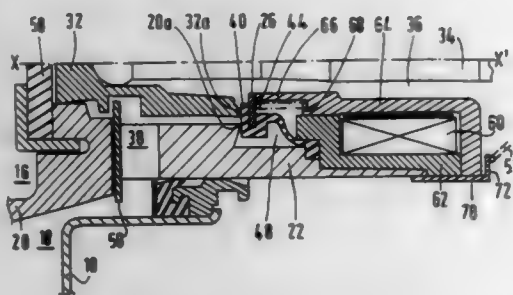
PCT Filed Oct. 29, 1993, Ser. No. 140,192

Claims priority, application France, Nov. 26, 1992, 92 14206

Int. Cl.<sup>6</sup> F15B 9/10

U.S. Cl. 91—369.2

10 Claims



1. A motor vehicle pneumatic brake booster, comprising a casing inside which a piston formed from a rear tubular part supporting a skirt defines, with the aid of an unrolling mem-

brane, a front chamber connected permanently to a vacuum source and a back chamber connected alternately to the front chamber or atmosphere via valve means actuated by a control rod capable of bearing, by means of a plunger, on one face of a reaction disk fastened securely to a thrust rod, the valve means comprising a valve element interacting via an active part with a first valve seat formed on the plunger and a second valve seat formed on the piston, the valve element normally being stressed forwards by elastic means, the booster further comprising actuation means provided to stress an active part of the valve element forwards in simultaneous interaction with the first and second valve seats.

5,437,218

## DIAPHRAGM PUMP HAVING VARIABLE DISPLACEMENT

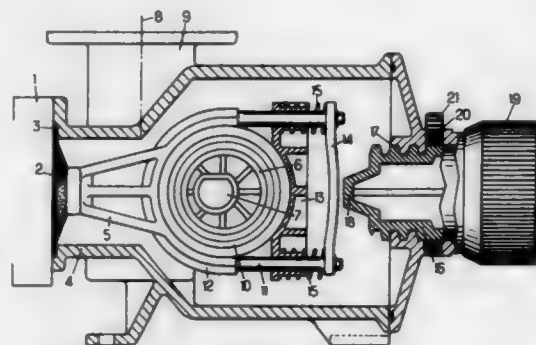
Jean-Paul Papin, Cretell, France, assignor to PCM Pompes, Vanves, France

Filed Apr. 4, 1994, Ser. No. 222,023

Int. Cl.<sup>6</sup> F01B 19/00, 31/14; F04B 17/00

U.S. Cl. 92—13.2

9 Claims



1. A diaphragm pump having a delivery rate which can be continuously adjusted between a zero value and a maximum value, comprising:
  - a continuously rotating eccentric drive member,
  - a connecting rod possessing, at one of its ends, a connecting-rod big end fitted with a bearing receiving, so as to rotate freely, the eccentric drive member and the other end of which is coupled to a central area of the diaphragm,
  - releasable coupling means for coupling, in a selective manner, said connecting-rod big end to the eccentric drive member during a desired, continuously adjustable fraction of stroke, and
  - adjustment means for adjusting, in a continuous manner, the desired fraction of stroke of the connecting rod between two extreme positions, these adjustment means comprising movable stop means capable of interacting with a bearing surface solidly fastened to the connecting rod, in which pump the connecting-rod big end is fitted with at least one slide extending substantially in the prolongation of the connecting rod on the opposite side from the diaphragm and capable of supporting the abovementioned bearing so as to slide freely in relation to the connecting-rod big end, and in which pump elastic return means are provided in order to hold said bearing at the bottom of the slide in the absence of counterforce exerted by the eccentric member on the bearing, said elastic return means acting on said bearing on the opposite side from the connecting rod.

5,437,219

## LOW STRESS CONICAL TYPE DIAPHRAGM

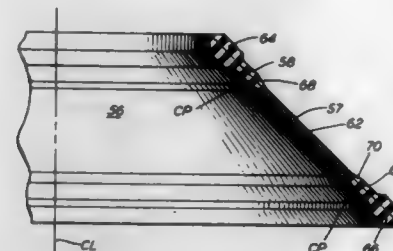
Daniel G. Scott, Pittsburgh; William K. Mong, North Huntingdon, and Willard P. Spalding, Pittsburgh, all of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 3, 1993, Ser. No. 145,112

Int. Cl.<sup>6</sup> F01B 19/00; F16J 3/00

U.S. Cl. 92—96

30 Claims



1. An annular elastomeric diaphragm member molded in an S-shaped cross-sectional configuration with a layer of reinforcing material embedded therein comprising:
  - (a) an inner annular periphery forming a central opening of said diaphragm member;
  - (b) a first annular bulbous portion extending radially outwardly from said inner annular periphery and having a first predetermined thickness;
  - (c) a first annular clamping section extending radially outwardly from said first annular bulbous portion, said first annular clamping section including a first annular tapered area and having a second predetermined thickness less than said first predetermined thickness;
  - (d) an annular flexure portion extending radially outwardly from said first annular tapered area, said annular flexure portion having a third predetermined thickness and said third predetermined thickness being less than said second predetermined thickness;
  - (e) a second annular clamping section having a second annular tapered area extending radially outwardly from said annular flexure portion, said second annular clamping section having a fourth predetermined thickness and said fourth predetermined thickness being greater than said third predetermined thickness and said fourth predetermined thickness being less than said first predetermined thickness; and
  - (f) a second annular bulbous portion extending radially outwardly from said second clamping section and said second annular bulbous portion having a fifth predetermined thickness greater than said fourth predetermined thickness.

5,437,220

## BALL BEARING PISTON

Chi Cheng, and Michael W. Cheng, both of 391 Western Ave., Clarendon Hills, Ill. 60514

Filed May 24, 1994, Ser. No. 248,161

Int. Cl.<sup>6</sup> F16J 1/02, 1/04

U.S. Cl. 92—178

8 Claims

1. An anti-friction piston for use in an internal combustion engine or pump for reciprocating motion with a cylinder comprising:
  - a piston head of circular cross-section with either a bowl disposed therein or a flat head, two to four ring grooves disposed around an outer periphery thereof;
  - a piston skirt selected from the group consisting of a one-piece integral piston/skirt combination and two-piece articulated piston with a detachable skirt portion;
  - four sets of bearing pads and four sets of a plurality of ball bearing received in said pads, said pads and bearings being recessed in an outer periphery of said skirt with two sets of said pads and bearings on each side of a wrist pin, said

bearing pads including a full width base pad portion and a partial width cover pad portion; and



a plurality of locating pins and screws securing each of said pad sets and said bearing sets to said skirt.

5,437,221

## GRATE FOR A GRILL

Kurt Schwüd, Tulpenweg 2, Höhenkirchen/Siegertsbrunn, Germany 85635

PCT No. PCT/EP93/00126, § 371 Date Oct. 12, 1994, § 102(e) Date Oct. 12, 1994, PCT Pub. No. WO93/13700, PCT Pub. Date Jul. 22, 1993

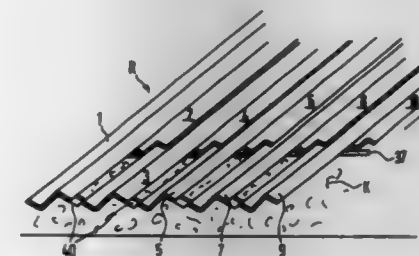
PCT Filed Jan. 20, 1993, Ser. No. 256,730

Claims priority, application Germany, Jan. 21, 1992, 42 01 519.7

Int. Cl.<sup>6</sup> A47J 27/00

U.S. Cl. 99—449

4 Claims



1. A bipartite, telescoping grate (R) having a plurality of bars (1, 2, 3, 4, 5, ...) defining an upper grate plane for taking up food to be grilled, wherein said bars (1, 2, 3, 4, 5, ...) are profiled metal sheets which are of substantially Z- or S-shaped cross section and are combined in two groups of bars (A, B), the first group (A) containing the odd bars (1, 3, 5, ...) and the second group (B) containing even bars (2, 4, 6, ...), and the bars of at least one group (A) or (B) being connected to form a moving unit (A, B) that is displaceable relative to the other group (B) or (A) in the longitudinal direction of the bars, and the adjacent profiled bars (1, 2, 3, 4, 5, ...) of the two groups (A, B) pushed together to form the complete grate (R) partly overlapping so as to form a closed surface in projection.

5,437,222

## GRILL AND OVEN COMBINATION

Mae F. Franklin, P.O. Box 372, Greeleyville, S.C. 29056

Filed May 9, 1994, Ser. No. 239,470

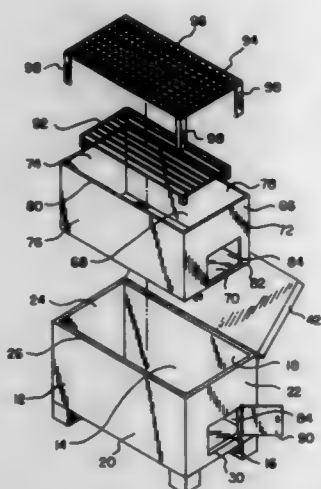
Int. Cl.<sup>6</sup> A47J 37/07

U.S. Cl. 99—450

1 Claim

1. A grill and oven combination for cooking food comprising, in combination:

- a box-shaped container having a hollow interior bounded by a bottom wall with opposed front and rear walls and opposed side walls extended upwards therefrom to define an opening with each wall having a layer of insulation with a thickness of between about 1½ inches to 2 inches disposed therein adapted for containing heat within the interior and one of the side walls having a rectangular hole disposed thereon adjacent to the bottom wall;
- a rectangular flat top wall hingeably connected to the container near the opening thereof to define a lid positionable in an opened orientation for allowing access to the interior of the container and a closed orientation for preventing access to the interior of the container and with the lid having a layer of insulation with a thickness of between about 1½ inches to 2 inches disposed therein adapted for containing heat within the interior of the container;
- a handle coupled to the top wall for allowing the lid to be positioned in the opened orientation or the closed orientation;
- a vent disposed on the lid having four holes radially extended in quadrature adapted for allowing heat and cooking fumes to escape from the interior of the container;
- a vent cover having a central portion pivotally connected to the lid between the four holes of the vent and four fins extended radially outwards therefrom with one fin having an upwardly extended finger tab for allowing the vent



- cover to be placed in one orientation for opening the vent and another orientation for sealing the vent;
- four rigid legs with each leg having a rectangular cross section and with each leg coupled to the bottom wall of the container near each corner thereof and extended downwards therefrom for placing the container in a generally level position;
- a box-shaped and heat-conductive liner disposed within the interior of the container, the liner having a hollow interior bounded by a bottom wall with opposed front and rear walls and opposed side walls extended upwards therefrom to define an opening with one of the side walls having a rectangular hole disposed thereon axially aligned with the hole on the side wall of the container to define an access hole for allowing combustible materials for cooking food to be added and combusted materials from cooking food to be removed;
- a rectangular planar door hingeably connected to the side wall of the container near the hole with the door positionable in one orientation for allowing access to the interior of the liner through the access hole and another orientation for preventing access to the interior of the liner through the access hole;
- a rectangular rack with four legs extended downwardly from the corners thereof disposed within the interior of

- the liner near the bottom wall thereof adapted for holding combustible materials thereon for cooking food; and
- a grill disposed within the interior of the liner having a rectangular and essentially planar mesh portion adapted for holding food thereon for cooking and four rigid legs extended downwards from each corner and thereby placing the mesh at a position directly above the rack and offset above the access hole.

5,437,223

# MEANS FOR CLOSING THE SEAM OF A ROLLED DOUGH BODY

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

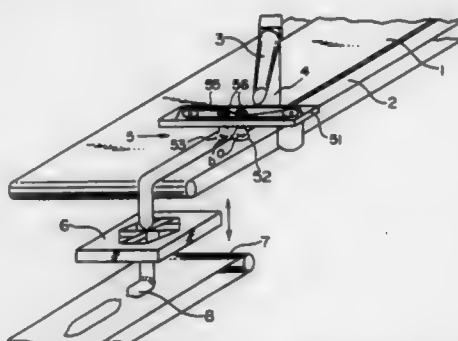
Filed Jan. 4, 1994, Ser. No. 177,053

Claims priority, application Japan, Jan. 16, 1993, 5-021930

Int. Cl.<sup>6</sup> A21C 11/00

U.S. Cl. 99—450.1

6 Claims



1. An apparatus for closing a seam of a wound dough body in a device for manufacturing the wound dough body from a dough sheet, one edge of the dough sheet forming the seam of the wound dough body, the apparatus comprising:

- a frame;
- a conveyor mounted on the frame and having an upper surface for conveying the dough sheet;
- a winding device disposed above the upper surface of the conveyor for forming the wound dough body by winding the dough sheet from a first side of the conveyor to a second side of the conveyor;
- first and second conical rolls rotatably fixed to the frame such that the rolls are disposed above the upper surface of the conveyor and downstream of the winding device; and
- means for rotating the first and second rolls such that the first and second rolls rotate in a downstream direction at a point at which the rolls face each other;
- wherein the first and second rolls are placed in such a closely-spaced positional relationship that the first and second rolls support the wound dough body conveyed therebetween, whereby conical surfaces of the first and second rolls press the seam against the dough body.

5,437,224

# APPARATUS FOR ADDING, REMOVING, AND EXCHANGING MARBLING FAT WITHIN RAW MEAT

Arthur I. Morgan, 600 E. Mermaid La., Philadelphia, Pa. 19118

Filed Aug. 30, 1994, Ser. No. 297,882

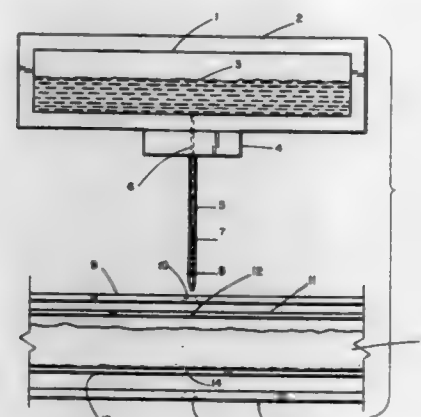
Int. Cl.<sup>6</sup> A22C 9/00, 17/00; A23L 1/31, 3/34

U.S. Cl. 99—533

9 Claims

1. An apparatus for altering fat content within raw meat comprising:
- a reservoir tank;
- temperature control means for maintaining a constant, predetermined temperature within said reservoir tank;
- at least one hollow piercing means for piercing a raw meat workpiece, said hollow piercing means defining at least one lumen therein, and including at least one open eye communicating said at least one lumen within said hollow

- piercing means to space outside of said hollow piercing means;
- conduit means for connecting said reservoir tank to said lumen of said at least one hollow piercing means;
- reciprocating means for reciprocating said at least one hollow piercing means;
- a stage having at least one opening therethrough, said at least



- one opening in registration with said at least one hollow piercing means;
- at least one die having at least one hole therethrough, said at least one hole in registration with said at least one hollow piercing means and said at least one opening of said stage, said at least one hole capable of removing stiffened material adhered to a surface of said at least one piercing means.

5,437,225

# DEVICE FOR REMOVING PITS FROM CHERRIES CLEANLY WITH A SINGLE HOLE

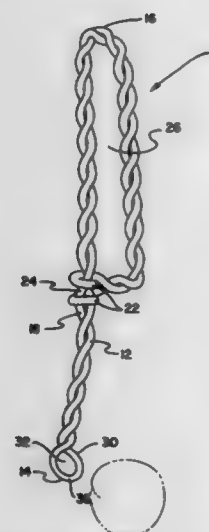
Violet E. Hicks, P.O. Box 3, Tenino, Wash. 98589

Filed Jun. 10, 1994, Ser. No. 258,474

Int. Cl.<sup>6</sup> A23N 4/12; A47J 23/00

U.S. Cl. 99—547

1 Claim



1. A new and improved device for removing pits from cherries cleanly with a single hole comprising, in combination:
- a wire with a circular cross section and having a first operative end and a second inoperative end and a central extent therebetween, the wire being formed of a single wire twisted about itself;
- the second end of the wire being formed with rings positioned about the central extent of the wire for providing a loop formed by the wire between the central extent and

- the second end to be used as a handle during operation and use; and
- the first end of the wire being configured into a pointed remote end and a central aperture therethrough with one flat surface for contacting and prying out the pit from a cherry when the pointed end is inserted into the stem end of the cherry and the opposite surface of the wire being formed curved from the curvature of the wire.

5,437,226

# TWINE CUTTER FOR A ROUND BALER

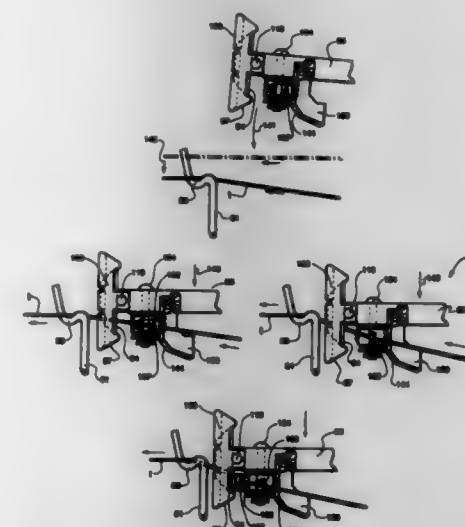
Robert A. Wagstaff, Lancaster, Pa., assignor to New Holland North America, Inc., New Holland, Pa.

Filed May 2, 1994, Ser. No. 236,057

Int. Cl.<sup>6</sup> B65B 63/04, 13/18; A01D 39/00

U.S. Cl. 100—5

9 Claims



1. In a round baler comprising a chamber for forming a cylindrical package of crop material, a generally transverse crop infeed opening in said chamber, a pair of sidewalls, a twine handling assembly mounted between said sidewalls and forwardly of said opening, said twine handling assembly including at least one twine arm having a twine dispensing end from which twine is dispensed in the vicinity of said infeed opening and fed therethrough for applying a plurality of helical wraps on the cylindrical package of crop material formed in said chamber, said twine handling assembly further including means for controllably moving said twine arm to dispense twine across said opening from said twine dispensing end, twine cutting apparatus having a twine cutting mechanism for cutting the twine, and a twine guide assembly mounted on one of said side walls for guiding the twine to said cutting mechanism after a predetermined amount of twine has been dispensed, the improvement comprising
- said twine cutting mechanism including a cutting edge, said twine guide assembly including twine guiding means for guiding said twine to the vicinity of said cutting edge, and auxiliary means for guiding said twine to a position adjacent said cutting edge after said twine guiding means has guided said twine to the vicinity of said cutting edge.



5,437,227

**DOCTOR BAND DISPLACEABLE PARALLEL TO CYLINDER'S AXIS OF ROTATION**

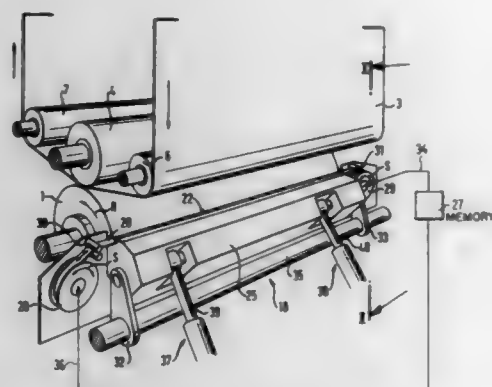
Werner Straubinger, Nürnberg, Germany, assignor to U. E. Sebold Druck und Verlag GmbH, Nuremberg, Germany  
Filed Dec. 9, 1993, Ser. No. 163,704

Claims priority, application Germany, Dec. 16, 1992, 42 42 582.4

Int. Cl.<sup>6</sup> B41F 9/10, 9/14

U.S. Cl. 101—169

9 Claims



1. A doctor arrangement for a rotary intaglio printing machine having a plate cylinder, having an axis of rotation, and a peripheral printing surface, comprising: a doctor bar; a doctor band mounted and guided on the doctor bar for displacement relative to the doctor bar in a direction parallel to the axis of rotation of the plate cylinder, said doctor band being pressed by said doctor bar against the peripheral surface of the plate cylinder for scraping excess ink from the plate cylinder, the doctor band being so flexible that it can be wound on and unwound about axes which extend transversely to its longitudinal direction, the length of the doctor band being substantially greater than the axial length of the plate cylinder; a respective winding device for winding and unwinding the doctor band adjacent each axial end of the plate cylinder; and a drive means for displacing the doctor band in the longitudinal direction during a printing operation whereby the doctor band is adapted to be unwound from the one winding device and wound onto the other winding device; and means to switch from a first feed speed for the doctor band corresponding to a normal operating condition to a second higher feed speed, to move a defective location of the doctor band quickly out of the region of contact with the plate cylinder.

5,437,228

**METHOD AND APPARATUS FOR PRINTING ADHESIVE BACKED MEDIA**

David M. Uland, Huntersville, N.C., assignor to Datasouth Computer Corporation, Charlotte, N.C.  
Filed Jan. 11, 1994, Ser. No. 180,050

Int. Cl.<sup>6</sup> B41F 1/08

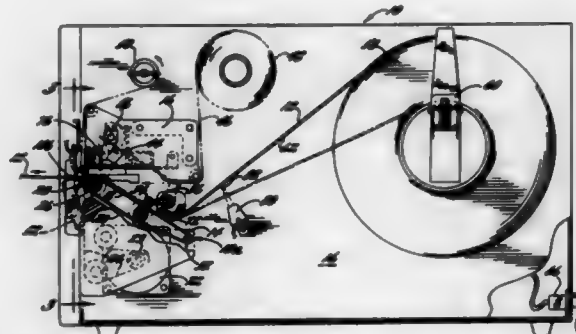
U.S. Cl. 101—288

29 Claims

1. An apparatus for printing a linerless label strip backed with a tacky adhesive which is supplied in a wound roll, and comprising:

- a support frame,
- a holder mounted to said frame for rotatably supporting the wound roll of the label strip,
- an endless belt,
- means rotatably mounting said endless belt to said frame so as to define an endless path of travel which includes an upper delivery run and a lower return run, with said upper delivery run defining an upstream end and a downstream end,
- a platen mounted within said endless belt along said upper delivery run,
- means for advancing said endless belt along said endless path

of travel in a direction so that said upper delivery run moves from said upstream end to said downstream end, means for printing indicia on one side of said label strip and including a print head positioned in alignment with said platen and so that said upper delivery run of said endless belt extends between said print head and said platen, and a stripping roller rotatably mounted within said endless belt at said downstream end of said upper delivery run such that said endless belt encircles a substantial portion of the peripheral surface of said stripping roller and such that said endless belt is sharply turned as it advances about said



stripping roller so as to thereby facilitate the release of the label strip from said upper delivery run at said downstream end thereof, the label strip being fed from said wound roll and delivered onto said upstream end of said upper delivery run of said endless belt such that the tacky adhesive backing of the label strip directly contacts said endless belt, and the advance of said endless belt feeds the label strip between said print head and said platen so as to permit printing thereon, and the label strip is withdrawn from the endless belt at said downstream end of said endless belt.

5,437,229

**ENHANCED THERMAL AND IGNITION STABILITY AZIDE GAS GENERANT INTERMEDIATES**

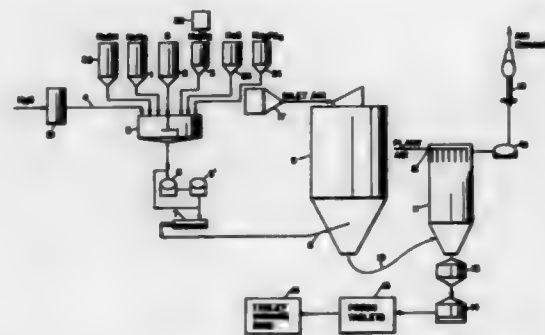
Robert D. Taylor, Hynum; Gary L. Smith, and Ritchie Olsen, both of Ogden, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Division of Ser. No. 651,157, Feb. 6, 1991, Pat. No. 5,223,184, which is a division of Ser. No. 563,772, Aug. 6, 1990, Pat. No. 5,019,220. This application Apr. 8, 1993, Ser. No. 19,948

Int. Cl.<sup>6</sup> C06B 45/00

U.S. Cl. 102—288

20 Claims



1. An intermediate slurry product made from a wet-ground mixture of a generant azide and an oxidizer/reactant therefor having a hydrazoic acid content of less than about  $3 \times 10 \text{ EXP}(-3)$  moles per liter, a pH of greater than 8.0 up to about 12.5, and impurity metal ions selected from the group consisting of Ca, Mg, Pb, Fe, Mn, Cu and mixtures thereof,

each of said metal ions being in a concentration level below about 25 ppm.

5,437,230

**STANDOFF MINE NEUTRALIZATION SYSTEM AND METHOD**

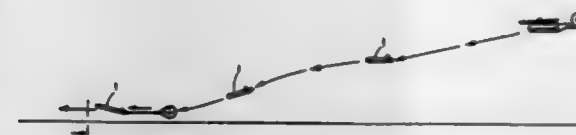
Gordon L. Harris; Stephen L. Harris, both of Rancho Santa Fe, and Neil A. Levy, Encinitas, all of Calif., assignors to Leigh Aerosystems Corporation, Carlsbad, Calif.

Filed Mar. 8, 1994, Ser. No. 207,217

Int. Cl.<sup>6</sup> F42D 3/00

U.S. Cl. 102—302

9 Claims



1. A system for deploying an explosive net over a mine field from an air transportation vehicle comprising, an explosive net having a forward end and an aft end, an aft net spreader frame assembly, a forward net spreader frame assembly, the forward end of the explosive net being attached to the forward net spreader frame assembly and the aft end of the explosive net being attached to the aft net spreader frame assembly, an extraction device for extracting the explosive net and the aft net spreader frame assembly and the forward net spreader frame assembly from the air transportation vehicle, the forward net spreader frame assembly and the aft net spreader frame assembly being constructed so as to collapse into compact form for compact storage together with the explosive net within the air transportation vehicle and so as to open to their respective fully open configurations after extraction from the air transportation vehicle.

5,437,231

**OVERHEAD CONVEYOR SYSTEM HAVING A PUSHER DEVICE WITH OVERLOAD AND BLOCKAGE PROTECTION**

Paul Janzen; Winfried Suhling, and Gerhard Schilling, all of Bielefeld, Germany, assignors to Dürkopp Adler Aktiengesellschaft, Germany

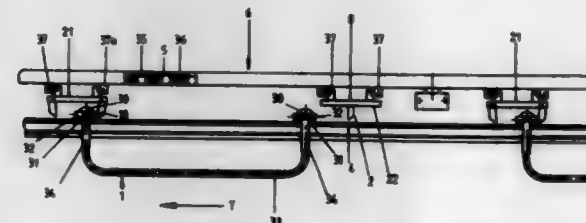
Filed Dec. 17, 1993, Ser. No. 168,845

Claims priority, application Germany, Dec. 24, 1992, 42 44 152.8

Int. Cl.<sup>6</sup> B61B 3/00

U.S. Cl. 104—172.4

11 Claims



1. An overhead conveyor system with rolling conveyor carriages guided on a main conveyor line, and a drive chain which revolves endlessly adjacent the main conveyor line in a direction of transport (T), the overhead conveyor system comprising:

at least one branch line and a switch for guiding conveyor carriages from the main line into the branch line; and a pusher which is fastened to the conveyor chain and arranged for urging conveyor carriages from the main line into the at least one branch line, the pusher including a carrier device and a claw which is fastened therein on a pivot for swinging in a vertical plane; the claw having a first active position for engaging conveyor carriages; a second inactive position in which the claw is swung upward in the direction of transport (T) for permitting a conveyor carriage to pass the pusher device in the direction of transport; and a third position in which the claw is swingable in the direction opposite the direction of transport (T) by encountering a blocked conveyor carriage on the conveyor line, the pusher further comprising a spring resisting movement of the claw into the third position, and a recess above the pivot point of the claw, the recess being covered in the first and second positions of the claw by a spring-loaded plate, the plate being swingable upward by the claw swinging into the third position against the force of the spring.

5,437,232

**BALLAST PLOW ASSEMBLY FOR A HOPPER-TYPE RAILROAD CAR**

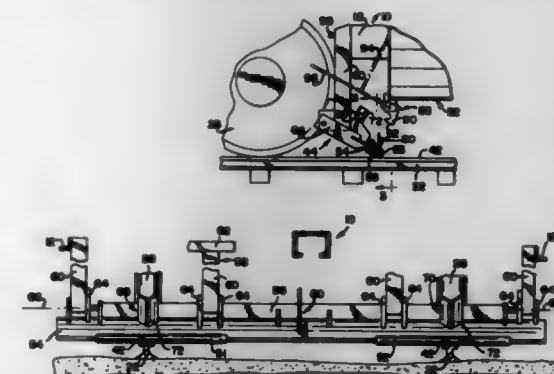
Norbert P. Borowski, Darles, Ill., assignor to Miner Enterprises, Inc., Geneva, Ill.

Filed Dec. 20, 1993, Ser. No. 169,246

Int. Cl.<sup>6</sup> B61F 19/00

U.S. Cl. 104—279

16 Claims



1. An apparatus including a ballast plow assembly connected to a hopper-type railroad car, said railroad car including a frame supported by two undercarriages for movement over the upper surfaces of a pair of railroad rails, said railroad car defining discharge openings from which ballast material is discharged, said ballast plow assembly comprising:

- a ballast plow arranged proximate to one of said undercarriages for forcibly removing ballast discharged from said openings from the upper surfaces of the railroad rails and generally distributing ballast between the railroad rails, said ballast plow having, in the direction of car movement, a rear end pivotally connected to said frame, a free forward end configured to extend laterally across and gravitationally engage the upper surfaces of said railroad rails and an upper surface extending between said ends, wherein when said ballast plow is disposed to engage said rails, the forward end of the ballast plow is arranged lower than the rearward end to define an attack angle relative to the upper surfaces of the railroad rails such that ballast discharged forwardly and arranged higher than the upper surfaces of the railroad rails will pass over the upper surface of the plow thereby urging the forward end of the ballast plow into contact with the upper surfaces of the railroad rails;
- a lift mechanism for removing the forward end of the ballast plow from engagement with the railroad rails; and

a locking mechanism for releasably holding the ballast plow out of engagement with the railroad rails.

5,437,233

**RAIL-CLEANING LOCOMOTIVE**

Wolfgang Richter, Nürnberg, Germany, assignor to Ernst Paul Lehmann Patentwerk, Nuremberg, Germany  
Filed Feb. 2, 1994, Ser. No. 190,823

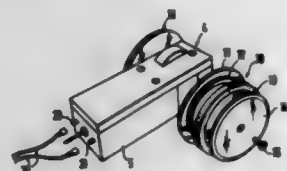
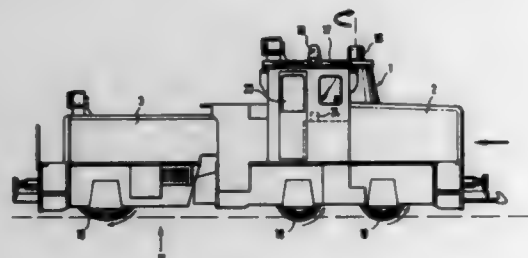
Claims priority, application Germany, Feb. 3, 1993, 9301455

U

Int. Cl.<sup>6</sup> B61F 19/00

U.S. Cl. 104—279

19 Claims



1. A rail-cleaning locomotive for electric toy trains operable on rails, comprising:

- a locomotive having a main locomotive unit and a cleaning unit, said cleaning unit being pivotal relative to said main locomotive unit,
- driving wheel means driven by driving motor means disposed on said main locomotive unit and operable to drive said locomotive along said rails,
- cleaning wheels on said cleaning unit for cleaning said rails as the locomotive passes over said rails,
- cleaning wheel motor means on said cleaning unit for driving said cleaning wheels, said cleaning wheel motor means being separate from said driving motor means;
- supply means for supplying a constant full driving voltage to said cleaning wheel motor means and said driving motor means, and
- an adjusting knob for varying the voltage supplied to said driving motor means from said supply means while said constant full driving voltage is supplied to said cleaning wheel motor means.

5,437,234

**ASSEMBLY FOR SECURING A GONDOLA OR A CHAIR TO A SUSPENSION BAR**

Herbert Duer, Schwarzach, Austria, assignor to Konrad Doppelmayr & Sohn Maschinenfabrik Gesellschaft m.b.H. & Co. KG, Wolfurt, Austria

PCT No. PCT/AT92/00141, § 371 Date May 5, 1994, § 102(e) Date May 5, 1994, PCT Pub. No. WO93/09013, PCT Pub. Date May 13, 1993

PCT Filed Nov. 5, 1992, Ser. No. 240,689

Claims priority, application Austria, Nov. 5, 1991, 2192/91

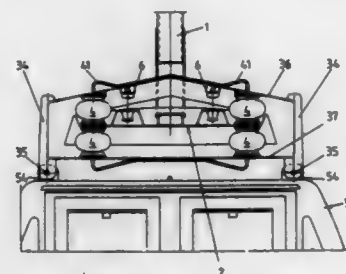
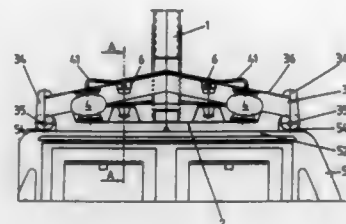
Int. Cl.<sup>6</sup> B61B 12/00

U.S. Cl. 105—149.1

12 Claims

1. A system including an assembly for securing a gondola or chair of a cable car system to a suspension bar, comprising:
- a support device attached at a lower end of a suspension bar attached to a supporting cable;
  - a load-bearing structure attached at a gondola or chair of a cable car system; and
  - at least two damping elements arranged in parallel and dis-

posed between said load-bearing structure and said support device such that said support device supports said load-bearing structure via said at least two damping elements;



said at least two damping elements each being in the form of an inflatable vessel.

5,437,235

**COMPUTER WORK STATION**

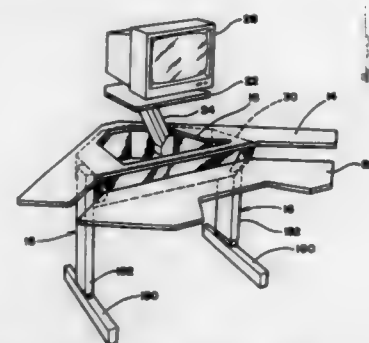
Travis M. Randolph, Saugatuck, Mich., assignor to Symbiote, Inc., Holland, Mich.

Filed Jun. 10, 1993, Ser. No. 75,051

Int. Cl.<sup>6</sup> A47B 85/00

U.S. Cl. 108—25

23 Claims



1. A computer work station comprising:

- a fixed work surface having a monitor opening therein;
- mounting means for supporting the fixed work surface at a raised elevation above a floor;
- a monitor platform that is positioned over the monitor opening and at least partially covers the monitor opening;
- a component support pan mounted on the underside of the work surface below the monitor opening, the pan having downwardly extending sidewalls and a bottom enclosing lower ends of the sidewalls, the pan having an open top the pan serving as a recessed and concealed housing for wiring and computer components;
- a monitor lift mechanism mounted in the pan and having an extendible upper end that fits through the monitor opening and is mounted to the monitor support platform the lift mechanism being vertically movable to raise and lower the monitor lift platform.

5,437,236

**MULTI-FUNCTIONAL TABLE WITH ELEVATIONAL CAPABILITIES**

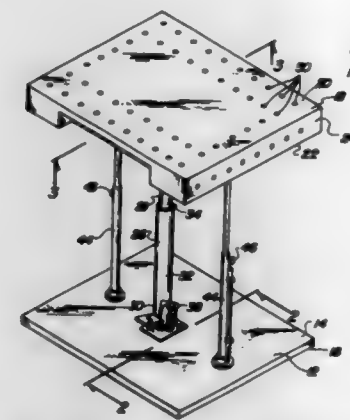
Harold R. Zeiner, 7459 Passer Rd., Coopersburg, Pa. 18036

Filed Oct. 17, 1994, Ser. No. 323,621

Int. Cl.<sup>6</sup> A47B 9/10

U.S. Cl. 108—147

9 Claims



1. A new and improved multi-functional table with elevational capabilities comprising, in combination:

- a base in a generally rectangular configuration having an upper surface and a parallel lower surface and a periphery therearound;
- a table top in a generally rectangular configuration having an upper surface and a parallel lower surface and with laterally depending sides;
- a central cylindrical support having an upper end secured to the lower surface of the table top and having a lower end secured to the upper surface of the base, the support being formed of a tubular member of an enlarged diameter at the lower end and a tubular member of a reduced diameter at the upper end for being slidably received within the lower end;
- a pump including a foot pedal secured to the base adjacent to the lower end whereby reciprocation of the foot pedal will act to supply air to a space between the upper and lower ends to thereby raise the upper end the table top to a desired working level;
- additional telescoping legs secured between the lower surface of the table top and the upper surface of the base for providing greater stability to the table top with respect to the base, the upper and lower ends of the additional legs being provided with bolts for the a coupling therebetween at a particular elevational orientation;
- a plurality of apertures formed in the table top and sides; supplemental components adapted to be secured to the table top, such components including:
- a hook with a threaded lower end and an inverted J-shaped upper end threadedly received in one of the apertures of the table top with a T nut and extending upwardly therefrom;
- a clamp secured having a base and an upper extent with an adjustable support secured to the upper surface of the table top;
- a drafting board and an associated plate, the associated plate being secured to one edge of the table top and means to adjust the plate a desired angle;
- a support member with opposed plates and apertures there-through adapted to be secured to the table top;
- a swivel having an upper circular component and a lower circular component with means depending from the lower circular component for coupling to the table top and a vertically extending axle therebetween with a bearing assembly around the axle; and
- a vise having a lower extent positionable with respect to the table, top an upper extent positionable above the work-piece to be secured and an intermediate extent therebe-

tween, the vise also including a threaded bolt rotatable to move a holding surface toward and away from an object to be supported on the table top.

5,437,237

**CONTINUOUS PYROLYSIS SYSTEM**

John L. Digre, 4612 Hazelwood Ave., Sacramento, Calif. 95821

Filed Mar. 24, 1994, Ser. No. 218,222

Int. Cl.<sup>6</sup> F23G 5/12

U.S. Cl. 110—346

19 Claims



16. A method for continuously pyrolyzing an influx material into different constituent compounds within an anaerobic environment, including the steps of:

- providing an enclosure with an entrance, a discharge and a heating means therein,
- defining a quanta of influx material to be entered into the enclosure,
- compressing the quanta of influx material,
- purging oxygen from the quanta of influx material,
- entering the quanta of influx material into the enclosure without substantial oxygen coupled thereto,
- activating the heating means to pyrolyze the influx material into pyrolysates, and
- discharging the pyrolysates from the disclosure.

5,437,238

**WAIST BAND ATTACHMENT SYSTEM**

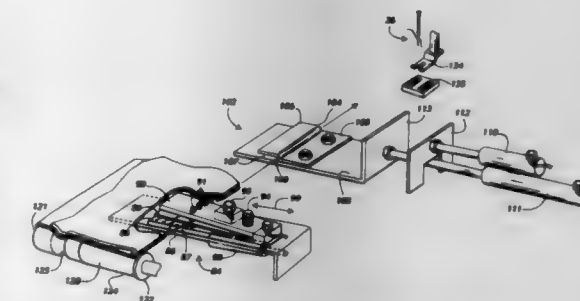
Elvin C. Price, Dacula; Preston B. Dasher, Lawrenceville, and Gerald C. Valentine, Buford, all of Ga., assignors to Atlanta Attachment Company, Lawrenceville, Ga.

Filed Oct. 4, 1993, Ser. No. 131,131

Int. Cl.<sup>6</sup> D05B 21/00

U.S. Cl. 112—470.29

11 Claims



7. An attachment for a sewing machine for guiding a stretchable loop waist band and the waist of a tubular garment part to the sewing machine comprising:

- guide spindles for holding the edges to be connected of the waist band and the tubular garment in side-by-side matched relationship in the sewing path of the sewing machine,
- drive means for moving the matched edges along the sewing path through the sewing machine, and
- decurling means positioned in the sewing path upstream of



the sewing machine for removing curl from the matched edges of the waist band and the waist edge of the tubular garment as the matched edges move toward the sewing machine.

means for delaying the operation of the sewing function of the sewing machine to sew the matched edges together until after the matched edges of the waist band and tubular garment part have been decurled by the decurling means and have been moved to the sewing machine.

5,437,239

## PROCESS FOR DEFINING QUILTED FABRIC

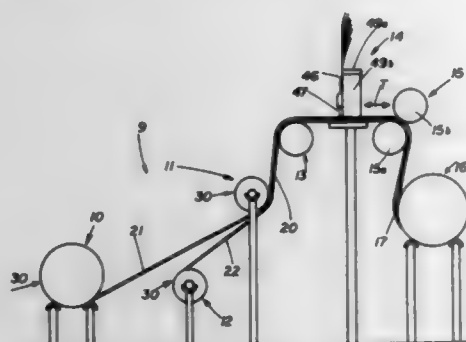
Steven A. Blake, 999 Blandford Blvd., Redwood City, Calif. 94062

Filed Apr. 27, 1993, Ser. No. 53,188

Int. Cl.<sup>6</sup> D05B 1/00; D05C 3/00; B32B 7/08

U.S. Cl. 112—475.22

10 Claims



1. A process for forming a puffed, smock-like quilted fabric having an exterior layer of non-stretchable material and bi-axial stretchable material overlaying a soft interior layer stitched together in automated manner, comprising the steps of:

- winding non-stretchable, stretchable and interior layers on separate rollers,
- placing the rollers on a quilting arrangement, positively feeding the layers from the rollers to a bidirectional acting sewing assembly, providing essentially zero elongation for the non-stretchable and interior layers and from 50 to 100 per cent stretch for the bi-axial stretchable layer in an axial stretch direction parallel to advancement of said stretchable, non-stretchable and interior layers,
- sewing the arranged layers in sets of sinusoidal-like seam patterns across the layers wherein each of said sinusoidal like seam patterns has an axis of formation essentially parallel to said axial stretch direction of the bi-axial stretchable layer,
- relaxing the stretchable to a natural state forming a series of puffs in rows across the layers normal to said axial stretch direction the stretchable layer, and aligning columns of puffs of even numbered rows with each other but which are laterally offset with respect to puffs of odd numbered rows a constant amount.

5,437,240

## BOOKMARK

Mike Miroyan, 1299 Seaside Ave., San Pedro, Calif. 90731

Continuation-in-part of Ser. No. 77,554, Jun. 14, 1993, Pat. No.

5,325,811. This application Jun. 8, 1994, Ser. No. 257,661

Int. Cl.<sup>6</sup> B42D 9/00

U.S. Cl. 116—235

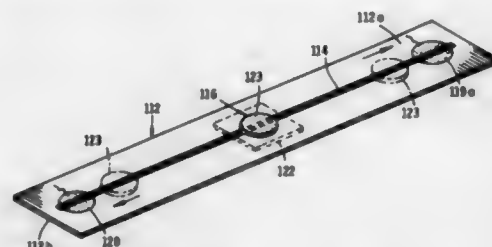
11 Claims

1. A bookmark for locating an exact page and line in a book comprising:

- an elongated body having an upper terminal portion, a lower terminal portion and a slit having a width and extending between said upper and lower terminal portions, said slit defining a track;
- a display imprinted on one of said upper and lower terminal portions of said body, said display including at least

one object depicting feature having a particular size and shape and being located proximate said slit; and

- an indicator means for indicating a particular line on a selected page of the book, said indicator means comprising an indicator element having a face portion disposed in a first plane and being of a size and shape generally corresponding to the size and shape of said object-depicting feature of said display, said indicator element also including a base portion disposed in a second plane spaced apart from said first plane, said base portion having an aperture



defining an inner edge, said face portion having an outer edge defining an area smaller than said aperture, said face portion being connected to said base portion by connector means including a pair of oppositely disposed connector elements passing through said slit and connecting the outer edge of said face portion to said inner edge of said base portion, whereby said indicator element is movable along said track from a first position overlying said object-depicting feature to a second position intermediate said upper and lower terminal portions of said body.

5,437,241

## DIFFERENTIAL PRESSURE INDICATOR

Gary C. Rosenberg, Safety Harbor, and Frank Gossett, Seminole, both of Fla., assignors to Pall Corporation, East Hills, N.Y.

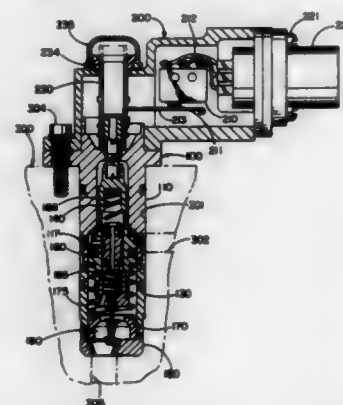
Continuation of Ser. No. 255,877, Jun. 8, 1994. This application

Aug. 1, 1994, Ser. No. 283,557

Int. Cl.<sup>6</sup> G01L 19/12

U.S. Cl. 116—268

21 Claims



19. A differential pressure indicator comprising:

- a housing having a high pressure port, a low pressure port, and a bore communicating with the pressure ports;
- a piston slidable in the bore of the housing between an actuated and an unactuated position and having an internal bore;
- a sensor for sensing movement of the piston to the actuated position;
- a shuttle slidably received in the piston bore and axially movable between a first position and a second position, the shuttle providing communication between a first surface area of the piston and the high pressure port when the shuttle is in its first position and the piston is in its unactu-

ated position and providing communication between a second surface area of the piston and the high pressure port when the shuttle is in its second position and the piston is in its unactuated position, the first surface area being different from the second surface area; and a first shuttle biasing spring disposed in the piston bore and exerting a biasing force on the shuttle toward the first position and a second shuttle biasing spring disposed in the piston bore and exerting a biasing force on the shuttle toward the second position, the first shuttle biasing spring being in fluid communication with one of the pressure ports and being made from a shape memory alloy having a transition temperature, the biasing force exerted by the first shuttle biasing spring increasing with temperature and being greater than the biasing force exerted by the second shuttle biasing spring at a fluid temperature above the transition temperature and being less than the biasing force exerted by the second shuttle biasing spring at a fluid temperature below the transition temperature.

5,437,242

## PROCESS AND APPARATUS FOR CONTROLLING THE MELT LEVEL WHILE PULLING SINGLE CRYSTALS

Christian Hofstetter, Burghausen; Walter Berger, Simbach am Inn; Werner Bauer, and Bernd Mittelbach, both of Burghausen, all of Germany, assignors to Wacker-Chemitronic Gesellschaft fuer Elektronik-Grundstoffe mbH, Burghausen, Germany

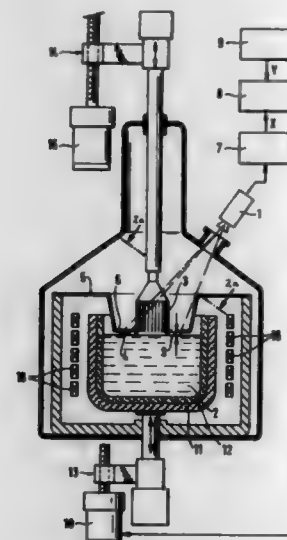
Filed Aug. 18, 1993, Ser. No. 108,897

Claims priority, application Germany, Sep. 17, 1992, 42 31 162.4

Int. Cl.<sup>6</sup> C30B 15/26

U.S. Cl. 117—14

5 Claims



1. A process for controlling the melt level of molten material in a crucible covered by a crucible cover while pulling a single crystal according to the Czochralski process, comprising:

- providing said crucible cover with at least one characteristic shaped portion in a distance S to the melt surface, said shaped portion causing a reflection from the melt surface;
- recording an image of an evaluation area from the melt surface, said evaluation area, at least in part, containing said reflection;
- determining with the aid of the recorded image said distance S and generating an actual signal proportional to this distance;
- comparing the actual signal with a set point signal and, if a difference is observed, generating a control signal to change the melt level.

5,437,243

## PROCESS FOR FABRICATING DIAMOND BY SUPERCRITICAL ELECTRICAL CURRENT

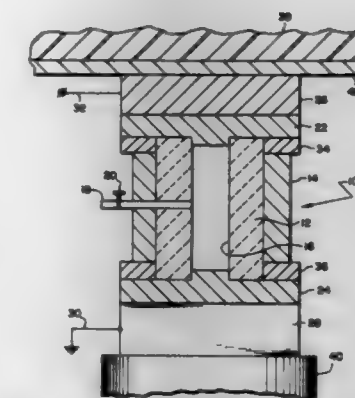
Maciej J. Pike-Bieganski, 28 W. 355 Rogers Ave., Warrenville, Ill. 60555

Filed Jul. 1, 1992, Ser. No. 909,087

Int. Cl.<sup>6</sup> C30B 13/20

U.S. Cl. 117—49

14 Claims



1. A method of producing allotropic transformation of graphite to diamond, said method comprising the steps of: providing a specimen of a selected shape and of the substance to be transformed; physically confining the specimen with electrically insulating high-strength material so that the specimen will hold its shape under pressure; applying pressure to the specimen between electrodes of a refractory material; applying to the specimen through the electrodes a pulse of an electrical current of super critical density and extremely short duration; and causing said current to flow through the entire specimen to produce an internal electrical field inside the entire specimen for a duration of only a few micro seconds during which the allotropic transformation of the entire specimen takes place without changing the original shape of the specimen.

5,437,244

## BALL FLOAT FOR A WATERING TANK

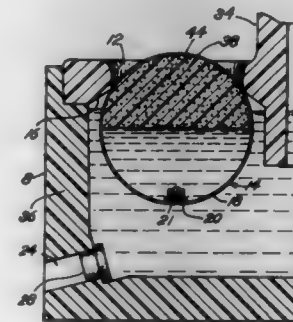
Carl Van Gilst, Goshen, Ind., assignor to Agri-Engineering, Inc., Goshen, Ind.

Filed Sep. 16, 1991, Ser. No. 760,154

Int. Cl.<sup>6</sup> A01K 7/00

U.S. Cl. 119—73

7 Claims



1. A livestock watering tank comprising:

- a tank for receiving water from a water source, such tank including a top wall, an opening extending through said top wall for access by the mouth of said livestock, a float located under said top wall sealing said opening, means for neutralizing the buoyancy of the float relative to the water so that only a minimum amount of downward force need be applied by the livestock with its said mouth to submerge said float and thereby expose said opening to allow

access to water for drinking by the livestock, said float having a hollow core, said means for neutralizing the buoyancy of said float including weighted material introduced within said hollow core, said float including port means for introducing said weighted material into said core, said weighted material introduced into said float being a liquid.

5,437,245

Patent Not Issued For This Number

5,437,246

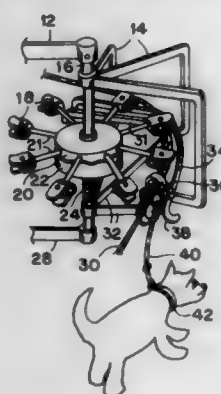
# CORNER TURNING FREE-RUN ANIMAL TROLLEY SYSTEM

Larry J. Noles, 19 Union St., Waterbury, Vt. 05676  
Filed Jan. 14, 1994, Ser. No. 180,982

Int. Cl.<sup>6</sup> A01K 29/00

U.S. Cl. 119—785

20 Claims



1. A corner turning a free-run animal trolley system comprising:

- a support cable formed in a loop;
- a trolley having sides encasing a trolley pulley wheel to engage the cable so that the cable supports the trolley on the cable with the trolley pulley wheel free to roll on the cable;
- an animal leash attached at one end to a base of the trolley and at another end adapted to be attached to an animal;
- at points along the cable where turns are desired, a horizontal rotatable cable support means for supporting the cable and maintaining the cable in a curved configuration around a turn;
- at the same points along the cable where turns are desired, at least one curved track to support at least one additional wheel on the trolley, wherein the curvature of the curved track is similar to the the curved configuration of the cable;
- a vertical support for rotatably supporting the horizontal rotatable cable support means;
- and a track support extending from the vertical support under said at least one curved track.

5,437,247

# DROP DOWN CORRELLING (LAW029)

Robert F. Dubil, Chester, and John R. Peterson, Randolph, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 8, 1994, Ser. No. 225,031

Int. Cl.<sup>6</sup> F22B 9/04

U.S. Cl. 122—44.2

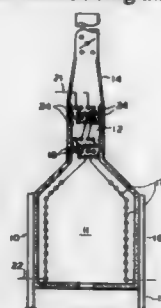
4 Claims

1. In a fired heater having walls defining a convection section including a tube bundle comprised of a plurality of vertical rows of horizontally disposed heat exchange tubes spaced apart from the walls, the improvement comprising:

- a plurality of elongated plate members pivotably mounted

on at least one horizontal tube in a vertical row that is one row removed from the wall,

each elongated plate member sized longitudinally to extend at a predetermined distance from the tube to the sidewall when in a first position, thereby preventing gas from channelling between the tubes and sidewall and wherein the plate member is positioned in an upwardly extending second position for introducing and for removing the tube



5,437,248

# FIRE TUBE BOILER

Tamotsu Miura; Masatoshi Miura, and Osamu Higuchi, all of Matsuyama, Japan, assignors to Miura Co., Ltd., Ehime, Japan

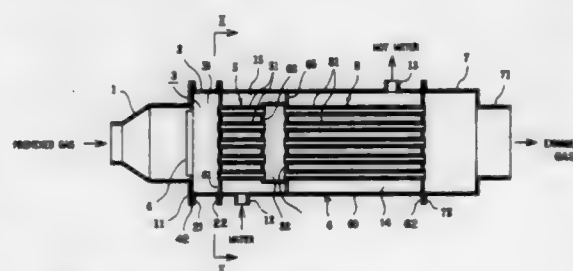
Filed Jul. 16, 1993, Ser. No. 92,079

Claims priority, application Japan, Jul. 23, 1992, 4-218228; Mar. 19, 1993, 5-085687

Int. Cl.<sup>6</sup> F22B 9/08

U.S. Cl. 122—51

9 Claims



1. A fire tube boiler comprising:

- a combustion chamber;
- a burner supplying combustion flame to said combustion chamber;
- a heat exchanger disposed in said combustion chamber and dividing said combustion chamber into a first and second chamber, said heat exchanger allowing passage of said combustion flame from said first chamber to said second chamber, said heat exchanger being disposed in said combustion chamber in proximity to said burner so that said combustion flame in said first chamber is less than 1500° C. and said combustion flame in said second chamber is between 1100° and 1400° C.; and
- a plurality of fire tubes allowing passage of said combustion flame in said second chamber to an exhaust.

5,437,249

# COMBINATION BURNER AND FLUE GAS COLLECTOR FOR WATER HEATERS AND BOILERS

Charles L. Adams, and Richard C. Adams, both of Fort Worth, Tex., assignors to PVI Industries, Inc., Fort Worth, Tex.

Filed Oct. 27, 1993, Ser. No. 143,937

Int. Cl.<sup>6</sup> F22B 5/00

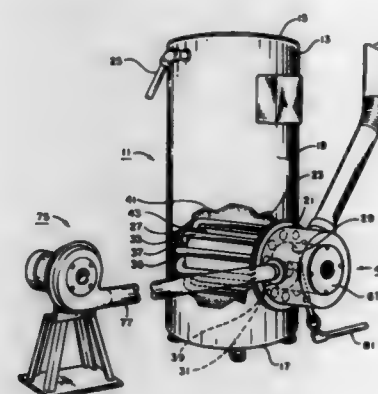
U.S. Cl. 122—17

9 Claims

1. A water heater or boiler having a closed tank with an exterior and an interior, the exterior having an opening therein,

the interior normally containing water, the improvement comprising:

- a combustion chamber located within the tank interior, the combustion chamber including a body portion having an open end located adjacent the opening in the closed tank exterior into which combustible fuel is introduced and ignited in the presence of air to create products of combustion;
- passage means for conducting products of combustion present within the combustion chamber to the exterior of the closed tank;
- a flue collector mounted on the exterior of the closed tank having a flue opening therein which communicates with the open end of the body portion of the combustion chamber, the flue collector having an annular chamber surrounding the flue opening and separated therefrom, the annular chamber communicating with the passage means for receiving the products of combustion;
- an outer wall portion which defines a closed end for the flue opening at one extent thereof and an oppositely arranged, inner wall portion which together with the outer wall



portion defines a closed compartment within the flue collector which is located externally of the combustion chamber and which is surrounded by but separated from the annular chamber, the inner wall portion having an opening therein which communicates with the combustion chamber;

- blower means for pressurizing the entire closed compartment with air;
- combustion means mounted within the opening in the inner wall portion of the flue collector for producing combustion, the combustion means including supply means for supplying fuel from a fuel source and an ignition means for igniting the fuel in the presence of air to produce products of combustion within the combustion chamber;
- wherein the blower means is a fan unit remotely located from the water heater and connected to the closed compartment of the flue collector by a conduit; and
- wherein the blower conduit communicates with the closed compartment of the flue collector by means of a duct which passes transversely through the annular chamber of the flue collector directly to the closed chamber.

5,437,250

# PLASMATRON-INTERNAL COMBUSTION ENGINE SYSTEM

Alexander Rabinovich, Salem; Daniel R. Cohn, Chestnut Hill, and Leslie Bromberg, Sharon, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.  
Continuation-in-part of Ser. No. 110,057, Aug. 20, 1993. This application Feb. 15, 1994, Ser. No. 196,701

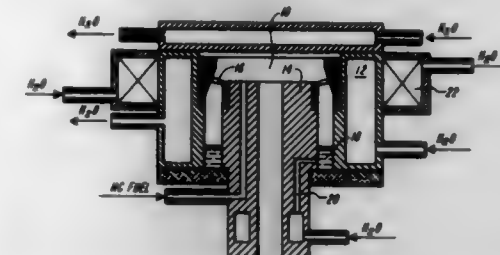
Int. Cl.<sup>6</sup> F02B 43/08

U.S. Cl. 123—3

9 Claims

1. Rotary power system comprising:  
a source of hydrocarbon fuel;

a plasmatron for receiving the hydrocarbon fuel and reforming it into a hydrogen-rich gas;  
an internal combustion engine adapted to receive the hydrogen-rich gas from the plasmatron; and



a generator powered by the engine and connected to deliver electrical energy to power the plasmatron wherein the plasmatron is a partial oxidation plasmatron.

5,437,251

# TWO-WAY ROTARY SUPERCHARGED, VARIABLE COMPRESSION ENGINE

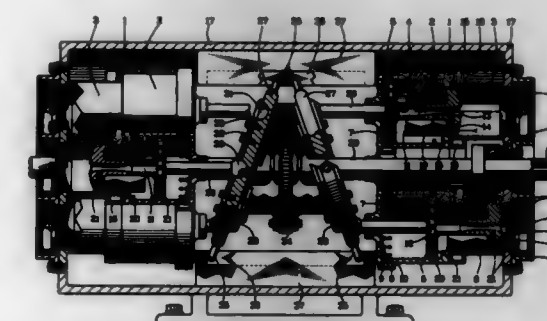
Richard R. Anglim, and Hazel L. Halfman, both of 8880 SW. 27th Ave., #B-68, Ocala, Fla. 32674

Filed May 16, 1994, Ser. No. 243,408

Int. Cl.<sup>6</sup> F01L 11/00

U.S. Cl. 123—56.3

15 Claims



1. An internal-combustion engine having:
  - at least one cylinder with a supercharge section of the cylinder at a supercharge end of the cylinder;
  - a power section of the cylinder at a power end of the cylinder having a selectively smaller diameter than a diameter of the supercharge section of the cylinder;
  - a piston having a power section of the piston in sliding-seal contact with inside peripheral walls of the power section of the cylinder and a supercharge section of the piston in sliding-seal contact with inside peripheral walls of the supercharge section of the cylinder;
  - exhaust ports at an exhaust end of the power section of the cylinder;
  - a transfer channel positioned circumferentially at an outside periphery of a bottom end of the supercharge section of the cylinder;
  - a plurality of outlet transfer ports in fluid communication from a low portion of the supercharge section of the cylinder to the transfer channel;
  - a plurality of inlet transfer ports in fluid communication from the transfer channel to a selectively higher portion of the supercharge section of the cylinder;
  - a one-way-inlet-valved port in the supercharge section of the cylinder;
  - an inlet port positioned centrally in a head of the piston;
  - an intake transfer conveyance within the piston positioned in fluid communication between the supercharge section of the cylinder and the intake port that is positioned centrally in the head of the piston;
  - an ignition means proximate a head of the cylinder; and



rotational power-takeoff means in rotational-power-takeoff relationship to the piston and the cylinder.

5,437,252

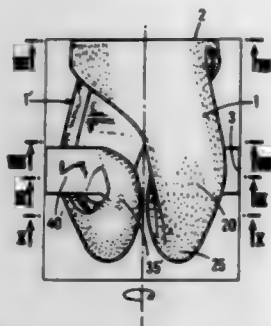
## ROTARY PLUG

Stephen Glover, Ruell Malmaison, France, assignor to Institut Français Du Pétrole, Ruell Malmaison, France  
Filed May 20, 1994, Ser. No. 246,616

Claims priority, application France, May 21, 1993, 93 06278  
Int. Cl.<sup>6</sup> F01L 7/02

U.S. Cl. 123—190.2

9 Claims



1. A substantially cylindrical rotary plug for admitting fluid in a combustion chamber of an internal-combustion engine, the rotary plug including a least one bent inner channel through which said fluid flows, each channel having an inlet port located on a lateral face of said rotary plug, an outlet port arranged at a cylindrical surface of said rotary plug, and a bend for holding back heavier constituents of the fluid under an effect of centrifugal force, wherein a thickness of a wall of the rotary plug between an outer face of the channel and an outside of the rotary plug is relatively thin at a level of said bend, and wherein at least one of the outlet ports of at least one of said channels and at least one of said bends are arranged in the same cross-section of the rotary plug.

5,437,253

## SYSTEM AND METHOD FOR CONTROLLING THE TRANSIENT TORQUE OUTPUT OF A VARIABLE DISPLACEMENT INTERNAL COMBUSTION ENGINE

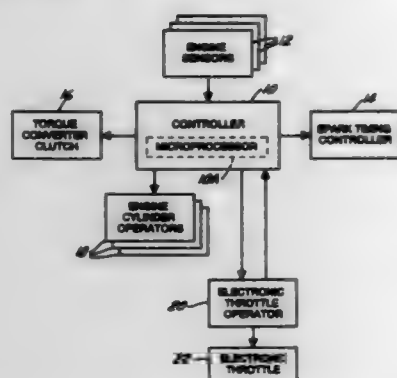
Roger L. Huffmaster, Canton, and Jerry D. Robichaux, Southgate, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 172,361, Dec. 23, 1993, Pat. No. 5,374,224.  
This application Aug. 31, 1994, Ser. No. 298,694

Int. Cl.<sup>6</sup> F02D 11/10, 43/04, 17/02; F02P 5/15

U.S. Cl. 123—399

15 Claims



1. A system for controlling the transient torque output of a multicylinder, variable displacement, spark-ignited, fuel-injected automotive internal combustion engine during periods

when the effective displacement of the engine is being changed, said system comprising:

- a spark timing controller;
- a throttle controller for positioning an intake air throttle;
- an engine cylinder operator means for deactivating and reactivating at least some of said cylinders;
- an engine controller having a processor for selecting the number of cylinders for operation and for operating said spark timing controller, said throttle controller, and said cylinder operator means such that during any transition from operation with a first number of activated cylinders to operation with a second number of activated cylinders, the processor will alter the spark advance and control the amount of air entering the engine cylinders so that the torque output of the engine will remain relatively unchanged during such transition.

5,437,254

## IGNITING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Takaharu Korenaga, and Tsutomu Momoyama, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

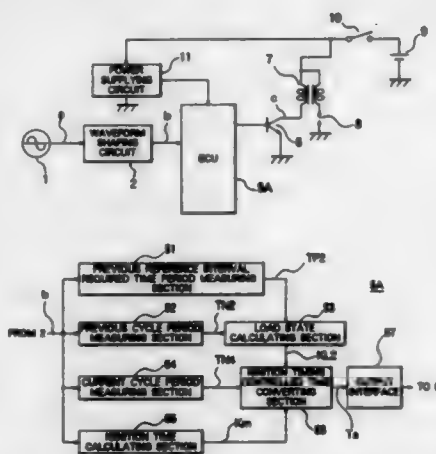
Filed Apr. 8, 1994, Ser. No. 225,304

Claims priority, application Japan, Apr. 12, 1993, 5-084473

Int. Cl.<sup>6</sup> F02P 5/15

U.S. Cl. 123—416

24 Claims



1. An igniting apparatus for an internal combustion engine comprising:

- rotation detecting means for generating a reference position signal corresponding to a plurality of reference positions for a cylinder of the engine and rotation of the engine;
- an ignition time calculating section for generating ignition time data based on said reference position signal outputted from said rotation detecting means;
- a previous reference interval required time period measuring section for measuring a previous required time period between the plurality of reference positions of the cylinder based on said reference position signal outputted from said rotation detecting means to output a previous reference interval required time period;
- a previous cycle period measuring section for measuring a previous cycle period of the rotation of the engine based on said reference position signal outputted from said rotation detecting means to output a previous cycle period;
- a load state calculating section for calculating a load state of the engine based on said previous reference interval required time period outputted from said previous reference interval required time period measuring section and said previous cycle period outputted from said previous cycle period measuring section;
- a current cycle period measuring section for measuring a current cycle period based on said reference position

signal outputted from said rotation detecting means to output a current cycle period;

an ignition timing controlled time calculating section for generating an ignition control signal corresponding to a target ignition time based on said ignition time data outputted from said ignition time calculating section and said current cycle period outputted from said current period measuring section, and for correcting said ignition control signal based on the load state outputted from said load state calculating section such that influence due to change of the rotation of the engine can be eliminated; and

igniting means driven by said ignition control signal outputted from said ignition timing controlled time calculating section.

5,437,255

## FUEL INJECTION SYSTEM EMPLOYING SOLID-STATE INJECTORS FOR LIQUID FUELED COMBUSTION ENGINES

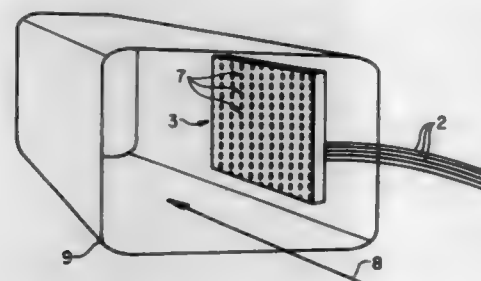
Mark L. Sadley, 336 Larchbrook Dr., Garland, Tex. 75043, and David A. Dean, 7733 E. R. Thornton #233, Dallas, Tex. 75228

Filed Mar. 15, 1994, Ser. No. 212,989

Int. Cl.<sup>6</sup> F02M 37/04; F02B 3/00

U.S. Cl. 123—472

6 Claims



1. Fuel injection apparatus for liquid fueled combustion engines, comprising:

- a mixing chamber structure having a passage through which a flow of air may be delivered to a liquid fueled combustion engine;
- a plurality of electrically actuated solid-state fuel-spraying jets, each comprising:
  - (1) a fuel chamber;
  - (2) a fuel inlet passage communicating with said fuel chamber for flowing fuel from a source thereof into said fuel chamber;
  - (3) an exit orifice communicating with said fuel chamber;
  - (4) an electrically actuated expelling means for causing fuel introduced into said fuel chamber through said fuel inlet passage to be forcibly expelled out of said exit orifice; and
  - (5) means for preventing a reverse flow of fuel from said fuel chamber outwardly through said fuel inlet passage;
- means for supplying fuel to said fuel inlet passages of said fuel-spraying jets;
- means for providing repetitive electrical actuating pulses of predetermined magnitudes, repetition rates, and durations to said electrically actuated expelling means of said fuel-spraying jets so as to produce a repetitive operating cycle in each of said fuel-spraying jet comprising:
  - (1) a time interval sufficient for fuel from said fuel supplying means to flow through said fuel inlet passage and fill said fuel chamber of said fuel-spraying jet; followed by
  - (2) expulsion of fuel through said exit orifice upon application of said electrical actuating pulse to said electrically actuated expelling means and;
- means for supporting said fuel-spraying jets on said mixing chamber structure so that fuel sprayed from said exit orifices of said fuel-spraying jets into said mixing chamber structure passage can operatively mix with a flow of air

being delivered therethrough to a liquid fueled combustion engine.

5,437,256

## METHOD OF CHECKING THE OPERABILITY OF A REGENERATION VALVE IN A TANK VENTING SYSTEM

Wolfgang Woletz, Esslingen; Hans Schröter, Stuttgart; Klaus Schust, Weinstadt, and Hartmut Kolb, Ludwigsburg, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

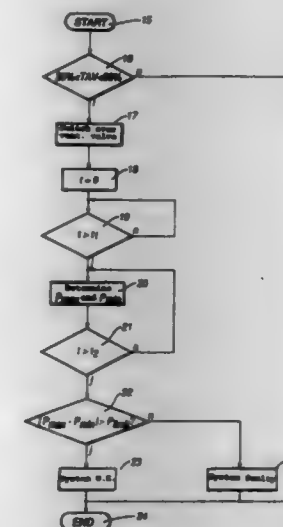
Filed Mar. 2, 1994, Ser. No. 204,790

Claims priority, application Germany, Mar. 6, 1993, 43 07 100.7

Int. Cl.<sup>6</sup> F02M 33/02

U.S. Cl. 123—519

4 Claims



1. A method of checking the operability of a cyclically controlled regeneration valve in a fuel tank venting system of a motor vehicle comprising an adsorption filter which is connected, via a connecting line, to the fuel tank and, via a discharge line in which the regeneration valve is arranged, to an intake pipe of an engine, with a pressure sensor being provided so as to be able to sense the pressure in the discharge line of said adsorption filter and supply its pressure signal to an evaluation device for determining operability of said regeneration valve, said method comprising the steps of: determining a duty ratio (TAV) of the regeneration valve as an exclusive result of the control of the tank venting system, initiating a regeneration valve operability check if said duty ratio is within a specified range, determining during the operability check in the evaluation device the extreme values ( $P_{max}$ ,  $P_{min}$ ) of the pressure variations for a predetermined period of time and indicating inoperability of the regeneration valve if, after expiration of the predetermined time period, the difference between the extreme pressure values ( $P_{max}$ ,  $P_{min}$ ) is below a predetermined threshold ( $P_{limit}$ ).

5,437,257

## EVAPORATIVE EMISSION CONTROL SYSTEM WITH VENT VALVE

Roy A. Giacomazzi, Rochester Hills; Gregory E. Rich, Richmond; Chester W. Przeklas, Mt. Clemens, all of Mich., and Kenneth W. Turner, Webster, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1994, Ser. No. 202,626

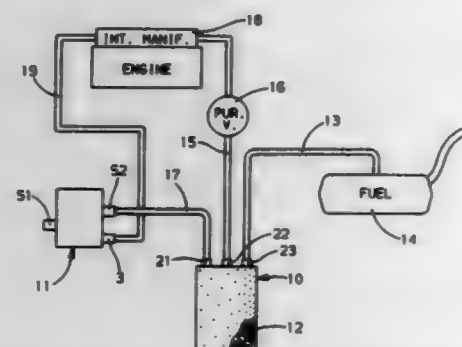
Int. Cl.<sup>6</sup> F02M 33/02

U.S. Cl. 123—520

4 Claims

1. An evaporative emission control system for a vehicle having an internal combustion engine with an intake manifold and a fuel system, comprising:

- a canister having a cavity with a first opening for transferring fuel evaporate between the fuel system and the cavity, a second opening for transferring fuel evaporate from the cavity to the intake manifold and a third opening for venting the cavity to atmosphere; and
- a vent valve for controlling flow between the cavity and atmosphere including:
- a housing having a canister port in communication with the third opening of the canister cavity, an atmosphere port in communication with the atmosphere, an actuator port in communication with the intake manifold and parallel first and second flow paths between the canister port and the atmosphere port:



- a first normally closed valve disposed in the first flow path including an operator responsive to subatmospheric pressure in the evaporative emission control system for opening the first normally closed valve;
- a second normally closed valve disposed in the second flow path including an operator in communication with the actuator port responsive to superatmospheric pressure in the evaporative emission control system and responsive to subatmospheric pressure in the actuator port from the intake manifold for opening the second normally closed valve.

5,437,258

**CARBURETOR FUEL ATOMIZER**

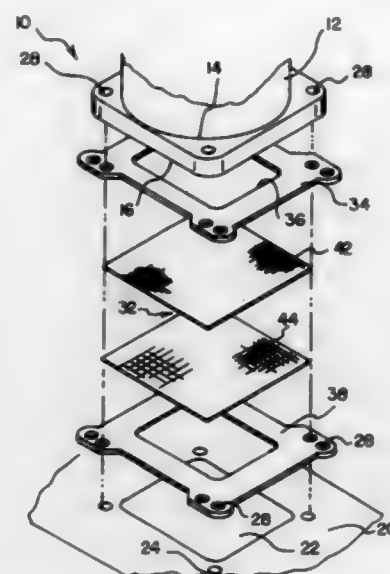
Edward F. Williams, and Sylvia M. Williams, both of 416 Bridgewiew Ct. #101, Virginia Beach, Va. 23452  
Filed Aug. 3, 1994, Ser. No. 285,164  
Int. Cl.<sup>6</sup> F02M 29/04

U.S. Cl. 123—593

2 Claims

1. A new and improved carburetor fuel atomizer comprising, in combination:
  - a carburetor having an input end and an output end for feeding gasoline to an internal combustion engine;
  - a manifold having an input end and an output end, the input end of the manifold being in fluid communication with the output end of the carburetor, the manifold adapted to distribute fuel from the carburetor to the appropriate portion of an internal combustion engine;
  - means to releasably couple the carburetor to the manifold with the output end of the carburetor in fluid communication with the input end of the manifold; and
  - an atomizer for dispersing the fuel leaving the carburetor prior to entering the manifold, the atomizer including a first gasket with an aperture therethrough coupled to the output end of the carburetor, a second gasket coupled to the input end of the manifold, a first screen fabricated of nylon mesh with about 160 to 280 mesh count coupled to the first gasket and a second screen of stainless steel with about a 20 mesh count positioned between the second gasket and the first screen whereby fluid from the carbure-

tor moving toward the manifold will be atomized prior to being fed to an internal combustion engine to increase



performance and efficiency of the internal combustion engine.

5,437,259

**INTERNAL-COMBUSTION-ENGINE IGNITION DEVICE**  
Kazuya Hamada, and Shigemi Murata, both of Himeji, Japan, assigns to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 70,798, Jun. 3, 1993, Pat. No. 5,377,653.

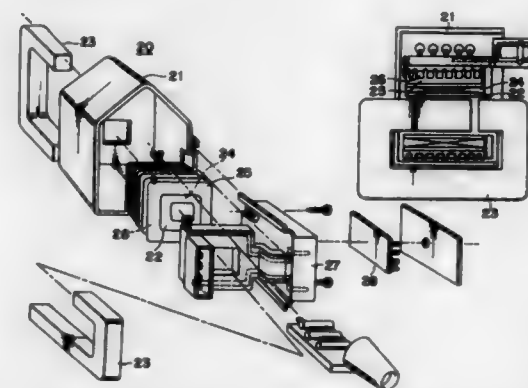
This application Jul. 12, 1994, Ser. No. 273,983

Claims priority, application Japan, Jun. 5, 1992, 4-145695; Jun. 5, 1992, 4-145696

Int. Cl.<sup>6</sup> F02P 17/12; G01M 15/00

U.S. Cl. 123—630

1 Claim



1. An internal-combustion-engine ignition device, comprising: a distributor including a central electrode connected to an ignition coil, and a plurality of peripheral electrodes respectively connected to ignition plugs of associated cylinders and adapted to be selectively connected to said central electrode; and an ion-current-detection unit for detecting an ion current generated upon combustion of an air-fuel mixture inside said cylinders, wherein said ion-current-detection unit is arranged integrally with another component of said internal-combustion-engine ignition device, and wherein said ion-current-detection unit is attached to said ignition coil.

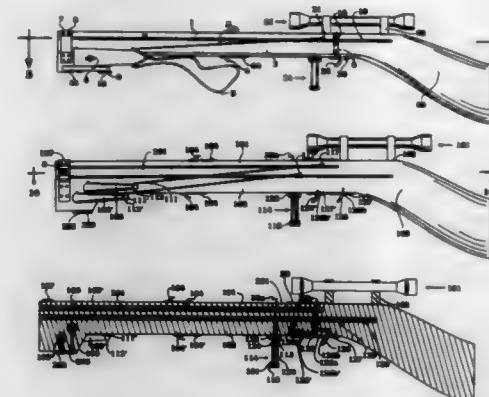
5,437,260

**CROSS BOW**

Franklin H. King, P.O. Box 8303, J.Coburg, Oreg. 97401  
Filed Dec. 2, 1993, Ser. No. 162,634  
Int. Cl.<sup>6</sup> F41B 5/12

U.S. Cl. 124—25

14 Claims



1. In a cross bow comprising a bow including a main string, a support engaged with and supporting said bow, and triggering means for cocking and firing said bow; the improvement comprising a loading string attached to said bow and hook means attached to said support and operable for receiving said loading string; said hook means being positioned on said support to enable said cross bow to be half cocked with said loading string and thereafter to be fully cocked with said main string.

11. A cross bow operable for shooting missiles, comprising a bow including a main string, a support engaged with and supporting said bow; said support defining a channel for missiles to be fired; triggering means for cocking and firing said cross bow; and supplying means operable for supplying balls to be fired from said cross bow; said supplying means comprising a magazine positioned below an opening defined in said support so that a ball can move from said magazine through said opening to said channel;

said magazine further comprising a chamber for receiving said balls, spring means operable for urging said balls toward said opening for delivering said balls to said channel for firing;

said triggering means further comprising a firing bolt operable for propelling a missile down said channel, a free float bolt and a spring urging said free float: bolt towards said firing bolt; whereby, firing said cross bow results in said firing bolt moving to propel the missile and said free float bolt follows the path of said firing bolt a predetermined distance along the said channel;

said cross bow further comprising a magnet positioned near said firing bolt for retaining a missile having a portion attracted to said magnet in said channel; said balls being attracted to said magnet and said spring means has a rounded end pushing said balls; said spring means has sufficient push to deliver the last remaining ball in said magazine with a small intrusion through said opening into said channel; whereby said free float bolt can pass relatively smoothly over said spring means.

13. A cross bow operable for shooting balls, comprising a first bow including a main string, a support engaged with and supporting said first bow; said support defining a first channel for a ball to be fired; first triggering means for cocking and firing said first bow; and supplying means operable for supplying balls to be shot from said first bow; said supplying means comprising a retaining spring means positioned on said support over an opening in said support communicating with said first channel, said retaining spring means operable to be moved to allow a ball to be loaded into said first channel, and said retaining spring means further operable to cover said opening in said support sufficiently to prevent a ball which has been loaded

into said first channel to exit said opening without said retaining spring being moved aside;

the cross bow further comprising a second channel defined in said support, a second bow mounted on said support and a second triggering system for cocking and firing said second bow; said second triggering system comprising a firing bolt, operable for propelling a missile down said second channel, a free float bolt and a spring urging said free float bolt towards said firing bolt; whereby, firing said second bow results in said firing bolt moving to propel the missile and said free float bolt follows the path of said firing bolt a predetermined distance along the said second channel.

5,437,261

**BALL PITCHING DEVICE**

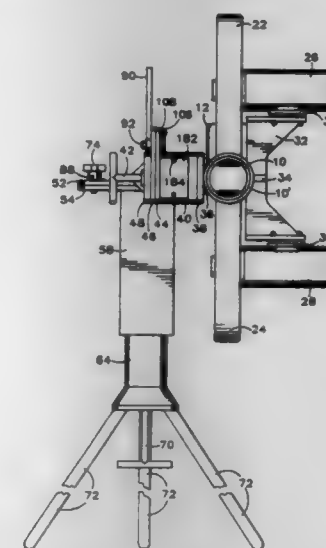
Kerry K. Paulson, Sherwood; Charles E. Kerr, Hillsboro, and Paul A. Heinsch, Portland, all of Oreg., assigns to Jugs, Inc., Tualatin, Oreg.

Filed Oct. 27, 1993, Ser. No. 144,109

Int. Cl.<sup>6</sup> A63B 69/40

U.S. Cl. 124—78

16 Claims



1. A ball pitching device, comprising:

- a) a base,
- b) ball feed means having a longitudinal ball-projecting axis,
- c) ball projecting means associated with the ball feed means for projecting a ball along said longitudinal axis, the ball projecting means including a rotary ball projecting wheel, an electric motor engaging the wheel for rotating the latter, and an electric circuit connected to the electric motor for varying the rotational speed of the motor and wheel,
- d) vertical adjustment means having a horizontal pivot axis,
- e) means mounting said vertical adjustment means on said base,
- f) means mounting said ball feed means and ball projecting means on said vertical adjustment means,
- g) the vertical adjustment means being operable to move the longitudinal ball projecting axis about said horizontal pivot axis, and
- h) incremental adjustment means engaging the vertical adjustment means for pivoting the latter incrementally about said horizontal pivot axis for changing the elevation of the longitudinal ball projecting axis vertically in incremental amounts the electric circuit including adjustable electric motor speed control means operable to adjust the electric motor speed in accordance with the incremental adjustment of the vertical adjustment means.



5,437,262

## BURNER APPARATUS

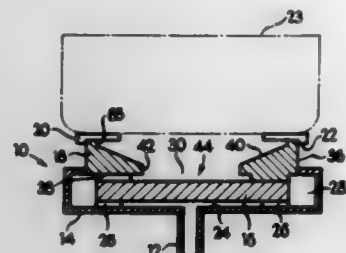
Paul E. George, II, Powell; D. Karl Landstrom, and Jemhu K. Raghavan, both of Columbus, all of Ohio, assignors to Gas Research Institute, Chicago, Ill.

Filed Feb. 17, 1994, Ser. No. 198,120

Int. Cl.<sup>6</sup> F24C 3/00

U.S. Cl. 126—39 H

5 Claims



1. A burner apparatus for the combustion of premixed gaseous fuel and air, and for heating an object positioned above said burner apparatus, by a combination of radiant heating and convective heating from said combustion, said burner apparatus comprising:

- a burner housing;
- an inlet, in said burner housing, for receiving said premixed gaseous fuel and air from a source of said premixed gaseous fuel and air;
- means for defining a combustion chamber within said burner housing, said combustion chamber having a first diameter;
- means for communicating said inlet and said combustion chamber with each other including
- means for producing a swirling motion of said premixed gaseous fuel and air, as said premixed gaseous fuel and air enters said combustion chamber;
- a quarl member defining an outlet throat for enabling escape of gases and heat, resulting from said combustion, from said combustion chamber, said outlet throat having second diameter which is less than said first diameter of said combustion chamber for facilitating retention of flame within said combustion chamber; and said quarl member including
- means for absorbing and re-radiating a portion of said heat produced by said combustion, operably disposed adjacent to and substantially downstream from said outlet throat, said quarl member having an outside diameter which is substantially greater than said first diameter of said combustion chamber,
- said quarl member further having an annular configuration with an upper surface which inclines upwardly from a radially inward position to a radially outward position,
- means for supporting an object to be heated on or above said quarl member;
- said quarl member absorbing and re-radiating heat to substantially uniformly apply and direct heat produced by said combustion, to said object positioned above said burner apparatus through a combination of convective and radiative heat transfer.

5,437,263

## HIGH EFFICIENCY FURNACE METHOD AND APPARATUS

Jeffrey R. Ellingham, Conroe; Gary W. Bonorden, and Mark A. Vackar, both of Houston, all of Tex., assignors to Goodman Manufacturing Company, Houston, Tex.

Filed Aug. 27, 1993, Ser. No. 113,591

Int. Cl.<sup>6</sup> F24H 3/02

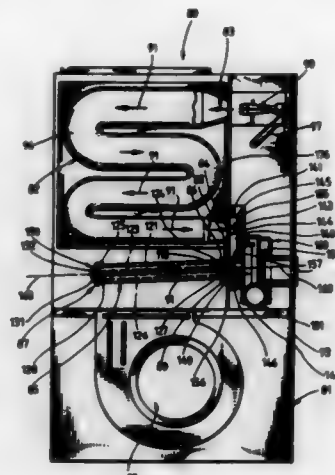
U.S. Cl. 126—110 R

31 Claims

26. A method for mounting a secondary heat exchanger in a furnace, having a primary heat exchanger, to permit the furnace to be installed for either an updraft or downdraft mode of operation, comprising the steps of:

hingedly mounting the secondary heat exchanger within the

furnace, whereby the secondary heat exchanger may be disposed in a first position with the secondary heat exchanger sloping downwardly toward the primary heat exchanger for downdraft operation of the furnace, or the



secondary heat exchanger may be disposed in a second position with the secondary heat exchanger sloping downwardly away from the primary heat exchanger for updraft operation of the furnace.

5,437,264

## WASTE HEAT COLLECTOR FOR DOMESTIC GAS WATER HEATERS

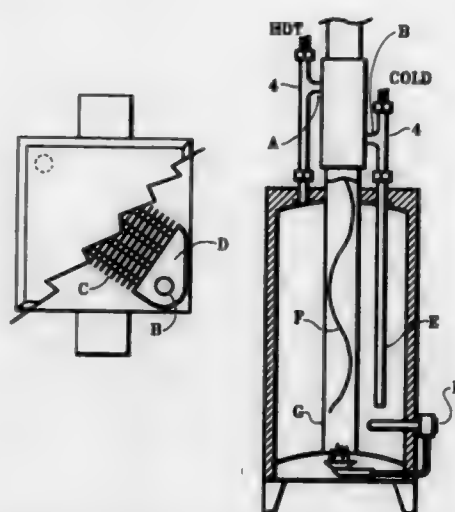
Billy J. McCormick, 43475 Cowboy Country Trail, Aguanga, Calif. 92536

Filed Sep. 7, 1993, Ser. No. 35,052

Int. Cl.<sup>6</sup> F24H 1/00

U.S. Cl. 126—364

1 Claim



1. A heat collecting device to capture the lost or wasted heat from a domestic water heater storage tank and circulate the heat back into the storage tank, comprising a standard water heater, means for collecting waste heat including a means for jetting cold water into the bottom of the storage tank, a radiator coil surrounded by aluminum collector fins with copper tanks on each end of the tubes, an inlet pipe and outlet pipe with connections to the storage tank and an inlet for cold water and an outlet for the hot water, said collecting means including a sheet metal box surrounding the fins and coil for directing the flow of exhaust gases from the water heater over the fins.

5,437,265

## GAS HEATING APPARATUS

Yasuhiro Yamauchi, and Akito Komori, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

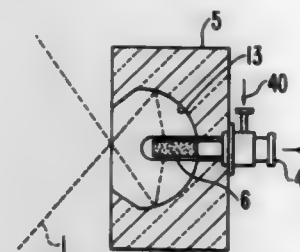
Continuation-in-part of Ser. No. 782,365, Oct. 24, 1991, abandoned. This application Nov. 19, 1993, Ser. No. 154,506

Claims priority, application Japan, Oct. 30, 1990, 2-290876

Int. Cl.<sup>6</sup> F24J 2/10

U.S. Cl. 126—657

5 Claims



1. A radiant gas heating apparatus comprising: a member of porous ceramic material heatable by a source of radiation, said member having a cylindrical portion, a portion closing one end of said cylindrical portion, and an open end opposite said one end, the porous ceramic material constituting said member having a porosity of 60–98% and a surface area of 3000 m<sup>2</sup>/m<sup>3</sup>, the pores of the ceramic material having an average diameter of no more than 5 mm, and the pores defining twisted passageways through the member which place the outer surface of the member in communication with the inner surface thereof; a transparent light-receiving vessel extending around said member and spaced from the outer surface thereof such that a flow passageway is defined between the outer surface of said member and an inner surface of said vessel, said flow passageway directing gas to be heated to the pores of said member so that the gas will pass through said member from the outer surface to the inner surface of the member; and a tube supporting said member at said open end thereof and having a passageway open to the interior of said member such that the gas which has passed from said flow passageway through the pores of said member of porous ceramic material will flow from the interior of said member into said tube.

5,437,266

## COIL SCREW SURGICAL RETRACTOR

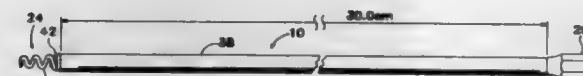
William McPherson, 14605 Ancloret Rd., Tampa, Fla. 33624; William B. Saye, and Eddie J. Reddick, both of 790 Church St. Ext. Ste. 380, Marietta, Ga. 30060

Filed Jul. 2, 1992, Ser. No. 909,223

Int. Cl.<sup>6</sup> A61B 17/02

U.S. Cl. 600—217

16 Claims



10. A surgical retractor assembly, comprising:

- (a) an elongate tubular sheath for introduction of a retractor into the body of animal, said sheath having a proximal end, a distal end, and a predetermined substantially uniform minimum inside diameter extending from said distal end to said proximal end;
- (b) an elongate rigid shaft having a proximal end, a distal end, and a maximum outside diameter less than said predetermined minimum inside diameter of said sheath, said shaft having a length greater than the length of said sheath and being adapted to be inserted through said sheath from said proximal end to said distal end; and
- (c) a coil screw attached to said distal end of said shaft and

extending outwardly therefrom to a sharp tip, said coil screw comprising a plurality of loops formed from an elongate wire, said elongate wire having a curved cross-section, said coil screw having an outside diameter less than said predetermined minimum inside diameter of said sheath, said coil screw terminating with a substantially flat surface at said sharp tip, a sharp edge being formed at said tip by the intersection of said flat surface and the outer surface of said elongate wire, and wherein the spacing between said loops of said coil screw is substantially about 2.4 to 3.2 millimeters whereby one or more sets of adjacent loops in said coil screw are sized and spaced to receive the wall of an organ so that the organ may be gripped and manipulated.

5,437,267

## DEVICE FOR DELIVERING AEROSOL TO THE NASAL MEMBRANES AND METHOD OF USE

Allan Weinstein, 9205 Pegasus Ct., Potomac, Md. 20854, and Robert Weinstein, 62 Commonwealth Ave., Boston, Mass. 02116

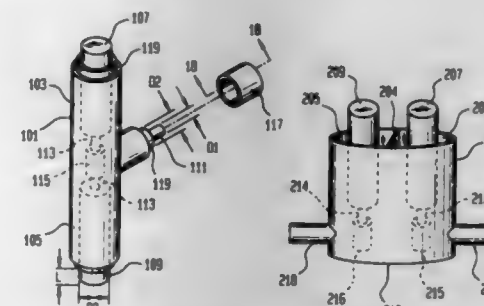
Filed Aug. 3, 1993, Ser. No. 101,328

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> A61M 11/00, 15/08, 16/10; A62B 7/00

U.S. Cl. 128—200.23

12 Claims



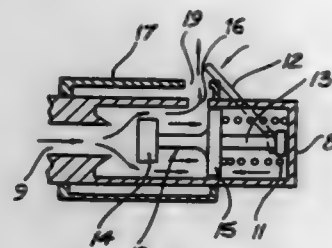
1. A device for delivering medication to a patient's nasal membranes and minimizing systemic side effects from administering the same, comprising:

- a housing having first and second chambers;
- said first chamber having a first internal compartment and a first removable canister of a first medication housed in said first compartment;
- said second chamber having a second internal compartment and a second removable canister of a second medication housed in said second compartment;
- said housing further having at least one outlet nozzle selected from (a) at least one common outlet nozzle in fluid communication with said canisters of medication and means for independently allowing aerosol spray from either of said first or second canisters to be discretely released through an exit nozzle to said common outlet nozzle and (b) a separate outlet nozzle in fluid communication with each of said first and second canisters of medication and means for independently allowing aerosol spray from one of said canisters to be discretely released through an exit nozzle to said separate outlet nozzle associated therewith;
- means for delivering aerosol directly onto a patient's nasal membranes and minimizing systemic side effects from said administration; and
- means for indicating at least one of (a) a prescribed dispensing sequence of medicament from said aerosol canisters received in said chambers, (b) the medicament contained in each of said canisters, and (c) patient symptoms to be treated by each of the medicaments released as aerosols from said canister.

5,437,268

**DIVING REGULATOR DEMAND VALVE WITH BAFFLES TO REDUCE BREATHING EFFORT AND VENTURI ADJUSTING MEANS**

Kim Preece, Manly Vale, Australia, assignor to T.D. Preece & Co. Pty. Ltd., Manly Vale, Australia  
Continuation of Ser. No. 654,659, Apr. 5, 1991, abandoned. This application Jun. 3, 1993, Ser. No. 71,946  
Claims priority, application Australia, Jun. 6, 1989, PJ4577  
Int. Cl.<sup>6</sup> A61M 16/00; A62B 7/04; F16K 31/26, 17/20  
U.S. Cl. 128—205.24 20 Claims



1. In a breathing regulator for use in underwater breathing through the mouth of a user including:
  - a primary housing with a breathing chamber having an inlet and an outlet;
  - a valve across the primary housing blocking the inlet and the outlet when closed and enabling travel of air between the inlet and the outlet upon demand by the user and thence from the housing via a mouthpiece to the mouth of the user;
  - a movable diaphragm in the primary housing responsive to demand for air from the user;
  - the improvement to the valve across the housing comprising:
    - a flow path within the primary housing between the inlet and the outlet;
    - a poppet slidably mounted in the flow path to open and close the flow path, the poppet including an elongated member having first and second ends with a first air baffle at one of the ends;
    - means for providing a bias on the poppet to normally close the flow path, the poppet when urged against the bias opening the flow path; p1 means connecting the moveable diaphragm and the poppet for moving the poppet responsive to the moveable diaphragm;
    - at least one second air baffle on the elongated member, located intermediate the first and second ends in the flow path, air, responsive to demand of the user traveling through the valve and continuously impinging upon the at least one second baffle and reduces the effort of the user required to operate the valve upon demand for air; and,
    - means for venturi assisted air direction through the valve comprising a hole in the primary housing of the valve and rotatable concentric sleeve about the primary housing and with an opening therein which selectively aligns with the hole to direct and throttle the free flow of air through the valve.

5,437,269

**MOUTH TO MOUTH RESUSCITATION DEVICE WITH OPTIONAL OXYGEN AUGMENTATION**

Loro W. Gooch, Pinellas Park, Fla., assignor to Dorothy Lillian Gooch; Dale Kwilecki and Charles E. Lykes, Jr., all of Clearwater, Fla.

Filed Jun. 10, 1992, Ser. No. 896,224

Int. Cl.<sup>6</sup> A61M 16/00

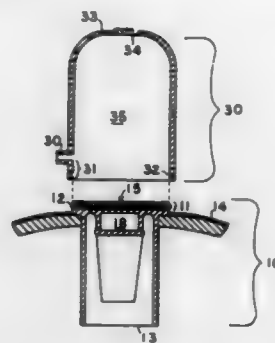
U.S. Cl. 128—202.28

20 Claims

1. A first aid apparatus useful in facilitating safe mouth-to-mouth resuscitation, the apparatus comprising:
  - a rescuer mouthpiece, which comprises a rescuer mouth port of dimension permitting rescuer person's mouth to make airtight connection and blow into said rescuer mouth-

piece, a fluid or gas chamber, a rescuer fluid or gas outlet, said rescuer fluid or gas outlet further comprising a cylindrical rescuer connection means for a connection with a victim mouthpiece, and

a victim mouthpiece which comprises a cylindrical victim connection means adapted to make a snug connection with said cylindrical rescuer connection means but permit rotation of said victim mouthpiece with respect to said rescuer mouthpiece, a fluid or gas inlet port in fluid or gaseous communication with said rescuer fluid or gas outlet at said rescuer end which is adapted with flow



restriction apparatus at a victim chamber end so as to permit fluid or gas to flow from said rescuer end to said victim chamber, but not from said victim chamber to said rescuer end, and a generally oblong victim outlet port in fluid or gaseous communication with said victim chamber, said victim mouthpiece further tapered from said rescuer mouthpiece connection means to said victim outlet port, said victim outlet port being of a size to easily fit within a victim person's mouth and said tapered portion being of adequate length to thrust into a victim person's mouth and over a victim person's tongue.

5,437,270

**POWDER INHALER HAVING A MULTI-POSITIONED METERING CUP**

Philip W. Braithwaite, Worcester, United Kingdom, assignor to Innovata Biomed Limited, St. Albans, England

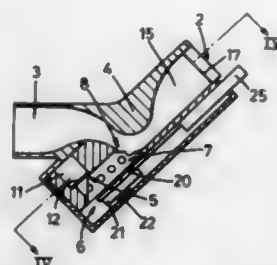
Filed Jan. 6, 1993, Ser. No. 24,721

Claims priority, application United Kingdom, Jul. 13, 1990, 9015522

Int. Cl.<sup>6</sup> A61M 15/08, 16/00; B05D 7/14; B65D 83/06

U.S. Cl. 128—203.15

12 Claims



1. An inhaler for delivering a substance in a finely divided form, comprising a body defining a storage chamber for the substance to be delivered and further defining an inhalation passage through which air is drawn via a mouthpiece; a metering member having a metering surface which is indented to provide at least one dispensing cup; and means for moving the metering member between a first position in which a dispensing cup is presented to the storage chamber to receive a volumetric dose of the substance and a second position in which a volumetric dose of the substance is presented to the inhalation passage in an upwardly open dispensing cup and in which, in normal use of the inhaler, at least a major proportion of the

substance in the dispensing cup is retained in the cup by the influence of gravity before air is drawn through the inhalation passage; said means for moving comprising means for moving the or each dispensing cup into a third position different from said first and second positions from which, in normal use of the inhaler, any of the substance remaining in the dispensing cup would tend to fall out of the cup, under the influence of gravity, after a dose of the substance has been presented in the cup to the inhalation passage and before that cup is again presented to the storage chamber, to ensure that the or each dispensing cup is substantially free from the substance before being presented to the storage chamber.

5,437,271

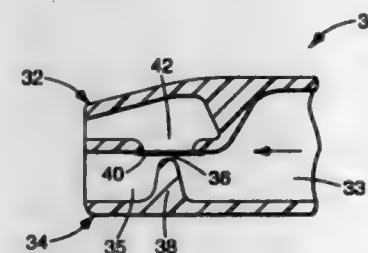
**DEAGGLOMERATORS FOR DRY POWDER INHALERS**  
Peter D. Hodson, Trowell, and David J. Greenleaf, Loughborough, both of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 31, 1994, Ser. No. 220,726

Int. Cl.<sup>6</sup> A61M 15/00, 16/20

U.S. Cl. 128—203.15

4 Claims



1. A deagglomerator for breaking up powder agglomerates in an air stream, comprising:
  - a housing defining a channel for the passage of powder laden air and further defining a mouthpiece; and
  - means for changing the geometry of said channel in response to varying air flow rate through said channel, said geometry changing means comprising:
    - a flexible membrane positioned within said housing so as to form a gap between said flexible membrane and said housing, said gap forming part of said channel, said flexible membrane being capable of flexing with increasing air flow rate through said channel so as to widen said gap; and
    - a hollow region formed in said housing and positioned adjacent said flexible membrane, said flexible membrane sealing off said hollow region from said channel, said hollow region and said channel both having an opening at the end of said mouthpiece such that a partial vacuum is created within said hollow region when a patient inhales at the end of the mouthpiece, thereby causing said flexible membrane to bow upwardly into said hollow region and widen said gap.

5,437,272

**PERFLUOROCARBON ASSOCIATED GAS EXCHANGE**  
Bradley P. Fuhrman, Pittsburgh, Pa., assignor to Alliance Pharmaceutical Corp., San Diego, Calif.

Filed May 1, 1991, Ser. No. 694,290

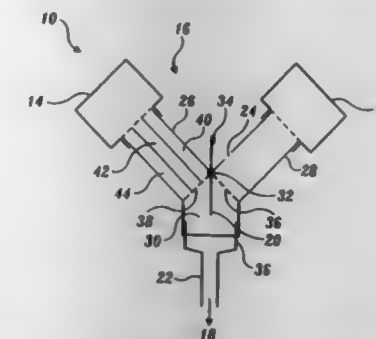
Int. Cl.<sup>6</sup> A61M 15/00

U.S. Cl. 128—203.12

18 Claims

1. A method for maintaining respiratory gas exchange, comprising the steps of:
  - first introducing into the pulmonary air passages of a mammalian host a volume of perfluorocarbon liquid from about 50% to not more than about 100% of the pulmonary functional residual capacity of the host; and
  - then physically admixing a volume of breathing gas with said introduced volume of perfluorocarbon liquid in the pulmonary air passages whereby said breathing gas forms

bubbles inside said liquid-containing pulmonary air passages so that oxygenation of said perfluorocarbon liquid



takes place in vivo, said admixing resulting when said host takes multiple breaths of a breathing gas.

5,437,273

**SLIDABLE ENDOTRACHEAL TUBE HOLDER**

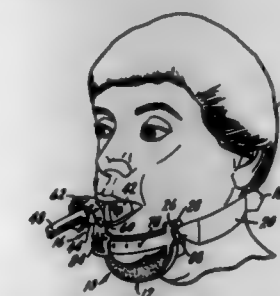
David A. Bates, Libertyville, and Barbara T. Skiba, Chicago, both of Ill., assignors to Sage Products, Inc., Crystal Lake, Ill.

Filed Jul. 8, 1993, Ser. No. 88,822

Int. Cl.<sup>6</sup> A61M 16/04

U.S. Cl. 128—207.17

17 Claims



1. A device for holding an endotracheal tube in alignment with the mouth of a patient, comprising
  - a. frame means shaped to engage the chin of a patient,
  - b. a tube-holding support engaged on said frame means in a position in alignment with the mouth of a patient,
  - c. means for securing said frame means to the head of a patient, and
  - d. adjustment means for changing the position of said tube-holding support on said frame means, said frame means including a frame member as a portion of said frame means, and said adjustment means including a slide formed in said tube-holding support and slidably engaged on said frame member, said slide including opposite guides extending from said support and engaging said frame member to retain said support on said frame member, and including means for locking said support to said frame member.

5,437,274

**METHOD OF VISUALIZING SUBMICRON-SIZE VESICLES AND PARTICLES IN BLOOD CIRCULATION**

Bahram Khoobehi, Metairie, La., and Gholam A. Peyman, 123 Walnut St., #805, New Orleans, La. 70118, assignors to Gholam A. Peyman, New Orleans, La.

Filed Feb. 25, 1993, Ser. No. 22,493

Int. Cl.<sup>6</sup> A61B 5/00

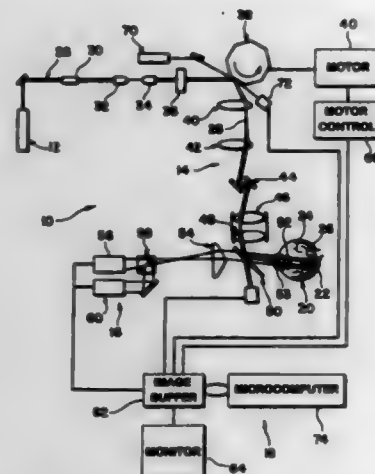
U.S. Cl. 128—633

30 Claims

1. A method of observing a carrier in the blood in the eye of an animal at a specific site, comprising the steps of encapsulating or incorporating a fluorescent dye in a "lipid vesicle, microcapsule, or nanocapsule" particulate carrier having a particle size of at least about 0.02 microns, said



fluorescent dye being capable of fluorescing within said carrier when a laser beam is applied, injecting the carrier into the blood stream of an animal so that the blood stream carries the carrier through the specific site, generating a laser beam from a scanning laser ophthalmoscope, said beam having a wavelength in the visible or



infrared part of the electromagnetic spectrum capable of fluorescing said dye, applying the laser beam to the carrier located at the specific site so as to fluoresce said fluorescent dye within the particulate carrier without rupturing the carrier, and visualizing and observing the particulate carrier at the specific site by fluorescing said dye.

5,437,275

**PULSE OXIMETRY SENSOR**

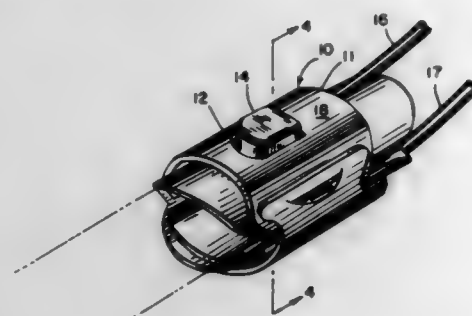
Neil T. Amundsen, Milwaukee, and Glenn T. Walters, Port Washington, both of Wis., assignors to Biochem International Inc., Waukesha, Wis.

Filed Feb. 2, 1994, Ser. No. 190,817

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—633

17 Claims



1. A pulse oximetry sensor comprising a photoemitter; a photodetector; and, a generally tubular housing having an inner wall, an outer wall and a lumen for receiving a body part of a patient; said housing having a pair of opposed pockets formed between the inner wall and the outer wall for removably receiving the photoemitter and the photodetector, respectively, said pockets each having a window in the inner wall through which light can pass and an aperture in the outer wall which aperture receives a portion of a respective one of the photoemitter and the photodetector; said housing also having side passages between the inner wall and the outer wall with each passage having an opening in the housing through which the photoemitter and the photodetector can be introduced into and removed from their respective pockets.

5,437,276  
**APPARATUS FOR MEASURING MAGNETIC SOURCES**  
Yoshiaki Takada, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

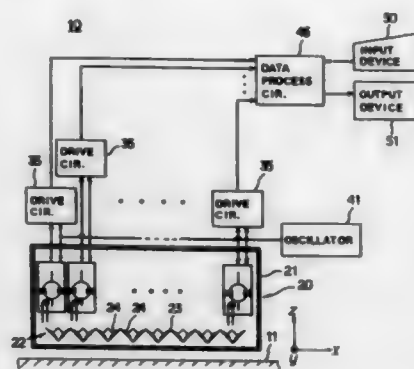
Filed Jul. 23, 1993, Ser. No. 96,468

Claims priority, application Japan, Jul. 24, 1992, 4-198638

Int. Cl.<sup>6</sup> A61B 5/05

U.S. Cl. 128—653.1

29 Claims



1. An apparatus for measuring a magnetic source existing in an object to be examined and producing a magnetic field outside the object, the apparatus comprising:  
means for detecting the magnetic field, the detecting means having a sensing portion adapted to be placed in proximity with the object and including an observing plane consisting of a plurality of sensing blocks each containing at least three sensing planes on which a magnetic sensor is mounted, normal directions to the sensing planes being different from each other,  
means for evaluating three-dimensionally intensities of the magnetic field at a given plurality of evaluation positions on the observing plane using the magnetic field detected by the detecting means; and  
means for obtaining positional information and quantity information of the magnetic source using the intensities of the magnetic field evaluated by the evaluating means.

5,437,277

**INDUCTIVELY COUPLED RF TRACKING SYSTEM FOR USE IN INVASIVE IMAGING OF A LIVING BODY**

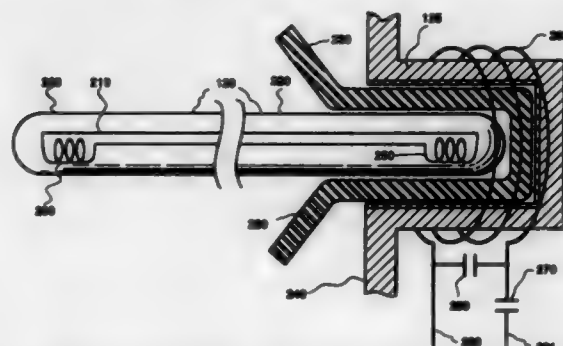
Charles L. Dumoulin, Ballston Lake, and Robert D. Darrow, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 96,205, Jul. 23, 1993, abandoned, which is a continuation of Ser. No. 793,923, Nov. 18, 1991, abandoned. This application Feb. 14, 1994, Ser. No. 194,979

Int. Cl.<sup>6</sup> A61B 19/00, 19/02

U.S. Cl. 128—653.1

14 Claims



1. A radiofrequency (RF) tracking system to track an invasive device in a living subject comprising:  
a) radiofrequency (RF) source for generating an RF signal;

- b) an interface assembly having  
1. retaining device and  
2. inducting coil connected to the RF source for transmitting the RF signal;  
c) an invasive device having an equipment end held by the retaining device and a distal end intended to be inserted in said subject, the invasive device also having  
1. a communicating coil in the equipment end inductively coupled to the inducting coil receiving the RF signal transmitted by the inducting coil,  
2. electrical leads connected to the communicating coil for passing the received RF signal, and  
3. a transmitting coil in the distal end connected to the electrical leads, for transmitting the RF signal into said subject;  
d) a sterile shield fitting between the interface assembly and the invasive device for creating an antiseptic sterile barrier between the invasive device and the interface assembly;  
e) an RF tracking means for calculating a position of the transmitting coil indicating the location and orientation of the invasive device from the RF signal.

5,437,278

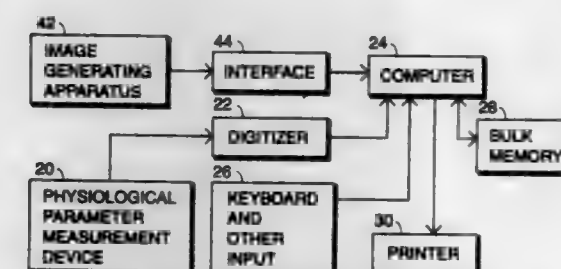
**MEDICAL DIAGNOSIS SYSTEM AND METHOD**

Peter J. Wilk, 185 West End Ave., New York, N.Y. 10023  
Filed Jan. 10, 1992, Ser. No. 819,120

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—653.1

14 Claims



1. A medical diagnostic method comprising the steps of:  
providing a video camera;  
aiming said video camera at a skin surface of a patient;  
operating said video camera to generate a digitized video signal encoding an image of the skin surface of the patient;  
automatically analyzing said video signal to derive digitized data pertaining to visually detectable characteristics of the skin surface of the patient;  
automatically comparing the digitized data with data stored in an electronic memory to derive a diagnosis as to a skin condition of the patient; and  
communicating the derived diagnosis to a user.

5,437,279

**METHOD OF PREDICTING CARCINOMIC METASTASES**

Lincoln C. Gray, Houston, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jul. 2, 1992, Ser. No. 908,239

Int. Cl.<sup>6</sup> A61B 6/03, 5/00

U.S. Cl. 128—653.1

1 Claim

1. A computer-executed method of analyzing a signal encoding machine-generated patient image data to identify zero or more lymph nodes having an elevated risk of containing cancer cells in a patient having a primary tumor, said method comprising:

- (a) receiving a first signal encoding the location of said primary tumor;  
(b) generating a second signal encoding the location of zero or more lymph nodes in said patient which appear to be abnormal or enlarged;  
(c) generating, as a function of said first signal and said

- second signal, a third signal encoding (i) an index of metastasis likelihood for a cluster of lymph nodes for said patient and (ii) a location for said cluster of lymph nodes for said patient; and  
(d) displaying a representative of said third signal;  
(e) wherein the location of said zero or more lymph nodes in said patient which appear to be abnormal or enlarged, encoded in said second signal, is derived from a signal encoding computerized tomography image data of said patient.

5,437,280

**MAGNETIC RESONANCE BREAST LOCALIZER**

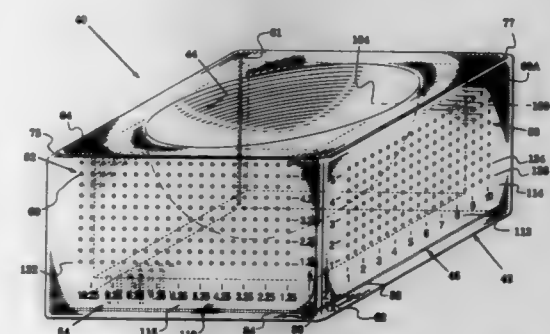
Karl L. Hussman, 501 Esplanade, #237, Redondo Beach, Calif. 90277

Filed Sep. 20, 1993, Ser. No. 124,690

Int. Cl.<sup>6</sup> A61B 5/055

U.S. Cl. 128—653.2

13 Claims



1. A magnetic resonance (MR) localizer for use with a medical instrument having a tip, comprising:  
at least one cup formed from a substantially MR transparent material to have a contour shaped and dimensioned to receive a breast therein;  
an MR visible coordinate system which serves to define points in an imaging space within the coordinate system having x, y, and z coordinate axes markers;  
means for positioning said at least one cup substantially within said imaging space; and,  
means for guiding the medical instrument to position the tip proximate to any chosen of said points.

5,437,281

**DIRECT DEMODULATION IN ULTRASOUND INSTRUMENTS**

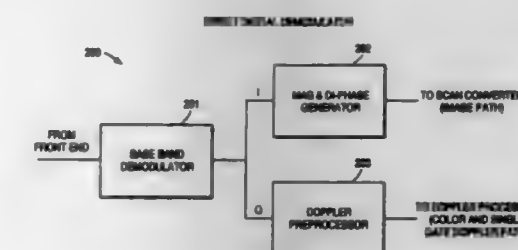
Sheng-Tz Lin, Santa Clara, and John P. Scheib, San Jose, both of Calif., assignors to Diasonics Ultrasound, Inc., Milpitas, Calif.

Division of Ser. No. 820,496, Jan. 14, 1992. This application May 4, 1994, Ser. No. 237,638

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—660.07

32 Claims



2. A digital demodulator for use in a real-time ultrasonic

imaging system having a front end for generating an ultrasound passband signal and a display for displaying an ultrasound image, said digital demodulator comprising: transform means for receiving said ultrasound passband signal and generating an analytic baseband signal in response to said ultrasound signal; and digital sampling mixer means for performing mixing by sampling of said analytic baseband signal to compensate the frequency and phase of said analytic baseband signal digitally, such that the ultrasound passband signal is converted to said analytic baseband signal without affecting the phase, Doppler information and magnitude contained therein.

5,437,282

# DRIVE SHAFT FOR ACOUSTIC IMAGING CATHETERS AND FLEXIBLE CATHETERS

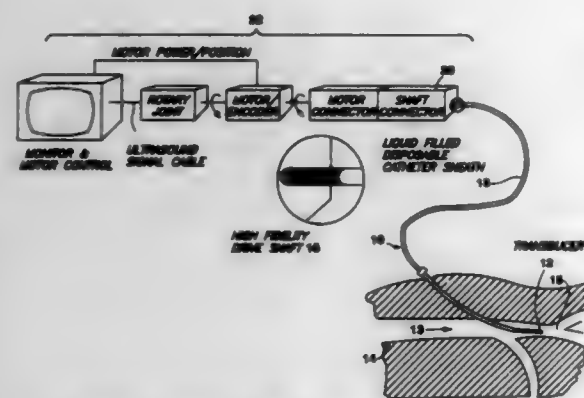
James D. Koger, Cambridge; Andrew Kapravy, Stoughton, both of Mass.; Kevin R. Heath, Providence, R.I., and Robert J. Crowley, Wayland, Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Filed Oct. 29, 1993, Ser. No. 144,725

Int. Cl.<sup>6</sup> A61B 8/12

U.S. Cl. 128—662.06

30 Claims



1. A flexible, rotatable shaft comprised of inner and outer tubular members in mutually interfering contact along their length, at least one of said tubular members comprising a wire, at least a portion of said wire being exposed to forces tending to produce kinks, said portion being comprised of a superelastic alloy, whereby substantial mechanical fidelity is achieved and resistance to damage improved by virtue of the superelasticity of said portion of said rotatable shaft.

5,437,283

# ENDOSURGICAL ULTRASONIC PROBE WITH INTEGRATED BIOPSY ACTUATOR

Joseph V. Ranalletta, Englewood; Dennis R. Dietz, Littleton, and Clyde G. Oakley, Englewood, all of Colo., assignors to Tetrad Corporation, Englewood, Colo.

Continuation-in-part of Ser. No. 989,515, Dec. 11, 1992, Pat. No. 5,335,663. This application Apr. 15, 1994, Ser. No. 228,507

Int. Cl.<sup>6</sup> A61B 8/12

U.S. Cl. 128—662.06

35 Claims



1. A medical endosurgical apparatus having ultrasonic imaging and biopsy capabilities, the apparatus comprising: an endosurgical ultrasonic imaging probe having a first portion that has a first shape which facilitates insertion

thereof, during use, through a surgical port and into a body cavity, and a second portion that has a second shape which substantially prevents insertion thereof, during use, through the surgical port and that remains outside of the body cavity, said first portion including ultrasonic means for receiving an ultrasonic signal and generating an electrical signal that is representative of the received ultrasonic signal and which may be used to prepare an image of tissue within the body cavity, said second portion including a probe handle for manipulating the probe, wherein said probe handle, due to said second shape, is substantially prevented from being inserted, during use, through said surgical port and remains outside the body cavity; biopsy actuator means for actuating a biopsy collection device that collects a tissue sample inside the body cavity; and means for facilitating readily physically interconnecting and readily physically disconnecting said probe handle and said biopsy actuator means so that said endosurgical ultrasonic imaging probe can be used with or without said biopsy actuator means and, when used with said biopsy actuator means, forms an integrated unit.

5,437,284

# SYSTEM AND METHOD FOR IN VIVO CALIBRATION OF A SENSOR

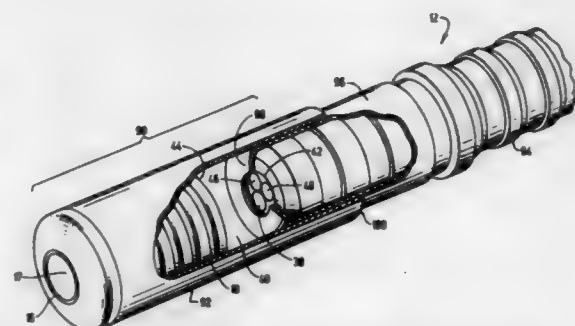
Brett A. Trimble, Del Mar, Calif., assignor to Camino Laboratories, Inc., San Diego, Calif.

Filed Dec. 30, 1993, Ser. No. 175,871

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—673

22 Claims



1. A calibration system for calibrating a sensor system having a first sensor that moves within a range when sensing a physiological parameter, the sensor system also having a processing system that monitors the position of the first sensor and provides an output signal representative of the physiological parameter based on the monitored position of the first sensor, the calibration system comprising:

- a stop device located so as to restrict the first sensor to a known position outside the sensing movement range when the sensor is engaged with the stop device;
  - a controllable force generator that selectively applies force to the first sensor to move it into contact with the stop device;
  - a force gauge that measures the force applied by the force generator and provides a measured force signal representative of the force applied by the force generator to move the first sensor into contact with the stop device; and
  - a memory having stored therein a reference force used to move the first sensor from a selected position at which the first sensor was subjected to a first force to the stop device;
- wherein the processing system controls the force generator to apply force to the first sensor to move it from an unknown position resulting from an unknown force acting upon the first sensor to the stop device, receives the measured force, signal from the force gauge, retrieves the

reference force, and determines the value of the unknown force based on comparing the reference force to the measured force.

5,437,285

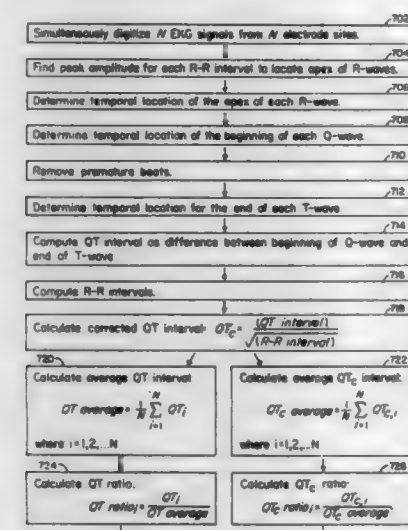
# METHOD AND APPARATUS FOR PREDICTION OF SUDDEN CARDIAC DEATH BY SIMULTANEOUS ASSESSMENT OF AUTONOMIC FUNCTION AND CARDIAC ELECTRICAL STABILITY

Richard L. Verrier, and Bruce D. Nearing, both of Bethesda, Md., assignors to Georgetown University, Washington, D.C. Continuation-in-part of Ser. No. 948,529, Sep. 22, 1992, Pat. No. 5,265,617, which is a continuation-in-part of Ser. No. 768,054, Sep. 30, 1991, Pat. No. 5,148,812, which is a continuation-in-part of Ser. No. 659,711, Feb. 20, 1991, abandoned. This application Nov. 30, 1993, Ser. No. 159,504

Int. Cl.<sup>6</sup> A61B 5/0452

U.S. Cl. 128—702

29 Claims



1. A method of assessing cardiac vulnerability comprising the steps of: sensing a plurality of ECG signals from a plurality of sites adjacent a heart; analyzing an amplitude of beat-to-beat alternation in T-waves of successive R-R intervals of at least one of said ECG signals to obtain an alternans measure; analyzing a magnitude of heart rate variability in successive R-R intervals of at least one of said ECG signals to obtain a heart rate variability measure; analyzing a magnitude of dispersion of repolarization in a QT interval across at least two of said plurality of ECG signals to obtain a dispersion measure; and simultaneously analyzing said alternans measure, said heart rate variability measure and said dispersion measure to assess cardiac vulnerability.

5,437,286

# INSTANT-ON, U-SHAPED CONDOM HOLDER PACKAGE

Alexander K. Stratton, 3912 N. Cactus Blvd., Tucson, Ariz. 85716

Filed Feb. 7, 1994, Ser. No. 192,348

Int. Cl.<sup>6</sup> A61F 6/04

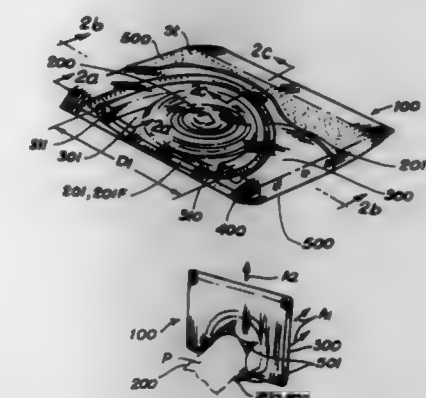
U.S. Cl. 128—844

4 Claims

1. A condom carrying apparatus, said apparatus comprising, in combination: (A) a condom member, said condom member comprising: (a) an open end defined by a flexible ring portion, (b) a folded condom material portion, and (c) a closed end portion; (B) a condom carriage member, said condom member being

detachably contained by said condom carriage member, said condom carriage member comprising:

- (a) a U-shaped opening delineated by a U-shaped structure designed for carrying said condom member, said U-shaped structure comprising:
  - (i) opposing ends that are spaced apart by a distance that facilitates lateral removal of said condom carriage member from said condom member after application of said condom member onto a user's penis,
  - (ii) an undercut groove for supporting said flexible ring portion,
  - (iii) a retainer shelf portion adjacent said groove for supporting said folded condom material portion, and
  - (iv) a wall structure adjacent said shelf portion, said wall structure forming a walled periphery about said U-shaped-opening; and



(C) at least one set of opposing, rupturable primary packaging film members attached to said carriage member to sanitarily cover said contained condom member, said flexible ring portion being releasably retained about said undercut groove, said folded condom material portion being disposed on said retainer shelf portion, and said condom's closed-end portion being disposed beyond said walled periphery about said U-shaped opening, said undercut groove having a variable depth undercut that facilitates releasably retaining said flexible ring portion in an enlarged open state during storage and application of said condom member, said variable depth undercut comprising a shallow portion that facilitates release of said condom member from said U-shaped opening structure upon applying a disengagement force to laterally remove said condom member from said carriage member.

5,437,287

# STERILIZATION OF TISSUE IMPLANTS USING IODINE

Richard E. Phillips, San Marcos; Mark A. Moore, Austin, both of Tex.; Ruth L. Russell, Long Beach, and David Cheung, Arcadia, both of Calif., assignors to Carbomedics, Inc., Austin, Tex.

Filed Aug. 17, 1992, Ser. No. 931,280

Int. Cl.<sup>6</sup> A61B 19/00; A61F 2/06, 2/02, 2/54

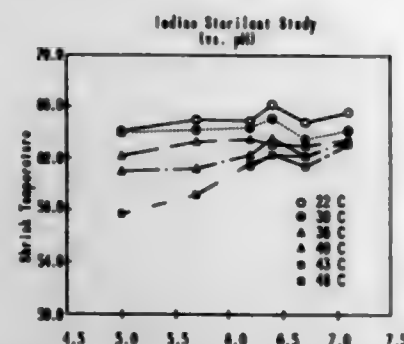
U.S. Cl. 128—898

12 Claims

1. A method for sterilizing a medical device intended for implantation inside the body of a mammal comprising the steps of: providing an implant comprised at least in part of excised proteinaceous tissue; and incubating said implant in a germicidal solution comprising



elemental iodine at a concentration, a temperature, and for a time effective to sterilize said implant without damaging



said implant, said germicidal solution having a pH between about 5.0-6.8.

5,437,288

## FLEXIBLE CATHETER GUIDEWIRE

Robert S. Schwartz, Rochester, Minn.; David Berry, Longmont, Colo.; Frederick S. Halverson, North Oaks, and James V. Donadio, III, Chaska, both of Minn., assignors to Mayo Foundation for Medical Education and research, Rochester, Minn.

Filed Sep. 4, 1992, Ser. No. 940,523

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128-772

22 Claims



1. A guidewire with a flexible distal end for use with catheters or the like comprising:

a metal wire having a proximal portion, a distal tip and a flexible portion therebetween, the flexible portion having a plurality of grooves formed in the metal wire so as to provide a desired flexibility, the grooves increasing in depth toward the distal tip to create a generally tapered core.

5,437,289

## INTERACTIVE SPORTS EQUIPMENT TEACHING DEVICE

Howard L. Liverance, 25 Van Etten La., Lake Katrine, N.Y. 12449, and Richard G. Spademan, 2600 Capitol Ave., Sacramento, Calif. 95816

Filed Apr. 2, 1992, Ser. No. 862,081

Int. Cl.<sup>6</sup> A61B 5/22, 5/103

U.S. Cl. 128-779

1 Claim

1. A self-contained, electronic device for providing operational feedback to a player of how he uses a sports equipment comprising:

a shoe having a heel area and a toe area;  
first means for sensing a force applied by a player to the heel area of the shoe;  
second means for sensing a force applied by the player to the toe area of the shoe;  
third means for sensing a force applied by the player to the heel area of the shoe, the third sensing means being positioned toward an instep side of the shoe with respect to the first sensing means;  
fourth means for sensing a force applied by the player to the toe area of the shoe, the fourth sensing means being positioned toward the instep side of the shoe with respect to the second sensing means;  
means, coupled to the first, second, third and fourth sensing

means, for determining whether the sensing means are activated in a predetermined order, wherein said predetermined order of activation is in the order of said first sensing means, said third sensing means, said second sensing means, and said fourth sensing means; and



alarm means operatively coupled to the determining means for indicating to the player when said sensing means are activated not in said predetermined order.

5,437,290

## SYSTEM AND METHOD FOR MONITORING INTRALUMINAL DEVICE POSITION

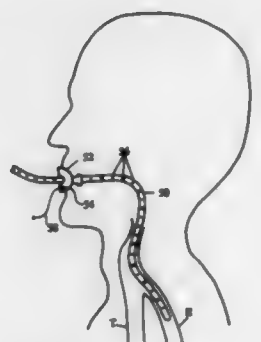
Ann F. Bolger, Menlo Park, and Chris Tacklind, Palo Alto, both of Calif., assignors to Board of Trustees of the Leland Stanford Jr. University, Palo Alto, Calif.

Continuation-in-part of Ser. No. 755,992, Sep. 6, 1991, abandoned. This application May 14, 1993, Ser. No. 62,670

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128-898

12 Claims



1. A method for monitoring penetration distance of an elongate device into a body lumen as the device is advanced and withdrawn within the lumen, said method comprising:  
detecting axially spaced-apart markings on the device as such markings pass by a location which is fixed relative to the lumen;  
producing an electronic output signal in response to the passage of each marking; and  
totalizing the signals to produce a value which corresponds to the penetration distance in real time.

5,437,291

## METHOD FOR TREATING GASTROINTESTINAL MUSCLE DISORDERS AND OTHER SMOOTH MUSCLE DYSFUNCTION

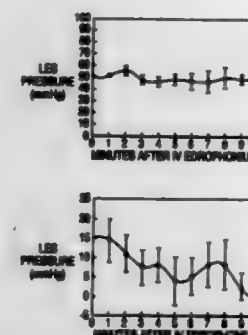
Pankaj J. Paricha, 5007 Southern Star Ter., Columbia, Md. 21044, and Anthony N. Kallou, 10708 Forestgate Pl., Glenndale, Md. 20769

Filed Aug. 26, 1993, Ser. No. 112,088

Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 128-898

24 Claims



1. A method for in vivo treatment of smooth muscle disorders of a mammal, comprising:  
injecting directly into a smooth muscle in a mammal an amount of a neurotoxin which inhibits neurotransmitter release from nerve terminals.

5,437,292

## METHOD FOR SEALING BLOOD VESSEL PUNCTURE SITES

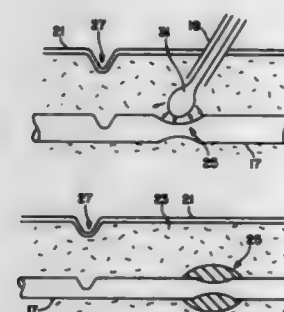
Nicholas Kipchidze, Bayside; Victor Nikolychik, Whitefish Bay, and John E. Baker, Wauwatosa, all of Wis., assignors to Bioscal, LLC, Bayside, Wis.

Filed Nov. 19, 1993, Ser. No. 155,457

Int. Cl.<sup>6</sup> A51B 17/00

U.S. Cl. 128-898

17 Claims



1. A method for sealing a puncture site in the wall of a blood vessel, the puncture site having been created accidentally, or intentionally during an endovascular or surgical procedure, wherein a substantially tubular percutaneous delivery device is positioned adjacent a blood vessel puncture site without penetrating the vessel, the method comprising the steps of:  
preparing a supply of a first solution containing fibrinogen; placing said fibrinogen-containing solution in a first syringe apparatus;  
preparing a supply of a second solution containing thrombin; placing said thrombin-containing solution in a second syringe apparatus;  
applying occlusive compression to the blood vessel at a position upstream of the puncture site;  
releasing the occlusive compression for a brief period of time to enable the puncture site to release an amount of blood into the tissue surrounding the puncture site, sufficient to surround the immediate vicinity of the puncture site, and

thereafter reapplying the occlusive compression to stop release of blood from the puncture site;

connecting the first and second syringe apparatus in simultaneous fluid communication with a mixing region and thereafter the delivery device so as to enable mixing of the fibrinogen and thrombin solutions prior to delivery to the puncture site;

actuating the first and second syringe apparatus so as to substantially simultaneously introduce the fibrinogen- and thrombin-containing solutions into the mixing region to form a gel and thereafter into the delivery device, and into the tissue of the patient adjacent to the puncture site but not into the blood vessel, so as to enable the gel to thereafter substantially solidify around the puncture site and seal the puncture site against further release of blood.

5,437,293

## COMBINED BRUSH AND COMB FOR APPLYING HAIR TREATMENT LIQUID

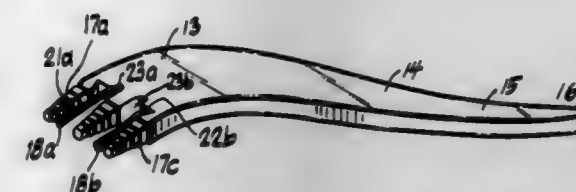
Edward Colon, Fairfield; Mary M. Schuid, Stamford, and Joseph Pereira, West Redding, all of Conn., assignors to Colatrol Inc., New York, N.Y.

Continuation of Ser. No. 700,383, May 3, 1991, abandoned. This application Sep. 2, 1992, Ser. No. 948,624

Int. Cl.<sup>6</sup> A45D 24/16

U.S. Cl. 132-120

7 Claims



1. A combined brush-comb adapted to apply touches of hair treatment liquid to a head of human hair, the combined brush-comb comprising a handle means and head means connected thereto and being without an internal liquid reservoir therein; said handle means providing a handle grip permitting the combined brush-comb to be manipulated by a user's hand; said head means being adapted to transfer the hair treatment liquid from a container thereof by dipping the head means therein and applying the hair treatment liquid to selected areas of the head of human hair;

said head means comprising comb tines and at least one brush tuft, each combine being elongated and having a surface thereon and having an imaginary axis and at least one groove in said surface formed in a plane about perpendicular to said axis; said groove being fillable with hair treatment liquid only by dipping the tine into the hair treatment liquid; and

said at least one brush tuft comprising a plurality of bristles, said brush tuft being about parallel to one of said comb tines and sufficiently proximate said one of said comb tines to be replenished with hair treatment liquid from said comb tine groove when said groove contains said hair treatment liquid;

wherein said handle means is a generally flat member, in side view, and in front view has a curved base portion, a curved center portion and a curved end portion terminating in a tip.

5,437,294

**COMPACT WITH ROTATABLE PANEL IN BASE AND/OR COVER**

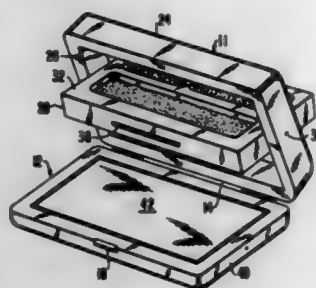
John A. Ebbets, III, Rockville Centre, N.Y., and Dennis J. Anderson, Randolph, N.J., assignors to LIR-USA Manufacturing Co., Inc., Yaphank, N.Y.

Filed Mar. 4, 1993, Ser. No. 27,207

Int. Cl.<sup>6</sup> A45D 42/02; B65D 69/00

U.S. Cl. 132—304

11 Claims



1. A compact for containing cosmetics, having an exterior and an interior and including a base member, a cover member, and means for connecting the base and cover members together in a manner permitting relative movement of the members to open and close the compact, wherein said base member comprises

- (a) a frame, exposed to the exterior of the compact when the compact is closed, defining and completely laterally surrounding at least one through opening;
- (b) at least one panel, said one panel having opposed major faces and being shaped and dimensioned to be received within said one opening in substantially flush relation to the frame, one of said major faces of said one panel being formed as a tray for holding cosmetic material to be contained in the compact; and
- (c) means for pivotally mounting said one panel to the frame for rotation within said one opening, relative to the frame, about an axis extending across said one opening, into and out of at least one position in which said one panel lies substantially flush with the frame and one of said major faces is exposed to the exterior of the compact when the compact is closed.

5,437,295

**METHOD AND APPARATUS FOR CONSTANT PROGRESSION OF A CLEANING JET ACROSS HEATED SURFACES**

Clinton A. Brown, Baltimore; William E. Hellyer; John T. Huston, both of Lancaster, and Anthony W. Dickman, Reynoldsburg, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 877,987, May 2, 1992, Pat. No. 5,337,438.

This application May 20, 1994, Ser. No. 247,001

Int. Cl.<sup>6</sup> B08B 3/02

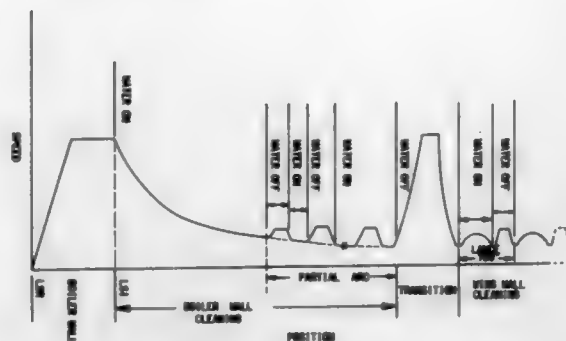
U.S. Cl. 134—37

17 Claims

1. A method of operating a sootblower including a retractable lance tube having at least one nozzle through which a spray of a fluid cleaning medium is directed against surfaces of a heat exchanger for cleaning said surfaces, comprising the steps of:

- projecting said spray of cleaning medium from said nozzle and directing said spray to impinge against said surfaces thereby cleaning said surfaces;
- rotating said lance tube and said nozzle at a given rate to cause rotation of said spray;
- longitudinally moving said lance tube along an axis;
- storing within a memory device a schedule of rate of lance tube rotation for various longitudinal positions of said lance tube, said schedule being derived as a function of both the rotational and longitudinal positions of said nozzle

and the distance of travel of said spray from said nozzle to said surfaces; and



varying said rate of lance tube rotation during each rotation of said lance tube according to said schedule to maintain a substantially constant rate of progression of said spray across said surfaces.

5,437,296

**SELF-CONTAINED MOBILE HEAT EXCHANGE TUBE BUNDLE CLEANING DEVICE**

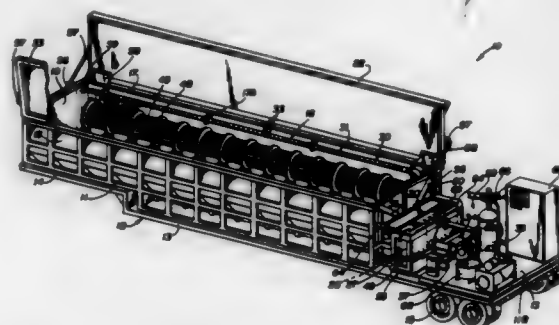
Robert Citino, Salem, Ohio, assignor to Pure Oil Engineering & Consultants Company, Salem, Ohio

Filed Jun. 7, 1994, Ser. No. 255,944

Int. Cl.<sup>6</sup> B08B 3/02

U.S. Cl. 134—108

13 Claims



1. An apparatus for cleaning heat exchanger tube bundles in a mobile self-contained enclosed environmentally isolated environment comprises in combination, a tube bundle receiving reservoir enclosure having a contoured bottom, upstanding opposing sidewalls and end walls, doors pivotally secured to said sidewalls, means for moving said doors in relation to said tubular bundle receiving reservoir enclosure, a cleaning fluid sump in communication with said tubular bundle receiving reservoir enclosure, drive and guide roller assemblies in said tubular bundle receiving reservoir enclosure to receive said heat exchanger tubular bundles, means for longitudinally adjusting said guide and drive rollers, and means for transversely adjusting said guide roller assembly in relation to said drive roller assembly, adjustable spray means within said tubular bundle receiving reservoir enclosure for spraying a cleaning fluid over the length of said heat exchanger tubular bundle, a main pump and filter assembly for recirculating said cleaning fluid from said sump to said adjustable spray means, a cleaning fluid supply reservoir interconnected with said sump, means for heating said cleaning fluid in said supply reservoir prior to recirculating through said main pump and filter assembly, thrust bearing assemblies in said tubular bundle receiving reservoir enclosure for engaging and guiding said heat exchanger tubular bundles during rotation within said tubular bundle receiving reservoir, means for controlling said drive roller assembly drive means, said main pump and filter assembly and

said means for heating said cleaning fluid in said cleaning fluid supply reservoir.

5,437,297

**CRANK HANDLE ASSEMBLY FOR USE IN AN UMBRELLA**

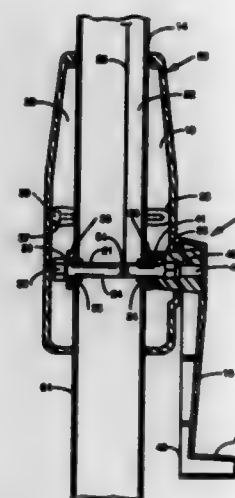
David H. Crisman, Baraboo, Wis., and Glen D. Kemnitz, Gallatin, Tenn., assignors to Sunbeam Corporation, Fort Lauderdale, Fla.

Filed Oct. 30, 1992, Ser. No. 969,641

Int. Cl.<sup>6</sup> A45B 25/14; G05G 1/08

U.S. Cl. 135—20.1

23 Claims



1. An umbrella, comprising:

- a collapsible cover,
- means for operatively moving said cover between open and closed positions,
- a hollow pole supporting said cover and having aligned openings,
- a crank handle assembly mounted in said pole, and including a rotatable, external crank and elongated bolt means transversely extending across said pole and through said aligned openings in said pole,
- a flexible cable extending within said hollow pole, one end portion of said cable being connected to said means for moving said cover, and the other end portion of said cable being connected to said bolt means, and said cable being wound around said bolt upon rotation of said crank for operation of said umbrella,
- said bolt means having a head portion which is insert molded in said handle to form a unitary piece consisting of said bolt means and said crank, and said head portion being fixedly secured in said crank for rotation therewith upon said rotation of said crank in said operation of said umbrella, and
- securing means for securing said crank handle assembly to said pole.

5,437,298

**SUNSHADE ARRANGEMENT**

Chen Y. Lin, 5th Fl., No. 58, Lane 185, Chung Cheng Rd., Lu Chou Hsiang, Taipei Hsien, Taiwan

Filed Nov. 24, 1993, Ser. No. 156,911

Int. Cl.<sup>6</sup> E04H 15/58

U.S. Cl. 135—117

7 Claims

1. A sunshade arrangement comprising:

- first and second pairs of spaced post means (10 and 20) each having upper and lower ends and including an outer tubular member (11) having upper and lower ends, an inner tubular member (12) telescopically received in the outer tubular member (11), and a means for controlling relative

telescopical movement between the inner and outer tubular members (11 and 12); first and second tubes (30 and 40) respectively mounted to the upper ends of the first and second pairs of post means (10 and 20);



a screen (80) having a first end securely mounted to the second tube (40) and a second end securely mounted to the first tube (30); and a socket means (90) having two receiving seats to hold the tubes (30, 40) and the associated post means (10, 20) together in parallel.

5,437,299

**MULTIPHASE FLUID FLOW SPLITTING AND MEASUREMENT**

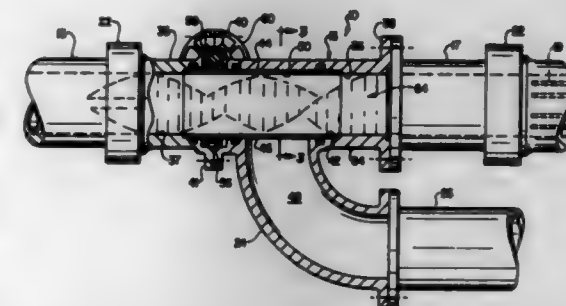
Miroslav M. Kolpak, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 7, 1994, Ser. No. 255,032

Int. Cl.<sup>6</sup> F17D 1/00

U.S. Cl. 137—1

17 Claims



16. A method for controlling the gas-to-liquid ratio in a mixture of gas and water flowing through a conduit system including a main conduit and at least one branch conduit intersecting said main conduit to conduct a portion of said mixture away from said main conduit, comprising the steps of: maintaining a minimum fluid velocity in said main conduit at a point of intersection of said main conduit with said branch conduit of at least about 8.0 feet per second; providing an effective cross-sectional flow area of the intersection of said branch conduit with said main conduit sufficient to provide a fluid velocity of fluid entering said branch conduit of at least about 15.0 feet per second so as to provide a gas-to-liquid ratio of fluid in said branch conduit substantially the same as the gas-to-liquid ratio of the fluid flowing in said main conduit and; providing means forming an orifice at said intersection of said branch conduit with said main conduit, said means



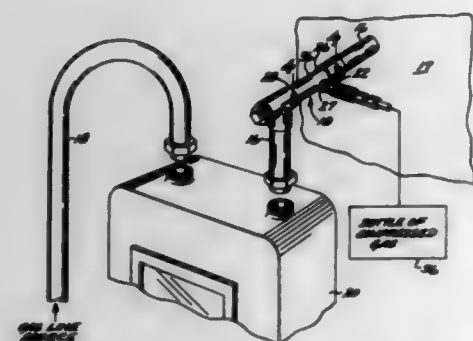
being operable to vary the effective cross-sectional flow area of said orifice to change the gas-to-liquid ratio of fluid flow entering said branch conduit at will.

5,437,300

**APPARATUS FOR CHANGING OUT GAS METERS**  
Harold R. Wianle, Kansas City; Ronald D. Bridgewater, Lee's Summit, and Robert K. Kitterman, Kearney, all of Mo., assignors to R. W. Lyall & Company, Inc., Corona, Calif.  
Filed Nov. 14, 1994, Ser. No. 337,768  
Int. Cl.<sup>6</sup> F16K 43/00

U.S. Cl. 137-112

12 Claims



1. A bypass valve to be connected in line with a gas service line from a gas meter comprising:

- an elongated tubular housing formed with a flow chamber therein having at one end a flow inlet and at its opposite end a flow outlet and including a side wall formed with an auxiliary port;
- a poppet cage mounted in said flow chamber and defining a poppet chamber therein and formed on one end adjacent said flow inlet with an annular auxiliary seat facing toward said flow outlet and on its opposite end with an annular flow seat facing toward said auxiliary seat and including a cage wall formed with a cage outlet spaced from said seats, said cage being connected on its end opposite said one end with said auxiliary port for communicating gas flow from said port into said cage; and
- a poppet received floatably in said poppet chamber to be, when said flow inlet is pressurized to a predetermined pressure, driven floatably in said poppet chamber against said flow seat to direct gas flow out said cage outlet and, when said auxiliary port is pressurized with gas to a selected pressure, greater than said predetermined pressure, be driven floatably in said poppet chamber against said auxiliary seat to direct gas flow from said auxiliary port out said cage outlet.

5,437,301

**INFLATION AND DEFLATION VALVE ESPECIALLY ADAPTED FOR USE WITH DUNNAGE AIR BAGS**  
J. W. Ramsey, Benton, Ark., assignor to Sunrise Arkansas, Inc., Benton, Ark.

Filed Aug. 19, 1993, Ser. No. 108,422  
Int. Cl.<sup>6</sup> F16K 15/20; B61D 45/00

U.S. Cl. 137-231

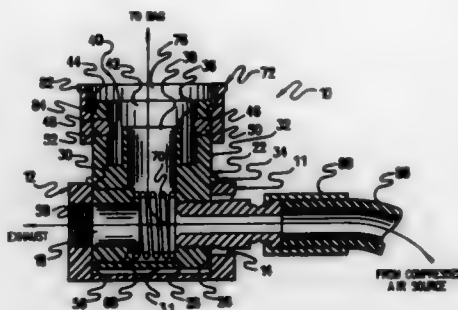
14 Claims

5. A method of inflating and deflating a dunnage air bag including an air bag valve, comprising the steps of:
- providing a source of compressed air;
  - providing an inflation and deflation valve comprising:
    - a valve body including an air supply bore for connection to said source of compressed air, an air exhaust passage, and an air conduit including a connector for engagement with said dunnage air bag valve;
    - an exhaust valve in said valve body for selectively opening and closing said air exhaust passage;
    - a valve actuator for selectively opening and closing said exhaust valve;

connecting said air supply bore to said source of compressed air;

connecting said air conduit connector to said dunnage air bag valve;

selectively operating said valve actuator to inflate or deflate said dunnage air bag without disconnection from said inflation and deflation valve; and



selectively directing an air stream from said compressed air source through said air supply bore and out of said air exhaust passage when said exhaust valve is open to facilitate deflation of said dunnage air bag through induced vacuum aspiration.

5,437,302

**EQUIPMENT FOR THE INTERCONNECTION OF TWO LINES TO ALLOW RUNNING OF PIGS**

José Eduardo M. Da Silva; Antônio Carlos F. Lino; Zephyrino L. Machado Filho, and Marcelo José B. Teixeira, all of Rio de Janeiro, Brazil, assignors to Petroleo Brasileiro S.A. - PETROBRAS, Rio de Janeiro, Brazil

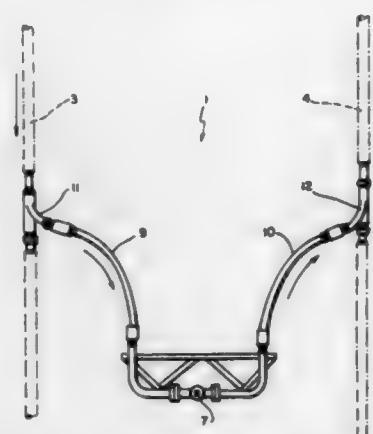
Filed Aug. 3, 1993, Ser. No. 100,920

Claims priority, application Brazil, Aug. 3, 1992, 9203009

Int. Cl.<sup>6</sup> B08B 9/04

U.S. Cl. 137-242

2 Claims



1. A device for the interconnection of two flexible flow lines adapted to extend between a subsea production station and a surface facility to allow running of pigs from one line to another, said device comprising a modular crossover apparatus including a control valve connected between two curved pipelines and a pair of substantially Y-shaped connections insertable in said flow lines respectively with ends of said curved pipelines remote from said control valve being connected to said Y-shaped connection whereby upon selective actuation of said control valve to an open position, a pig can be launched from the surface facility through a first of said flow lines, passed through said crossover apparatus and returned through a second of said flow lines to clean said second flow line and push all debris back to said surface facility.

5,437,303

**APPARATUS FOR CONTAINING FLUID LEAKS AND OVERFLOWS FROM APPLIANCES**

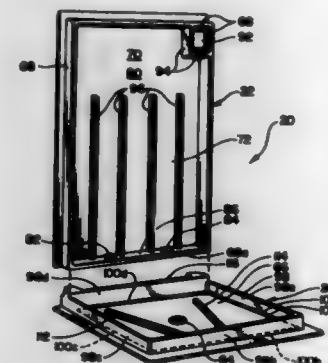
Addison M. Johnson, 1346 E. Juniper Beach Rd., Camano Island, Wash. 98292

Continuation-in-part of Ser. No. 891,458, May 29, 1992, Pat. No. Des. 347,468. This application May 31, 1994, Ser. No. 251,511

Int. Cl.<sup>6</sup> E03B 7/08; F16L 55/07

U.S. Cl. 137-312

19 Claims



1. An assembly for containing fluid leaks and overflows from an appliance to which a fluid supply conduit, a fluid waste conduit, and a power supply outlet are operatively connected, comprising:

- a. a wall protecting member arranged between the appliance and a wall against which the appliance is mounted, where the wall protecting member is fluid impermeable and has at least one orifice through which the fluid supply conduit, fluid waste conduit, and power supply outlet extend and mounted therein; and
- b. a floor protecting member arranged between the appliance and a floor on which the appliance is mounted, where the floor protection member is fluid impermeable and has an overflow orifice formed therein to allow fluid to drain from the floor protecting member to a destination of waste fluid, wherein the wall protecting member being positioned and mounted relative to the floor protecting member, thereby allowing any fluid leakage and overflow from the fluid supply conduit and the fluid waste conduit to fall into the floor protecting member.

5,437,304

**DEVICE FOR ALTERNATE ADMISSION OF A LIQUID OR A PRESSURIZED GAS TO ONE OR MORE MOULDS USED IN PLASTICS PROCESSING**

Jean-Louis Delcroix, Avenue Meynard, Villa No. 12, 84600 Valréas, France

Filed Feb. 26, 1993, Ser. No. 22,999

Claims priority, application Germany, Mar. 30, 1992, 42 10 312.6

Int. Cl.<sup>6</sup> F16K 11/07, 11/083

U.S. Cl. 137-595

7 Claims

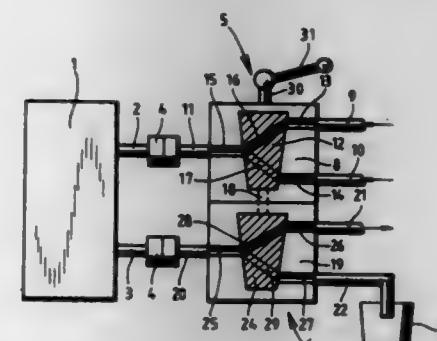
1. Device for alternate admission of a liquid or a gas under pressure to one or more moulds (1) used in plastics processing, comprising

- at least one pair of three-way valve elements (5, 6, 7, 48) with shut-off components (12, 24; 40 to 44) which are positively coupled one with another,
- a connection (9) for the admission of water and a compressed air connection (10) as well as an outlet (11) joined with a feed (2) for at least one mould (1) at the first three-way valve element (5 or 7),
- an inlet (20) joined with a drain (3) of at least one mould (1),
- a connection (21) for a liquid drain and an outlet (22) for

liquid and compressed gas at the second three-way valve element (6 or 48),

an arrangement of channels (13-17; 25-29; 34-39) in the valve body (8, 19, 32) and the moving shut-off component (12, 24, 40-44) of the two linked three-way valve elements (5, 6, 7, 48)

for communication between the connection (9) for the liquid feed and the outlet (11) joined with the feed (2) for the mould (1) at the first three-way valve element (5, 7), as well as between the inlet (20) joined with the drain (3) of the mould (1) and the connection (21) for a liquid drain at the second three-way valve element (7, 48) with the linked three-way valve elements (5, 6; 7, 48) in a first position,



for communication between the compressed gas connection (10) and the outlet (11) joined with the feed (2) of the mould (1) at the first three-way valve element (5, 7) as well as between the inlet (20) joined with the drain (3) of the mould (1) and the outlet (22) for liquid and compressed air at the second three-way valve element (7, 48) with the linked three-way valve elements (5, 6; 7, 48) in a second position, and

for blocking all connections, inlets and outlets (9, 10, 11; 20, 21, 22) at both three-way valve elements (5, 6; 7, 48) with the linked three-way valve elements (5, 6; 7, 48) in a third position.

5,437,305

FLOW CONTROL VALVE

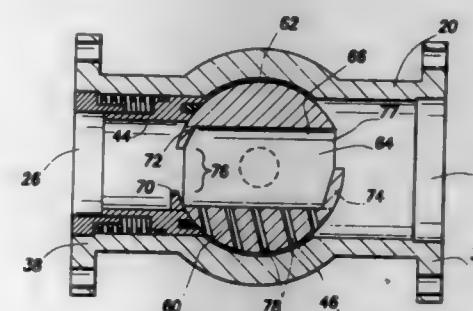
Chris M. Leinen, Houston, Tex., assignor to Forward Spin Technologies, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 108,394, Aug. 18, 1993, abandoned, which is a division of Ser. No. 949,459, Sep. 22, 1992, Pat. No. 5,287,889. This application Sep. 1, 1994, Ser. No. 299,998

Int. Cl.<sup>6</sup> F16K 5/10

U.S. Cl. 137-625.32

16 Claims



1. A valve for throttling flows through pipelines, comprising:

- a valve body having an inlet flow passage and an outlet flow passage therethrough;
- a valve element received in said body and having a valve element passage therethrough, said valve element passage

selectively alignable with said body inlet and body outlet passages;  
 an inlet flow diffuser extending from a wall of said inlet flow passage and terminating inwardly of said inlet flow passage wall;  
 a valve element inlet flow diffuser extending from wall of said valve element passage in a position diametrically opposed to said inlet flow diffuser;  
 a valve element outlet flow diffuser extending inwardly from said valve element passage at a position diametrically opposed to said valve element inlet flow diffuser and terminating inwardly of said valve element passage;  
 each said diffuser defining an effective area; and  
 the effective area of said valve element outlet flow diffuser is no larger than the combined effective area of said inlet flow diffuser and said valve element inlet flow diffuser.

5,437,306

## DOUBLE-SOLENOID TYPE ELECTROMAGNETIC VALVE

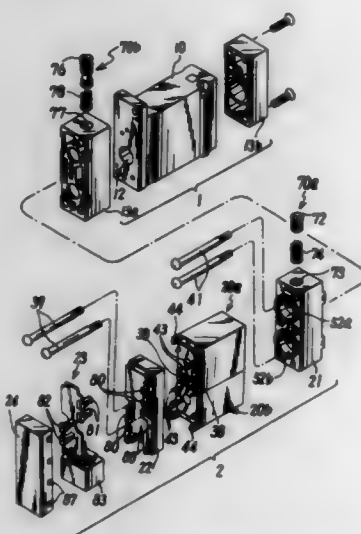
Yoshio Asou; Bunya Hayashi; Hideharu Sato; Takumi Matsumoto; Makoto Ishikawa; Ryushiro Kaneko; Keisuke Shimachi, and Shinichi Yoshimura, all of Yawara, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Dec. 1, 1993, Ser. No. 158,797

Int. Cl.<sup>6</sup> F15B 13/043

U.S. Cl. 137—625.64

7 Claims



1. A double-solenoid type electromagnetic valve, comprising:

- a main valve unit, having a main valve disc provided in a valve bore slidably in an axial direction thereof, and a pair of pistons arranged on both ends in an axial direction of said main valve disc, said main valve unit controlling a main fluid by switching over the main valve disc via said pistons driven by pilot fluid pressure; and
- a pilot valve unit having two solenoids for selectively applying said pilot fluid pressure on said pistons by action of the solenoids, wherein the two solenoids in said pilot valve unit have the same structure and the same external shape and are provided each with a connecting mechanism on a side thereof and are separably connected to one another via said connecting mechanism.

5,437,307

## INTAKE BYPASS VALVE

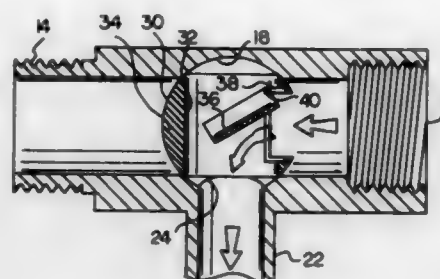
Lawrence D. Cianfrocca, II, 402 Potomac Ave., Fairmont, W. Va. 26554

Filed Jun. 27, 1994, Ser. No. 265,812

Int. Cl.<sup>6</sup> F16K 11/00

U.S. Cl. 137—878

3 Claims



2. An intake bypass valve comprising:

- a primary tubular member with an axis, the primary tubular member having a central extent with a cavity at its central extent for the receipt of a spherical ball;
- a secondary tubular member with an axis coupled to the primary tubular member, the secondary tubular member adapted to direct a flow of fluid from the central extent of the primary tubular member; and
- a spherical ball rotatably positioned within the cavity of the primary tubular member, the ball adapted to be rotated about an axis, the ball having a central aperture there-through with an axis, the ball also having a wall with a clapper plate pivotally located in the wall of the ball, the clapper plate including an exterior surface and a spring adapted to resiliently urge the clapper plate into a closed position wherein its exterior surface is co-extensive with the wall of the ball, the clapper plate adapted to be moved into an open position wherein the clapper plate is located within the aperture of the ball.

5,437,308

## DEVICE FOR REMOTELY ACTUATING EQUIPMENT COMPRISING A BEAN-NEEDLE SYSTEM

Pierre Morin, Levallois Perret; Christian Bardin, Rueil Malmaison, and Jean Boulet, Paris, all of France, assignors to Institut Francais du Pétrole, Malmaison, France

Continuation of Ser. No. 887,787, May 26, 1992, abandoned, which is a continuation of Ser. No. 459,284, Dec. 29, 1989, abandoned. This application Oct. 19, 1993, Ser. No. 154,446

Claims priority, application France, Dec. 30, 1988, 88 17603

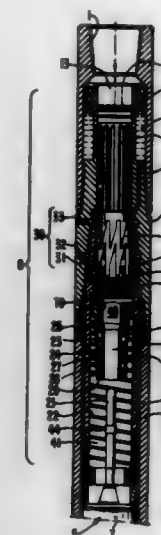
Int. Cl.<sup>6</sup> F15D 1/02

U.S. Cl. 138—46

6 Claims

1. A device for varying a flow condition of a fluid so as to enable a remote actuation a piece of equipment, the device comprising an actuating piston for enabling an actuation of the piece of equipment and including a bore through which the fluid flows, a nozzle, communicating with the bore, which axially slides relative to the actuating piston, a needle, cooperable with the nozzle, which varies the flow conditions of the fluid supplied to the device through the bore and the nozzle in response to axial movement of the nozzle relative the needle and means for returning the slidably mounted nozzle to a predetermined position relative to the actuating piston, and

wherein the nozzle and the needle are sized with respect to actuating piston such that the means for returning responds



accurately to a flow rate threshold value for actuating the piece of equipment.

5,437,309

## LOCKABLE WELL CAP

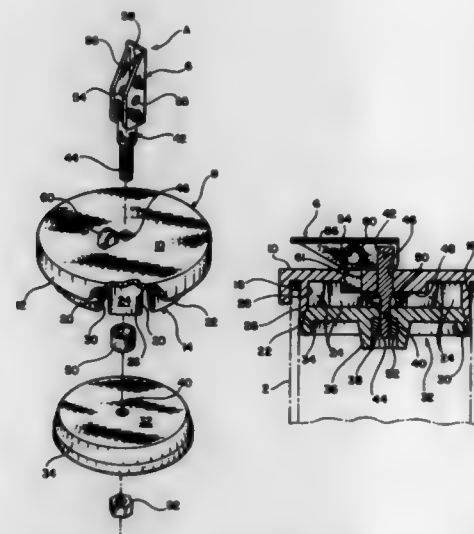
Robert D. Timmons, R.F.D. Meadowdale Rd., Prairie Du Sac, Wis. 53578

Filed Mar. 15, 1994, Ser. No. 213,204

Int. Cl.<sup>6</sup> F16L 55/10

U.S. Cl. 138—89

12 Claims



1. A locking cap for securing the open end of a well to prevent contaminants from entering the well comprising:

- a) cap member adapted to be disposed over the open end of a well pipe casing to be locked;
- b) outer flange member downwardly extending from said cap member and integral therewith, said outer flange member having an interior wall, an exterior wall and a bottom edge, said outer flange member interior wall is substantially perpendicular to said cap member and adapted to engage against the exterior surface of the well pipe casing to be locked;
- c) inner flange member downwardly extending from said cap member and integral therewith, said inner flange member having an interior wall, an exterior wall of uniform diameter and a bottom edge, said inner flange mem-

ber exterior wall is substantially perpendicular to said cap member and parallel to said outer flange inner surface, said inner flange member including a series of parallel slots extending longitudinally inward from said inner flange member bottom edge and towards said cap member to provide a series of radially expandable gripping fingers positioned along the perimeter of the well pipe casing interior surface;

- d) cam disk positioned coaxially adjacent said inner flange member bottom edge, said cam disk being selectively movable against said fingers to radially expand each of said fingers and cause the surface of said inner flange exterior wall to be substantially contacted along its length against the interior surface of the well pipe casing thereby securing said cap member in place; and
- e) means for actuating said cam disk to selectively urge said disk against said fingers.

5,437,310

## PLUG ASSEMBLY

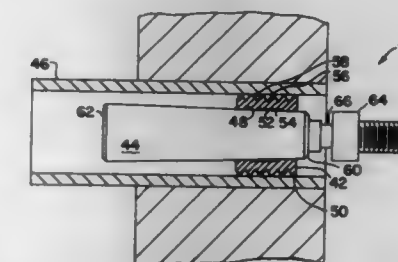
Eugene E. Cunningham, Dublin, Pa., assignor to Expando Seal Tools, Inc., Montgomeryville, Pa.

Filed Aug. 5, 1994, Ser. No. 286,527

Int. Cl.<sup>6</sup> F16L 55/10

U.S. Cl. 138—89

16 Claims



1. A plug assembly for use in plugging a tube having an inner surface, comprising:

- a ring having an inner surface and an outer surface, said outer surface for contacting the inner surface of the tube; and
- an elongate wedge receivable within said ring for radially outwardly expanding said ring to seal against the inner surface of the tube when said wedge is displaced axially at least partially through said ring, said wedge having an outer surface, said ring inner surface and said wedge outer surface being disposed in confronting relation and being slidable relative to one another, said ring inner surface having at least one groove formed therein and said wedge outer surface being smooth, said at least one groove in said ring inner surface cooperating with said wedge outer surface for reducing friction between said ring inner surface and said wedge when said wedge is being displaced through said ring.

5,437,311

## FUEL SYSTEM CONDUIT

Kim A. Reynolds, Berwyn, Pa., assignor to Markel Corporation, Norristown, Pa.

Continuation-in-part of Ser. No. 788,207, Nov. 5, 1991, abandoned. This application Oct. 14, 1993, Ser. No. 136,340

Int. Cl.<sup>6</sup> F16L 11/12

U.S. Cl. 138—115

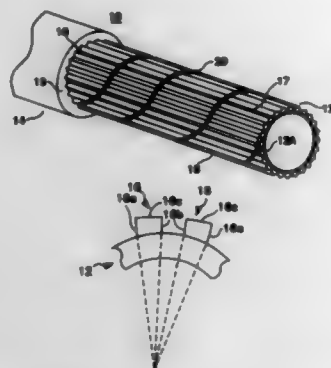
16 Claims

1. An improved fuel system conduit for transporting fuel and/or fuel vapor in an automobile comprising:

- an inner tube comprising fluorocarbon polymeric material and having an inner surface for contacting and containing the fuel or fuel vapor and having an outer surface comprising a plurality of exterior ridges substantially parallel to the longitudinal axis of the tube, said exterior ridges comprising a base, first and second sidewalls that are



substantially divergent, and a top wall connected between said first and second sidewalls; and an outer tube surrounding and coaxial with the inner tube, said outer tube comprising a thermoplastic polymeric



material, the interior surface of said outer tube having interior grooves substantially completely surrounding said exterior ridges such that said inner and outer tubes are mechanically locked together.

5,437,312

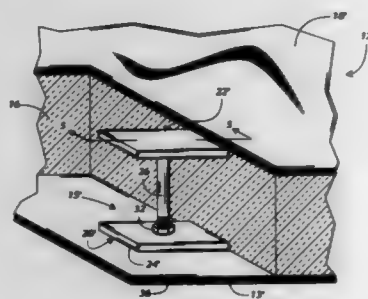
## REINFORCED INSULATION BLANKET

Marcelino A. Gumangan, Lenexa; James M. Bleigh, Olathe, and Paul M. Owyer, Bonner Springs, all of Kans., assignors to Performance Contracting, Inc., Lenexa, Kans.

Continuation-in-part of Ser. No. 9,843, Jan. 27, 1993, abandoned. This application Jan. 27, 1994, Ser. No. 188,148 Int. Cl.<sup>6</sup> F16L 59/14

U.S. Cl. 138—149

17 Claims



1. A reinforced insulation blanket for insulating an industrial component and supporting jacketing relative to the industrial component, the insulation assembly comprising:

a flexible insulation blanket including, at least, a top surface and a bottom surface; and a plurality of support assemblies connected to said flexible insulation blanket,

wherein each support assembly of said plurality of support assemblies includes, at least,

an upper plate exterior to said flexible insulation blanket and proximate to said top surface of said flexible insulation blanket for abutting said jacketing,

a lower plate exterior to said flexible insulation blanket and proximate to said bottom surface of said flexible insulation blanket for abutting the industrial component, wherein a separation distance is defined between said upper plate and said lower plate, and wherein said flexible insulation blanket is sandwiched between said upper plate and said lower plate, and a support member pierced through said flexible insulation blanket, wherein said support member connects said upper plate to said lower plate and maintains said separation distance between said upper plate and said lower plate, and

wherein said plurality of support assemblies are arranged

spatially separate from one another such that the reinforced insulation blanket is flexible.

5,437,313

## WEFT THREAD DISTRIBUTION DEVICE FOR A SERIES SHED LOOM

Marcel Christe, Rüti, Switzerland, assignor to Sulzer Rueti AG, Rüti, Switzerland

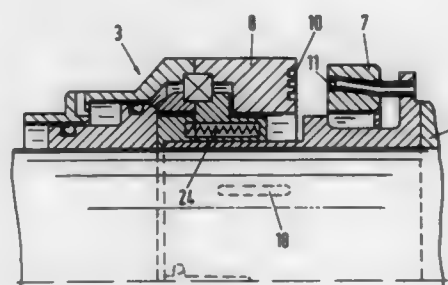
Filed May 6, 1994, Ser. No. 239,099

Claims priority, application European Pat. Off., May 13, 1993, 93810353

Int. Cl.<sup>6</sup> D03D 47/30

U.S. Cl. 139—28

9 Claims



1. A device for the distribution of weft threads onto weft ducts of a rotor of a series shed loom having an air-jet picking system, the device comprising a first part including a first axially oriented face (7) rotating with the rotor (2) and having a number of transfer ducts (11) for the weft yarns, a second part (8) which is rotatable and axially displaceable in relation to the first part and includes a second axially oriented face and a number of connecting ducts (10) for the weft yarns, at least one rolling bearing (14) coaxially mounting the first and second parts so that the first and second faces are opposite each other, means for biasing the first and second parts towards each other into an operating position and for maintaining a gap (9) between the first and second faces, and an operating mechanism (3) for axially displacing the second part (8) in relation to the first part (7) against a force generated by the biasing means to thereby uncover the transfer and connecting ducts (10, 11) for the weft yarn.

5,437,314

## WARP FEED CONTROLLER HAVING TENSION DETECTORS FOR USE IN TWIN BEAM WEAVING MACHINE

Tsutomu Sainen, Kanazawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan

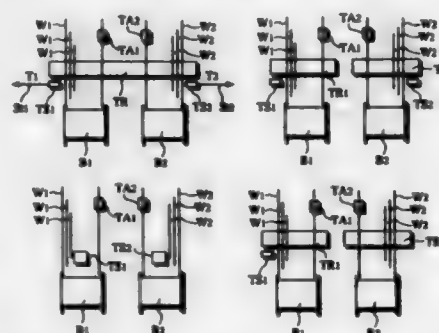
Filed May 11, 1994, Ser. No. 240,564

Claims priority, application Japan, May 11, 1993, 5-109566

Int. Cl.<sup>6</sup> D03D 49/06

U.S. Cl. 139—103

5 Claims



1. A warp feed controller for use in a twin beam weaving

machine having a pair of left and right warp beams for feeding two groups of warp yarns each in a sheet-like form, said warp feed controller comprising:

tension detection means for detecting a tension of at least one of the groups of warp yarns fed from the pair of warp beams;

a first control system for controlling a rotation of one of the warp beams on the basis of a tension deviation from a target tension under detection of the tension by said tension detection means;

a pair of tension detectors for detecting tensions of the groups of warp yarns fed from the warp beams and joining with each other, the tension of each group of warp yarns being detected in a boundary portion of the sheet-like form; and

a second control system for controlling a rotation of the other of the warp beams on the basis of a tension difference output from said tension detectors, respectively.

5,437,315

## MULTILAYER FORMING FABRIC

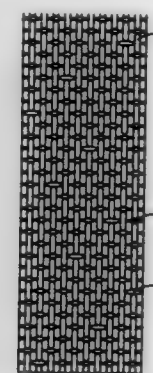
Kevin J. Ward, Kentville, Canada, assignor to Huyck Licensco, Inc., Wilmington, Del.

Filed Mar. 9, 1994, Ser. No. 208,635

Int. Cl.<sup>6</sup> D03D 23/00

U.S. Cl. 139—383 A

5 Claims



1. A triple layer papermakers fabric for use in the forming section of a papermaking machine comprising:

a top fabric layer including machine direction yarns interwoven with cross machine direction yarns;

a bottom fabric layer including at least one set of machine direction yarns interwoven with at least one set of cross machine direction yarns;

a binder yarn extending generally parallel with the cross machine direction yarns in the top fabric layer and bottom fabric layer and interweaving with the top fabric layer and bottom fabric layer;

wherein, the binder yarn replaces the cross machine direction yarn of the top fabric layer when said binder yarn engages the machine direction yarns of the top fabric layer.

5,437,316

## METHOD AND APPARATUS FOR DRIPLESS FILLING OF CONTAINERS

Dennis D. McPherson, Wharton, Tex., assignor to McPherson Dripless Systems Co., Inc., Missouri City, Tex.

Division of Ser. No. 787,415, Nov. 4, 1991, Pat. No. 5,255,720, which is a continuation-in-part of Ser. No. 503,830, Apr. 3, 1990, abandoned. This application Jul. 12, 1993, Ser. No. 90,888

Int. Cl.<sup>6</sup> B65B 1/04

U.S. Cl. 141—86

12 Claims

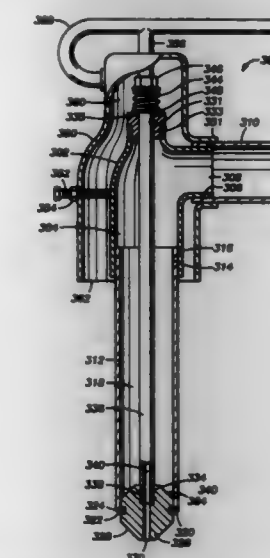
1. An apparatus for dripless filling of drum type containers with predetermined volumes of liquid, said drum type containers having a generally planar upper wall surface having a filling opening therein, said apparatus comprising:

(a) a liquid supply housing adapted to receive liquid from a

liquid supply and having a seal retainer defining a drip collection vacuum tube opening and a vacuum tube seal about said drip collection vacuum tube opening;

(b) a liquid dispensing tube having a lower end and extending from said liquid supply housing and defining a tapered sealing surface at said lower end thereof, said liquid dispensing tube defining an internal tubular dimension;

(c) a dispensing tip being provided at the lower end of said dispensing tube and having open and closed positions relative to said dispensing tube, said dispensing tip defining upper and lower tapered surfaces and a generally cylindrical external portion of slightly less dimension than said internal tubular dimension and being at least partially located within said dispensing tube at said closed position of said dispensing tip, said lower tapered surface defining a downwardly directed, centrally located point, said dispensing tip further defining an internal drip collection



passage terminating at said downwardly directed, centrally located point;

(d) an annular seal member being supported by said dispensing tip and adapted for sealing contact with said tapered sealing surface in the closed position of said dispensing tip;

(e) a drip collection vacuum tube being connected to said dispensing tip and providing support therefor, said drip collection vacuum tube being a valve actuator for positioning of said dispensing tip at said open and closed positions relative to said dispensing tube, said drip collection vacuum tube extending in movable relation through said liquid supply housing and being sealed with respect to said liquid supply housing by said vacuum tube seal; and

(f) means urging said drip collection vacuum tube relative to said liquid supply housing in a direction establishing engagement of said annular seal member with said tapered sealing surface, said drip collection vacuum tube being adapted for communication with a source of vacuum.

5,437,317

## VENTILATION LINE OPENING/CLOSING MEANS OF FUEL TANK

Seiichi Takatsuka; Yukihiro Tsugita, and Kyokuichi Sato, all of Soja, Japan, assignors to Om Corporation, Okayama, Japan

Filed Jan. 4, 1994, Ser. No. 177,266

Claims priority, application Japan, Feb. 4, 1993, 5-017457

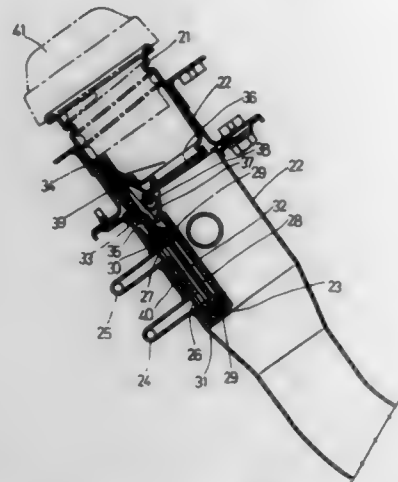
Int. Cl.<sup>6</sup> B65B 1/04, 3/04

U.S. Cl. 141—312

5 Claims

1. A ventilation line opening/closing means of a fuel tank, characterized in that an opening/closing valve provided in a ventilation line for vapor leading from the fuel tank to a canis-

ter includes a closure means for closing the valve by opening a shutter when a fuel supplying nozzle is inserted into a filler port and said valve remains closed even when said fuel supply-



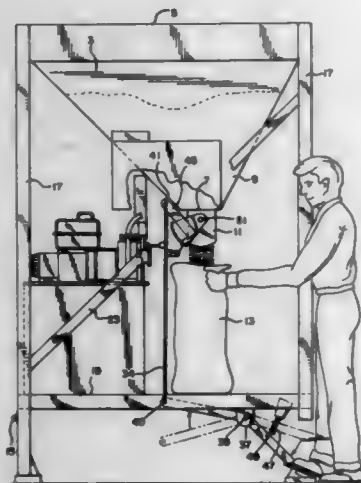
ing nozzle is removed from said filler port and an opening means for opening the valve only when a filler cap is tightly fitted in the filler port.

5,437,318

# POWER-DRIVEN APPARATUS FOR DISPENSING FLUENT MATERIAL INTO CONTAINERS

Estacia Kanzler, Round Lake, and Jack D. Eiler, Ingleside, both of Ill., assignors to The Sandbagger Corp., Wauconda, Ill. Continuation-in-part of Ser. No. 155,252, Nov. 22, 1993. This application Jul. 11, 1994, Ser. No. 274,668

Int. Cl.<sup>6</sup> A65B 1/04, 3/04; B67C 3/00  
U.S. Cl. 141—313 20 Claims



1. A fluent material dispensing apparatus for filling containers with fluent material comprising:

- a hopper, having a top and bottom, for receiving and holding fluent material, the hopper's top being open and the hopper converging downwardly towards the hopper's bottom, wherein multiple discharge openings are located at the hopper's bottom;
- multiple discharge chutes having top and bottom ends for dispensing fluent material, the top end of the discharge chutes being formed around each of the discharge openings;
- a support frame for supporting the hopper, the support frame comprising base members and a plurality of vertical legs extending between the hopper and the base members

- and at least one diagonal strut coplanar with the rear of the support frame;
- swing gate means pivotally mounted to each discharge chute, the swing gate means being movable from an open to a closed position over the bottom of the discharge chute for selectively covering the discharge chute to control the discharge of fluent material from the hopper;
- a swing gate actuating means for selectively moving the swing gate means between an open and a closed position;
- rotatable auger means mounted in the hopper for moving fluent material over the discharge openings, the auger extending transversely within the length of the hopper; and,
- auger power means for rotating the auger within the hopper to move the fluent material over the discharge openings and to unblock any clogged discharge opening.

5,437,319

# PIVOTING POWER TOOL WITH TABLE

Andrea Garuglieri, Colle Brianza, Italy, assignor to Black & Decker Inc., Newark, Del.

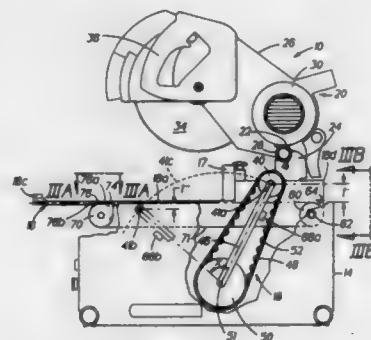
Filed Aug. 25, 1993, Ser. No. 111,700

Claims priority, application United Kingdom, Aug. 28, 1992, 9218363

Int. Cl.<sup>6</sup> B25H 1/00

U.S. Cl. 144—286 R

20 Claims



1. A power tool comprising a frame, a table mounted on the frame, a working assembly mounted on one side of the table, and a pivot system operatively associated with said working assembly, said pivot enabling the table to pivot between two dispositions thereof with respect to the frame about an axis which is moveable in the frame, said axis being moveable between two positions in a transverse direction with respect to said axis.

5,437,320

# GOLF CLUB PROTECTOR

Henry Sung, 19826 E. Vista Hermosa, Walnut, Calif. 91789

Filed Apr. 8, 1994, Ser. No. 224,889

Int. Cl.<sup>6</sup> B65D 65/06

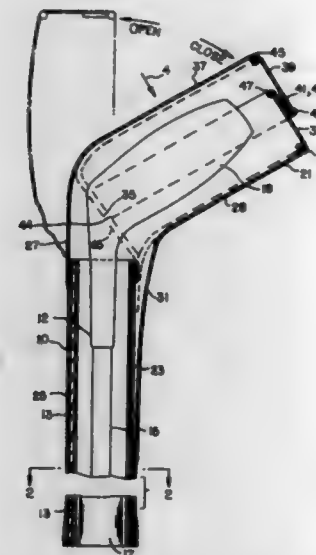
U.S. Cl. 150—160

9 Claims

1. A golf club protector comprising an elongated rigid tube adapted to assume an upright vertical position in a golf bag for housing the shaft of an inverted golf club, and a flexible head cover extending upwardly from said rigid tube to entirely surround the hitting head of the inverted golf club; said flexible head cover comprising a flexible tubular sleeve (25,27) encircling at least an upper edge area of said rigid tube; said sleeve having spaced upper edges (35) acutely angled to the sleeve axis, with each acutely angled edge having a lower end and an upper end;

a lower panel (28) joined to said sleeve at a point between the lower ends of said acutely angled edges, said lower panel having an arcuate edge extending between the lower ends of said acutely angled edges; a first arcuate flange (33) joined to the arcuate edge of said lower panel and to said acutely angled edges, whereby said lower panel and said

first flange cooperatively form an upwardly facing container for the head of an inverted golf club; an upper panel (37) joined to said sleeve at a point between the upper ends of said acutely angled edges; said upper panel having an arcuate edge that forms a continuation of said acutely angled edges; a second arcuate flange (39) joined to the arcuate edge of said upper panel and to said acutely angled edges, whereby said upper panel and said second flange cooperatively form a hood adapted to fit over the aforementioned container;



The flange on said lower panel being normally telescoped within the flange on said upper panel, whereby the hood prevents rain water from migrating into the flexible cover; said hood being hingedly joined to the acutely angled upper edges of said sleeve so that the hood can be pulled away from said lower panel, for removing a golf club from the protector or inserting a golf club into the protector; said hood having a normal closed position wherein the flange on said lower panel is telescoped within the flange on the upper panel.

5,437,321

# BELT REINFORCING STRUCTURE FOR A PNEUMATIC TIRE

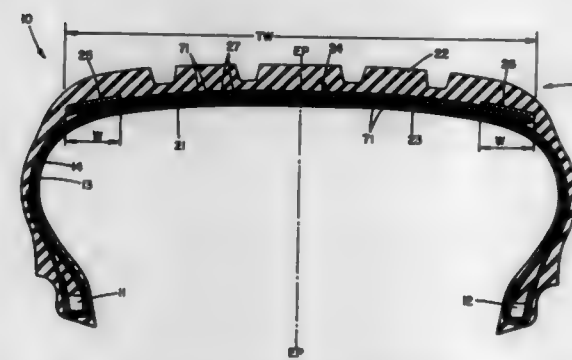
Michel Breny, Holzthum, Luxembourg, assignor to The Good-year Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 52,982, Apr. 27, 1993, abandoned. This application May 23, 1994, Ser. No. 247,370

Int. Cl.<sup>6</sup> B60C 3/04, 9/20, 9/26

U.S. Cl. 152—454

8 Claims



1. A pneumatic automobile tire having an aspect ratio below 60, comprising a carcass of at least one radial ply, a tread disposed radially outward of the crown region of the carcass,

a belt assembly having an overall width substantially equal to the tread width (TW) interposed between the tread and the crown region in circumferential surrounding relation to the carcass, wherein the belt assembly consists essentially of

- a belt ply having folded portions on each lateral side, being reinforced with reinforcement cords extending parallel to one another and making an angle of 60° to 75° with respect to the equatorial plane (EP) of the tire, the axially outer portions of the ply being folded in a radially outward direction; and
- a spirally wound structure extending substantially transversely between the folded edges of the folded portions of said belt ply, consisting of at least one spirally wound strip, said at least one spirally wound strip being made from elastomeric material reinforced by textile cords and forming at least one annular layer, the cords making an angle of 0° to 5° with respect to the equatorial plane (EP) of the tire and wherein the spirally wound structure is reinforced with cords of a textile material having on a homogeneous specimen a Young's modulus of at least 40,000 MPa.

5,437,322

# LEAK RESISTANT MOUNTING SYSTEM FOR A RETRACTABLE AWNING

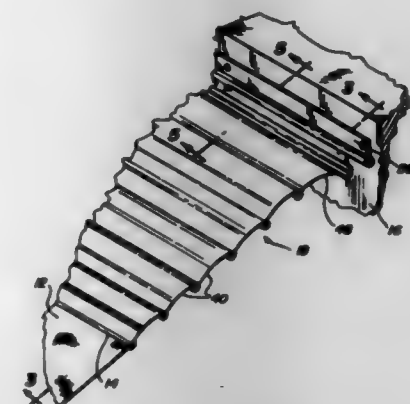
Brent W. Murray, Longmont, Colo., assignor to Carefree/Scott Fetzer Company, Broomfield, Colo.

Filed Nov. 22, 1993, Ser. No. 155,932

Int. Cl.<sup>6</sup> E04F 10/08

U.S. Cl. 160—61

14 Claims



1. In a system establishing a leak resistant connection between a retractable awning and a support surface for draining liquid therefrom, the awning being supported by the support surface along an inner edge and being movable between an extended position and a retracted position adjacent to the support surface, the inner edge of the awning being connected by a connector to the support surface, wherein the improvement resides in said connector comprising:

- a single-piece elongated slat having an inner longitudinal edge, an outer longitudinal edge, and an unobstructed intermediate trough portion extending downwardly between said inner and outer longitudinal edges, said trough portion being provided for draining substantial quantities of liquid;
- said inner longitudinal edge of said slat being connected to the support surface; and
- said outer longitudinal edge of said slat being connected to the awnings.



5,437,323

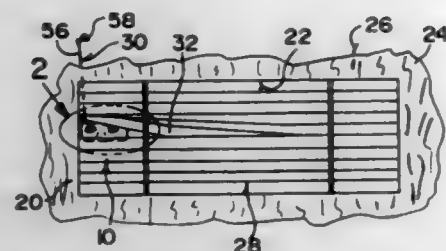
**BURGLAR DETERRENT DECOY**

Jeffery M. Holden, 20515 Aldine Westfield #67, Humble, Tex. 77338

Filed Jun. 25, 1993, Ser. No. 82,534  
Int. Cl.<sup>6</sup> E06B 9/38

U.S. Cl. 160—178.1

4 Claims



1. A burglar deterrent decoy, which comprises:
- a) a partial face mask with simulated eyes and nose;
  - b) means for mounting said partial face mask to a side jamb of a window in a wall of a building behind a window blind; wherein said mounting means includes:
    - i) a bent arm having a first segment imbedded within said partial face mask and a second segment extending from one side thereof;
    - ii) an L-shaped bracket having a first leg and a second leg;
    - iii) first means for affixing said first leg to the side jamb of the window; and
    - iv) second means for affixing said second leg in an adjustable manner to said second segment of said bent arm; and
  - c) means for retaining a slat of the window blind in front of said partial face mask in a bent up raised position, so as to produce an illusion that a person is looking out through the window blind to scare away a burglar.

5,437,324

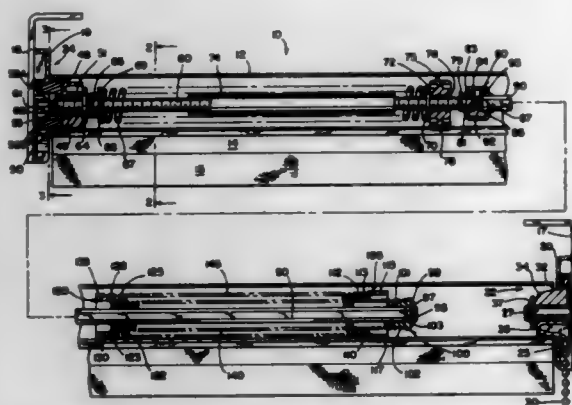
**SHADE WITH VARIABLE LOAD BRAKING AND LIFT ASSIST**

Alan R. Sternquist, Pleasanton, Calif., assignor to Newell Operating Company, Freeport, Ill.

Filed Jan. 19, 1994, Ser. No. 183,737  
Int. Cl.<sup>6</sup> E06B 9/56

U.S. Cl. 160—299

23 Claims



1. A roller shade of the type including a generally cylindrical tube for winding and unwinding a shade material attached thereto and also comprising a variable load brake for resisting the tendency of the shade to free-fall as increasing amounts of shade material are unwound therefrom, the brake including:
- a threaded member mounted within the tube,
  - a rotary member threadably engaged with the threaded

member and arranged to move therealong when the tube is rotated, and

a spring in the tube engaging the rotating member and arranged to exert an increasing force against the rotating member when shade material is unwound from the tube and a decreasing force against the rotating member when shade material is wound on the tube.

5,437,325

**DEVICE FOR RAPIDLY CHANGING AND MAINTAINING A LATERAL WALL OF A MACHINE FOR THE CONTINUOUS CASTING OF A METAL PRODUCT BETWEEN ROLLS**

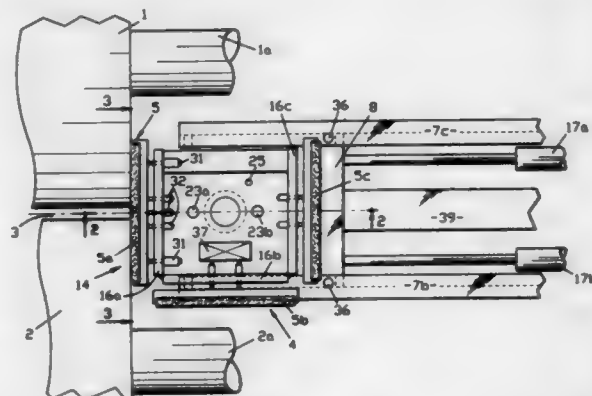
Hugues Legrand, Antony, and François Mazodier, Saint Etienne, both of France, assignors to Usinor Sacilor, Puteaux and Thyssen Stahl Aktiengesellschaft, Duisburg, Germany

Filed Apr. 7, 1994, Ser. No. 224,293

Claims priority, application France, Apr. 14, 1993, 93 04 384  
Int. Cl.<sup>6</sup> B22D 11/06

U.S. Cl. 164—428

10 Claims



1. Device for rapidly changing and maintaining a lateral wall of a machine for the continuous casting of a metal product which comprises two counter-rotary rolls which have axial ends and parallel axes, are disposed in confronting relation and define a given gap therebetween, two lateral walls bearing against said axial ends of said rolls so as to define a pouring space between said rolls and said lateral walls,

said device comprising in combination: a support, a carriage for shifting said lateral wall mounted on said support to be movable in a direction parallel to said axes of said rolls between a forward position and a withdrawn position relative to said rolls,

a turret mounted on said carriage to be rotatable about an axis perpendicular to said axes of said rolls, and comprising means for fixing at said given angle of rotation of said turret so as to shift a replacement lateral wall from a standby position to a position occupied by a lateral wall which is in service and has to be replaced.

means for shifting said turret in rotation in steps of an amplitude corresponding to said given angle of rotation of said turret so as to shift a replacement lateral wall from a standby position to a position occupied by a lateral wall which is in service and has to be replaced.

5,437,326

**METHOD AND APPARATUS FOR CONTINUOUS CASTING OF METAL**

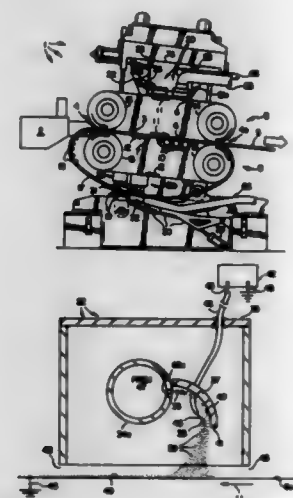
Thomas S. Graham, Shelburne; Wojtek Szarypiorski; Jerome B. Allyn, both of Colchester; Dean A. Boozan, Waterville; George Desorcie, Westford; Norman Bergeron, Burlington; R. William Hazelett, Colchester; John Pennucci, Grand Isle, and S. Richard Hazelett, Colchester, all of Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Continuation-in-part of Ser. No. 931,824, Aug. 18, 1992, Pat. No. 5,279,352. This application Jun. 28, 1993, Ser. No. 84,352. The portion of the term of this patent subsequent to Jan. 18, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B22D 11/06

U.S. Cl. 164—481

33 Claims



31. A revolvable mold wall for use in continuously casting molten metal against said revolvable mold wall, said revolvable mold wall having a workface bearing thereon:

a temporary dry dust cushion comprising:

dry, refractory powder particles,

said particles having been carried by an air stream generally in a first direction, with said air stream having been redirected generally to a second direction for carrying said particles generally in said second direction more directly toward the mold wall than said first direction,

said particles having been electrostatically charged by corona discharge prior to applying the charged particles to said workface for forming said dry dust cushion on said workface,

said particles being non-wetting to molten metal to be cast against said dust cushion on said workface, and said particles being adhered to said workface by their having been electrostatically charged prior to their application to said workface.

5,437,327

**CPU HEAT DISSIPATING FAN DEVICE**

Ming Der Chiou, 3F., No. 3, Alley 11, Lane 327, Sec. 2, Chung Shan Rd., Chung Ho City, Taipei, Taiwan

Filed Apr. 18, 1994, Ser. No. 228,847

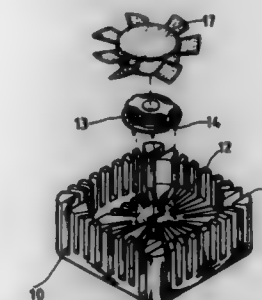
Int. Cl.<sup>6</sup> F28F 7/00

U.S. Cl. 165—122

4 Claims

1. A CPU heat dissipating device comprising:
- a radiating flange, a motor mount, and a fan motor; wherein said radiating flange includes a plurality of mounting holes in a central area thereof, said mounting holes have an open upper end and a closed lower end,
  - said motor mount includes an axle hole in a center thereof, said axle hole receives a motor shaft of said fan motor, and

said motor mount further includes a plurality of split bolts extending downward from a bottom side of said motor



mount, said split bolts being received in said mounting holes of said radiating flange.

5,437,328

**MULTI-STAGE HEAT SINK**

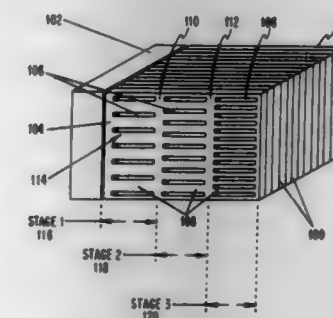
Robert E. Simons, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1994, Ser. No. 230,678

Int. Cl.<sup>6</sup> F28F 13/00

U.S. Cl. 165—146

16 Claims



12. A heat sink for a body to be cooled, said heat sink comprising:

a series of plates stacked in layers with said plates having slots formed therein such that said slots are aligned to form a base, for thermal contact with said body to be cooled, and at least two stages of internal air flow channels;

said internal air flow channels being substantially parallel to each other within said stages; and with said internal air flow channels increasing in number within each successive stage away from said base.

16. A heat sink for cooling a body, said heat sink comprising: a body composed of thermally conductive material having a base for placement in thermal contact with said body to be cooled, said body also having a first row of substantially parallel fluid flow channels adjacent to said base and at least one subsequent row of substantially parallel fluid flow channels disposed adjacent to said first row of channels, with there being more channels in at least one subsequent row of channels than in said first row of channels, said at least one subsequent row of channels being located further away from said base than said first row of channels.

5,437,329

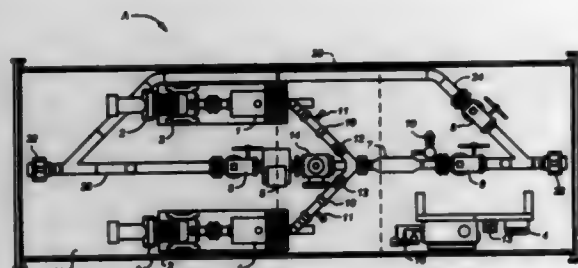
**METHOD AND APPARATUS FOR ACTIVATION OF FURNACE SLAG BASE CEMENT**

Fred Brooks, Houston; Thomas W. Daves, The Woodlands, and William Lang, Spring, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jan. 25, 1994, Ser. No. 186,438  
Int. Cl.<sup>6</sup> E21B 33/13, 47/00

U.S. Cl. 166—250

17 Claims



1. A method of preparation of formulations for cementing a wellbore, comprising:  
mixing drilling mud with blast furnace slag (BFS) in rig equipment normally used for mud circulation during drilling;  
pumping the mixture of mud and BFS into the wellbore; and  
injecting activator inline into the BFS/mud mixture before it enters the wellbore.

5,437,330

**LINER CEMENTING SYSTEM AND METHOD**

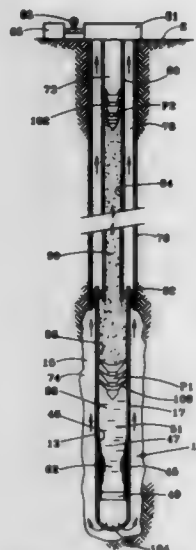
Louis M. Gambertoglio, The Woodlands, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Jul. 27, 1994, Ser. No. 281,466

Int. Cl.<sup>6</sup> E21B 33/13

U.S. Cl. 166—289

20 Claims



1. A method of cementing an annulus surrounding a liner within a wellbore, comprising:  
running the liner to a desired depth within the wellbore with a landing collar secured to and extending below the liner to form a flow column through the liner and the landing collar;  
providing a bypass passageway for communication between a bore within the liner longitudinally above the landing collar and a bore within the liner longitudinally below the landing collar;  
sealingly blocking a circulation port within the landing

collar for controlling flow through the bypass passageway;  
pumping circulation fluid through the flow column extending through the liner and the landing collar;  
placing a first pump down plug into the flow column; thereafter positioning a cementitious material in the flow column;  
blocking circulation through the landing collar with the first pump down plug;  
blocking circulation through the bypass passageway; thereafter increasing fluid pressure within the liner above the landing collar until the circulation port is opened;  
pumping the cementitious material through the opened circulation port, through the bypass passageway, and into an annulus surrounding the liner;  
placing a second pump down plug within the flow column subsequent to positioning the cementitious material in the flow column; and  
sealing the circulation port from fluid above the second downhole plug with the second pump down plug.

5,437,331

**METHOD FOR FRACTURING SUBTERRANEAN FORMATIONS USING CONTROLLED RELEASE BREAKERS AND COMPOSITIONS USEFUL THEREIN**

D. V. Satyanarayana Gupta, The Woodlands, and Bethicia B. Prasek, Houston, both of Tex., assignors to The Western Company of North America, Houston, Tex.

Filed Aug. 24, 1994, Ser. No. 295,269

Int. Cl.<sup>6</sup> E21B 43/26

U.S. Cl. 166—300

11 Claims

1. A method for fracturing a subterranean formation which comprises introducing into said formation at a flow rate and pressure sufficient to produce a fracture in said formation, a fluid comprised of an aqueous gel and a delayed gel breaker wherein said gel breaker comprises polymer particles each defining a network of internal pores and having a breaker entrapped within said network of pores, wherein said particles are polymers having a cross-linking density of at least about 10% and said breaker has been introduced to said pores by absorption or by entrapment of the breaker during polymerization of the particle.

5,437,332

**CONTROL SYSTEM FOR WILD OIL AND GAS WELLS AND OTHER UNCONTROLLED DANGEROUS DISCHARGES**

John L. Pfeffer, 833 Howard Ave., New Orleans, La. 70113

Continuation-in-part of Ser. No. 683,449, Apr. 10, 1991. This application Sep. 16, 1993, Ser. No. 122,127

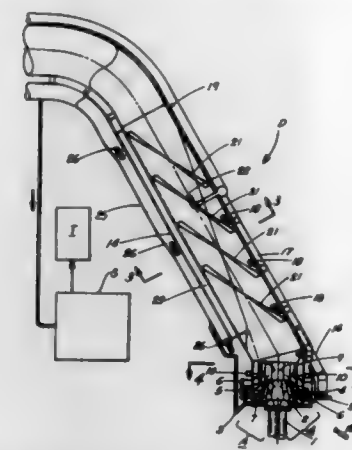
Int. Cl.<sup>6</sup> A62C 3/00

U.S. Cl. 166—364

22 Claims

1. A control system for an uncontrolled discharge from a wild oil or gas well or other uncontrolled stream of dangerous material having a discharge opening producing a highly pressurized fluid discharge stream, which system utilizes a device which captures at least in substantial part the discharge stream from the discharge opening, comprising:  
an elongated structure having a hollow interior placed over and attached to the discharge opening, causing the discharge to enter into the interior of said structure, said elongated structure having a bottom portion and an upper portion, with the direction of elongation of said structure between said bottom portion and said upper portion substantially diverging away from the vertical at an angle, causing the discharge from the discharge opening to impinge on the interior, angled surface of said structure;  
a first set of movable vanes and actuating means associated

with said first set of vanes for moving its associated vanes under force located in said bottom portion; and



- a second set of movable vanes and actuating means associated with said second set of vanes for moving its associated vanes under force located in said upper portion.

5,437,333

**ADJUSTABLE ROCK COLLECTING IMPLEMENT WITH GUARDS**

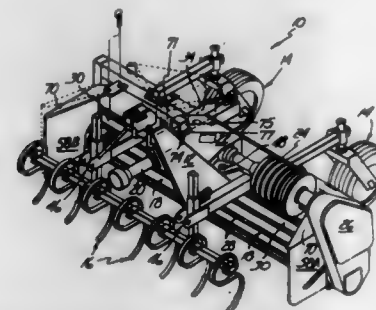
Mac E. McPherson; Michael G. McPherson, both of Jamestown, N. Dak.; Kenneth L. Innocent, Sacramento, Calif.; Gary A. Parkos, and Roger D. Noskas, both of Browerville, Minn., assignors to Glenmac Inc., Jamestown, N. Dak.

Filed Jul. 21, 1993, Ser. No. 94,856

Int. Cl.<sup>6</sup> A01D 33/04

U.S. Cl. 171—19

9 Claims



1. A field implement for gathering debris on the ground, the field implement, comprising:  
a frame;  
a ground-engaging roller rotatably mounted to the frame, the ground-engaging roller rotating to gather debris from the ground;  
a pair of removable guard plates detachably secured to the frame wherein a guard plate is disposed at each end of the ground-engaging roller and wherein each guard plate includes a mounting pin; and  
a storage system secured to the frame for storing the pair of removable guard plates when not in use, the storage system including an aperture suitable for receiving the mounting pin of each guard plate and means receiving an edge of each plate therebetween.

5,437,334

**EDGER**

Makizo Hirata, Kakogawa; Shigeharu Ohama, and Michio Nishimura, both of Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Division of Ser. No. 522,923, May 14, 1990, Pat. No. 5,139,091.

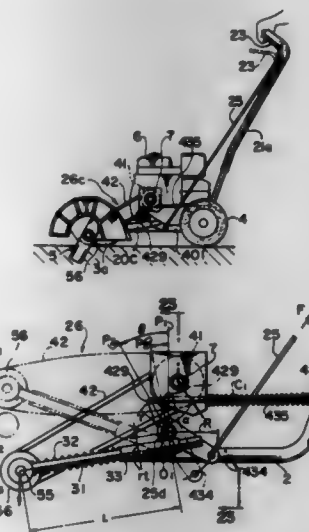
This application Sep. 27, 1991, Ser. No. 766,271

Claims priority, application Japan, May 15, 1989, 1-55970 U; May 18, 1989, 1-58022 U; May 22, 1989, 1-128554; Jun. 28, 1989, 1-75824 U; Jun. 28, 1989, 1-75825 U; Jun. 28, 1989, 1-75826 U; Jul. 4, 1989, 1-79244 U

Int. Cl.<sup>6</sup> A01B 33/08

U.S. Cl. 172—15

3 Claims



1. An edger having a main frame, at least one front wheel fastened in the front portion of said main frame, two rear wheels fastened in the rear portion of said main frame, a rotary blade disposed in the front portion on either side of said main frame and capable of conducting edging, an engine mounted on said main frame and a driving device for operating said rotary blade with said engine, said driving device comprising:  
a driving pulley;  
a pulley to be driven;  
a driving belt arranged between said two pulleys;  
a swing arm having the center of its swinging motion at a position different from the center of rotation of said driving pulley;  
a rod slidably supported by said swing arm and supporting said pulley to be driven;  
a tension spring for urging said rod in a direction in which the distance between the shafts of said two pulleys is elongated;  
a control rod connected to said swing arm for the purpose of controlling the height of said pulley to be driven and clutch engagement;  
a clutch lever disposed in a frame handle and connected to said control rod; and  
a return spring for urging said swing arm to a clutch disengagement state, wherein said return spring intersects a vertical plane containing a rotational axis of said driving pulley at a location beneath said rotational axis.

5,437,335

**MEANS FOR BACKFILLING MULTIPLE AERATION HOLES**

Albert K. Hines, Sr., Rte. 2, Box 135, Enfield, N.C. 27827

Filed May 20, 1993, Ser. No. 63,765

Int. Cl.<sup>6</sup> A01C 15/00; A01B 45/02

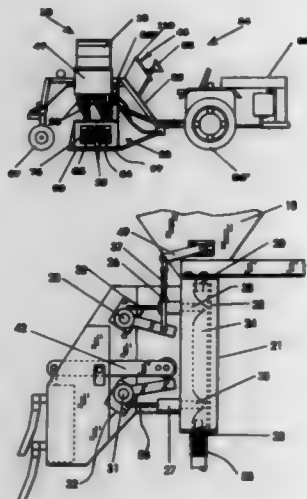
U.S. Cl. 172—22

4 Claims

1. A means for simultaneously backfilling a plurality of



aeration holes formed in soil to improve vegetation growth including a transport means having a means associated therewith for forming said plurality of holes comprising: a hopper type means mounted on said transport means for holding bulk granulate, flowable backfill medium; a plurality of flexible deformable metering tube means having a memory operatively connected to said holding means; tube means operatively connected to and passing from each of said metering tube means to a point adjacent each of said plurality of aeration holes; and control means in the form of pairs of upper and lower plungers disposed adjacent each of said deformable measuring tubes and



biased to crimp off such tubes to prevent flow of granulate material; upper and lower control levers pivotally mounted at one end and operatively secured to respective pairs of upper and lower plungers; a pivoted rocker arm operatively mounted adjacent said upper and lower control lever to alternately withdraw the upper and lower plungers from the adjacent deformable metering tube; and means for controlling said rocker arm whereby granulate material from said hopper can fill each of the deformable metering tubes when the upper plunger is out of contact therewith and can dispense said granulate material when the upper plunger deforms the tube and the lower plunger is out of contact therewith.

5,437,336

# METHOD AND APPARATUS FOR CREATING AN ADVANTAGEOUS GROWING ZONE IN A SOILBED HAVING A TOPSOIL STRATUM AND A HARDPAN STRATUM

Darrell C. Symonds, 1009 Woodland Dr., Pooler, Ga. 31322  
Filed Apr. 19, 1993, Ser. No. 47,419  
Int. Cl.<sup>6</sup> A01B 5/00

U.S. Cl. 172-176

33 Claims

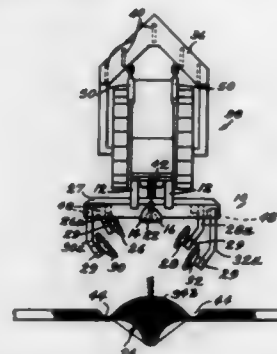
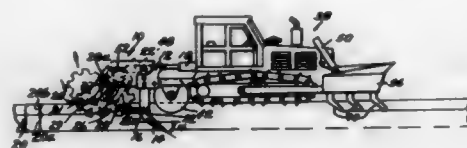
1. An apparatus to produce an improved planting bed in soil having a subsurface hardpan stratum and a surface topsoil stratum, comprising:

- a frame;
- means attached to said frame for creating a fracture zone in said subsurface hardpan stratum and said topsoil stratum, wherein said fracturing means operates to form an elongated trench having a predetermined depth in said fracture zone; and
- at least two pairs of rotatable blades mounted rearwardly on said frame and spaced transversely apart from said fracturing means for breaking up said topsoil stratum and mounding topsoil in said elongated trench, wherein each blade of each pair of blades is parallel to the other blade of said pair.

15. A method of preparing a soilbed having a subsurface hardpan stratum and a surface topsoil stratum, in order to

provide an improved planting medium for plants having root systems, comprising the steps of:

- forming an elongated trench of a predetermined depth in the soil which extends in depth through said topsoil stratum and at least partway into said hardpan stratum, thereby fracturing said hardpan stratum;



- lifting and inverting topsoil from said topsoil stratum along said elongated trench; and
- mounding said lifted and inverted topsoil in said elongated trench.

5,437,337

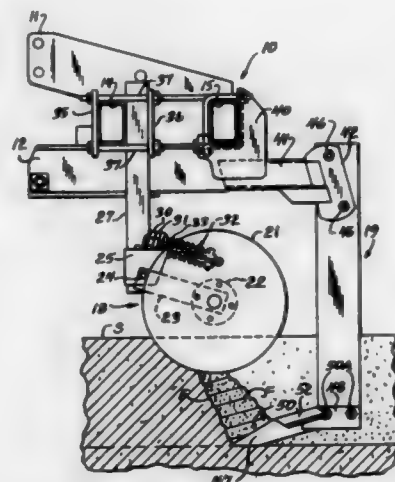
# TILLAGE UNIT WITH REDUCED DISTURBANCE OF SURFACE RESIDUE AND SOIL

William J. Dietrich, Sr., Congerville, Ill., assignor to DMI, Inc., Goodfield, Ill.

Filed Jul. 22, 1993, Ser. No. 96,560  
Int. Cl.<sup>6</sup> A01B 13/08, 39/08

U.S. Cl. 172-196

6 Claims



1. An agricultural tillage implement adapted to be drawn by a tractor, comprising a frame; a plurality of tillage units mounted in laterally spaced relation on said frame, each tillage unit comprising, in combination, a coulter mounted to said frame for cutting a slot in the soil; and a chisel plow mounted to said frame behind said coulter and including a generally vertical shank having a width less than approximately  $\frac{1}{4}$  inch mounted in alignment with said coulter, a plow point mounted to the bottom of said shank and extending forwardly of said shank beneath said coulter slot, said point having an upper,

soil-cutting edge inclined upwardly and rearwardly from a leading portion and cooperating with the coulter slot to fracture soil in a zone above said point without substantially displacing the fractured soil; and a pair of wings having upper lift surfaces extending upwardly and rearwardly while extending downwardly and laterally of said point and having cutting edges located substantially entirely in front of the leading edge of said shank and adapted to lift the soil behind the fracture zone and to loosen said soil without throwing the soil to the side, and to part the soil before said shank enters said coulter slot, whereby said soil is loosened while leaving the surface profile substantially undisturbed and leaving only a narrow groove in the soil formed by said narrow shanks with reduced disturbance of surface residue.

5,437,338

# HYDRAULIC DRIVE UNIT FOR DRIVING A DRILLING TOOL

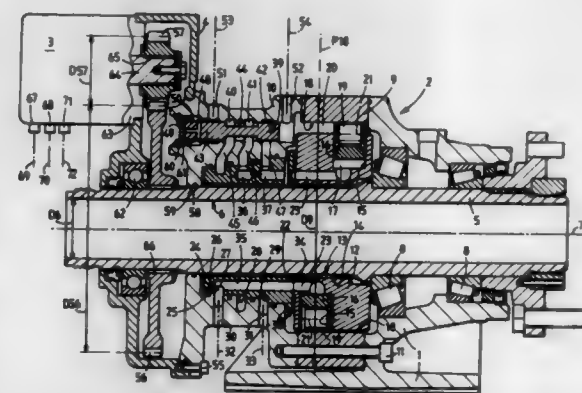
Louis Martin, Compiègne, and Ulrich Häger, Cernoy, both of France, assignors to Poclair Hydraulics, France

Filed Dec. 3, 1993, Ser. No. 162,492

Claims priority, application France, Dec. 11, 1992, 92-14970  
Int. Cl.<sup>6</sup> F21B 3/02

U.S. Cl. 173-47

10 Claims



1. A drive unit comprising: a frame; a driven shaft mounted to rotate with respect to the frame about an axis of rotation; a first pressurized fluid motor presenting a lobed cam fixed with respect to said frame; a cylinder block fixed, with respect to rotation, with said driven shaft; a plurality of cylinders arranged in the cylinder block and disposed radially with respect to the axis of rotation; a plurality of pistons mounted to slide in the cylinders and capable of abutting said cam; the shaft being capable of being driven by the first motor at at least one first speed of rotation and presenting a recess which constitutes a passage which conveys drilling fluid to a drilling tool; and, the cylinder block of said first motor being coaxial to the axis of rotation and is disposed about said shaft, wherein:

- said drive unit comprises a second motor which is coupled in rotation to said shaft and which is capable of driving said shaft at a second speed of rotation substantially higher than said at least one first speed of rotation;
- a first pinion gear is fixed, with respect to rotation, with the shaft, surrounds said shaft and is coaxial to the axis of rotation;
- the second motor presents an output shaft with which is fixed, with respect to rotation, with a second pinion gear which meshes with said first pinion gear;
- the first pressurized fluid motor is disengageable and is provided with a disengagement mechanism capable of controlling withdrawal of said pistons out of abutment with the lobed cam.

5,437,339

# AIR-PRESSURE-OPERATED IMPLUSION MECHANISM

Hiroshi Tanaka, Tokyo, Japan, assignor to Max Co., Ltd., Tokyo, Japan

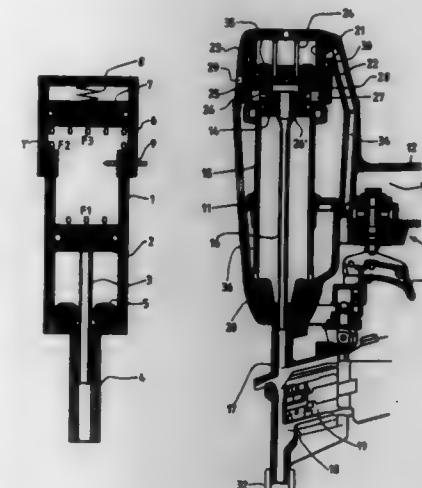
Filed Mar. 17, 1993, Ser. No. 32,324

Claims priority, application Japan, Mar. 18, 1992, 4-091519;  
Oct. 12, 1992, 4-077258 U

Int. Cl.<sup>6</sup> B25C 1/04

U.S. Cl. 173-210

6 Claims



1. A compressed-air-operated impulsion mechanism comprising:

an impulsion cylinder member having a longitudinal axis; an impulsion piston slidably fitted in said impulsion cylinder member along said longitudinal axis, said impulsion piston having an effective area facing a first direction; and a reaction force absorbing means for absorbing a reaction force of said impulsion piston arising when said impulsion piston is driven in a second direction opposite said first direction, said reaction force absorbing means being slidably fitted in said impulsion cylinder member along said longitudinal axis, said reaction force absorbing means having an effective area facing said second direction which is greater than said effective area of said impulsion piston, said respective effective areas being opposed to one another in said impulsion cylinder member such that compressed air is introduced therebetween to thereby drive said reaction force absorbing means in said first direction and drive said impulsion piston in said second direction.

5,437,340

# MILLOUT WHIPSTOCK APPARATUS AND METHOD

Richard B. Lee, Spring, and John W. Brandon, Kingwood, both of Tex., assignors to Hunting MCS, Inc., Houston, Tex.

Filed Jun. 23, 1994, Ser. No. 264,684

Int. Cl.<sup>6</sup> E21B 7/08

U.S. Cl. 175-61

17 Claims

8. A whipstock apparatus for installation in a casing of a well bore comprising:

- a cylindrical body having a concave longitudinally tapered upwardly facing tool deflecting surface at an upper end and an aperture in said tool deflecting surface through which the threaded lower end of a drill string passes;
- drill string connection means in said cylindrical body for releasable threaded connection to said drill string threaded lower end, said drill string connection means keyed in said cylindrical body to prevent rotation of said drill string connection means when making or breaking the threaded connection between said drill string threaded lower end and said drill string connection means;
- a piston in said cylindrical body slidably mounted in said

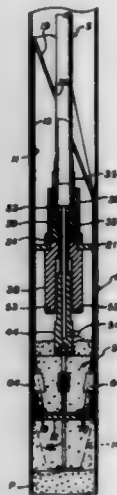
drill string connection means for longitudinal movement relative to said cylindrical body and said drill string connection means;

a fluid passage extending through said drill string and said drill string connection means and in fluid communication with said piston to effect longitudinal movement thereof upon fluid pressure of a first magnitude in said fluid passage; and

gripping means in said cylindrical body connected with said piston for lateral extension outwardly from the circumference of said cylindrical body to engage the interior surface of said casing upon longitudinal movement of said piston in one direction and for retraction inwardly from the circumference of said cylindrical body upon longitudinal movement of said piston in another direction, said gripping means in the extended position preventing relative movement between said cylindrical body and said casing and in the retracted position allowing relative movement therebetween.

16. A method of setting a millout whipstock in the casing of a well bore for changing the direction of drilling comprising the steps of;

connecting the lower end of a drill string to a millout whipstock having an angular deflection shoe at a top end and a radially expandable slip assembly at a lower end actuated by fluid pressure on a longitudinal piston which has a fluid passage closed off by a rupture disk,



running the millout whipstock into the casing of the well bore to a desired level,

determining the orientation of said millout whipstock deflection shoe,

exerting a fluid pressure through said drill string at a first magnitude to move said piston and expand said slip assembly radially outward to engage the interior surface of said casing,

pumping cement through said drill string at a fluid pressure of a second magnitude greater than said first magnitude to burst said rupture disk and flow through said drill string and through said piston to fill the spaces around said radially expandable slip assembly and the lower end of said millout whipstock to anchor said millout whipstock in said casing with said slip assembly in the engaged condition against the interior surface of said casing, removing said drill string from said millout whipstock, connecting a cutting mill assembly to the lower end of a drill string including a motor driving a rotating cutter mill through a bent sub and a non-rotating stabilizer member connected above the cutter mill, and

running said cutting mill assembly into said casing such that only the non-rotating stabilizer and not the rotating cutter mill contacts said deflection shoe to laterally deflect the

non-rotating stabilizer while the side cutter mill cuts a window in said casing to allow drilling of a new well bore.

5,437,341

## MULTI-DRILL MOUNTER

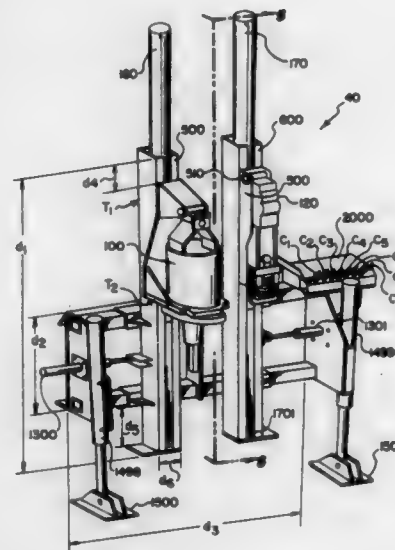
Jack Horn, 12381 E. 112th Ave., Henderson, Colo. 80640, and  
Jerald Werth, 1093 N. Pond Dr., Brighton, Colo. 80601

Filed Oct. 20, 1993, Ser. No. 139,211

Int. Cl.<sup>6</sup> E21B 3/04

U.S. Cl. 175—122

12 Claims



1. A multi tool mounter for attaching two earth working tools to a mounting platform on an earth working machine, comprising:

a backplate having removable mounting means to the mounting platform;  
said backplate further comprising means for supporting an upper and a lower horizontal track;  
a first pair of sliding brackets mounted on said upper and lower horizontal tracks;  
a second pair of sliding brackets mounted on said upper and lower horizontal tracks;  
said first pair of sliding brackets supporting a first vertical derrick;  
said second pair of sliding brackets supporting a second vertical derrick;  
means to alternately center the first and second vertical derrick on said backplate; and  
said first and second vertical derrick each further comprising mounting means for an earth working tool.

5,437,342

## DRILL STRING PROTECTION

Frederick Powada, Bridge of Mondynes, Fordoun, Laurencekirk, Kincardineshire, AB30 1LD, United Kingdom

Filed Nov. 19, 1993, Ser. No. 155,256

Claims priority, application United Kingdom, Nov. 20, 1992, 9224359

Int. Cl.<sup>6</sup> E21B 17/10

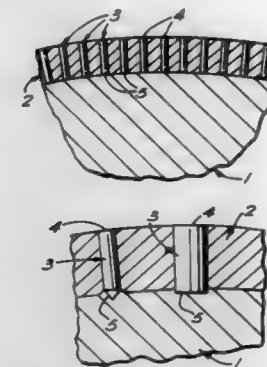
U.S. Cl. 175—325.5

5 Claims

1. A wear-resistant sheath for a cylindrical drill string component, comprising:

a matrix in the form of a tubular member of fiber-reinforced plastics materials snugly embracing the drill string component; and

a closely packed array of hard pins embedded in the matrix each of the pins having a substantially cylindrical body



with an radially of the sheath and with one end disposed substantially at an outer surface of the sheath.

5,437,343

## DIAMOND CUTTERS HAVING MODIFIED CUTTING EDGE GEOMETRY AND DRILL BIT MOUNTING ARRANGEMENT THEREFOR

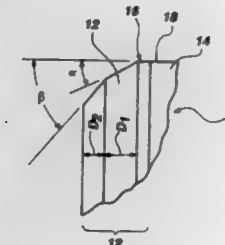
Craig H. Cooley, Bountiful; Jeffrey B. Lund, and Redd H. Smith, both of Salt Lake City, all of Utah, assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jun. 5, 1992, Ser. No. 893,704

Int. Cl.<sup>6</sup> E21B 10/46

U.S. Cl. 175—431

20 Claims



1. A cutting element for use on a rotary drag bit for drilling subterranean formations, comprising:

a substantially planar table of superhard material having a face,  
a side and a peripheral edge between said face and said side, said peripheral edge being defined at least in part by:  
a first, outer chamfer adjacent said side and oriented at a first acute angle to a line perpendicular to the plane of said table adjacent said peripheral edge; and  
a second, inner chamfer contiguous with said first, outer chamfer and oriented at a second, greater acute angle to said line than said first, outer chamfer.

5,437,344

## MOUNTING APPARATUS FOR AUTOMOTIVE ENGINES

Manabu Wada, Shizuoka, Japan, assignor to Suzuki Motor Corporation, Hamamatsu, Japan

Filed Jan. 21, 1994, Ser. No. 184,454

Claims priority, application Japan, Jan. 22, 1993, 5-027491

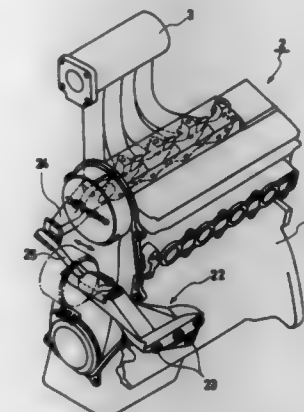
Int. Cl.<sup>6</sup> B60K 5/12

U.S. Cl. 180—291

9 Claims

1. A device for mounting an automotive engine comprising:  
an engine having front and rear, said engine further having a cylinder block, said cylinder block having a forward and rear ends and opposed first and second sides, and further comprising a manifold attached to said engine cylinder block first side;  
a mount bracket, said mount bracket having a forward end

and an aft end, said aft end of said mount bracket attached to said second side of said cylinder block, said mount bracket extending in a bent manner to said front of said engine;



a boss formed by extending one end of said manifold attached to said engine cylinder block first side; and  
a stiffener joining said boss and said forward end of said mount bracket.

5,437,345

## PINNABLE WATERWAY

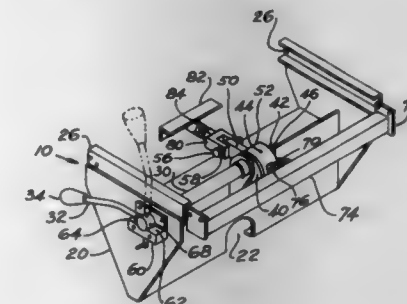
Frances E. Schmidt; Randy W. Zimmer, both of Appleton, and Wendy L. Schultz, Neenah, all of Wis., assignors to Pierce Manufacturing Inc., Appleton, Wis.

Filed Feb. 16, 1994, Ser. No. 197,035

Int. Cl.<sup>6</sup> E06C 7/00

U.S. Cl. 182—129

11 Claims



1. An apparatus for connecting a waterway to a section of a ladder, the apparatus comprising:

an attachment means attached to the ladder;  
a sleeve having an exterior surface with a connecting link attached thereto;  
a cam having an off-set axis rotatably contained within the sleeve;  
a connecting means for connecting the connecting link to the attachment means of the ladder;  
a rotating means connected to the cam at the off-set axis for rotating the cam and moving the connecting link into and out of a locked position.



5,437,346

**STATION FOR PRICE SCANNING VERIFYING AND SELECTIVELY BAGGING PURCHASE ITEMS**  
Charles Dumont, Old Parham Road - P.O. Box 1409, St. Johns, Antigua, France

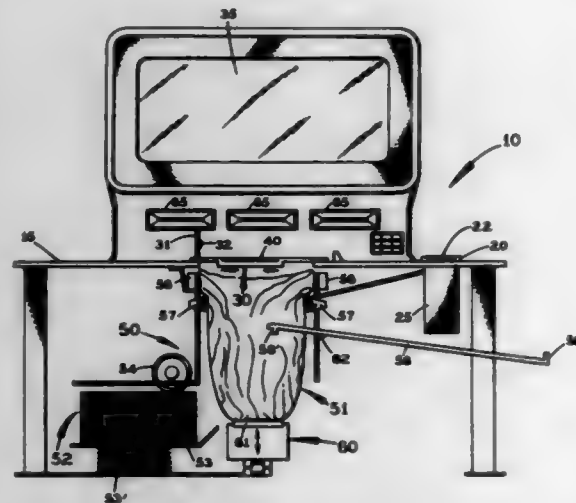
Filed May 11, 1994, Ser. No. 241,354

The portion of the term of this patent subsequent to Sep. 6, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A47F 9/04

U.S. Cl. 186-61

14 Claims



1. To be used with a purchase monitoring device which is utilized to scan a bar code of an item to be purchased and obtain and store pricing and purchase information relative to the item to be purchased, a purchase checkout station comprising:

- a monitor cradle structured and disposed to receive and hold the purchase monitoring device,
- said monitor cradle including a data input connection disposed in information receiving and transmitting communication with data transmission connector of the purchase monitoring device,
- said data input connection structured and disposed to receive the pricing and purchase information relative to the items to be purchased from the purchase monitoring device,
- data processing means structured and disposed to store and total the pricing and purchase information of all of the items to be purchased,
- display means structured and disposed to display the pricing and purchase information regarding the items to be purchased and the pricing totals regarding all of the items to be purchased to a user,

a verification platform structured and disposed to receive each of the items to be purchased individually thereon, verification means structured and disposed to verify that the item to be purchased placed on said verification platform has been scanned with the purchase monitoring device so as to store the purchase and pricing information relative to the item to be purchased in the purchase monitoring device, and that the pricing and purchase information relative to the item has been transmitted from the purchase monitoring device to the data processing means,

bagging means structured and disposed to position an empty bag in an open position such that it will receive the item to be purchased, and only that item, therein from said verification platform, upon positive verification of the item to be purchased by said verification means, said bagging means being further structured to enable only a predetermined quantity of said items to be purchased to be disposed in said bag.

5,437,347

**CABLE TENSIONING DEVICE FOR ELEVATORS**  
Joachim Biewald, Winnenden/Degenhof; Volker Scheub, Waiblingen; Helge Holler, Pforzheim; Karl Fenkl, Stuttgart; Stefan Hugel, Schwaikheim; Wolfgang Barth, Bietigheim-Bissingen; Hans-Georg Grell, Oestrich; Marin Grosser, Böblingen; Hermann Moll, Weissach im Tal; Horst Pollmann, Weil der Stadt, and Peter Schneider, Ditzingen, all of Germany, assignors to C. Haushahn GmbH & Co., Stuttgart, Germany

Division of Ser. No. 14,310, Feb. 5, 1993, Pat. No. 5,398,781.

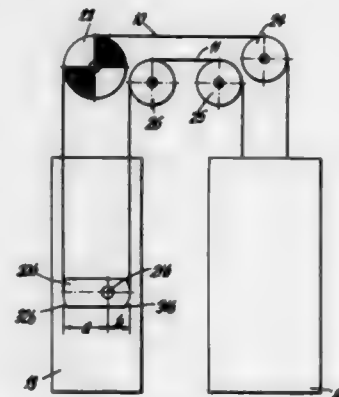
This application May 12, 1994, Ser. No. 242,092

Claims priority, application Germany, Feb. 5, 1992, 9201374 U

Int. Cl.<sup>6</sup> B66B 11/04

U.S. Cl. 187-264

4 Claims



1. A cable tensioning system for elevators including an elevator cabin, a counterweight, drive and support cables connecting the elevator cabin and the counterweight, and a drive mechanism including a drive disc for driving the drive cable and located above the elevator cabin, said cable tensioning system comprising:

- a support point attached to one of said elevator cabin and said counterweight; and
- a rocker attached at said support point and having a first attachment point, at which the support cable is attached, and a second attachment point, at which the drive cable is attached, said first and second attachment points being horizontally spaced from said support point a first distance and a second distance, respectively, a ratio of the second distance to the first distance defining a force ratio required for maintaining driving ability of the drive cable, wherein said rocker is configured as a two-sided lever, said support point being attached between said first and second attachment points, and said drive cable extending upward from said rocker.

5,437,348

**VEHICLE BONNETS**

John B. Cady, Hampton in Arden; Mark S. Howard, Whitley; Stephen A. Fisher, Pinner; Robert C. W. Lloyd, Earlsdon, and Alan V. Thomas, Shephed, all of United Kingdom, assignors to Jaguar Cars Limited, United Kingdom

Division of Ser. No. 869,021, Apr. 15, 1992, Pat. No. 5,263,546.

This application Aug. 18, 1993, Ser. No. 108,481

Claims priority, application United Kingdom, Apr. 16, 1991, 9108068

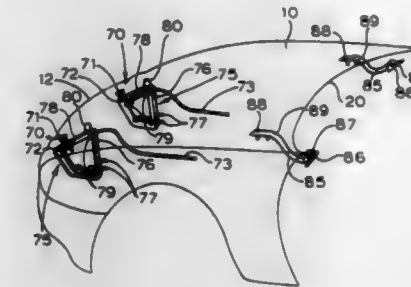
Int. Cl.<sup>6</sup> B62D 25/12

U.S. Cl. 180-69.21

5 Claims

1. A vehicle bonnet assembly including a bonnet, the bonnet being hinged to the vehicle body by hinge means located adjacent its trailing edge, releasable latch means being provided adjacent the leading edge of the bonnet, said latch means being secured to the vehicle body by a structural member, the structural member being a quadrilateral frame member located longitudinally of the vehicle, the corners of the frame member

being weakened in order to provide hinge points, so that the frame member will collapse longitudinally of the vehicle when a load is applied thereto due to an impact load applied to the



leading edge of the bonnet, whereby collapsing of the frame member causing the bonnet to move rearwardly and the hinge means being arranged to lift the trailing edge of the bonnet upon rearward movement of the bonnet.

5,437,349

**ELECTRICALLY OPERATED POWER STEERING APPARATUS**

Hidekazu Kurahashi; Horishi Iwasaki; Hideki Hayakawa; Yuzo Nagai, and Seichi Hirai, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Mar. 8, 1994, Ser. No. 207,927

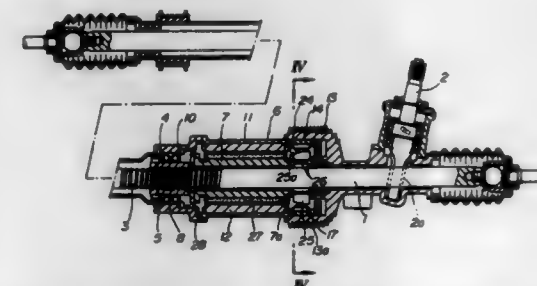
Claims priority, application Japan, Mar. 8, 1993, 5-046220;

Mar. 8, 1993, 5-046221; Mar. 8, 1993, 5-046538; Mar. 8, 1993, 5-046539

Int. Cl.<sup>6</sup> B62D 5/04

U.S. Cl. 180-79.1

14 Claims



1. An electrically operated power steering apparatus, comprising:

- a steering shaft axially movable in response to a manual steering force applied from a steering wheel, said steering shaft having a ball screw;
- a nut screw threaded over said ball screw with a plurality of balls interposed therebetween;
- a brushless motor for assisting in axially moving said steering shaft, said brushless motor having a rotor coupled to said nut screw and rotatably disposed around said steering shaft, and a stator having winding terminals;
- an outer casing having a first inner circumferential surface which supports said nut screw through a bearing, a second circumferential surface which supports said stator, and an adjacent portion disposed adjacent to said brushless motor remote from said nut screw;
- a power circuit unit including a power device disposed in said adjacent portion closely to said stator, said power circuit unit having terminals electrically connected to the winding terminals of said stator;
- a torque sensor;
- means for controlling said brushless motor and said power circuit unit, said controlling means being in electrical communication with said torque sensor; and
- means for providing power to said power circuit unit.

5,437,350

**STEERING COLUMN ASSEMBLY, IN PARTICULAR FOR MOTOR VEHICLES**

Jean-Philippe Sallex; André Hoblingre, both of Valentigney, and Christian Henique, Audincourt, all of France, assignors to ECIA - Equipement et Composants pour l'Industrie Automobile, Audincourt, France

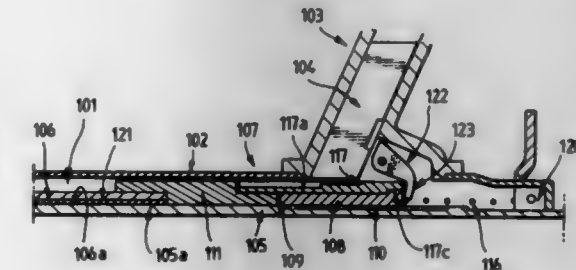
Filed Jun. 2, 1993, Ser. No. 71,007

Claims priority, application France, Jun. 3, 1992, 92 06735

Int. Cl.<sup>6</sup> B60R 25/02

U.S. Cl. 180-287

35 Claims



1. Steering column assembly for a motor vehicle, including a steering shaft (101) mounted so as to move in rotation in a column body (102) including an anti-theft bolt mechanism (103) for the vehicle, which can move between a retracted position and an active anti-theft position, the shaft including two shaft portions (105, 106; 140, 141), one carrying a steering wheel and the other being connected to the rest of a vehicle steering mechanism, said shaft portions being connected by disengagable linkage means (108) which can move, under the control of the anti-theft mechanism and by rotating the steering wheel and the shaft portions, between an active position for coupling the two shaft portions and a retracted anti-theft position freeing the two shaft portions from each other so that the shaft portion (105; 140) carrying the steering wheel can rotate freely with respect to the other shaft portion (106; 141) connected to the rest of the vehicle steering mechanism, the assembly being characterized in that corresponding end zones (105a, 106a) of the shaft portions are arranged one around the other, and in that the disengagable linkage means (108) comprises means connected to the shaft portion connected to the rest of the vehicle steering mechanism and means connected to and mounted so as to move around the shaft portion carrying the steering wheel between the active and the retracted position.

5,437,351

**FRICTION DISK BRAKE MECHANISM FOR ELECTRIC MOTOR**

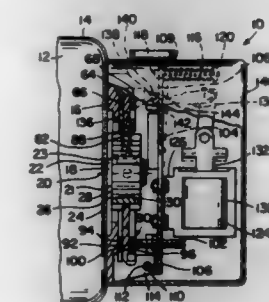
Bernard J. Lindner, Brookfield, Wis., assignor to Rexnord Corporation, Milwaukee, Wis.

Filed Dec. 23, 1993, Ser. No. 172,648

Int. Cl.<sup>6</sup> B60T 13/04

U.S. Cl. 188-18 A

1 Claim



1. A brake mechanism for selectively stopping and permit-

ting rotation of a shaft journaled in a motor frame, said brake mechanism comprising:

- a hub secured to the shaft for rotation therewith, said hub having therein a central bore adapted to house the shaft, said hub including a periphery having a plurality of first splines each having a first width in the circumferential direction of the hub and at least two second splines each having a second width in the circumferential direction of the hub and greater than the first width, each of said second splines including a radially outer surface, two of said second splines being spaced 90° from each other and having therein respective set screw bores extending radially inwardly from said radially outer surface to said central bore for receiving respective set screws to secure the hub to the shaft;
- a friction disk surrounding the hub for rotation therewith, said friction disk including a pair of opposed friction surfaces and having therein an aperture extending between said friction surfaces for receiving said hub, said aperture including spline recesses for receiving the hub splines and said friction disk including disk splines which mate with the hub splines and which provide for rotation of said friction disk with said hub;
- an anti-rattle clip inserted between said friction disk and said radially outer surface of one of said second splines; and
- brake disk engagement means mounted for movement toward and away from said friction disk.

5,437,352

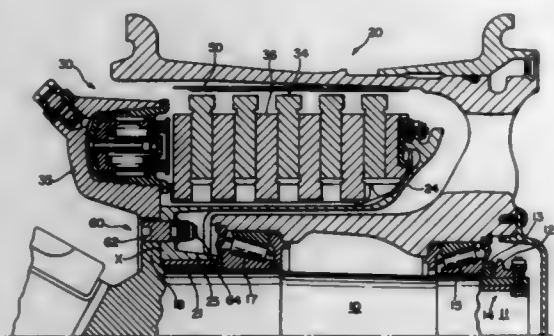
**AIRCRAFT BRAKE TORQUE TRANSFER ASSEMBLY**  
Brian G. Harker, Granger, Ind., assignor to AlliedSignal Inc., Morristown, N.J.

Filed Jul. 1, 1993, Ser. No. 86,214

Int. Cl. F16D 55/36

U.S. Cl. 188-71.5

10 Claims



1. A brake torque transfer assembly, comprising axle means upon which is mounted rotatably a wheel via bearing means, a brake assembly comprising a torque tube engaging nonrotatably said axle means and maintained at a predetermined axial position by abutting said axle means, a piston housing connected with said torque tube, at least one disc member connected with said wheel, the torque tube engaging directly and nonrotatably the axle means via at least one key member extending from one of the torque tube and axle means and received engagingly with the other of said axle means and torque tube, the key member comprising a key part received within a complementary shaped opening of said torque tube and held in engagement therewith by a nut member received on said key part, and nut means at said axle means and engaging said bearing means, the torque tube abutting the axle means and maintained at the predetermined axial position via engagement with the bearing means which engages both the wheel means and said nut means.

5,437,353

**MAGNETIC ADJUSTABLE BRAKING DEVICE**

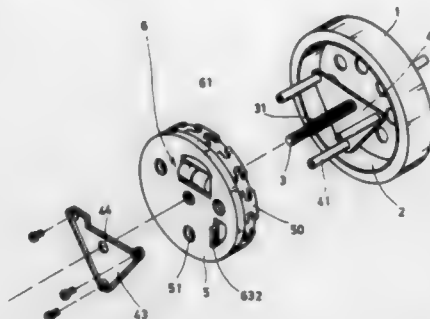
Hong-Chi Wu, No. 1-2, Lane 975, Chun-Jih Road, Tao-Yuan City, Taiwan

Filed Dec. 30, 1993, Ser. No. 175,510

Int. Cl. F16F 15/03; B60L 7/28

U.S. Cl. 188-164

3 Claims



1. A magnetic adjustable braking device, comprising a rotating housing having a flywheel which connects with a belt being integrated at the outer wall of the rotating housing, a bearing being disposed inside the flywheel; a magnetic conductor ring being disposed at the inner periphery of the rotating housing;
- a shaft member disposed inside the bearing of the flywheel, the shaft member having a worm gear portion at a middle portion of the shaft member;
- a positioning device having a supporting post, inner guiding plate and an outer guiding plate and being connected to the shaft member by means of a hole;
- a sliding housing having a lubricated bearing slidably received by the supporting post, a permanent magnet disposed at inner ring portion of the sliding housing;
- a driving device which is disposed inside the sliding housing, said driving device including a driving motor supported by a bracket, a pinion disposed at the output shaft of the motor, a pair of rod members which pass through the bracket, the rod members being connected via a pair of gears disposed respectively at the rod members, the gears being meshed and driven by the pinion, accordingly, the rod members being rotated in different directions, the middle portion of each of the rod members being provided with a further worm gear which is meshed with the worm gear portion of the shaft member; and
- a decoder disposed at one side of the driving device, a flexible plate being disposed on one side of the decoder and driven by the worm gear, by the contact of the flexible plate to the circuit of the decoder, the rotational position of the worm gear can be supplied to a control panel by means of a socket.

5,437,354

**TILT CONTROL APPARATUS FOR VEHICLES**

Stewart G. Smith, Cloud Farm - Nine Gates Rd., Yorklyn, Del. 19736

Continuation of Ser. No. 89,238, Jul. 12, 1993, abandoned. This application Feb. 10, 1994, Ser. No. 195,903

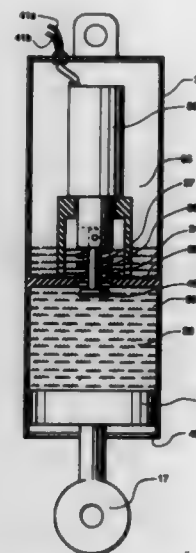
Int. Cl. F16F 9/46

U.S. Cl. 188-299

16 Claims

1. In a vehicle having an interior and an exterior, a transverse axle and a body, and being subject to swaying and tilting when the vehicle turns a corner or is driven around a curve, the improvement which comprises an apparatus for limiting the swaying and tilting movement of said vehicle comprising, on at least one side of the vehicle, a chamber partially filled with hydraulic fluid and having an upper end and a lower end; a movable piston sealing the lower end of said chamber, attached to said transverse axle; the upper end of the chamber being closed and attached to said body of the vehicle; a plate

within said chamber having a substantially central opening separating said fluid within the chamber into a lower portion and an upper portion; movable sealing means within said chamber and when activated seals said central opening; means for moving the sealing means to seal said opening; means for sensing the tilting movement of said vehicle, electrically com-



bined with means for moving the sealing means to seal said opening when the sensing means is activated at a predetermined tilt position of the body to prevent flow of said fluid from the lower portion of the chamber into the upper portion of the chamber and thus prevent tilting of the frame or body of the vehicle.

5,437,355

**FRICION CLUTCH HAVING A BRAKE MECHANISM**  
Masao Takagi; Satoshi Machida, both of Sakai, and Akio Hattori, Osaka, all of Japan, assignors to Kubota Corporation, Osaka, Japan

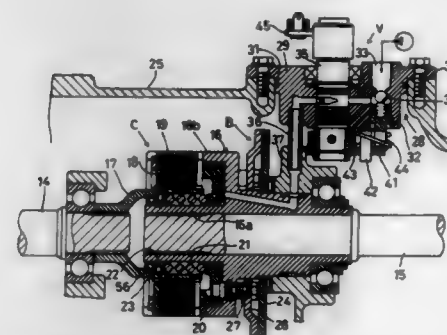
Filed Oct. 8, 1993, Ser. No. 134,426

Claims priority, application Japan, Apr. 19, 1993, 5-091020

Int. Cl. F16D 67/02

U.S. Cl. 192-18 A

7 Claims



1. A friction clutch mounted in a transmission case and connected between a drive shaft for receiving engine power and a driven shaft for receiving power from the drive shaft and transmitting the power to a power takeoff shaft, said friction clutch comprising:

- a first sleeve connected to said drive shaft;
- a second sleeve connected to said driven shaft;
- friction disk means disposed between said first sleeve and said second sleeve, said friction disk means being switchable between a clutch engaging state to enable power transmission between said first sleeve and said second

sleeve, and a clutch disengaging state to disable the power transmission;

- a clutch piston movable between a first position to place said friction disk means in said clutch engaging state, and a second position to place said friction disk means in said clutch disengaging state; and
- a brake mechanism for braking rotation of said driven shaft when said friction disk means is in said clutch disengaging state, said brake mechanism including:
  - a first braking member operatively connected to said clutch piston; and
  - a second braking member for contacting said first braking member when said clutch piston is moved to said second position, said second braking member being rotatable through a predetermined range with said first braking member.

5,437,356

**CENTRIFUGAL CLUTCH**

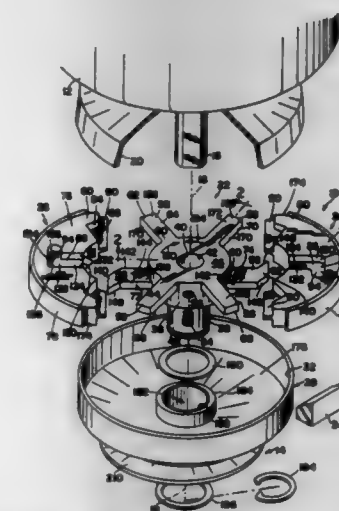
Thomas H. Lohr, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed Oct. 18, 1993, Ser. No. 138,414

Int. Cl. F16D 43/14

U.S. Cl. 192-105 BA

34 Claims



1. A centrifugal clutch comprising a clutch shoe formed to include a drive arm-receiving pocket having an inlet channel, a drive channel communicating with the inlet channel, an open mouth defining an inlet into the inlet channel, and spaced-apart aggressive and non-aggressive cam follower walls defining the drive channel, the aggressive cam follower wall facing toward the open mouth of the inlet channel and the non-aggressive cam follower wall facing away from the open mouth of the inlet channel;
- a rotor having an axis of rotation and including a rotor arm extending into the drive arm-receiving pocket, the aggressive cam follower wall and the rotor arm cooperating to define means for camming during rotation of the rotor about its axis of rotation in a first direction so that the rotor arm engages the aggressive cam follower wall and creates a force directed radially outwardly away from the axis of rotation to increase the torque capacity of the clutch, the non-aggressive cam follower wall and the rotor arm cooperating to define means for camming during rotation of the rotor about its axis of rotation in a second direction so that the rotor arm engages the non-aggressive cam follower wall and creates a force directed radially inwardly toward the axis of rotation to decrease the torque capacity of the clutch, and
- a housing having an inner wall around the clutch shoe and rotor, the housing including means for holding the clutch



shoe and rotor in engaged relation so that the rotor arm drives the clutch shoe to impart centrifugal force to the clutch shoe to move the clutch shoe outwardly from the axis of rotation to engage and rotate the inner wall during rotation of the rotor in the first direction at a speed greater than a minimum predetermined speed and during rotation of the rotor in the second direction at a speed greater than a minimum predetermined speed.

5,437,357

**BILL IDENTIFICATION APPARATUS**

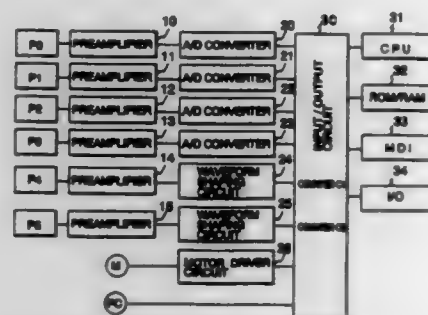
Michihiro Ota, Sakado, and Takayuki Kojima, Kawagoe, both of Japan, assignors to Nippon Conlux Co., Ltd., Tokyo, Japan  
Filed Dec. 20, 1993, Ser. No. 170,402

Claims priority, application Japan, Dec. 25, 1992, 4-358125

Int. Cl.<sup>6</sup> G07F 7/04; G07D 7/00

U.S. Cl. 194—206

9 Claims



1. A bill identification apparatus comprising:  
transportation means for transporting bills along a transportation path;  
detecting means in the transportation path for sampling the bills in synchronism with the bill transportation speed, detecting the physical properties of the bills in each of detection positions  $i$ , and outputting detected data  $p_i$  for the detected properties;  
memory means for storing standard pattern values  $p_{ci}$ , indicative of average values for the individual detection positions  $i$  computed in accordance with the detected data  $p_i$  obtained by sampling a number of authentic bills by said detecting means, and standard deviation values  $p_{si}$  indicative of the degrees of scattering of data in the detection positions  $i$ ;  
correction value computing means for obtaining a correction value  $p_m$  for making an average value of the detected data  $p_i$  for a detection section, detected by sampling the bills to be identified by said detecting means, equal to an average value of the standard pattern value  $p_{ci}$  for the detection section;  
heterogeneity computing means for obtaining a heterogeneity  $p_r$  by correcting the detected data  $p_i$ , detected by sampling the bills to be identified by said detecting means, using the correction value  $p_m$ , then subtracting the corresponding standard pattern value  $p_{ci}$  from thus corrected detected data value  $p_i$ , and integrating the square of the resulting remainder divided by the corresponding deviation value  $p_{si}$ , for a detection frequency corresponding to the detection section; and  
discriminating means for concluding that a bill is authentic only when the correction value and the heterogeneity are within respective predetermined tolerances thereof.

5,437,358  
**DEVICE FOR CHECKING THE MARKING OF A CUP IN CUP RETURN AUTOMATS**

Max Schiffelholz, Peter-Henlein-Strasse 10, D 8870 Günzburg, Germany

PCT No. PCT/EP92/01820, § 371 Date May 24, 1993, § 102(e) Date May 24, 1993, PCT Pub. No. WO93/03461, PCT Pub. Date Feb. 18, 1993

PCT Filed Aug. 10, 1992, Ser. No. 39,113

Claims priority, application Germany, Aug. 8, 1991, 41 26 258.1

Int. Cl.<sup>6</sup> G07F 7/06; B07C 5/342

U.S. Cl. 194—212

23 Claims



17. Apparatus for checking an optically detectable marking on a cup to determine whether to accept or reject the cup in a cup collection apparatus, said checking apparatus comprising:  
a detector for said optically detectable marking;  
means for retaining a cup in a position in said checking apparatus that enables said optically detectable marking to be evaluated by said detector;  
means for retracting said retaining means when a determination of appropriate marking has been made so that said cup then passes through said checking apparatus; and  
stacking means below said guide cylinder for receiving the open end of said cups and stacking them upon a shaft after release of said retaining means.

5,437,359

**PARTS INSERTION MACHINE**

Shigeaki Maruyama, Kanagawa, and Yukio Kawazu, Saitama, both of Japan, assignors to Sony Corporation, Japan

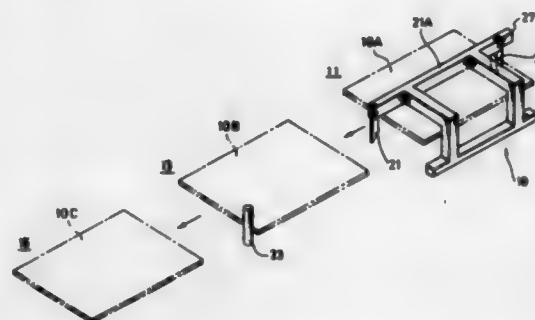
Filed Mar. 25, 1994, Ser. No. 217,721

Claims priority, application Japan, Mar. 31, 1993, 5-074629

Int. Cl.<sup>6</sup> B65G 43/00

U.S. Cl. 198—341

11 Claims



1. A printed wiring board feeding apparatus for sequentially feeding printed wiring boards to a predetermined position, comprising:  
(a) a sensor for detecting information on each of the printed wiring boards;  
(b) feeding stroke determining means for separately determining a feeding stroke for each of said printed wiring boards based upon the information detected by said sensor; and

(c) a feeding unit for feeding each of said printed wiring boards to said predetermined position based upon the feeding stroke determined by said feeding stroke determining means, said sensor being mounted to said feeding unit for movement therewith.

5,437,360

**CONVEYING SYSTEM FOR STACKED ARTICLES**

Hans J. Eberhard, Lupinenstrasse 14, D-76287 Rheinstetten, Germany

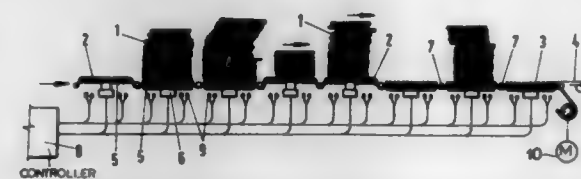
Filed Apr. 7, 1994, Ser. No. 224,836

Claims priority, application Germany, Apr. 7, 1993, 43 11 519.5

Int. Cl.<sup>6</sup> R65G 47/26

U.S. Cl. 198—460.2

13 Claims



1. A system for conveying stacks of objects, the system comprising:

a pair of elongated arrays of idler rollers extending longitudinally parallel next to each other, defining a central longitudinally extending and upwardly open gap,  
defining a generally horizontal support plane extending longitudinally through a plurality of stations, whereby the stacks of objects can be supported on the rollers in the stations, and  
each formed by a plurality of rollers rotatable about parallel axes extending perpendicular to the gap;  
a flexible conveyor belt having a reach extending longitudinally along the gap between the arrays of rollers;  
guide means engaging the reach and normally holding the reach below the plane;  
means including respective actuators at the stations engageable underneath the reach at the respective stations and operable to raise the reach only at the respective stations through the gap and above the plane; and  
reversible drive means connected to the belt for generally continuously advancing the reach in longitudinal directions, whereby when the actuator of one of the stations lifts the belt at the one station any stack in the one station will be engaged by the belt and displaced longitudinally.

5,437,361

**ARTICLE CONVEYOR UNIT**

Toshiyuki Ohmori; Shigemi Hatanaka, both of Chiba; Yasuhiro Homma, Saitama; Eiichi Saito, Chiba, and Nobuyuki Kamishioiri, Tochigi, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Apr. 7, 1994, Ser. No. 224,676

Claims priority, application Japan, Apr. 8, 1993, 5-104955

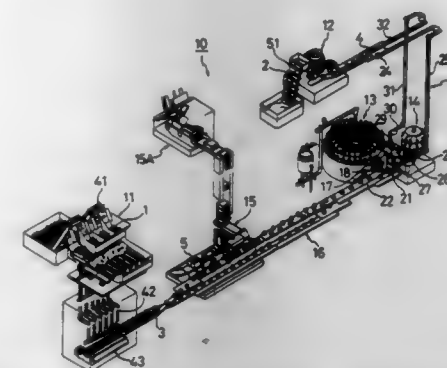
Int. Cl.<sup>6</sup> B65G 17/46; B67B 3/062, 3/064; B65B 7/28

U.S. Cl. 198—465.1

20 Claims

1. An article conveyor unit comprising:  
an article holder position regulating member extending along an article holder movement path;  
an article holder having a seating magnet, the article holder having a guide surface positionable in frictional contact with the article holder position regulating member; and  
an article holder positioning magnet disposed along the article holder movement path, the article holder positioning magnet exerting a magnetic action on the seating

magnet of the article holder to position the guide surface of the article holder in forced contact with the article



holder position regulating member as the article holder is conveyed along the article holder movement path.

5,437,362

**RETAINER PACKAGE FOR RESILIENT SURGICAL SUTURES**

Hans-Jürgen F. Sinn, Fairfield, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

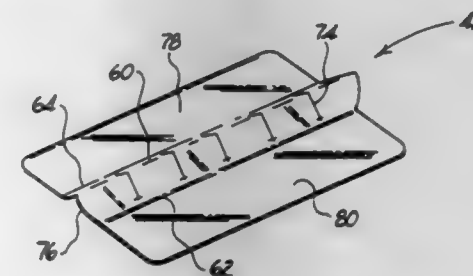
Continuation of Ser. No. 870,292, Apr. 17, 1992, Pat. No. 5,301,801. This application Sep. 3, 1993, Ser. No. 116,311

The portion of the term of this patent subsequent to Apr. 12, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61B 17/06

U.S. Cl. 206—63.3

19 Claims



1. A needle park for a suture retainer package comprising:  
a substantially planar member having at least one central score line extending along a longitudinal axis thereof, said planar member being foldable along said central score line to define first and second opposed portions;  
at least one needle mounting slit having first and second ends extending across said at least one central score line for contacting and releasably securing at least one surgical needle; and  
an orthogonal relief slit extending across said at least one needle mounting slit adjacent each of said first and second ends thereof and lying on both sides of said mounting slit.

5,437,363

**WRAP-AROUND CARRIER SLEEVE WITH ARTICLE RETAINING MEANS**

Greg Gungner, Port Coquitlam, Canada, assignor to Crown Packaging Ltd., Vancouver, Canada

Filed May 27, 1994, Ser. No. 250,290

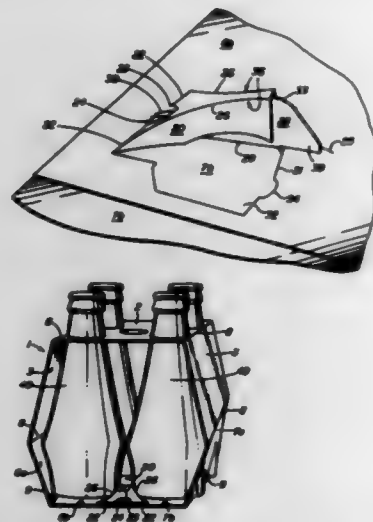
Int. Cl.<sup>6</sup> B65D 5/4805

U.S. Cl. 206—140

8 Claims

1. A blank for forming a wrap-around article carrier sleeve comprising a plurality of panels connected end-to-end including first and second end panels at opposite ends of the blank that cooperate to form a bottom of the carrier sleeve, wherein the first end panel includes at least one retaining flap struck

from the panel thereby defining an opening in the panel, the retaining flap being joined to the first end panel at a fold line, and wherein the second end panel is configured to overlap the first end panel outside the bottom of the carrier sleeve and includes at least one male supporting tab comprising a neck and at least one shoulder extending to the side of the neck, the neck being joined to the second end panel at a fold line; and wherein said male supporting tab is configured to extend through the



opening in the first panel from which the retaining flap is struck, the shoulder of the male tab being configured to engage with the first panel adjacent the opening whereby the male supporting tab supports the retaining flap within the carrier sleeve; and

wherein the retaining flap has at least one secondary fold line extending from a portion of the retaining flap not connected to the first panel for facilitating folding of the retaining flap on the male supporting tab.

5,437,364

# PACKAGE COMPRISING CONTAINERS, CARRIER, AND HANDLE

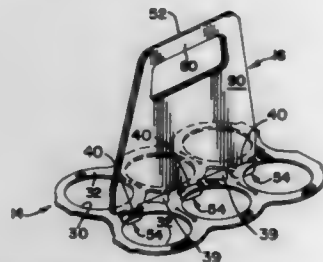
James A. Broskow, Buffalo Grove, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed May 5, 1994, Ser. No. 238,423

Int. Cl.<sup>6</sup> B65D 75/00

U.S. Cl. 206—150

18 Claims



1. A package, comprising:

a plurality of substantially identical containers arranged in a substantially rectangular array including at least one longitudinal row of containers disposed upon each side of a plane dividing said package longitudinally;

a carrier comprising a single sheet of resilient polymeric material and having container-receiving apertures arranged in a substantially rectangular array including at least one longitudinal row of container-receiving apertures disposed upon each said of said plane for respectively receiving said containers when said carrier is applied to said containers;

hole means defined within said carrier at a position located

between a set of four of said container-receiving apertures for permitting a user to insert at least one finger therein in order to permit said package to be carried by said carrier; and

a handle comprising a separate sheet and having at least one longitudinal row of tabs extending downwardly for respectively extending through a longitudinal row of slots defined within said carrier at positions interposed between adjacent pairs of said container-receiving apertures and along said plane, and extending upwardly above said carrier so as to define substantially vertical, expansive planar surfaces suitable for labelling said package and to permit said package to be carried by said handle.

5,437,365

# GOLF BAG WITH AUXILIARY HANDLES

John A. Solheim, Phoenix, Ariz., assignor to Karsten Manufacturing Corporation, Phoenix, Ariz.

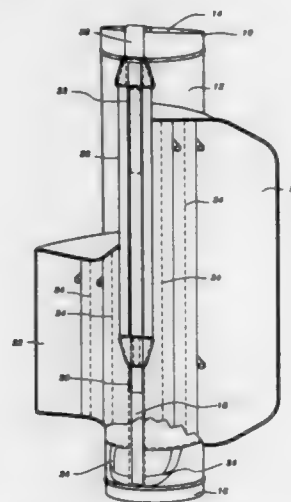
Continuation of Ser. No. 189,721, Jan. 27, 1994, abandoned. This

application Feb. 2, 1995, Ser. No. 383,659

Int. Cl.<sup>6</sup> A63B 55/00

U.S. Cl. 206—315.3

5 Claims



1. A golf bag adapted to be carried by a person, said golf bag comprising:

a generally tubular body having a spine, a top end which is open and a bottom end which is closed, said spine extending longitudinally of said body between said top and bottom ends;

a first storage pocket attached to said body along one side thereof;

a second storage pocket attached to said body along another side thereof;

a shoulder strap having an upper end connected to said body adjacent said top end thereof and a lower end connected to said body intermediate said upper and lower ends thereof, said shoulder strap being of sufficient length for looping over one shoulder of the person;

a pair of auxiliary handles attached to said body adjacent said bottom end thereof, each of said pair of auxiliary handles being disposed so that it may be grasped by one hand of the person carrying the golf bag when utilizing said shoulder strap, one of said pair of auxiliary handles being disposed below said first storage pocket, and the other one of said pair of auxiliary handles being disposed below said second storage pocket; and

each of said pair of auxiliary handles having a first end attached to said body adjacent said spine at a first location proximate said closed end thereof and a second end attached to said body at a second location spaced circumferentially away from said spine, said second location being

disposed intermediate said first location and said top end of said body when viewed in a longitudinal direction extending from said bottom end of said body toward said top end thereof.

5,437,366

# HANDGUN STORAGE CONTAINER FOR EMERGENCY ACCESS

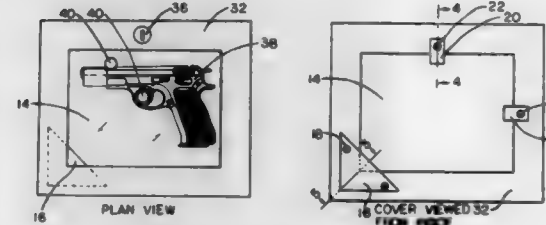
Farrin W. West, 2696 N. Oneida La., Provo, Utah 84604; David F. West, 755 W. 300 S., Provo, Utah 84601; Daniel L. West, 210 W. 1200 S. #31, Provo, Utah 84601, and Darrin J. West, 340 W. 920 S. #6, Provo, Utah 84601

Filed May 18, 1994, Ser. No. 245,430

Int. Cl.<sup>6</sup> B65D 85/00

U.S. Cl. 206—317

1 Claim



1. A handgun storage container, comprising:

a) a housing having an inner chamber sized to contain a handgun of any of a range of sizes of handguns, one end of said housing containing a first opening for normal access which is closed by an openable access cover held in a closed position thereof by a releasable locking mechanism, thus preventing unauthorized opening thereof;

b) a sheet of tempered glass, of predetermined thickness, rigidly attached to one of said cover and said housing and covering a second opening in said one of said cover and said housing for emergency access which second opening is dimensioned to allow the entrance of an adult human hand to grasp the handgun and remove it from said container;

c) one or more shear support members rigidly attached to said one of said cover and said housing and joined normally to the inner surface of said sheet of tempered glass and along the edges of said sheet of tempered glass at spaced locations around the perimeter of said sheet of tempered glass;

d) a trigger mechanism comprising a means for rigidly restraining at least one segment, of predetermined length, of the perimeter of said sheet of tempered glass from moving away from said housing when said shear supports fail as a result of a predetermined impact being directed normally to the outer surface of said sheet of tempered glass, thus causing said sheet of tempered glass to disintegrate into small fragments said trigger mechanism being attached to said one of said cover and said housing over at least one corner of said sheet of tempered glass;

whereby an adult human can, in an emergency, remove a handgun from a locked container, without first unlocking the container, simply by striking the sheet of tempered glass with his or her fist, causing the shear supports to break away, and allowing the trigger mechanism to cause the sheet of tempered glass to disintegrate into relatively harmless fragments, thus allowing access to the handgun.

5,437,367

# CARRYING CASE FOR ELECTRONIC COMPONENTS

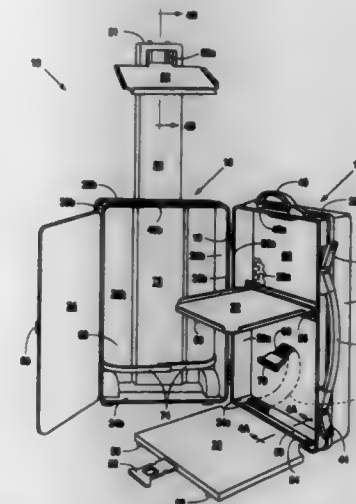
Mitchell L. Martin, P.O. Box 691226, San Antonio, Tex. 78269

Filed Dec. 15, 1993, Ser. No. 168,051

Int. Cl.<sup>6</sup> B65D 85/38

U.S. Cl. 206—320

18 Claims



1. A carrying case for electronic components, the carrying case comprising a container having:

a first shell, the first shell being generally rectangular and having a bottom surface, a near side wall and removed side wall, an upper wall and a lower wall, the walls being generally perpendicular to the bottom surface and defining an interior of said first shell and terminating at the edges defining a perimeter of said first shell;

a second shell, the second shell being generally rectangular and having a bottom surface, a near side wall and removed wide wall, an upper wall, and a lower wall, the walls being generally perpendicular to the bottom surface and defining an interior of said second shell and terminating at edges defining a perimeter of said second shell;

means pivotally connecting said first shell to said second shell along the near side wall edges of each of said shells, such that the container may be movable between a closed position with the perimeters of said shells in contact, to an open position, with the perimeters of said shells spaced apart;

a first shelf attached to the interior of said first shell and foldable between a closed position parallel to the bottom surface of said first shell to a use position perpendicular to the bottom surface of said first shell, said use position being generally coincident with the plane of the lower wall of said first shell; and

lock means to selectively maintain said first shelf in either of the use position or the closed position, while said container is in the open position,

wherein said container may be placed in an open position and laid on a flat surface with the lower end walls of said shells and said first shelf, locked in said use position providing support therefor, with said first shelf further providing support for electronic components.

5,437,368

# PACKAGING FORMAT AND A POSITIONING DEVICE FOR FASTENERS AND THE LIKE

Marshall E. Mikel, 115 15th Ave., Menlo Park, Calif. 94402

Division of Ser. No. 805,866, Dec. 10, 1991, Pat. No. 5,256,012.

This application Jul. 2, 1993, Ser. No. 87,601

Int. Cl.<sup>6</sup> B65D 85/24, 85/62

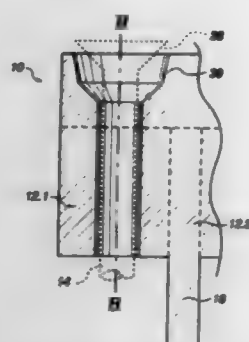
U.S. Cl. 206—341

7 Claims

1. A packaging format for fasteners comprising an elongated strip of interconnected fastener retainers, each



retainer including a land for receiving a shank of a fastener therethrough and retaining the shank such that the tip of the fastener protrudes beyond the land, and at least one support for supporting, in use, the land and the tip of the fastener clear of a working surface until the fastener is driven to approach the working surface, said at



least one support being configured to allow the tip of the fastener to be directly viewed and aligned by a user when retained in the retainer and protruding beyond the land and clear of the working surface and when the fastener approaches the working surface to confirm the point at which the tip of the fastener will first intersect the working surface.

5,437,369

## TOOL BUCKET WITH TOOL-LOCKING HANDLE

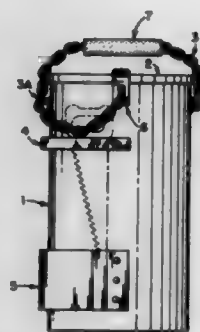
Thomas C. Spitere, 5393 Walton Heath, Las Vegas, Nev. 89122

Filed Dec. 1, 1993, Ser. No. 159,537

Int. Cl.<sup>6</sup> B65D 85/20

U.S. Cl. 206—373

9 Claims



1. A tool holding apparatus, comprising:
  - a container;
  - a shelf, located inside said container so as to support tools in substantially upright positions within said container;
  - a lid pivotally attached to said container;
  - means, connected to said container, for storing an elongated tool externally to said container;
  - said external storing means includes a bracket member so as to allow an elongated tool stored by said container to slidably engage therewith, and a pocket member operably cooperating with said bracket member so as to receive an end of the elongated tool slidably engaged with said bracket member;
  - said apparatus further comprising a chain removably attached to said container at a plurality of locations thereon; and
  - said chain is extended through an aperture of an elongated tool stored externally to said container by said bracket and pocket members so as to secure the tool to said container in a substantially locked engagement therewith.
7. A tool holding apparatus, comprising:
  - a container;

a shelf disposed within said container, having an inner wall, an outer wall, and flooring; means for holding an elongated tool externally to said container, including a bracket member attached along an outer surface of said container, and a pocket member attached to an outer surface of said container and situated in substantial alignment with said bracket member so as to hold an end portion of the elongated tool; and a substantially bendable handle removably attached to said container, a portion of said handle being inserted through an aperture of an elongated tool held externally to said container by said bracket and pocket members, so as to secure the elongated tool to said container.

5,437,370

## PACKAGE COMPRISING CONTAINERS IN UNITIZED UPPER AND LOWER TIERS

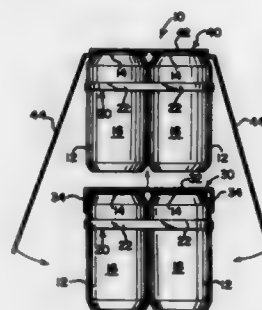
Leslie S. Marco, Bloomington, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed May 5, 1994, Ser. No. 238,421

Int. Cl.<sup>6</sup> B65D 75/00

U.S. Cl. 206—430

22 Claims



1. A unitized package, comprising:
  - a plurality of substantially identical containers having upper and lower ends and side walls, and arranged in an upper tier and a lower tier; each tier comprising a plurality of such containers disposed in a substantially rectangular array, and a carrier comprising a single sheet of resilient polymeric material so as to have band segments defining container-receiving apertures with said carrier being applied to said containers of said tier so that said containers are received by said container-receiving apertures and so that said band segments embrace said side walls of said containers said tier;
  - a covering sheet folded so as to form a cover panel and two lateral panels, said cover panel covering at least a substantial part of said upper ends of at least some of said containers of said upper tier, and each lateral panel extending downwardly from said cover panel so as to extend along and below adjacent ones of said containers of said upper tier, and along adjacent ones of said containers of said lower tier at least as far down as said carrier of said lower tier, so as to be disposed externally of said substantially rectangular arrays of containers disposed within said upper and lower tiers; and
  - means for fixing each lateral panel to at least one of said band segments of said carrier of said lower tier so as to unitize said upper and lower tiers of said package.

5,437,371

## CHILD RESISTANT BLISTER PACKAGE

Gilbert Lataix, Clermont-Ferrand, France, assignor to Merck &amp; Co., Inc., Rahway, N.J.

Filed May 10, 1994, Ser. No. 241,239

Int. Cl.<sup>6</sup> B65D 83/04

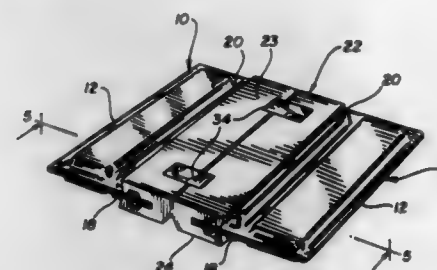
U.S. Cl. 206—539

4 Claims

1. A child resistant blister package comprising:
  - (i) a blister package formed from a film having a plurality of

cavities formed therein in which units of medication are placed and a cover sheet which overlies said cavities and which is bonded to said film, said blister package adapted to have:

- (a) opposed, extended sides which are chamfered on the corners;
- (b) at least one notch formed in each said opposed, extended sides;
- (c) a pair of raised, parallel rib members provided on and substantially co-extensive with each of said opposed, extended sides, said pairs of rib members being positioned inboard of said notches and spaced from each other;
- (d) means to overlay said opposed, extended sides such that said pairs of parallel ribs and said notches are in vertical superimposed alignment with each other; and,
- (ii) a generally rectangular locking member having opposed top and bottom walls, opposed side walls and opposed end walls, said locking member having:
  - (a) at least one T-shaped key slot formed within said locking member and extending through said opposed end walls;



- (b) a channel formed in a side wall of said locking member communicating with the head of said T-shaped key slot and defining opposed upward and downward extensions capable of receiving and impinging therebetween the overlaid, opposed extended sides of said blister package, the head of said T-shaped key slot capable of receiving therein in close fitting relationship the outermost superimposed and aligned rib members;
  - (c) at least one rectangular-shaped flexible lock between the T-shaped key slot which blocks a portion of the extended groove formed by the leg of said T-shaped key slot, said lock being positioned so that its outwardly projecting flange is aligned with and engages the notch formed in the opposed extended sides of the blister package;
- such that manual flexing of said locking member permits said locking member to be slidably removed from or mounted on said blister package and, when mounted on said blister package, release of said manual flexing permits said outwardly projecting flanges to impinge therebetween the notch formed in overlaid, opposed extended sides of said blister package.

5,437,372

## APPLICATOR DEVICE

Myra S. Per-Lee, 16136 Avenida Venusto, #2, San Diego, Calif. 92128

Continuation of Ser. No. 107,510, Aug. 17, 1993, Pat. No. 5,388,700. This application Sep. 19, 1994, Ser. No. 308,642

The portion of the term of this patent subsequent to Feb. 14, 2012, has been disclaimed.

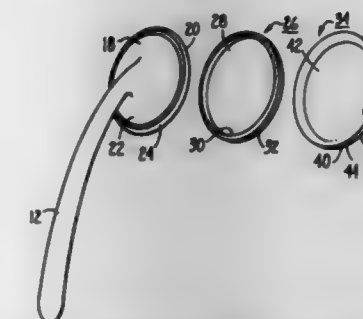
Int. Cl.<sup>6</sup> A45D 40/26

U.S. Cl. 206—581

7 Claims

1. An applicator device, comprising:
  - an elongated curved shaft having a first end and a second end, the shaft including a manually grippable segment formed adjacent the first end of the shaft;
  - an applicator head formed on the second end of the shaft, the head having an applicator surface; and
  - at least two contact pads, each pad being individually en-

gageable with the head such that each pad can be easily removed therefrom by hand without damaging the head or pad, each pad being selected from the group consisting of a first contact pad engageable with the head, the first pad having art exposed non-porous contact surface for applying relatively viscous skin treatment substances to the skin of the person, a second contact pad engageable with the head, the second pad having art exposed porous contact surface for retaining relatively non-viscous skin



treatment substances for applying the relatively non-viscous skin treatment substances to the skin of the person, a third contact pad engageable with the head, the third pad having an exposed sisal contact surface for cleansing the skin of the person, and a scratch pad non-adhesively engaged with the head for covering the applicator surface, the pad having art exposed contact surface made of plastic hook material, wherein the scratch pad can be manually removed from the head without damaging the head or pad and replaced with another pad.

5,437,373

## AERAILIC SEPARATOR, PARTICULARLY FOR SORTING WASTE

Alain Desmadryl, Linselles, France, assignor to Delta Neu S.A., France

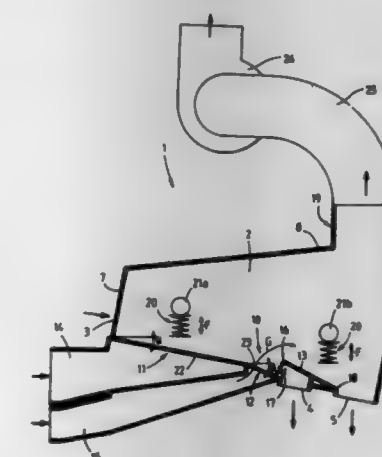
Filed Jan. 13, 1994, Ser. No. 180,665

Claims priority, application France, Jan. 26, 1993, 93 01117; European Pat. Off., Dec. 20, 1993, 93490025

Int. Cl.<sup>6</sup> B07B 4/00

U.S. Cl. 209—137

10 Claims



1. An aerailic separator for separating materials into three batches of different weights or shapes, which comprises a separation chamber presenting an upper face, a lower face and four lateral faces and comprising a) in the lower part of a first lateral face, an inlet opening for admission of the materials to be separated, b) in the lower face, successively from said first lateral face up to the opposite lateral face, a first perforated inclined plane with an inclination of angle  $\alpha$  with respect to the

horizontal, a second perforated inclined plane with an inclination of angle  $\beta$  greater than or equal to  $\alpha$ , a first opening for outlet of the batch corresponding to the heaviest materials, a second opening for outlet of the batch corresponding to the materials of intermediate weight, a first inclined deflector extending above the first outlet opening up to the front edge of the second outlet opening, and c) in the upper part of the separation chamber, towards the zone overhanging the first and second outlet openings, a third opening for outlet of the batch corresponding to the light materials, the third opening connected to a suction system, said separator further comprising two air-supply channels which open out respectively in perforations of the first and second inclined planes, wherein the density and dimensions of the perforations of the first inclined plane, as well as the flowrate of air of the first supply channel are chosen so that air jets through the first inclined plane lift in disorderly manner the materials introduced in the separation chamber promoting the individualization thereof, and making the materials move over the first plane, wherein the density and dimensions of the perforations of the second inclined plane, as well as the flowrate of air of the second supply channel are chosen so that the materials of intermediate weight are projected by the air jets through the second inclined plane above the first deflector and are evacuated via the second outlet opening while the heavier materials are evacuated via the first outlet opening, and wherein the suction system provokes a depression inside the separation chamber so that the light materials lifted by the air jets are entrained through the third outlet opening.

5,437,374

## ADJUSTABLE ORIFICE TROMMEL

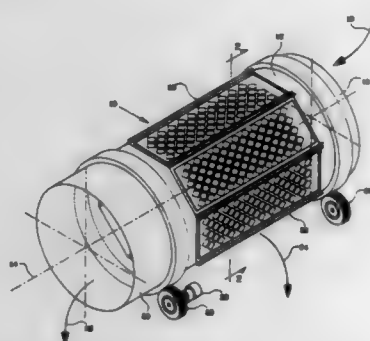
Marlin D. Billa, Bixby, Okla., and Ron Chandler, East Peoria, Ill., assignors to Osborn Engineering, Inc., Tulsa, Okla.

Filed Jul. 23, 1993, Ser. No. 97,689

Int. Cl.<sup>6</sup> B07B 1/22, 1/49

U.S. Cl. 209—288

7 Claims



1. An adjustable orifice trommel having an elongated body rotatable about an axis, an entry for insertion of particulate material and an exit for retrieving screened material, which trommel comprises:

means to rotate said elongated body about said axis including motor means to rotate at least one wheel which frictionally engages said elongated body;

a plurality of openings in said elongated body, each said body opening having four equal sides and four right angles and wherein said angles are adjacent to angles of an adjacent opening; and

at least one outer portion slidable axially in relation to said body, each outer portion having a plurality of openings matable with said body openings so that moving said outer portion will vary the size of orifices formed with said orifices formed always having four equal sides and four right angles.

5,437,375

## DOUBLE-DOCUMENT DETECTION SYSTEMS

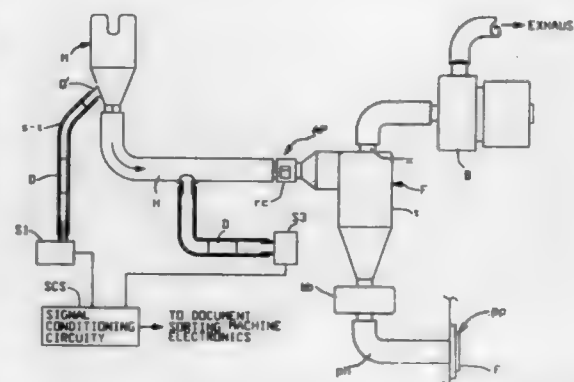
Zhongtai Chen, West Bloomfield; Ronald G. Shell, Bloomfield Hills; Randy C. Keller, Canton, and J. Michael Spall, Plymouth, all of Mich., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 30, 1993, Ser. No. 176,368

Int. Cl.<sup>6</sup> B07C 5/00; B65H 7/12

U.S. Cl. 209—591

7 Claims



1. A method for on-the-fly detection and separation of multiple documents transported in a track restraining and directing means, wherein said documents are first subjected to twin opposed vacuum forces from suction means, to separate multiple documents; then a measuring and analysis of the resulting pressure differentials within the vacuum-forming system is taken; said system being provided with a cyclonic filter-separator upstream of said suction means, for removing and storing dust and debris entrained within the vacuum-forming air flow, said cyclonic filter being so designed and adapted as to provide constant vacuum-forming airflow regardless of the nature or quantity of debris removed and collected as said; and said system being provided with pressure sensing means so constructed and adapted to give clear indication of the separated or unseparated state of said documents, said pressure sensing means being further provided with variable damping means; with said vacuum forces being applied to the passing documents by means of a single combined vacuum manifold comprising two vacuum ports so constructed and adapted as to impart opposing vacuum forces to both sides of said passing documents or multiple documents; and wherein said single combined vacuum manifold further incorporates a combined plenum, so constructed and adapted to provide equal vacuum force to both said vacuum ports from a single vacuum source, with such plenum being further adapted to provide sense port means for attachment of a pressure sensing means as close as possible to both said vacuum ports.

5,437,376

## HOLDER FOR FLAT ARTICLES, SUCH AS CD CASSETTES, CD-ROM CASSETTES, PROGRAM DISKETTES AND THE LIKE

Tommy Larsen, Them, Denmark, assignor to Tommy Larsen ApS, Them, Denmark

Filed Dec. 29, 1993, Ser. No. 174,930

Claims priority, application Denmark, Feb. 12, 1993, 157/93; Germany, Apr. 2, 1993, 9305038 U; Denmark, Dec. 23, 1993, 9300558

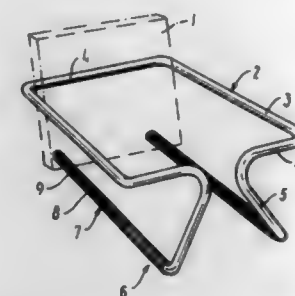
Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—40

11 Claims

1. A holder for flat articles in the form of CD cassettes, CD-ROM cassettes, diskettes and the like, comprising: a base part to support the articles placed in the holder; and a frame part arranged above and at a distance from the base part and provided with two longitudinal side members,

wherein said articles are to be placed as a stack between said two longitudinal side members; said holder moreover comprising end members serving as rest means for the articles placed in the holder, and comprising at least one connecting member connecting the frame part with the base part;



said base part being provided with an essentially plane support face for the articles and with anti-slip means to prevent the supported articles from sliding on the support face of the base part.

5,437,377

## TREE ATTACHABLE ARROW HOLDER

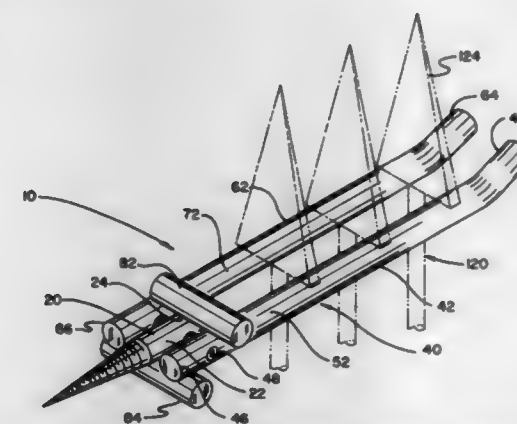
Alan F. Riemenschneider, 24369 178th St., Spirit Lake, Iowa 51360

Filed May 31, 1994, Ser. No. 251,115

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—86

8 Claims



1. A tree attachable arrow holder for retaining a plurality of hunting arrows in a tree anchorable rack proximal a bow hunter atop a tree stand whereby the arrows are readily accessible to the hunter, the tree attachable arrow holder comprising:

a rack structure whereupon a plurality of arrows may be hung by the arrowhead, the rack structure comprising: first and second essentially identical parallel spaced apart elongated arrow support arms, each support arm having a lateral through hole near a blunt proximal end thereof and a slightly upturned blunt distal end for preventing arrows from inadvertently sliding from the arms; upper and lower cross members fixedly connected transverse the first and second support arms, the upper cross member being positioned intermediate the lateral through holes and the distal ends of the support arms near the lateral holes thereof, the lower cross member being positioned intermediate the proximal ends and the lateral through holes of the support arms near the proximal ends thereof;

a horizontal anchor screw for driving into a tree, the anchor screw having an elongated shank with a lateral through hole near a blunt distal end thereof, the anchor screw shank being disposed between the proximal ends of the

spaced apart support arms such that the lateral through holes of the anchor screw and the first and second support arms align with each other; and

a hinge pin extending through the lateral through holes of the anchor screw and the first and second support arms such that the rack structure is pivotable to an installation position wherein the support arms extend generally normal the anchor screw forming a turning handle for driving the anchor screw into the tree, the cross members contacting the anchor screw shank whereby limiting pivotal travel of the rack structure to prevent the support arms from contacting the tree, the rack structure being pivotable to an operational position wherein the support arms extend generally horizontally parallel the anchor screw for holding arrows therebetween, the cross members contacting the anchor screw shank whereby limiting pivotal travel of the rack structure to prevent arrows from sliding from the support arms.

5,437,378

## SPIRAL TIE RACK

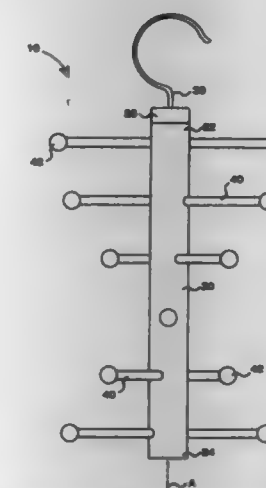
Thien Q. Ta, 7658 Cerritos Ave. #G, Stanton, Calif. 90680

Continuation-in-part of Ser. No. 76,152, Jun. 14, 1993, abandoned. This application Apr. 18, 1994, Ser. No. 229,194

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—115

20 Claims



1. A rack for hanging ties and similar items, comprising: a central pole having a first end and a second end and defining an axis;

a hook connected to the first end of the central pole in a relatively rotatable manner, the hook including a curved portion which is adapted to be supported by a horizontal closet rod; and

a plurality of tie support arms rigidly fixed to and extending outwardly from the central pole, wherein the tie support arms are spaced at substantially uniform circumferential intervals around the axis of the central pole with each of the tie support arms being arranged at a circumferentially distinct position on the central pole;

wherein each of the tie support arms terminates at a free end, and wherein the free ends of the tie support arms are arranged so as to define at least one portion of at least one substantially helical curve.



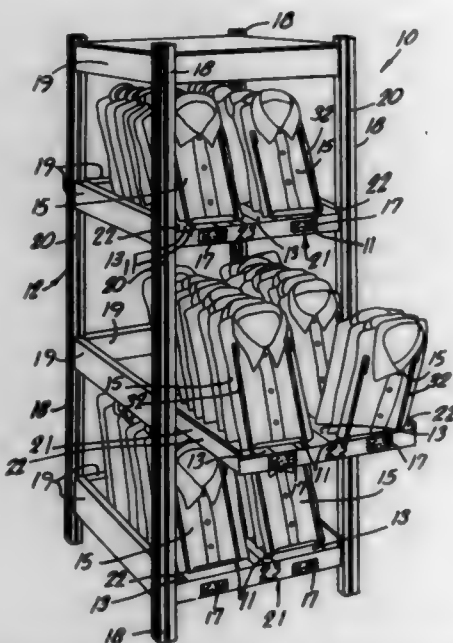
5,437,379

**MERCHANDISE DISPLAY ASSEMBLY**

Morris A. Wolf, 7048 Macapa Dr., Los Angeles, Calif. 90068,  
and Leo Wolf, 10355 Cheviot Dr., Los Angeles, Calif. 90064  
Filed Mar. 8, 1993, Ser. No. 28,542  
Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211-169

19 Claims



1. A merchandise display assembly for holding a plurality of groups of merchandise in stored positions and presenting each group for access and individual inspection of the items of merchandise in that group by a prospective purchaser, said display assembly comprising:

a plurality of display racks each comprising an elongated base adapted to be disposed in a horizontal position and having a plurality of upstanding merchandise-holding wickets on the base, said wickets being pivotally mounted at their lower ends on the base for rocking back and forth longitudinally of the base between forward and rearward angularly spaced positions, and each having support means including an elongated, channel-shaped tray extending across the lower end of the wicket for supporting the lower edge of an item of merchandise thereon and having upstanding front and rear holding members on the support means for engaging the front and rear sides of the item of merchandise, said holding members having spaced upper ends for insertion and removal of the merchandise; each of said trays of said wickets having two downturned tabs at its opposite ends straddling the base of the display rack and pivotally connected thereto to support the wicket above the base for pivoting between said forward and rearward positions;

and a display frame having frame members defining a plurality of recesses for said display racks, each of said display racks being disposed in a retracted position in one of said recesses and movable relative to said display frame for extension from the retracted position out of the display frame into an extended position for inspection of the merchandise on the rack;

said display racks and said wickets being disposed substantially outside of said display frame when in said extended positions for access to the wickets by prospective purchasers, whereby rocking of the wickets in front of any particular item to the forward positions exposes that item to the purchaser for inspection and removal.

5,437,380

**SYSTEM FOR DIVIDING A WIRE DECK**

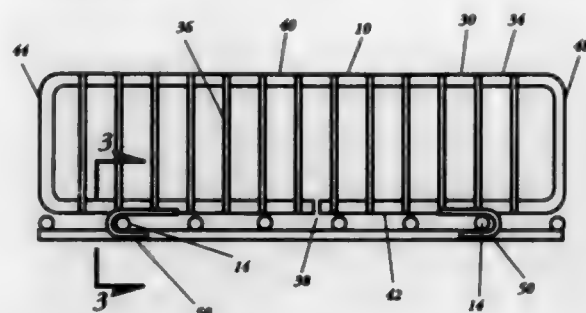
Thomas H. Peay, Antioch, and Donald E. Schrader, Nashville,  
both of Tenn., assignors to Nashville Wire Products Co.,  
Nashville, Tenn.

Continuation of Ser. No. 14,194, Feb. 5, 1993, abandoned. This  
application Sep. 8, 1994, Ser. No. 302,243

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211-184

3 Claims



1. A device attachable to a wire deck having longitudinal and latitudinal wires, said device comprising:

- a. a divider having a perimeter member which surrounds said divider except at a space and having an upper side and a lower side wherein said space making said perimeter member uncontinuous along said lower side;
- b. a pair of opposed, spaced-apart clips attached to said lower side of said perimeter member of said divider;
- c. said upper side of said perimeter member for biasing said clips releasibly attachable to either said longitudinal or said latitudinal wires;
- d. plural vertical support members joining said upper side and said lower side; and
- e. said divider, said clips, and said plural support members unitarily constructed so as to allow attachment to said wires without separation.

5,437,381

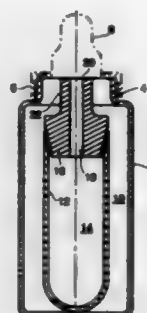
**NURSING BOTTLE**

Shlomo Herrmann, Talmon B. Mobile Post Modlin 71935, Israel  
Filed May 6, 1994, Ser. No. 239,031

Int. Cl.<sup>6</sup> A61J 9/00

U.S. Cl. 215-11.1

7 Claims



1. A valveless dual compartment nursing bottle, comprising a first container, defining a first compartment, having a neck portion to which a nipple is attachable by means of a joining member, and a second container, defining a second compartment including a closure member having at least one relatively narrow outlet port for said second compartment and said outlet port being positioned approximately at the level of said neck portion but not extending beyond said neck portion, said first compartment serving to accommodate a first liquid and said second compartment serving to accommodate a second liquid, whereby, upon the nipple being sucked, said first liquid is the first to be drawn, said second liquid starting to flow only after

said first compartment has been substantially emptied of said first liquid.

5,437,382

**SAFETY LOCK PILL CONTAINER**

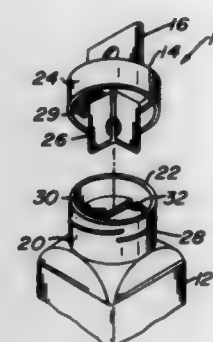
Jerome D. Gluckman, Apt. 713S, 666 W. Germantown Pike,  
Plymouth Meeting, Pa. 19462

Filed Sep. 30, 1994, Ser. No. 316,594

Int. Cl.<sup>6</sup> B65D 17/52, 51/18, 55/02

U.S. Cl. 215-204

16 Claims



1. A container comprising:

- a container body defining a cavity for holding pharmaceutical items, the container body including a neck which has an opening formed therein;
- a stopper removably disposed within and attached to the neck and having a recess formed therein;
- a removable cap comprising:
  - an annular side wall which is positioned about the neck portion and projects downward along the neck when the cap is in a first position in which it is disposed on and attached to the neck,
  - a first tab which extends upward from the cap when the cap is disposed on and attached to the neck,
  - a second tab extending downward from the cap when the cap is disposed on and attached to the neck, the second tab being located within the annular side wall, and including at least one vertically projecting substantially flat tab member having a width dimension which is less than the opening in the neck portion and having a height of sufficient dimension so as not to engage with the recess in the stopper when the cap is disposed on and attached to the neck portion in the first position; and
- said first tab adapted to be engaged with the recess in the stopper when the cap is removed from being disposed on and attached to the neck, such that the cap may be used in a second position as a tool to remove the stopper from the neck.

5,437,383

**SNAP-HINGE CLOSURE CAP WITH FULL CIRCUMFERENTIAL SEAL**

Gene Stull, 1 Winston Farm La., Far Hills, N.J. 07931

Filed Jun. 11, 1993, Ser. No. 74,499

Int. Cl.<sup>6</sup> B65D 47/08

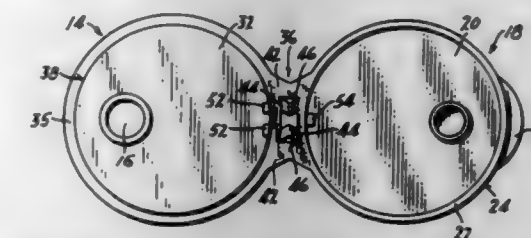
U.S. Cl. 215-235

5 Claims

1. A closure cap construction for a container, comprising in combination:

- a cap body adapted to be mounted on the container, said cap body having a discharge opening,
- a sealing cap for the cap body, and
- c) snap-action hinge means connecting the sealing cap to the cap body for movement between an opening and closing position thereon,
- d) said cap body and sealing cap having cooperable engageable sealing means providing a complete peripheral seal

therebetween when the sealing cap is disposed in its closing position on the cap body,  
e) said snap-action hinge means being disposed completely exteriorly of said sealing means so as to not impair the integrity of the latter,



f) said hinge means comprising a pair of toggle joints extending between the sealing cap and cap body, and a pair of elongate, angularly-shaped stretchable tension webs disposed between said toggle joints and extending between the sealing cap and cap body.

5,437,384

**CONTAINER APPARATUS FOR FLUID MATERIAL**

Peter J. Farrell, 72 Bushey Way, Beckenham, Kent, United Kingdom BR3 2TD

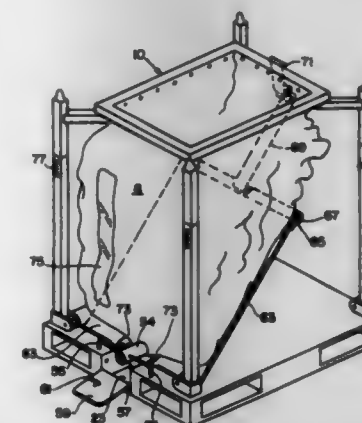
Filed Jun. 3, 1993, Ser. No. 72,181

Claims priority, application United Kingdom, Jun. 5, 1992,  
9212032

Int. Cl.<sup>6</sup> B65D 88/20

U.S. Cl. 220-1.5

8 Claims



1. Container apparatus for transporting and storing fluid material, which container apparatus comprises a flexible bag having opposed sidewalls, corners and an upper portion with sides, a liner bag within said flexible bag, a rigid frame member which is attached to said upper portion of the flexible bag, a rigid base, and elongate support members which are positioned outside the flexible bag, the elongate support members being such that they are moveable from a first position in which they extend between the rigid frame member in the rigid base to hold the rigid frame member firm with respect to the rigid base, to a second position in which they allow the sides of the flexible bag to collapse by folding when the flexible bag does not contain the fluid material, and the container apparatus being characterized in that the rigid frame member is provided with inboard portions which are attached to the sides of the said upper portion of the flexible bag thereby to draw the sides of the flexible bag substantially inboard of the rigid base, the inboard portions having corners which are adjacent upper portions of the elongate support members when the elongate support members are in their first position so that the corners of the inboard portions of the rigid frame member cause the fluid material during filling to be forced toward the corners of the flexible bag which are attached by points of attachment of

the flexible bag to the corners of the inboard portions of the rigid frame member, the inboard portions causing the upper portion of the flexible bag to have opposing sidewalls which are inclined towards each other in order progressively to reduce the perimetric area of the flexible bag as the liner bag is filled thereby to eliminate the need for manual adjustment, which would be necessary if the opposing sidewalls were parallel, of the liner bag during filling of the container apparatus with the fluid material, characterized in that the container apparatus is free of constraint members which extend parallel to the rigid base, and characterized in that the container apparatus includes a flat member which is attached to the rigid base at one extremity and which is positioned under the flexible bag and to which raising means is attached at the other extremity, the raising means being such as to move the flat member to a raised position thus inclining the base of the flexible bag to facilitate drainage.

5,437,385

# **LIDS WITH CAMS FOR CLOSING A POT OF PAINT AND SIMILAR APPLICATIONS**

Sylvain Fillon, La Boissière Ecole, France, assignor to Fillon Pichon S.A., Faveroles, France

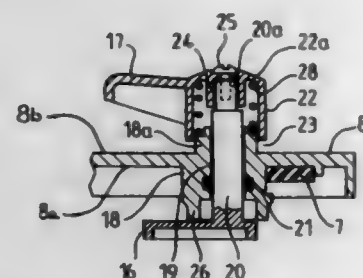
Filed Jul. 6, 1994, Ser. No. 271,413

Claims priority, application France, Jul. 6, 1993, 93 08255

Int. Cl.<sup>6</sup> B65D 51/22

U.S. Cl. 220—238

6 Claims



1. A lid for closing a container, said lid comprising: an underside and a top side;
- a seal, connected to said underside, for sealingly abutting against an upper edge of a rim of a container when the container is closed by said lid, wherein the rim of the container is provided with a friction-sensitive, corrosion-protective coating and wherein the rim has a downwardly facing bearing surface;
- cams pivotably connected to said underside;
- a lever for each said cam, said lever connected to said top side for pivoting said cam;
- said lever comprising a spindle connected to said cam;
- said lever further comprising a spring for biasing said spindle and said cam into an upward clamping position for closing the container, in which clamping position said cam rests with an upper side thereof at said bearing surface of the rim and presses said seal against the upper edge; and
- a means for spacing each said cam from said underside such that said upper side of said cam is positioned below said bearing surface of the rim in any position of said cam but said clamping position of said cam and such that said cams are pivoted in a plane below and parallel to said bearing surface and apply a compressive force to said bearing surface only in said clamping position.

5,437,386

# **CONTAINER WITH TAMPER-EVIDENT LID REMOVAL MEANS**

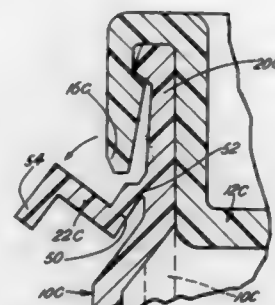
John W. Von Holdt, 6864 Lexington La., Niles, Ill. 60648

Filed Aug. 11, 1993, Ser. No. 105,305

Int. Cl.<sup>6</sup> B65D 17/32, 41/16

U.S. Cl. 220—306

10 Claims



1. A plastic container having a top and a bottom and defining a sidewall closed at said bottom and open at said top, a container lip defined at a top of said sidewall and comprising a pair of spaced, annular walls surrounding a longitudinal axis of said container to define an upwardly open recess between said spaced walls for receiving and locking a depending peripheral, annular container lid portion of a container lid on said top of said container, an outwardly extending first locking shoulder at an upper end of an inner one of said spaced walls, and a complementary inwardly extending second locking shoulder adjacent an upper end of said depending peripheral, annular container lid portion whereby when said container lid is forced downwardly on said top of said container to cause said depending peripheral annular lid portion to project down into said upwardly open recess, said first and second locking shoulders interlock to cause said container lid to be locked to said top of said container, and an outer one of said spaced walls being connected to said inner one of said spaced walls by a generally horizontal flange, said outer one of said spaced walls defining at least one pair of spaced points of tearing weakness to permit breaking of said outer one of said spaced walls and outward and downward folding of both a part thereof positioned between said points of tearing weakness and a portion of said horizontal flange to provide access to said peripheral lid portion for lid removal.

5,437,387

# **CONTAINER WITH SCREW-ON CAP HAVING A CONTROLLED-TORQUE LATCH**

James A. Burns, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 15, 1993, Ser. No. 4,946

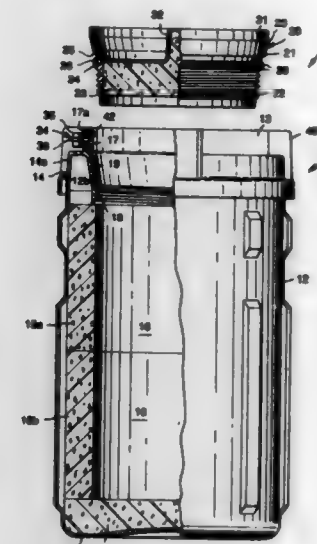
Int. Cl.<sup>6</sup> B65D 45/16

U.S. Cl. 220—326

12 Claims

1. A container comprising:
  - a) a housing;
  - b) a removable cap;
  - c) a first wall on one of the housing and cap, the first wall comprising a first threaded portion and having a tapered face that is coaxial with the first threaded portion;
  - d) a second wall on the other of the housing and cap, the second wall comprising a second threaded portion that is adapted to mate with the first threaded portion;
  - e) a catch formed on the second wall;
  - f) a bore formed through the first wall;
  - g) a manually releasable, self-activating latch mounted on the first wall, the latch comprising an elongated lever, the lever comprising a locking member which is adapted to protrude through the bore and slide along the second wall when the first and second threaded portions are being threadably secured together, wherein the latch and the catch are positioned on their respective walls such that the

locking member is adapted to engage the catch to prevent relative movement between the first and second threaded portions only when a predetermined torque is applied to the first and second threaded portions; and



- h) a sealing ring mounted on the second wall which is adapted to be compressed against the tapered face of the first wall when the first and second threaded portions are threadably secured together.

5,437,388

# **CONTAINER**

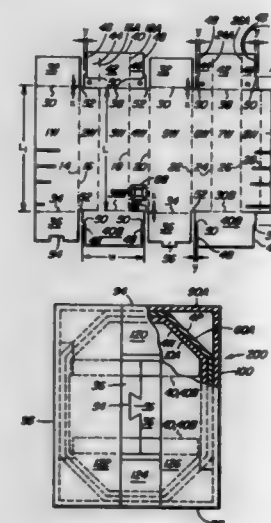
Frederick W. Bartelt, Jeffersonstown, Ky.; David F. Gillard, Woodstock, Ga.; James G. Harbison, McComb, Miss., and Achim R. Lorenz, Dickson, Tenn., assignors to MacMillan Bloedel Packaging, Inc., Montgomery, Ala.

Filed Dec. 5, 1994, Ser. No. 341,214

Int. Cl.<sup>6</sup> B65O 5/56

U.S. Cl. 220—416

8 Claims



1. A container comprising an inner sleeve formed by a plurality of foldably interconnected walls, at least one group of three adjacent of said walls composed of a center wall and a pair of laterally adjacent walls positioned one on each side of the center wall, a flap foldably connected to said center wall along one end thereof, said flap having a width wider than said center wall and extending symmetrically laterally on opposite sides of said center wall, a step formed on each lateral edge of

said flap, said set of three walls being shorter than immediately adjacent walls of said inner sleeve positioned on the sides of said laterally adjacent walls remote from said center wall thereby to provide a pair of abutment edges one formed at the end of each of said immediately adjacent walls by an edge of each of said immediately adjacent walls adjacent to said step and flap, said the widths of each of said laterally adjacent walls and the angles between the walls of said group of walls being correlated to ensure that an edge formed by each of said steps is in a substantially abutting relationship with its respective adjacent of said abutment edges when said sleeve is erected and said flap is folded into a position substantially perpendicular to the axis of said sleeve.

5,437,389

# **BEVERAGE CONTAINER**

Richard H. Kaufman, Chappaqua; Theodore J. Kovacic, Bedford, both of N.Y.; Hideyoshi Okita, Huntington Beach, Calif.; Martin M. Bostwick, Norwalk, Conn.; Andrew T. Kostanecki, Darien, Conn.; Robert H. Brainard, Danbury, Conn., and Patrick B. Nolan, Norwalk, Conn., assignors to Kraft Foods, Inc., Northfield, Ill.

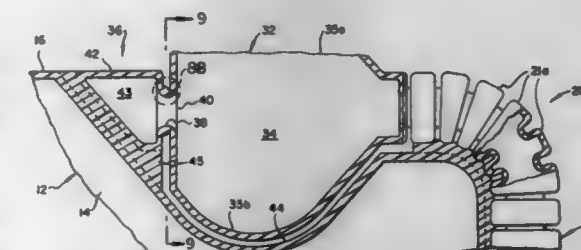
Continuation-in-part of Ser. No. 958,670, Oct. 8, 1992, Ser. No. 958,396, Oct. 8, 1992, and Ser. No. 898,114, Jun. 12, 1992, which is a continuation-in-part of Ser. No. 776,444, Oct. 17, 1991. This application Oct. 8, 1992, Ser. No. 958,408

The portion of the term of this patent subsequent to Jan. 31, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> B65D 25/00

U.S. Cl. 220—710

27 Claims



1. A unitary, blow-molded beverage container comprising: a main body defining a container volume in which a beverage is contained, said main body including a top and a bottom;
- a flexible straw having a proximal end which is fluidly connected with the container volume adjacent said bottom of said main body and a distal end formed as a mouthpiece with an aperture and wherein said mouthpiece is located adjacent said top of said main body; and
- an attaching means for removably attaching said mouthpiece of said flexible straw to said top of said main body and for closing said aperture of said mouthpiece of said flexible straw, said attaching means including a hollow connecting piece attached to said top and a short hollow bridge extending from said distal end of said flexible straw and about said aperture to said hollow connecting piece, whereby said hollow bridge is broken during removal of said distal end of said flexible straw from said hollow connecting piece and thereby said aperture of said flexible straw is uncovered prior to use;
- wherein, said attaching means further includes a connection means for permanently attaching said hollow connecting piece to said top of said container; and wherein said top of said container includes a concavity adjacent said mouthpiece such that said mouthpiece is easily grasped and twisted about a longitudinal axis thereof to break said hollow bridge while leaving said hollow connecting piece attached to said top.



**5,437,390**  
**MEDICATION CONTROL AND DISPENSING PACKAGE ASSEMBLY**

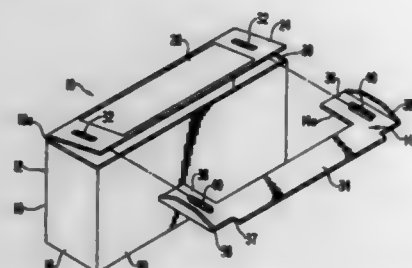
Jerome M. Ronick, Artromick International, Inc., 4900 Hilton Corp. Dr., Columbus, Ohio 43232

Filed Feb. 11, 1993, Ser. No. 16,249

Int. Cl.<sup>6</sup> B65D 25/10

U.S. Cl. 220-768

13 Claims



1. A medication control and dispensing assembly comprising:

a medication dispensing carton having walls defining a medication dispensing opening, and a top wall portion made of bendable material and being connected to a portion of said walls in such a manner so as to be movable between a closed condition covering said medication opening and an open condition so as to permit withdrawal of medication from said carton, said top wall portion having connecting means adapted for connection with a frame means; and, frame means for supportive coupling with said medication dispensing carton, said frame means being securely mounted only to said top wall portion by retaining means removably coupable with said connecting means, said frame means cooperating with said top wall portion for retaining the configuration of said top wall portion.

**5,437,391**

**ICE DISPENSER CONTROLLING ROCKING CHUTE**

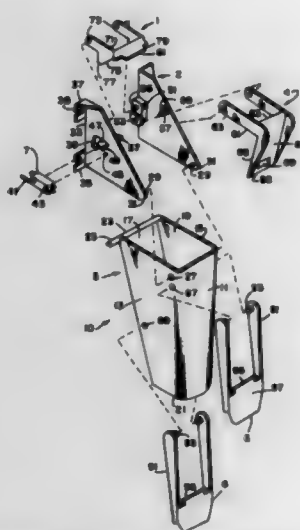
Jerry L. Landers, Sellersburg, Ind.; Thomas J. Pfeifer, and Harvey R. Brandon, both of Louisville, Ky., assignors to SerVend International, Inc., Sellersburg, Ind.

Filed Dec. 20, 1993, Ser. No. 169,386

Int. Cl.<sup>6</sup> B67D 3/00

U.S. Cl. 222-1

20 Claims



1. Ice controlling apparatus comprising brackets for mounting beside an ice dispensing opening on an ice dispenser, chute pivot pins mounted on the brackets at positions remote from the ice dispensing opening, a chute having a front, a back,

sides, an open top and an open bottom, and having holes for receiving the pins for suspending and rotating the chute on the pins, an opening in one of the brackets, a rib extending along a top of the back and extending outward from one side of the chute through the opening in the brackets for limiting rearward rotation of the chute, and a limit switch connected to the brackets and having a wand for contacting the rib and starting ice dispensing operations when the wand is contacted by the rib as the chute is rocked rearward by a user.

**5,437,392**

**DISPENSING DEVICE IN AUTOMATIC DISTRIBUTORS FOR PRODUCTS PACKED IN BOXES**

Giancarlo Carboni, Parma, Italy, assignor to S.A.I.A. S.p.A., Parma, Italy

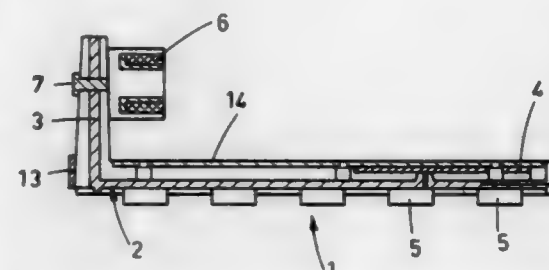
Filed May 20, 1994, Ser. No. 246,681

Claims priority, application Italy, May 24, 1993, PR93A0023

Int. Cl.<sup>6</sup> B65H 3/16

U.S. Cl. 221-212

2 Claims



1. A dispensing device in automatic distributors of boxed products, comprising:

a base plate exhibiting a vertical wall;  
an electromagnet fixed on the vertical wall;  
an electronic card housed on the dispensing device;  
a multicore cable exhibiting a crimp connector for supplying the electronic card;  
an impulse counter for sending impulses to the electronic card to command the electromagnet.

**5,437,393**

**APPARATUS FOR DELIVERING BULK FOODS**

Steen Blicher, Dorthesvej, Denmark, and Logan Langballe, Winnetka, Ill., assignors to System Feed Inc., Winnetka, Ill.

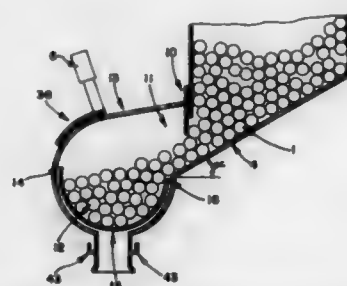
Filed Dec. 10, 1993, Ser. No. 165,086

Claims priority, application Denmark, Dec. 11, 1992, 1493/92; May 19, 1993, 0582/93

Int. Cl.<sup>6</sup> G01G 13/00; B67D 5/06

U.S. Cl. 222-77

18 Claims



1. A system for dispensing a desired portion of a dry, granular foodstuff comprising:

a) a reservoir containing a supply of said foodstuff;  
b) a dispenser compartment communicating with said reservoir to receive foodstuff therefrom;  
c) separator means (10) for limiting the quantity of foodstuff permitted to pass from said reservoir to said dispenser compartment; and

d) dispenser means connected to said dispenser compartment for dispensing said foodstuff from said dispenser compartment, whereby the user may select the amount of foodstuff to be transferred from the reservoir to the dispenser compartment and then dispense the selected amount.

**5,437,394**

**VISCOUS LIQUID DISPENSER**

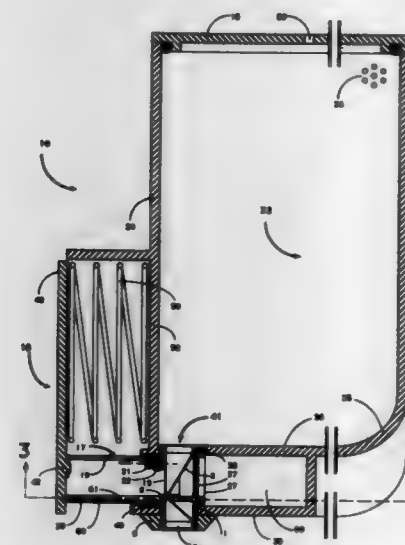
Wolf E. Ruck, 1720 Lincolnshire Blvd., Mississauga, Ontario, Canada L5E 2S7

Filed Sep. 23, 1992, Ser. No. 948,649

Int. Cl.<sup>6</sup> B65D 35/54, 83/00

U.S. Cl. 222-96

45 Claims



1. A dispensing means for a viscous material comprising:

(a) a reservoir for containing a viscous material, said reservoir having a first basal dispensing opening;  
(b) a slot in said reservoir, said slot having a second basal dispensing opening;  
(c) a nozzle housing received by said first and second basal dispensing openings in communication with said reservoir;  
(d) a nozzle received by said nozzle housing in fluid communication with said reservoir;  
(e) a manual plunger and urging means to urge said plunger to an undepressed, unactuated position;  
(f) a means for selectively blocking the dispensing of material through said first and second basal dispensing openings comprising:

a slider leg depending from said plunger and associated with said first and second basal dispensing openings with said leg blocking the dispensing of material when said plunger is in a first undepressed position, and said leg not blocking the dispensing of material when said plunger is depressed to a second position;

said manual plunger being operatively connected to said means for selectively blocking the dispensing of material through said first and second basal dispensing openings; whereby the force of gravity acting on viscous material contained in said reservoir pressurizes viscous material at the bottom of said reservoir so that when said reservoir contains viscous material and said nozzle is not blocked, viscous material at said second basal dispensing opening is exposed to ambient air pressure so that viscous material at the bottom of said reservoir is urged to exit through said nozzle by the pressure differential between the pressure at the bottom of said reservoir and ambient air pressure;

(g) means for selectively urging and blocking the dispensing

of material through said second basal dispensing opening comprising:

a plunger arm depending from said plunger and associated with said first and second basal dispensing openings with said arm urging the dispensing of material through said second basal dispensing opening when said plunger is depressed from said undepressed first position to said depressed second position, and with said arm not urging the dispensing of material through said second basal dispensing opening when said plunger is in said first undepressed position, or when said plunger is in said second depressed position, or when said plunger is returning from said depressed second position to said undepressed first position; and with said arm blocking the dispensing of material through said nozzle when said plunger is in said depressed second position, and with said arm blocking the dispensing of material through said second basal dispensing opening during at least a portion of the return stroke of said plunger when said plunger is returning from said depressed second position to said undepressed first position;

said manual plunger being operatively connected to said means for selectively urging and blocking the dispensing of material through said second basal dispensing opening; whereby mechanical pressure exerted on said nozzle by said plunger arm when said plunger is depressed may increase pressure in said nozzle so that viscous material contained in said nozzle is urged to exit through said second basal dispensing opening by the pressure differential between the pressure in said nozzle and ambient air pressure; and

whereby, after viscous material contained in said nozzle is dispensed through said second basal dispensing opening and said plunger is released and is returning from said depressed second position to said undepressed first position, the mechanical pressure exerted on said nozzle by said plunger arm may be reduced when said plunger is returning to said undepressed first position and pressure in said nozzle may fall below ambient air pressure so that material at said second basal dispensing opening may be urged by a pressure differential to re-enter said nozzle while said nozzle is not blocked by said selective blocking means; and

whereby mechanical pressure is exerted on said nozzle by said plunger arm when said plunger is in said depressed second position so that said nozzle is pinched closed between said arm and said nozzle housing, thereby blocking the dispensing of viscous material through said nozzle; and whereby mechanical pressure is maintained on said nozzle by said arm when said plunger is released and is returning from said depressed second position to said undepressed first position so that said nozzle remains pinched closed between said arm and said nozzle housing during at least a portion of the return stroke of said plunger when said plunger is returning from said depressed second position to said undepressed first position, thereby blocking the dispensing of viscous material through said nozzle; and

whereby viscous material contained in said reservoir may be blocked from entering said nozzle by said selective urging and blocking means when said plunger is in said depressed second position and during at least a portion of the return stroke of said plunger when said plunger is returning from said depressed second position to said undepressed first position, and free to enter said nozzle when said plunger is in said undepressed first position;

(h) venting means for venting said reservoir to ambient air pressure prior to actuation of said manual plunger means, said venting means comprising an opening to allow ambient air to enter said reservoir when the pressure in said reservoir is at or below ambient pressure.

5,437,395

**MODULAR BEVERAGE DISPENSER**

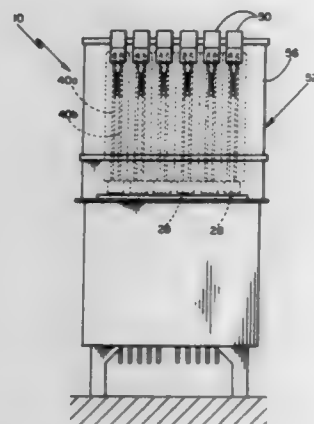
Ronald E. Bull, and Harlan R. Davis, both of Mason City, Iowa, assignors to IMI Cornelius Inc., Anoka, Minn.

Filed Sep. 15, 1992, Ser. No. 946,053

Int. Cl.<sup>6</sup> B67D 5/56, 5/62

U.S. Cl. 222—129.1

25 Claims



1. A beverage dispenser, comprising:
  - a lower housing for retaining a cooling means therein, the cooling means for cooling a plurality of beverage constituents flowing through a plurality of beverage delivery lines extending through the cooling means from the first ends thereof for connecting to sources of the beverage constituents to second ends thereof,
  - a dispensing tower, the dispensing tower having an outer housing defining a tower interior, and the tower having a lower end and a top end, the tower top end for supporting a plurality of beverage dispensing valves on a valve retaining housing surface thereof, and the tower lower end for securing to the lower housing,
  - a plurality of beverage line segments extending through the tower interior, each beverage line segment having a first end at the valve retaining housing surface for connecting to one of the plurality of beverage dispensing valves and having a second end, and means for providing releasable fluid connecting between the second ends of the beverage line segments and the second ends of the delivery lines.

5,437,396

**DISPENSER APPARATUS**

Rhonda L. Russillo, and Donald Russillo, both of 1403 Boreas Dr., Orlando, Fla. 32822

Filed Jun. 6, 1994, Ser. No. 254,261

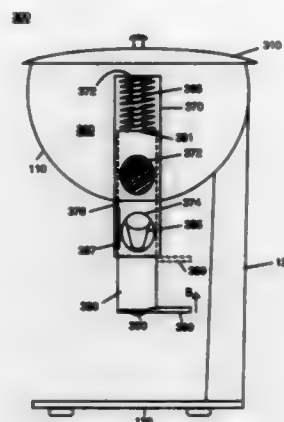
Int. Cl.<sup>6</sup> B67D 5/06

U.S. Cl. 222—185.1

19 Claims

1. An apparatus for dispensing preselected amounts of condiments comprising:
  - a chamber for storing a condiment having a granular size, the chamber having sides and a bottom;
  - a push valve located in the bottom of the chamber for filling and dispensing the condiment, the push valve having an inner cylinder for sliding within an outer cylinder and a clearance therebetween, the clearance being smaller than the granular size, the outer cylinder having an upper portion with a first opening and a lower portion with a second opening, the upper portion extending into the chamber, the lower portion extending beneath and exterior to the chamber, the inner cylinder has an indented

portion, wherein the indented portion is aligned with the first opening during a fill position, and the indented por-



tion is aligned with the second opening during a dispense position.

5,437,397

**MEDIA DISPENSER WITH LOADABLE MEDIUM RESERVOIR**

Karl-Heinz Fuchs, Radolfzell, Germany, assignor to Ing. Erich Pfeiffer GmbH & Co. KG, Germany

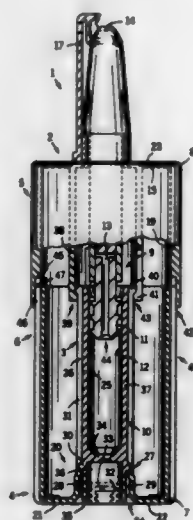
Continuation of Ser. No. 766,036, Sep. 26, 1991, abandoned. This application Jul. 26, 1993, Ser. No. 97,969

Claims priority, application Germany, Sep. 27, 1990, 40 30 531.7

Int. Cl.<sup>6</sup> G01F 11/10

U.S. Cl. 222—321.9

45 Claims



1. A dispenser for media discharging comprising:
  - at least one discharge actuating means (2);
  - at least one discharge feeder (3) having at least two actuating units (4, 5) movable against one another via an actuating stroke, said actuating units (4, 5) forming a preassembled common unit (49);
  - at least one medium reservoir (10) transferable from a dismounted state separate from and outside of said common unit (49) to a mounted state operationally connected to said common unit (49) in a discharge position;
  - at least one mounting support (20) for mountingly receiving said at least one medium reservoir in said discharge position; and
  - means for permitting insertion of said at least one medium reservoir (10) into said preassembled common unit (49)

from a location apart from said preassembled common unit after assembly of said common unit (49) in said discharge position without disassembly of said common unit (49).

5,437,398  
**MEDIA DISPENSER WITH ISOLATED PUMP RESTORING SYSTEM**

Stefan Ritsche, Radolfzell, Germany, assignor to Ing. Erich Pfeiffer GmbH & Co. KG, Germany

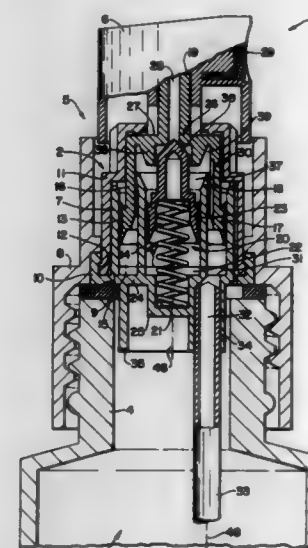
Continuation of Ser. No. 788,560, Nov. 6, 1991, abandoned. This application Aug. 16, 1993, Ser. No. 106,808

Claims priority, application Germany, Nov. 9, 1990, 40 35 663.9

Int. Cl.<sup>6</sup> B67D 5/42

U.S. Cl. 222—321.8

20 Claims



1. A dispenser for discharging media from a medium reservoir to an outlet formed in a dispenser head, said dispenser comprising:

means for actuating discharge of the medium, said means for actuating being operatively connected between the medium reservoir and the outlet; and

at least one medium duct extending between the medium reservoir (3) and the outlet (29), wherein said means for actuating includes a pump having a presuction chamber (15), said presuction chamber being annular in cross section, operably variable in volume and supplied with the medium via an inlet opening (31) providing medium from the medium reservoir in the vicinity of an end face of said presuction chamber (15) and wherein said pump includes a pump chamber and an intermediate valve openably separating said pump chamber and said presuction chamber, wherein said presuction chamber (15) has an inner boundary defined by an outer circumference of said pump chamber (39), said presuction chamber (15) having an outer wall boundary spaced from said inner wall boundary.

5,437,399

**DEVICE FOR HOLDING WRITING INSTRUMENTS**

Michael Levitt, 34-05 Woodward St., and Gregory Gelman, 33-29 Poplar St., both of Oceanside, N.Y. 11572

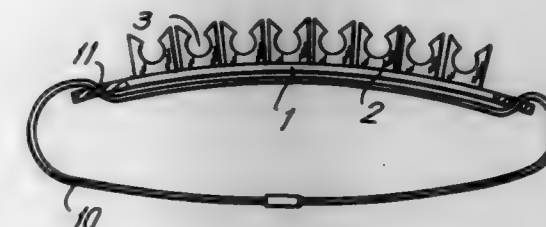
Continuation-in-part of Ser. No. 838,025, Feb. 20, 1992, Pat. No. 5,289,961. This application Feb. 23, 1994, Ser. No. 177,475

The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A45F 5/00

U.S. Cl. 224—247

10 Claims



1. A device for holding writing instruments, comprising an elongated supporting member having a predetermined direction of elongation; a plurality of holding members arranged on said supporting member substantially side-by-side along the direction of elongation of said supporting member and each having at least one receptacle from receiving at least one writing instrument, each of said receptacles being elastically expandable so that a writing instrument can be introduced in said receptacle and then contractible so as to reliably retain the introduced writing instrument in said receptacle upon the contraction of said receptacle, said holding members being spaced from one another by a distance which is smaller than a size of each of said receptacles in the expanded position as considered in the direction of elongation of said supporting member, so that a writing instrument can be inserted into said receptacles but cannot be inserted into a space between said holding members.

5,437,400

**CAN POUR SYSTEM**

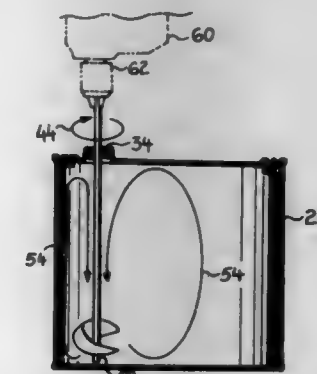
Paul L. Loeffler, 1508 Monroe Dr., Edgewater, Fla. 32132

Filed Jun. 24, 1994, Ser. No. 265,125

Int. Cl.<sup>6</sup> B65D 25/40

U.S. Cl. 222—570

4 Claims



1. A can pour system comprising:
  - a lid comprising a lid tongue and a lid spout, said lid spout comprising a spout aperture and a spout male thread;
  - a cap comprising a cap female thread sized to mate with said spout male thread;
  - an agitator, said agitator comprising an agitator wing having an inner helical edge attached to an agitator lower shank at one end of an agitator shank, and an agitator shank drill chuck end at another end of said agitator shank, said



agitator wing and said agitator shank being sized to freely fit through said spout aperture;  
 an agitator wing outer edge on said agitator wing, said agitator wing outer edge describing a counter-clockwise helix departing from said agitator shank drill chuck end about said agitator lower shank, when viewed from said agitator shank drill chuck end.

5,437,401

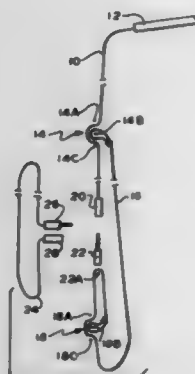
**PERSONAL HARNESS FOR CARRYING ARTICLES**

Richard Seltzer, 55 River Rd., Flanders, N.J. 07836

Filed Feb. 7, 1994, Ser. No. 192,376

Int. Cl.<sup>6</sup> A45F 3/02

U.S. Cl. 224—151



1. A personal harness for carrying at least one article, comprising:

- a shoulder strap having a pair of carrying ends; and
- a pair of hitch means for holding at least said one article, said pair of hitch means being separately attached to said shoulder strap near said pair of carrying ends, each of said hitch means comprising:
  - a primary slide slidably mounted on said shoulder strap;
  - a cinch strap attached to said primary slide; and
  - a clasp for detachably joining said cinch strap and a corresponding one of said carrying ends of said shoulder strap, said clasp, when closed, being closer to an adjacent one of said carrying ends than said primary slide and being operable to disengage said hitch means to release said article.

5,437,402

**CHILD CARRIER**

Patrick S. Ring, 5725 Noble Ave., Van Nuys, Calif. 91411

Filed Aug. 22, 1994, Ser. No. 293,656

Int. Cl.<sup>6</sup> A47D 13/08

U.S. Cl. 224—159

3 Claims



1. A method for supporting a child on the shoulders of a person, comprising the steps of:

- a) supporting a child on the shoulders of a person with the child's legs on opposite sides of the person's head;

- b) securing the child's first ankle to a first ankle wrap;
- c) securing the child's second ankle to a second ankle wrap, said first and second ankle wraps being connected to a first portion of a connecting element; and
- d) extending said connecting element down the front of said person and securely attaching a second portion of said connecting element to the front of the waist of said person.

5,437,403

**TRAVEL PACK WORN ON THE PERSON**

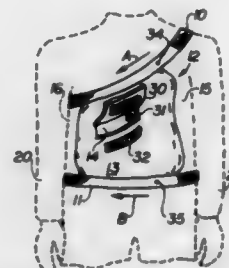
Gerald Lemanski, II, 1300-A E. 8th St., Tempe, Ariz. 85281

Filed Dec. 20, 1993, Ser. No. 169,387

Int. Cl.<sup>6</sup> A45F 3/02

U.S. Cl. 224—208

1 Claim



1. A carrier adapted to be mounted on a user and including (a) a first continuous strap shaped to circumscribe and slide around the body of the user, and to extend under an arm on one side of the user and up and over a shoulder on an opposite side of the user;

(b) a second continuous strap spaced apart from said first strap and shaped to circumscribe and slide around a waist of the user, a space between said first and second straps on said one side of the user being less than the space between said first and second straps on the said opposite side of the user; and,

(c) a travel pack connected to and extending between said first and said second straps for carrying articles, said and straps adapted to slide sliding around the body of the user from a front, over said one side, and to a back of the user and including at least

- (i) a pliable back panel normally positioned against the body of the user,
  - (ii) a pliable front panel connected to said back panel, said back and front panels at least partially bounding and defining a storage chamber;
- wherein said travel pack is shaped and dimensioned to bend and to contour around the user's body when the space between said first and second straps is reduced by sliding said travel pack from the front or back of the user to said one side of the user.

5,437,404

**ADJUSTABLE SHEAR BLOCK ASSEMBLY**

Yury Shkolnikov, Glenview, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Jul. 13, 1993, Ser. No. 91,180

Int. Cl.<sup>6</sup> B25C 5/00

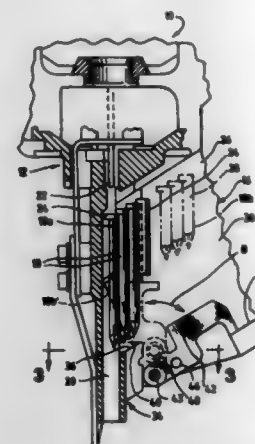
U.S. Cl. 227—109

20 Claims

1. An apparatus for guiding fasteners of at least two different longitudinal lengths as they are moved through an exit of a fastener magazine and into a driving bore so as to be driven by a fastener driving tool, comprising:

- shear block guide surface means movably connected to a shear block for movement between a first operative position at which said shear block guide surface means is disposed out of alignment with respect to said driving bore for permitting driving of fasteners having a first longitudinal length, and a second operative position at which said shear block guide surface means is substantially in alignment with a wall defining said driving bore

for effectively shortening the length of said exit of said fastener magazine so as to permit driving of fasteners having a second longitudinal length, which is shorter than



said first longitudinal length, while preventing said fasteners of said second longitudinal length from tipping or tumbling as said fasteners of said second longitudinal length are driven.

5,437,405

**METHOD AND APPARATUS FOR STITCH BONDING OF WIRES TO INTEGRATED CIRCUIT BONDING PADS**

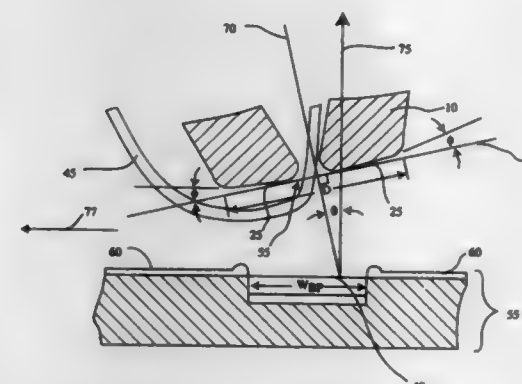
Chaiarong Assanasaveet, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 22, 1994, Ser. No. 293,822

Int. Cl.<sup>6</sup> B23K 31/02

U.S. Cl. 228—180.5

7 Claims



1. A method of bonding wires to integrated circuit bonding pads using a bonding capillary which defines an axis and has a capillary tip about an opening of the bonding capillary, the opening being aligned with the capillary axis, having a face on the tip, the face having a face surface oriented at a face angle with respect to a face plane perpendicular to the capillary axis, the method of wire bonding comprising the steps:

- positioning of the capillary tip in proximity to a second bonding pad of a second integrated circuit die;
- tilting the capillary tip with respect to a surface of the second bonding pad of the second integrated circuit die such that a tilt angle defined as an angle between the face plane and the surface of the second bonding pad is greater than zero but less than the face angle thereby substantially preventing a portion of the face surface from contacting the second integrated circuit die; and
- welding a second end of a bonding wire, exuding from the opening of the capillary, to the surface of the second

bonding pad to form a stitch bond of the second end of the bonding wire to the second bonding pad; whereby the second end of the bonding wire is stitch bonded to the second bonding pad to connect electrically the second end of the bonding wire to the second bonding pad such that the portion of the face surface is substantially prevented from damaging the second integrated circuit die.

5,437,406

**SEMI-RIGID CEREAL CARTON**

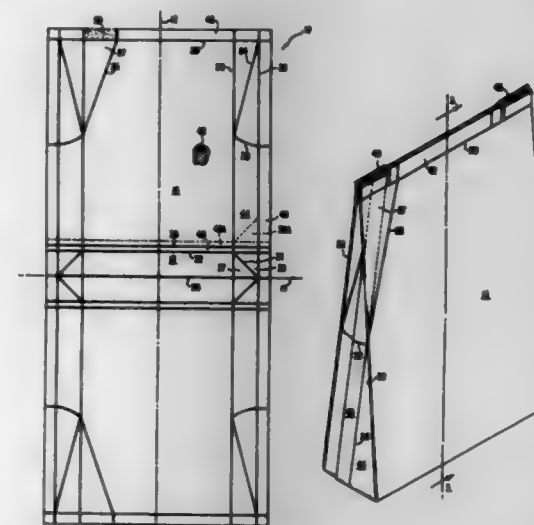
Robert L. Gordon, Monroe; Katherine A. Swenson, Goshen; David E. Stier, Middletown, all of N.Y., and Teresa A. Brook, Cordova, Tenn., assignors to International Paper, Purchase, N.Y.

Filed Jul. 2, 1993, Ser. No. 85,485

Int. Cl.<sup>6</sup> B65D 5/18

U.S. Cl. 229—193

11 Claims



1. A generally vertical semi-rigid container, said container being closed and having an interior and having an interior surface covered by a barrier layer of thermoplastic polymer, and having an exterior surface including side walls and end walls, said latter walls having upper edges, the container having a flat, rectangular bottom panel and a top, the container having a generally rectangular, annularly continuous lower rim extending below said bottom panel, said container formed of a unitary generally rectangular paperboard blank having edges, said edges of said blank being sealed together by said polymer to form two said vertical end walls each having a respective central fin and a lowermost portion and an uppermost portion, a fin closure at said top of the container, said top fin closure having opposite ends, the container being generally triangular in vertical, transverse section, and wherein at least one said end wall fin is sealed flat against said lowest portion of its respective end wall but is not sealed flat against said uppermost portion of its respective end wall.

5,437,407

**DETERGENT PACKING PAPER BOX**

Do Wook Kim, Seoul, Rep. of Korea, assignor to Dae Young Packing Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jul. 11, 1994, Ser. No. 272,478

Claims priority, application Rep. of Korea, Apr. 11, 1994, 94-7511

Int. Cl.<sup>6</sup> B65D 5/54

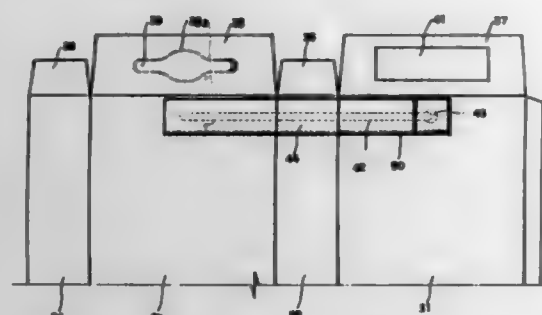
U.S. Cl. 229—225

6 Claims

1. A paper box for packing detergent having four vertical wall members, top members extended from upper ends of the vertical wall members and bottom members extended from

lower ends of the vertical wall members, said paper box comprising:

a tear tape portion formed at upper portions of a first, a second and a third vertical wall members selected from the four vertical wall members, the tear tape portion beginning at a nail inserting hole formed at a middle part



of the upper portion of the first vertical wall member, passing through the second vertical wall member and terminating in a middle part of the upper portion of the third vertical wall member; and the first vertical wall member formed with the nail inserting hole has a detachable tape attached thereto such that the nail inserting hole is hermetically sealed.

5,437,408

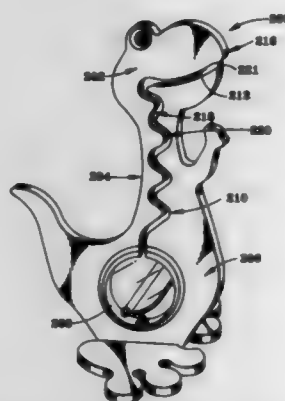
## ANIMAL COIN BANK

John M. Chesnut, P.O. Box 795, Grantham, N.H. 03753  
Filed Nov. 2, 1993, Ser. No. 146,659

Int. Cl.<sup>6</sup> G07F 1/04

U.S. Cl. 232-4 R

30 Claims



1. A bank having an open coin path which provides continuous viewing of a coin as it passes along the coin path comprising:

a bank body;

a substantially vertical coin path having,

a major slot having a front, a back, and side surfaces, said major slot having a width W and a depth D, and a major slot centerline defining a major serpentine slot, said major serpentine slot having a line of sight less than about five-sixteenths (5/16) of an inch in width,

at least one minor slot intersecting said major slot, said at least one minor slot having an open front, an open back, and side surfaces, said at least one minor slot having a width w and a depth d and a minor slot centerline defining a view path,

said major slot centerline and said at least one minor slot centerline being parallel and defining a center surface parallel to said side surfaces of said major slot and said at least one minor slot, said center surface being midway between said side surfaces of said major slot and said side surfaces of said at least one minor slot,

W is greater than about fifteen-sixteenths (15/16) of an

inch and is less than or equal to about one and three-sixteenths (13/16) less w/2 inches,

D is greater than about one-sixteenth (1/16) and less than or equal to one-eighth (1/8) of an inch, w is less than about three-eighths (3/8) of an inch; and a coin reservoir in said body communicating with said major slot.

5,437,409

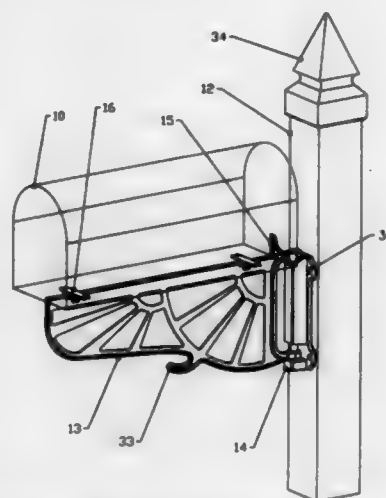
## PIVOTING MAILBOX APPARATUS

Charles M. Coushaine, 56 Birch Dr., Rindge, N.H. 03461  
Filed Apr. 19, 1994, Ser. No. 229,901

Int. Cl.<sup>6</sup> B65D 91/00; F16M 13/00

U.S. Cl. 232-39

13 Claims



1. A pivoting apparatus for attaching a mailbox to a post comprising:

a box support section having at least two attachment mailbox mounting flanges that attach said support section to the mailbox, said box support section also having a top portion having a compound angled surface and a bottom portion, with said top and bottom portions having an opening;

a post bracket that is attached to the post, said bracket having a top portion having a compound angled surface and a bottom portion, with said top and bottom portions having an opening, and wherein the compound angle of said top portion of said box support section corresponds to the compound angle of said top portion of said post bracket;

a shaft having a diameter corresponding to the openings in said top and bottom portions of said box support section and corresponding to the openings in said top and bottom portions of said post bracket, said shaft pivotally connecting said box support section to said post bracket through the openings in said top and bottom portions of said post bracket and said box support section such the compound angled surfaces of said post bracket and said box support section are adjacent to one another;

a compression spring surrounding said shaft and between the top portion of said post bracket and the bottom portion of said box support section, wherein the pivoting of said box support section causes said spring to be compressed;

wherein a lateral force against said box support section causes said box support to pivot on said shaft by riding up the compound angled surface of said post bracket.

5,437,410

## PASSIVE FRAGRANCE DISPENSER

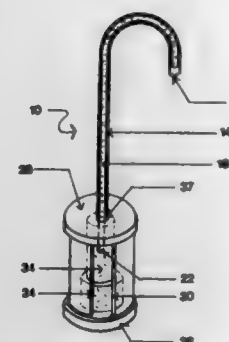
Wolfgang Babasade, New Milford, N.J., assignor to ISC, Inc., Mahwah, N.J.

Filed Jun. 20, 1994, Ser. No. 262,780

Int. Cl.<sup>6</sup> A61L 9/04

U.S. Cl. 239-55

8 Claims



1. An aromatic substance dispenser, comprising:

(a) a housing containing a diffuser;

(b) said diffuser being capable of absorbing quantities of said aromatic substance and thence to diffuse vapors of said aromatic substance into a surrounding environment;

(c) a first end of a tube being placed within and secured to said housing;

(d) a rod being placed within said tube, said rod extending throughout most of the length of said tube;

(e) said rod extending a distance beyond said first end of said tube into said housing and in contact with said diffuser, the other end of said rod terminating within said tube from a second end of said tube, said second end of said tube being external to said housing;

(f) said rod and said diffuser being made of an absorbent material capable of absorbing said aromatic substance;

(g) said housing having means for totally enclosing said diffuser from the surrounding environment when diffusing of said aromatic substance to said environment is not required, and said housing having means for partially exposing said diffuser to said surrounding environment when diffusing of said aromatic substance to said environment is required;

(h) said tube having means for admitting a liquid quantity of said aromatic substance at said second end of said tube so that under the influence of gravity and capillary action said rod is saturated with said aromatic substance;

(i) means for sealing said second end of said tube after said liquid quantity of said aromatic substance has been admitted to said tube; and

(j) said absorbent material within said diffuser absorbing said aromatic substance from said rod by said gravity and said capillary action, so that when it is required to diffuse said aromatic substance to said surrounding environment activating said housing means for partially exposing said diffuser to said surrounding environment causes said aromatic substance to be diffused into said surrounding environment.

5,437,411

## VECTORED EXHAUST NOZZLE FLAP AND SEAL POSITIONING APPARATUS

Bernard J. Renggli, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 14, 1992, Ser. No. 990,487

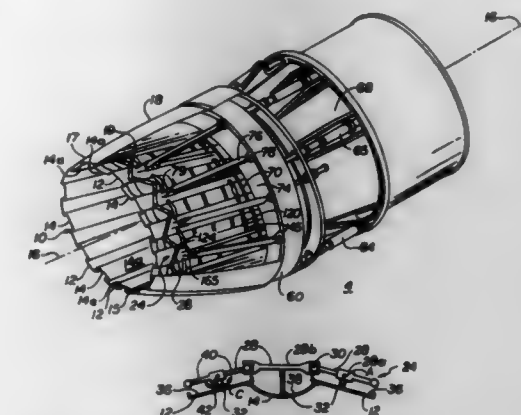
Int. Cl.<sup>6</sup> B64C 15/02

U.S. Cl. 239-265.39

17 Claims

1. A positioning apparatus for centering adjacent longitudinally extending seals and flaps in an aircraft gas turbine engine exhaust nozzle, said positioning apparatus comprising:

a plurality of flap centering levers rotatably mounted on backs of the flaps,  
a plurality of seal centering levers rotatably mounted on backs of the seals, and



said flap centering levers pivotally connected to adjacent ones of said seal centering levers.

5,437,412

## VARIABLE GEOMETRY JET ENGINE EXHAUST NOZZLE

Olivier Carletti, Vaux le Penil, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.), Paris, France

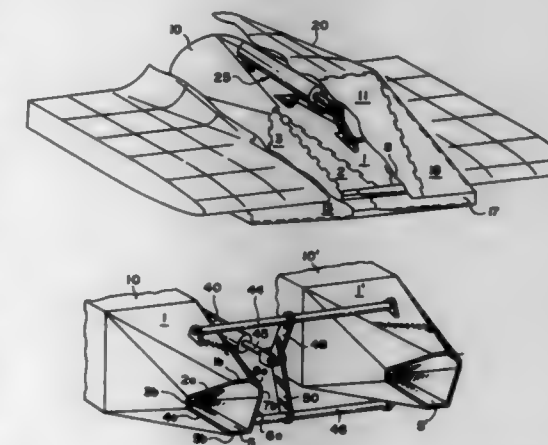
Filed Jun. 23, 1994, Ser. No. 264,338

Claims priority, application France, Jun. 23, 1993, 93 07606

Int. Cl.<sup>6</sup> F02K 1/12

U.S. Cl. 239-265.25

21 Claims



1. A variable cross-section nozzle for a jet powered aircraft having a jet exhaust duct and a surrounding aircraft structure, comprising:

a) an inner adjustable nozzle comprising:

i) first, second, third and fourth main inner flaps, each flap having a base pivotally attached to the jet exhaust duct such that the bases of the first and third flaps extend generally parallel to each other and the bases of the second and fourth flaps extend generally parallel to each other, the first and third flaps having a generally trapezoidal configuration with the larger bases attached to the jet exhaust duct; and,

ii) first, second, third and fourth secondary inner flaps each having a generally triangular configuration with two sides pivotally attached to sides of two adjacent main inner flaps;

b) an outer adjustable nozzle comprising:



- i) first, second, third and fourth main outer flaps, each flap having a base pivotally attached to the surrounding aircraft structure such that the bases of the first and third main outer flaps are generally parallel to each other and the bases of the second and fourth main outer flaps extend generally parallel to each other, the first and third main outer flaps having a generally trapezoidal configuration with the larger bases attached to the surrounding aircraft structure; and,
- ii) first, second, third and fourth secondary outer flaps each having a generally triangular configuration with two sides pivotally attached to sides of two adjacent main outer flaps; and,
- c) control means operatively connected to at least the first and third main inner flaps and the first and third main outer flaps to synchronously control the positions of the flaps to vary the geometry of the opening defined by the nozzle.

5,437,413

# **MULTIPLE DISK AIR ASSIST ATOMIZER FOR FUEL INJECTION**

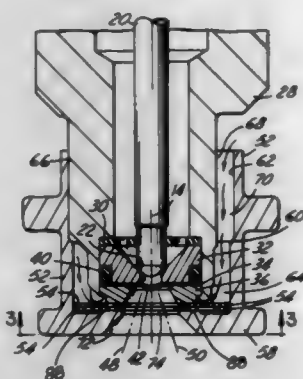
Jingming J. Shen, Newport New, and Vernon R. Warner, Wicomico, both of Va., assignors to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Mar. 24, 1994, Ser. No. 217,589

Int. Cl.<sup>6</sup> F02M 61/00

U.S. Cl. 239-424.5

10 Claims



1. An air-assisted fuel injector having a nozzle for injecting fuel into an induction air system of an internal combustion engine, and an air assist means fitted onto the nozzle for directing assist air to flow axially along the outside of the nozzle and then radially inwardly toward injected fuel that has just left the nozzle to assist in atomizing the same, the injector comprising a shroud member disposed over the nozzle, having a side wall cooperating with the nozzle to form axially extending passage means via which assist air passes axially along the outside of the nozzle, and an end wall extending radially inwardly from said side wall to form an aperture means through which the injected fuel that has just left the nozzle passes;
- an insert member means disposed between said shroud member and the nozzle;
- said insert member means having a stack of disks sandwiched axially between and in mutual abutment with both said end wall and the nozzle, in that plural ones of said disks each has a first annulus containing at least one circumferential discontinuity that provides the stack with a corresponding at least one air assist opening through which radially inward flow of assist air passes toward the injected fuel that has just left the nozzle; and
- said plural ones of said disks are arranged in the stack such that said at least one circumferential discontinuity in a first of said plural ones of said disks is circumferentially offset from said at least one circumferential discontinuity of a second of said plural ones of said disks to cause the corresponding at least one air assist opening of said first of said

plural ones of said disks to direct its assist air radially inwardly at a location that is both axially and circumferentially different from the location at which said second of said plural ones of said disks directs its assist air radially inwardly.

5,437,414

# **RECIRCULATING SHREDDER**

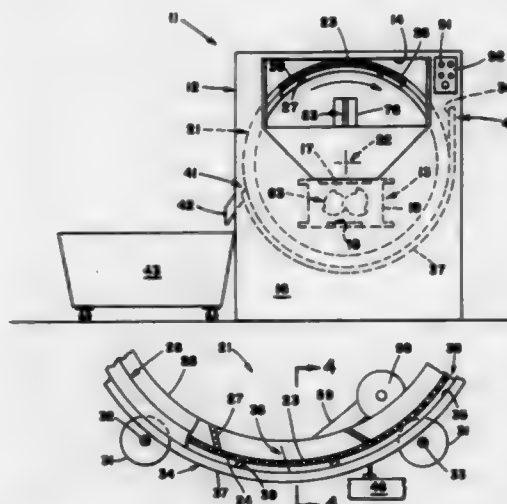
John L. Hall, 8444 Julie Lynne Cir., Tracy, Calif. 95376

Filed Jun. 27, 1994, Ser. No. 265,829

Int. Cl.<sup>6</sup> B02C 18/22, 18/40

U.S. Cl. 241-74

8 Claims



7. Shredding apparatus having a shredder with an intake for receiving materials that are to be fragmented and an outlet at which the fragments are released from the shredder wherein said apparatus further comprises:

- a revolvable annular trommel having an array of apertures therein and wherein said trommel extends under said outlet and over said intake in position to intercept released fragments which are too large to pass through the apertures, wherein said trommel has a cylindrical screen portion in which said apertures are situated and wherein said trommel has an annular outward extending lip at each end of said cylindrical screen portion,
- a fragment guide disposed adjacent said lips of said trommel and having a curved surface which has a curvature conforming to the curvature of said screen portion and which is spaced apart from said screen portion to provide a gap between said screen portion and said curved surface, said fragment guide having an edge at one side of said trommel over which fragments that have passed completely through one of said apertures are discharged and wherein said guide extends from said edge around the bottom of said trommel and up along at least a portion of the opposite side of said trommel whereby elongated pieces of material which are sufficiently thin to enter said apertures and which have a length exceeding the thickness of said gap are prevented from passing completely through said apertures and are returned to said intake by the motion of said trommel,
- further including a plurality of spaced apart cleats disposed in said gap and being secured to said trommel for movement therewith and wherein each of said cleats extends from one of said lips to the other thereof, and
- a motor coupled to said trommel to revolve said trommel whereby the intercepted fragments are returned to said shredder intake.

5,437,415

# **DRUM CONDITIONER**

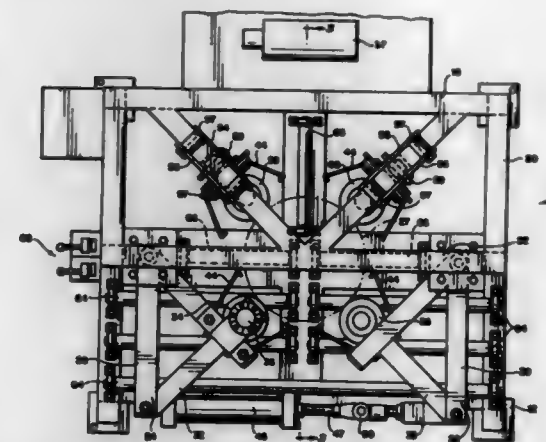
Lindy L. May, Strafford, Mo., assignor to Custom Metalcraft, Inc., Springfield, Mo.

Filed Dec. 14, 1993, Ser. No. 165,902

Int. Cl.<sup>6</sup> B02C 17/18

U.S. Cl. 241-299

11 Claims



1. A drum conditioner for rotating and providing external forces on a drum or container to loosen powdered products or other material in a finely divided state contained therein, comprising:

- a frame member having front and back portions;
- a left gate assembly and a right gate assembly mounted on the front portion of said frame member, each of the gate assemblies having a pressure roller mounted vertically thereon for contact with said drum;
- a pair of pressure rollers mounted vertically on the back portion of the frame member for contact with said drum;
- means for rotating said drum; and
- means for applying external pressure on said drum; whereby the rotation of said drum and the application of external force to said drum act to loosen and crack the material contained within said drum.

5,437,416

# **WINDING/REWINDING APPARATUS AND METHOD FOR A CAMERA**

Akira Ezawa, Tokyo; Koichi Daitoku, Sagami-hara, and Tsutomu Wakabayashi, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 190,572, Feb. 2, 1994, abandoned, which is a continuation of Ser. No. 810,118, Dec. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 599,830, Oct. 29, 1990, abandoned. This application Sep. 28, 1994, Ser. No. 312,677

Claims priority, application Japan, Oct. 26, 1989, 1-279560; Mar. 30, 1990, 2-084587; Dec. 26, 1990, 2-414372

Int. Cl.<sup>6</sup> G03B 1/04

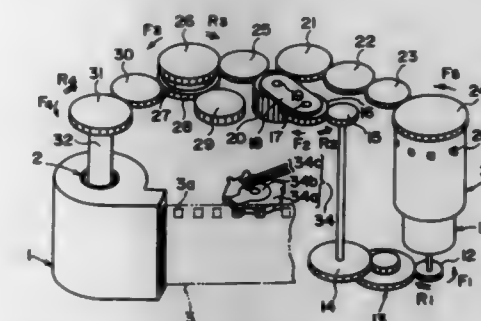
U.S. Cl. 242-356.60

17 Claims

1. A winding/rewinding apparatus for a camera using a thrust-type film unit having a cartridge and a cartridge spool rotatable with respect to the cartridge to thrustingly feed out a film, comprising:
- a motor rotatable in forward and reverse directions;
- a rotatable rewinding shaft for engaging the cartridge spool to rotate the cartridge spool with respect to the cartridge;
- a winding spool rotatable to wind the film from the cartridge; and
- transmission means for transmitting forward rotational force of said motor to said rewinding shaft and to said winding spool such that said rewinding shaft rotates the cartridge spool with respect to the cartridge to thrustingly advance a portion of the film to said winding spool and said winding spool thereafter winds the film thereon, with the film

winding speed of said winding spool being greater than the film advancing speed of said rewinding shaft;

said transmission means including clutch means engaging for transmitting forward rotational force of said motor to said rewinding shaft, and disengaging in response to an in-



crease in the rewinding shaft speed caused by the winding of the film by said winding spool for discontinuing the transmission of forward rotational force of said motor to said rewinding shaft when the film is being wound by said winding spool.

5,437,417

# **DEVICE FOR WINDING A WEB**

Rolf Kammann, Westerkappeln-Velpe, Germany, assignor to Windmüller & Hölscher, Lengerich, Germany

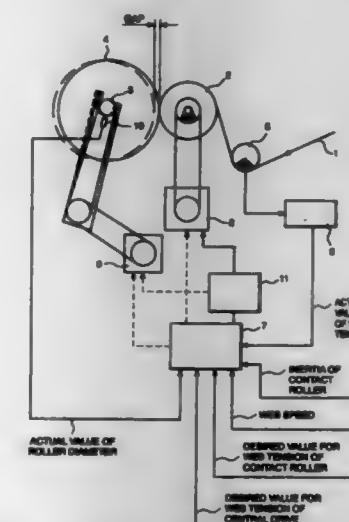
Filed Oct. 19, 1993, Ser. No. 137,791

Claims priority, application Germany, Oct. 19, 1992, 9214095 U; Nov. 30, 1992, 9216261 U

Int. Cl.<sup>6</sup> B65H 18/08

U.S. Cl. 242-541.1

4 Claims



1. A device for winding a web, preferably a plastic film web produced in a blowing or casting process, comprising:
- a winding tube for a web, driven by an electric winding motor;
- a web tension measuring roller for measuring tension of the web;
- a contact roller positioned between the winding tube and the web tension measuring roller driven by a motor and which for contact winding can be positioned against a film roll that is in the process of forming, and which for gap winding is positioned at a distance from the film roll; and
- a control device for controlling the motors as a function of feeding speed of the web and in accordance with measured tension of the web, such that coil hardness of a

wound film roll can be influenced in a predetermined way; wherein:

for contact winding torque of the winding motor (9) is controlled according to increasing diameter of the wound film roll and the contact roller (2) is driven at a speed that is controlled according to the measured tension of the web, and for gap winding the speed of the winding motor (9) is controlled according to the measured tension of the web.

5,437,418

# APPARATUS FOR CROSSLINKING INDIVIDUALIZED CELLULOSE FIBERS

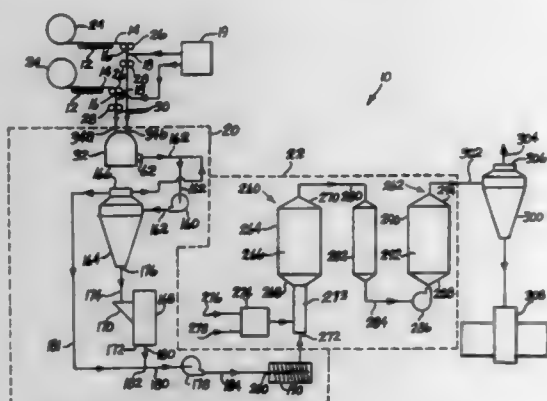
Peter A. Graef, Tacoma; Colin Elston, Gig Harbor; Fred E. Olmstead, Tacoma; Clifford R. Bolstad, Milton; Mark W. Bowns, Auburn; Frank R. Hunter, Bellevue, and Allan R. Carney, Payallup, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 665,761, Mar. 7, 1991, Pat. No. 5,252,275, and a continuation-in-part of Ser. No. 607,268, Oct. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 395,208, Aug. 17, 1989, Pat. No. 5,225,047, which is a continuation-in-part of Ser. No. 284,885, Dec. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 140,922, Dec. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 4,729, Jan. 20, 1987, abandoned. This application Jan. 13, 1992, Ser. No. 820,323

Int. Cl.<sup>6</sup> B02C 11/08

U.S. Cl. 241-65

25 Claims



1. An apparatus comprising:  
an applicator that applies a crosslinking substance to a mat of cellulose fibers at a fiber treatment zone;  
a fiberizer having a fiberizer inlet;  
a conveyor that conveys the mat through the fiber treatment zone and directly to the fiberizer inlet without stopping for curing;  
the fiberizer providing sufficient hammering force to separate the cellulose fibers of the mat into a fiber output of substantially unbroken individual cellulose fibers; and  
a dryer coupled to the fiberizer and which receives the fiber output, dries the fiber output, and cures the crosslinking substance, thereby forming dried and cured fibers.

5,437,419

# ROTORCRAFT BLADE-VORTEX INTERACTION CONTROLLER

Frederic H. Schmitz, Palo Alto, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 6, 1992, Ser. No. 972,790

Int. Cl.<sup>6</sup> B64C 27/00

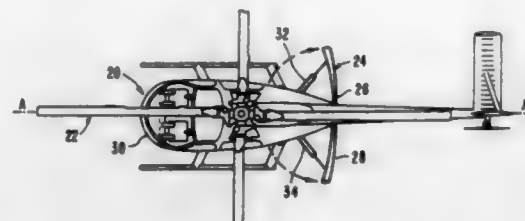
U.S. Cl. 244-17.11

6 Claims

1. An apparatus for decreasing blade-vortex interaction

noise of a rotorcraft having a fuselage and a rotor system, comprising:

control means for increasing the absolute value of inflow to the rotor system; and  
means for actuating the control means under flight condition when inflow is near zero,



wherein the control means comprises first and second drag panels mounted respectively on opposite sides of the fuselage and being movable between operative and inoperative positions by the actuating means and being vertically oriented and extending radially outwardly when in the operative position.

5,437,420

# HIGH TORQUE DOUBLE GIMBAL CONTROL MOMENT GYRO

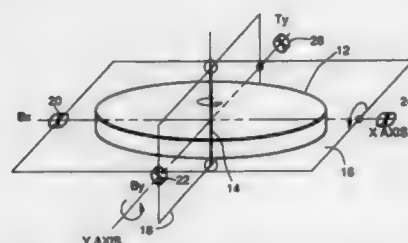
Harold A. Rosen, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 16, 1993, Ser. No. 93,540

Int. Cl.<sup>6</sup> B65G 1/28

U.S. Cl. 244-165

7 Claims



1. A double gimbal control moment gyroscope (10) for controlling the attitude of a spacecraft, comprising:  
first (16) and second (18) interconnected gimbals respectively rotatable about first and second orthogonal axes;  
a momentum wheel (12) rotatable about a third axis orthogonal to each of said first and second axes;  
first torque means (24) for applying a first control torque to said first gimbal (16) about said first axis;  
second torque means (26) for applying a first control torque to said second gimbal (18) about said second axis;  
first braking means (20) for applying a first braking force to said first gimbal (16) to reduce the inertia of said first gimbal (16) resulting in an amplification of the effect of the control torque applied to said second gimbal (18) by said second torque means (26); and  
second braking means (22) for applying a second force to said second gimbal (18) to reduce the inertia of said second gimbal (18) resulting in an amplification of the effect of the control torque applied to said first gimbal (16) by said first torque means (24),  
said first torque applying means and said first braking means being mounted on opposite sides of said first gimbal,  
said second torque applying means and said second braking means being mounted on opposite sides of said second gimbal,  
each of said first and second braking means including an electromagnetically operated brake including brakeshoe

means for frictionally engaging a corresponding one of said gimbals, and electrically responsive coil means for producing an electromagnetic field urging the brakeshoe means into frictional engagement with the associated gimbal.

5,437,421

# MULTIPLE ELECTROMAGNETIC TILES FOR BOUNDARY LAYER CONTROL

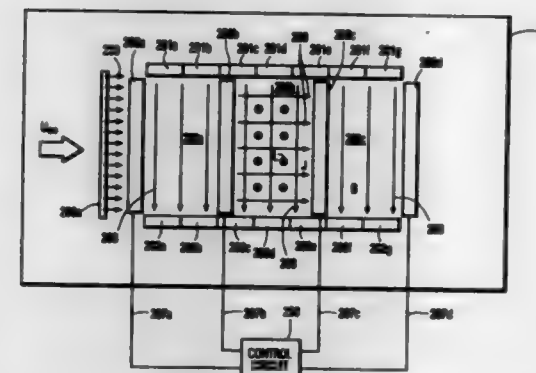
Daniel M. Nosenchuk, Mercerville, and Garry L. Brown, Princeton, both of N.J., assignors to British Technology Group USA, Inc., Gulph Mills, Pa.

Continuation-in-part of Ser. No. 966,390, Oct. 26, 1992, abandoned, and Ser. No. 986,257, Dec. 7, 1992, Pat. No. 5,320,309, which is a continuation-in-part of Ser. No. 904,570, Jun. 26, 1992, abandoned. This application Dec. 17, 1993, Ser. No. 169,599

Int. Cl.<sup>6</sup> B64C 21/00; F15D 1/12

U.S. Cl. 244-205

36 Claims



1. An apparatus for controlling a boundary layer in a flow of an electrically conductive fluid moving relative to a surface, said apparatus comprising:

a plurality of selectively actuatable control region tiles distributed over the surface, each said tile being bounded by magnetic field generating means for generating in the fluid a magnetic field  $\vec{B}(x,y,z,t)$  having flux lines with a predetermined orientation with respect to the direction of relative movement of the fluid and the surface and electric current generating means for generating in the fluid an electric current density  $\vec{J}(x,y,z,t)$  traversing the magnetic flux lines, wherein said magnetic field generating means and said electric current generating means are disposed relative to each other such that actuation of a particular tile generates a magnetic field  $\vec{B}$  and electric current density  $\vec{J}$  that create in the flow a force  $\vec{L}(x,y,z,t) = \vec{J} \times \vec{B}$  having a non-zero component normal to the surface; and control means for selectively actuating said tiles to create the force  $\vec{L}$  in the flow along selected said tiles for controlling the flow.

5,437,422

# RAILWAY SIGNALLING SYSTEM

Gregory D. Newman, Chippenham, United Kingdom, assignor to Westinghouse Brake and Signal Holdings Limited, United Kingdom

Filed Feb. 9, 1993, Ser. No. 15,144

Claims priority, application United Kingdom, Feb. 11, 1992, 9202830

Int. Cl.<sup>6</sup> B61L 27/04

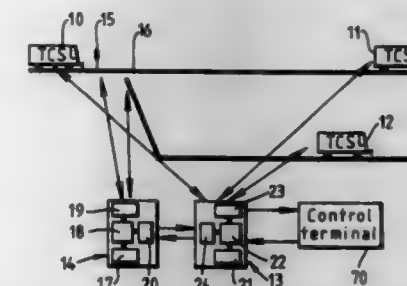
U.S. Cl. 246-5

15 Claims

1. A railway signalling system comprising:  
control means for controlling the movements of railway vehicles on a railway track, including storage means for storing data defining physical characteristics of the railway track and the locations of the vehicles, first processing means for processing the data stored in the storage means to determine permissible movements of the vehi-

cles, and first communication means for transmitting to the vehicles movement data defining the vehicles' permissible movements; and

protection means carried by at least one of the vehicles for causing the vehicle to move under the control of the control means, comprising second communication means for receiving the said movement data relating to the vehi-



cle, second storage means for storing geographical data defining physical characteristics of the railway track, second processing means for processing the movement data in dependence on the geographical data to determine a maximum safe operating speed for the vehicle, and operation means for controlling the vehicle to travel at no more than the determined maximum safe operating speed.

5,437,423

# GOLF BAG SUPPORT ASSEMBLY WITH RETRACTABLE SPIKE

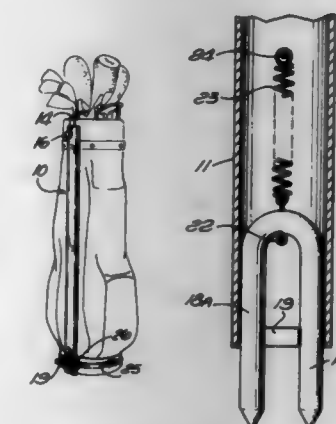
Richard C. Sinclair, P.O. Box 1531, Laguna Beach, Calif. 92652

Filed Sep. 3, 1993, Ser. No. 116,020

Int. Cl.<sup>6</sup> A63B 55/00

U.S. Cl. 248-96

8 Claims



1. A golf bag support assembly comprising:  
a rigid tubular housing having an elongated longitudinal slot at its lower end;  
a double pronged elongated spike slidably disposed longitudinally within said housing, said spike having first and second prongs extending downwardly and spaced apart, parallel relationship; and  
a foot pedal rigidly affixed intermediate the ends of said spike to extend radially outward from said spike through said slot; and  
attachment means for securing said housing to a golf bag having an upper rim surrounding a top opening for receiving golf clubs to extend along its length.



5,437,424

## SEPTIC PIPE FIELD DRAIN HOLDERS

John H. Netz, Sr., 17540 Lappans Rd., St James, Md. 21781

Filed May 9, 1994, Ser. No. 239,448

Int. Cl.<sup>6</sup> F16L 3/00

U.S. Cl. 248-49

1 Claim



1. A septic pipe field drain holder comprising:
  - a vertical disposed cylindrical shaft having a lower pointed end and an upper pressure applying end;
  - a pair of horizontally disposed cylindrical support rods coupled to and extending radially from the shaft in a horizontal orientation at intermediate points along the length of the shaft, the support rods having interior ends coupled to the shaft at fixed locations and exterior ends forming an opening of a fixed size for the receipt of a pipe to be supported, each of the support rods having a vertically disposed aperture in axial alignment adjacent the exterior ends;
  - a supplemental horizontal rod extending horizontally above the pair of horizontal support rods for applying pressure to drive the shaft downwardly;
  - a cylindrical pin positionable through the apertures of the support rods for locking the pipe in position therebetween to thereby define a rectangular space bounded by the pin and shaft vertically and by the rods horizontally for receiving and securing a pipe during operation and use; and
  - a chain having a lower end secured to the upper extent of the pin and an upper end secured to the shaft adjacent to the supplemental horizontal rod.

5,437,425

## FOLDING STAND FOR AN OFFICE CHAIR

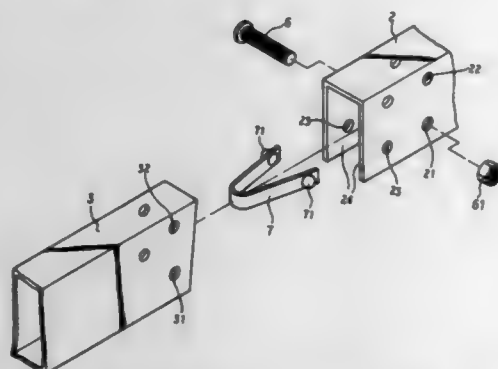
Chun H. Hou, No. 10, Lane 228, Yen Ho Street, Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Feb. 14, 1994, Ser. No. 194,849

Int. Cl.<sup>6</sup> F16M 11/38

U.S. Cl. 248-188.6

2 Claims



1. A folding stand for an office chair, comprising: an annular frame, adapted to receive an upright shaft of an office chair; a plurality of lugs radially and horizontally extended from said

annular frame; a plurality of retainer springs; and a plurality of legs hinged respectively to one of said lugs and alternatively locked to one of said lugs respectively by a respective one of said retainer springs between a working position where a respective one of said legs is in line with a respective one of said lugs or a collapsed position where a respective one of said legs is perpendicular to a respective one of said lugs, wherein said lugs are each shaped like a channel plate, with each of said lugs comprising a longitudinal bottom opening, a pair of bolt holes on two opposite vertical side walls of said lugs, a pair of first retaining holes and a pair of second retaining holes respectively defined on the two vertical side walls, wherein said legs are made of a hollow structure, each leg having a pair of opposite bolt holes at one end connected to the bolt holes on its respective lug on the inside of said respective lug by a screw bolt and a nut, a pair of opposite retaining holes alternatively connected to the pair of first retaining holes or second retaining holes on its respective lug by a respective retainer spring, and a wheel at an opposite end of a respective one of said legs for supporting the folding stand on a surface; said retainer spring being received inside a respective one of said leg, having two projecting rods on two opposite ends thereof respectively extending out of the pair of retaining holes on the respective leg and, alternatively engaged into the pair of first retaining holes on the respective lug to lock the respective leg in the working position, or the pair of second retaining holes on the respective lug to lock the respective leg in the collapsed position.

5,437,426

## BRACKET ARRANGEMENT FOR HANG-ON FURNITURE UNIT

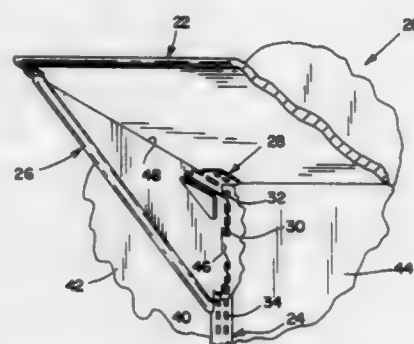
Douglas B. MacDonald, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Jun. 25, 1993, Ser. No. 82,599

Int. Cl.<sup>6</sup> A47B 96/06

U.S. Cl. 248-222.1

26 Claims



1. A furniture arrangement comprising:
  - a hang-on furniture unit;
  - an upright support including slots adapted to support said hang-on furniture unit;
  - a cantilever bracket including first and second generally orthogonal edges, said first orthogonal edge including first teeth adapted to engage selected slots in said upright support, said orthogonal edge being adapted to support said hang-on furniture unit, said second orthogonal edge including a first retainer;
  - a locking bracket including a second retainer adapted to securely engage said first retainer to retain said locking bracket to said cantilever bracket, said locking bracket further including second teeth adapted to engage said selected slots in said upright support and form an interlocking arrangement with said first teeth when said second retainer is engaged with said first retainer, said first and second teeth extending in opposite directions so that said locking bracket and said cantilever bracket cannot be removed as a unit from said support; and

said cantilever bracket including a first attachment flange and said locking bracket including a second attachment flange for attachment to said hang-on furniture unit, said first attachment flange being substantially coplanar with said second attachment flange whereby said cantilever bracket and said locking bracket can be attached to said hang-on furniture unit to form an interconnected unit that is interlockingly retained to said upright support and thus which cannot be inadvertently disengaged from said upright support.

5,437,427

## BINOCULAR MOUNTING ASSEMBLY FOR ASTRONOMICAL OBSERVATIONS

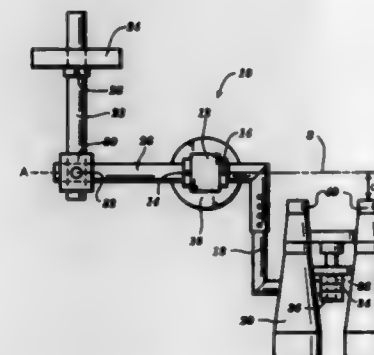
Peter D. Johnson, 2451 Nott St., Niskayuna, N.Y. 12309

Filed Jan. 25, 1994, Ser. No. 186,284

Int. Cl.<sup>6</sup> E04G 3/00

U.S. Cl. 248-286

10 Claims



1. An altitude adjustable mounting assembly for optical observing devices comprising:
  - a rotatable shaft;
  - a bearing for receiving said rotatable shaft therethrough, said shaft being rotatable about a horizontal axis;
  - a counterweight;
  - a first securing member for mounting said counterweight to a first end section of said rotatable shaft, said first securing member extending rearwardly from said horizontal axis of said rotatable shaft;
  - a second securing member for mounting an optical observing device to a second, opposing end section of said rotatable shaft, said second securing member extending forwardly from the horizontal axis of said rotatable shaft, said first and second securing members extending in substantially opposite directions; and
  - a coupling arrangement for attaching said bearing to a supporting structure;
 wherein said optical observing device is arcuately rotatable upon a rotation of said shaft within said bearing; and wherein said second securing member is length adjustable.

5,437,428

## PICTURE MOUNT SYSTEM

Felix Mirza, 33 Vista Firenze, Laguna Hills, Calif. 92653

Filed Apr. 30, 1993, Ser. No. 55,086

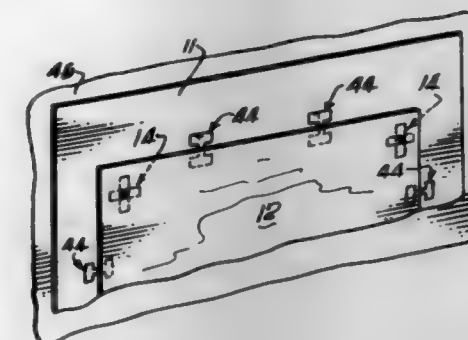
Int. Cl.<sup>6</sup> A47G 1/16

U.S. Cl. 248-467

35 Claims

1. A device for securely mounting a sheet to a backing and comprising
  - a first member including opposing tongues, the tongues having sides with adhesive characteristics, and
  - a second member having a side and in which a channel is formed,
 said first member disposed in the channel in a crossed relationship to said second member, its tongues extending outwardly of the channel,

said side of said second member having an adhesive characteristic,



said sides of said tongues and said side of said second member being adhesively mountable interchangeably to either the sheet or to the backing.

5,437,429

## PICTURE HOOK HANGER

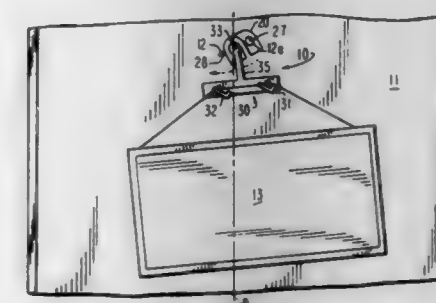
Jonah Atlas, 31 Longview Dr., Eastchester, N.Y. 10709

Filed Nov. 23, 1993, Ser. No. 156,452

Int. Cl.<sup>6</sup> A47G 1/16

U.S. Cl. 248-493

12 Claims



1. A self adjusting wall hanger, comprising:
  - a securing member;
  - a V-shaped retention member having opposing legs with an aperture in each leg, said leg apertures being aligned and offset from each other to allow for angled insertion of said securing member for anchoring one of said legs to a wall, thereby securing said retention member to the wall; and
  - an object holding member comprising means for holding an object thereon, said object holding member having an extension element adapted for fitting between said opposing legs and having an aperture therein configured for alignment with said leg apertures, said object holding member being secured to said retention member and to the wall by said securing member and being floatingly moveable relative to said retention member and said securing member, to allow said holding member to self adjust relative to the force of gravity.

# 5,437,430 METHOD FOR PREPARING OR REPAIRING A MACHINE FOUNDATION

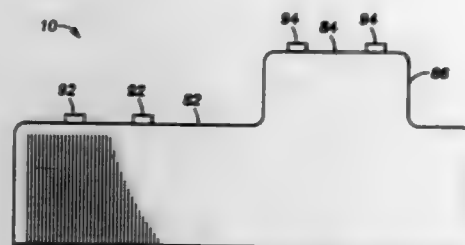
William L. Welch, Houston; Don W. Sluder, Lake Jackson, and Wallace D. Hill, Pasadena, all of Tex., assignors to APT, Inc., Cypress, Tex.

Continuation-in-part of Ser. No. 625,293, Dec. 10, 1990, Pat. No. 5,165,651, which is a continuation-in-part of Ser. No. 449,606, Dec. 11, 1989, abandoned. This application Oct. 16, 1992, Ser. No. 962,968

Int. Cl.<sup>6</sup> F16M 9/00

U.S. Cl. 248—679

8 Claims



1. A corrosion resistant form for easily producing a machine foundation by surrounding reinforcement rods which extend upward from a slab to secure the form to the slab and providing two flat surfaces for a machine comprising:

a hollow form made of a material free from fluid attack selected from the group consisting of an aggregate filled thermosetting resin and thermoplastic resin;

said hollow form having vertical walls and a single horizontal wall having more than one horizontal surface, each horizontal surface being vertically spaced to provide a flat surface for attaching a machine which requires portions of said machine to be aligned at the same horizontal level; and

at least one wall having at least one opening for filling said hollow form with a fortifying material.

5,437,431

# MOLD FOR FORMING PILOT ANCHOR HOLES IN CONCRETE

Enrique A. Pita, 1068-D Summit Trail Cir., West Palm Beach, Fla. 33406

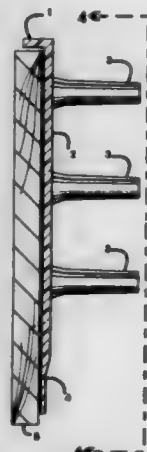
Continuation of Ser. No. 998,317, Dec. 29, 1992, abandoned, which is a continuation of Ser. No. 585,805, Sep. 20, 1990, Pat. No. 5,174,910. This application Oct. 14, 1994, Ser. No. 324,153

The portion of the term of this patent subsequent to Dec. 29, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> B28B 7/16, 7/28

U.S. Cl. 249—112

12 Claims



6. A mold for forming a plurality of pilot holes in a spaced apart pattern, said holes penetrating a surface of a solidifying

concrete structure supported by a concrete form member, said mold comprising:

a mold base temporarily connectable to the concrete form member on a front face, said mold base having a substantially flat back face opposite said front face; and

a plurality of hole-forming projections having base portions arranged in a spaced apart pattern on the back face of the mold base, said hole-forming projections extending from said base portions through a longitudinal dimension to distal end portions, said longitudinal dimension of each hole-forming projection being at least twice as long as any lateral dimension through a cross section of the hole-forming projection that parallels the mold base for forming a spaced apart pattern of pilot holes in the concrete structure as it solidifies, each of said hole-forming projections having a smooth surface and a distal end periphery that is no larger than a periphery of the hole-forming projection at the base portion to permit removal of said hole-forming projections from the concrete structure when solidified.

5,437,432

# HOIST MACHINE

Masaru Fujikawa, Sayama, Japan, assignor to Elephant Chain Block Company Limited, Osaka, Japan

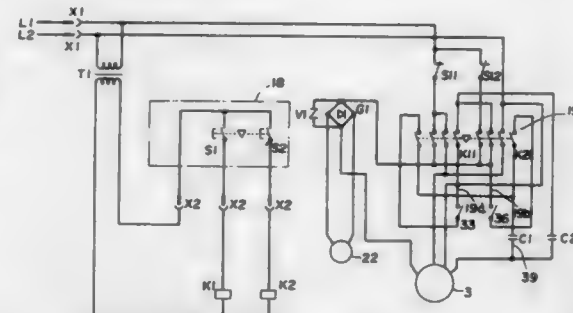
Filed Apr. 16, 1993, Ser. No. 46,951

Claims priority, application Japan, Jun. 15, 1992, 4-155246

Int. Cl.<sup>6</sup> B66D 1/54

U.S. Cl. 254—362

6 Claims



1. A hoist machine for hoisting or lowering a load, comprising:

(a) a capacitor start single phase motor having a start capacitor, and a normal and reverse rotation switching circuit, including means for receiving an external command, for selectively switching a rotation direction of the motor between a normal direction in which a load is hoisted and a reverse direction in which the load is lowered in response to said external command;

(b) a driving member which is connected to and is driven by the motor in normal and reverse directions to hoist and lower the load; and

(c) a governor, operable in response to drive and stop operation of the motor, rotatable in normal and reverse directions, to govern a switching device which turns on and off the start capacitor in response to operation of the governor, wherein said switching device comprises:

(d-1) a hoisting side switch provided with a first hoisting side contact arm connected to a hoisting side line of the normal and reverse rotation switching circuit of the motor and a second hoisting side contact arm connected to the start capacitor, one of the first and second hoisting side contact arms serving as a fixed side contact arm and the other of the first and second hoisting side serving as a movable side contact arm, the first and second hoisting side contact arms being normally in the on position in which the first and second hoisting side contact arms contact with each other when the motor comes to a stop;

(d-2) a lowering side switch provided with a first lowering

side contact arm connected to a lowering side line of the normal and reverse rotation switching circuit of the motor and a second lowering side contact arm connected to the start capacitor, one of the first and second lowering side contact arms serving as a fixed side contact arm, the other of the first and second lowering side contact arms serving as a movable side contact arm, the first and second lowering side contact arms being normally in the on position in which the first and second lowering side contact arms contact with each other when the motor comes to a stop; and

(d-3) a switch control panel rotatable, in response to operation of the governor, in a predetermined range in the same rotation directions as that of the governor, and also movable backwards and forwards in an axial direction of the governor, whereby:

when the governor rotates in the normal direction, the switch control panel rotatably moves to an opposing position to the second hoisting side contact arm of the hoisting side switch and also moves axially backwards, so as to cause the second hoisting side contact arm to be moved away from the first hoisting side contact arm and be disconnected therefrom, with on-operation of the lowering side switch being maintained, and

when the governor rotates in the reverse direction, the switch control panel rotatably moves to an opposing position to the second lowering side contact arm of the lowering side switch and also moves axially backwards so as to cause the second lowering side contact arm to be moved away from the first lowering side contact arm and be disconnected therefrom, with on-operation of the hoisting side switch maintained.

5,437,433

# ADJUSTABLE STAIR RAIL SYSTEM

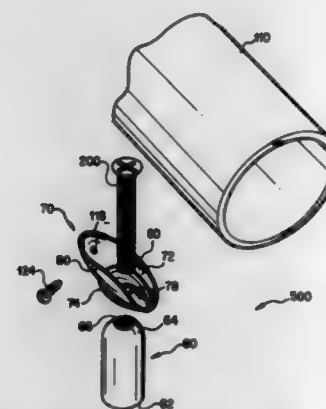
Ron Rezek, Culver City, Calif., assignor to Lavi Industries, Inc., Valencia, Calif.

Filed Sep. 28, 1993, Ser. No. 127,875

Int. Cl.<sup>6</sup> E04F 11/18

U.S. Cl. 256—67

9 Claims



1. An adjustable baluster connector system including a plurality of balusters adapted to support an inclined rail, the system comprising:

a plurality of balusters each of which has an upper portion, the upper portion of each baluster having an annular groove formed therein which groove extends from an end of the baluster toward a middle portion of the baluster to form an annular bore, each of said balusters including a bore formed therein adjacent the annular groove;

a plurality of spindle top members each including a hollow cylindrical sleeve having an open lower end and a rounded, dome-shaped upper end, said open lower end of each spindle top being received in the annular groove of one of said plurality of balusters, said rounded upper end

of each spindle top having an aperture passing therethrough;

a plurality of saddle members each having opposite surfaces and an opening passing through the saddle member from one of said opposite surfaces to the other of said opposite surfaces, one of said opposite surfaces of each saddle member including an arcuate depression positioned on the rounded upper end of a respective spindle top so that the position of the saddle member can be adjusted with respect to the spindle top, and the other of said opposite surfaces of each saddle member including a saddle shaped recess configured to receive a tubular rail; and

a fastener engaging the aperture of a respective spindle top, the opening of a respective saddle member, and the bore of a respective baluster to secure the spindle top and the saddle member to the baluster.

5,437,434

# METHOD OF PREVENTING GENERATION OF EARTH CIRCULATING CURRENT IN INDUCTION HEATING APPARATUS FOR MOLTEN STEEL

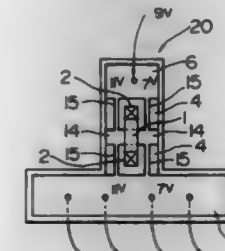
Yoji Ao; Issa Tokuda, both of Futaba, and Minoru Honda, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 18, 1994, Ser. No. 276,800

Int. Cl.<sup>6</sup> B22D 41/01

U.S. Cl. 266—44

7 Claims



1. A method of substantially preventing the occurrence of circulating electric current while induction-heating a molten steel to control its temperature said molten steel being received in a tundish used in continuous casting apparatus and adapted to feed said molten steel to mold means of said continuous casting apparatus, said tundish comprising a molten steel-receiving chamber, a molten steel-discharging chamber, electrical ground circuit means provided for each of said chambers, refractory wall means for separating the chambers from each other, electromagnetic induction heating means for heating said molten steel received in the tundish which heating means is provided with iron core having at least two legs and at least one coil surrounding at least one of said legs to thereby form a closed magnetic circuit in said iron core and which heating means is at least partly located within the refractory wall means, and at least two channels each operatively connecting both of said molten steel-receiving and molten steel-discharging chambers, each of which channels interlinked with the iron core to thereby form a loop current circuit in the molten steel, said method comprising the steps of disposing said channels substantially symmetrically with respect to the iron core while extending said at least one leg of the iron core through said tundish so that an electromagnetic connection between said iron core and said channels is substantially symmetrical with respect to said iron core to thereby make an electrical potential of said molten steel-receiving chamber substantially equal to that of the molten steel-discharging chamber, and induction-heating said molten steel received in said tundish through said induction heating means, whereby substantially preventing occurrence of said circulating current in said ground circuit means when said chambers are electrically grounded through said ground circuit means during the induction-heating of the molten steel.



5,437,435

## GAS PURGING DEVICE

Lorenz Dütsch, Völkand; Karl-Heinz Höfer, Urmitz, and Helmut Preyer, Kartscheid, all of Germany, assignors to Radex-Heraklith Industriebeteiligungs Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 749,266, Aug. 23, 1991, abandoned.

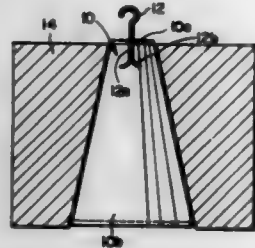
This application Sep. 7, 1993, Ser. No. 117,489

Claims priority, application Germany, Aug. 25, 1990, 40 26 977.9

Int. Cl.<sup>6</sup> C21C 5/48

U.S. Cl. 266—220

21 Claims



1. Gas purging device for introducing gases and/or solid reactants into the metal melt of a metallurgical crucible, comprising a gas purging plug (10), and a nozzle sleeve (22) surrounding the plug (10), or a gas purging plug (10) and a well nozzle (14) surrounding the plug (10), or a gas purging plug (10), a nozzle sleeve (22) surrounding the plug of (10), and a well nozzle (14) surrounding the nozzle sleeve (22), and at least one mounting device which comprises a hole (16) provided in an upper end face of the plug (10), of the nozzle sleeve (22) or of the well nozzle (14) into which (a) corresponding hook(s) (12) or loops can be stationarily but detachably inserted.

5,437,436

## STAND-ALONE GAS SPRING

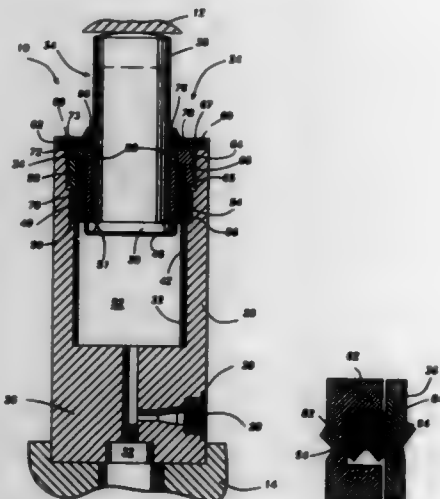
John Holson, Taylor, and Frederick R. Waldecker, Livonia, both of Mich., assignors to Ni-Tech, Inc., Westland, Mich.

Filed Aug. 20, 1993, Ser. No. 110,067

Int. Cl.<sup>6</sup> F16F 9/02

U.S. Cl. 267—119

8 Claims



1. A self-contained gas spring for use in cushioning a die press, said spring comprising:

- a cylinder body having an open end and a closed end, said cylinder body defining an interior chamber;
- a bearing means mounted within the interior chamber of said cylinder body;
- a piston having a rod portion and a head, said piston being reciprocally mounted within said interior chamber with said rod extending through said bearing means and out of

said open end, said rod engaging said bearing means such that said rod is guided within said interior chamber by said bearing means;

an annular end cap having an interior wall, said annular end cap being releasably mounted within said open end of said cylinder body, said rod extending through said annular end cap;

an annular sealing means mounted within said annular end cap, said sealing means engaging said piston rod to prevent gas from escaping from said cylinder body, said sealing means having a first portion facing said closed end and a second portion facing said open end, said first portion being flexible and said second portion being relatively inflexible relative to said first portion, said first and second portions being formed of distinct materials, said first portion having an end face with a concave center extending to outer ears, said outer ears being compressed against said rod and said interior wall of said end cap to seal said gas within said chamber, said second portion being adapted to expand in response to pressure being applied against said first portion to prevent said first portion of said seal from creeping between said rod and said interior wall; whereby said gas spring can withstand elevated pressures without said seal failing.

5,437,437

## VIBRATION ISOLATOR WITH DIAPHRAGMS IN EACH SIDE WALL

Kazuya Takano, Kamakura; Hiroshi Kojima, Yokohama, and Takao Ushijima, Chigasaki, all of Japan, assignors to Bridge-stone Corporation, Tokyo, Japan

Division of Ser. No. 915,132, Jul. 20, 1992, Pat. No. 5,393,041.

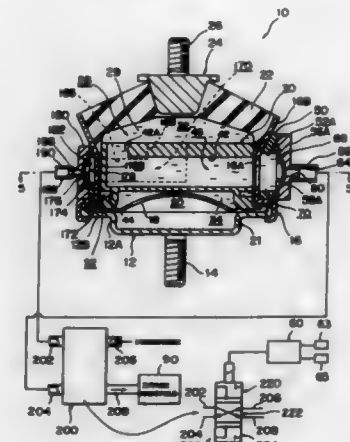
This application Dec. 5, 1994, Ser. No. 353,285

Claims priority, application Japan, Jul. 23, 1991, 3-182434; Sep. 3, 1991, 3-223038; Sep. 9, 1991, 3-227799; Sep. 30, 1991, 3-251758; Nov. 6, 1991, 3-290130; Nov. 6, 1991, 3-290131

Int. Cl.<sup>6</sup> F16F 11/00, 9/00

U.S. Cl. 267—140.14

12 Claims



1. A vibration isolator for absorbing and attenuating vibrations from a vibration-generating portion, comprising:

- a mounting member connected to one of said vibration-generating portion and a vibration-receiving portion;
- a hollow cylindrical member connected to the other one of said vibration-generating portion and said vibration-receiving portion;
- a resilient member connected to said mounting member, said resilient member being disposed to close one opening of said hollow cylindrical member and being adapted to be deformed during the occurrence of the vibrations;
- a first diaphragm for closing another opening of said hollow cylindrical member;
- a partition member disposed at an inner side of said hollow

cylindrical member, said partition member partitioning an inner space of said hollow cylindrical member;

an expandable and shrinkable main liquid chamber disposed within said hollow cylindrical member between said resilient member and said partition member;

a first auxiliary liquid chamber disposed within said hollow cylindrical member between said first diaphragm and said partition member;

a first limiting passage provided in said partition member, said first limiting passage connecting said main liquid chamber and said first auxiliary liquid chamber thereby allowing communication with each other;

a first air chamber disposed facing a side of said first diaphragm opposite to a side thereof where said first auxiliary liquid chamber is disposed;

a second auxiliary liquid chamber formed within a side wall of said hollow cylindrical member;

a second diaphragm constituting a part of a partition wall of said second auxiliary liquid chamber;

a second air chamber disposed on a side of said second diaphragm opposite to a side thereof where said second auxiliary liquid chamber is disposed, said second air chamber being arranged such that when an interior thereof is set under negative pressure, said second air chamber causes said second diaphragm to be brought into close contact with an inner wall surface thereof causing said second air chamber to virtually disappear and preventing the movement of said second diaphragm;

negative-pressure means for setting the interior of said second air chamber under negative pressure;

a second limiting passage provided in said partition member, said second limiting passage connecting said main liquid chamber and said second auxiliary liquid chamber thereby allowing communication with each other; and

a third auxiliary liquid chamber communicating with said main liquid chamber and located adjacent a third air chamber, wherein said third auxiliary liquid chamber has a diameter larger than those of said first and second limiting passages and communicates with said main liquid chamber via a third limiting passage for absorbing high-frequency vibrations, and wherein said negative-pressure means sets said third air chamber under negative pressure.

5,437,438

## VIBRATION ISOLATOR WITH DIAPHRAGM AND AIR CHAMBER IN A SIDE WALL AND CONNECTED TO AN AIR TANK

Kazuya Takano, Kamakura; Hiroshi Kojima, Yokohama, and Takao Ushijima, Chigasaki, all of Japan, assignors to Bridge-stone Corporation, Tokyo, Japan

Division of Ser. No. 915,132, Jul. 20, 1992, Pat. No. 5,393,041.

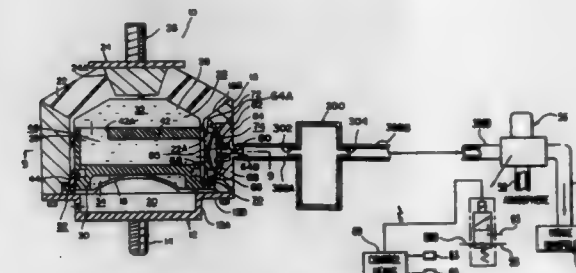
This application Dec. 5, 1994, Ser. No. 353,286

Claims priority, application Japan, Jul. 23, 1991, 3-182434; Sep. 3, 1991, 3-223038; Sep. 9, 1991, 3-227799; Sep. 30, 1991, 3-251758; Nov. 6, 1991, 3-290130; Nov. 6, 1991, 3-290131

Int. Cl.<sup>6</sup> F16F 11/00, 9/00

U.S. Cl. 267—140.14

13 Claims



1. A vibration isolator for absorbing and attenuating vibrations from a vibration-generating portion, comprising:

a mounting member connected to one of said vibration-generating portion and a vibration-receiving portion;

a hollow cylindrical member connected to the other one of said vibration-generating portion and said vibration-receiving portion;

a resilient member connected to said mounting member, said resilient member being disposed to close one opening of said hollow cylindrical member and being adapted to be deformed during the occurrence of the vibrations;

a first diaphragm for closing another opening of said hollow cylindrical member;

a partition member disposed at an inner side of said hollow cylindrical member, said partition member partitioning an inner space of said hollow cylindrical member;

an expandable and shrinkable main liquid chamber disposed within said hollow cylindrical member between said resilient member and said partition member;

a first auxiliary liquid chamber disposed within said hollow cylindrical member between said first diaphragm and said partition member;

a first limiting passage provided in said partition member, said first limiting passage connecting said main liquid chamber and said first auxiliary liquid chamber thereby allowing communication with each other;

a first air chamber disposed facing a side of said first diaphragm opposite to a side thereof where said first auxiliary liquid chamber is disposed;

a second auxiliary liquid chamber formed within a side wall of said hollow cylindrical member;

a second diaphragm constituting a part of a partition wall of said second auxiliary liquid chamber;

a second air chamber disposed on a side of said second diaphragm opposite to a side thereof where said second auxiliary liquid chamber is disposed, said second air chamber being arranged such that when an interior thereof is set under negative pressure, said second air chamber causes said second diaphragm to be brought into close contact with an inner wall surface thereof causing said second air chamber to virtually disappear and preventing the movement of said second diaphragm;

negative-pressure means for setting the interior of said second air chamber under negative pressure; and

a second limiting passage provided in said partition member, said second limiting passage connecting said main liquid chamber and said second auxiliary liquid chamber thereby allowing communication with each other, wherein an air tank having a capacity greater than that of said second air chamber is disposed between said second air chamber and said negative-pressure means, second auxiliary liquid chamber to communicate with each other.

5,437,439

## RUBBER BEARING FOR THE CENTRAL PIN OF A LEAF SPRING SUSPENSION IN A MOTOR VEHICLE

Susanne Brokamp, Damme, and Hubert Siemer, Dinklage, both of Germany, assignors to Lemeörder Metallwaren AG, Lemförde, Germany

Filed Mar. 18, 1994, Ser. No. 210,216

Claims priority, application Germany, Mar. 24, 1993, 43 09 425.3

Int. Cl.<sup>6</sup> B60G 11/24

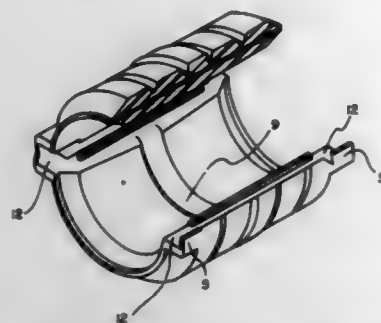
U.S. Cl. 267—293

9 Claims

7. A rubber bearing in combination with a central pin of a leaf spring suspension in a motor vehicle, comprising:

- a housing split in an axial plane to form two housing half shells;
- a rubber bushing arranged on the central pin with radial pretension, said rubber bushing being formed of two rubber bushing half shells, abutting surfaces of said rubber bushing being located opposing one another in an assembled state and being spaced apart from one another in a preassembled state, said rubber bushing half shells being connected to one another at their ends by flexible webs for

maintaining said two rubber bushing half shells joined in said preassembled state and for extending to enlarge a distance between said two half shells during a radial expansion as said rubber bushing is pushed onto the central



pin, each of said rubber bushing half shells having recesses for accommodating said webs, whereby said webs fold inwardly, into said recesses, upon radial compression of said rubber bushing.

5,437,440

## SWING APPARATUS

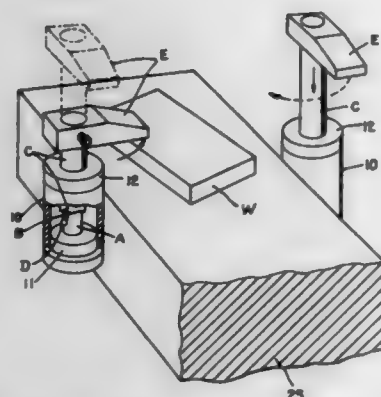
Rickey L. Keaton, West Union, S.C., assignor to Compact Air Products, Inc., Westminster, S.C.

Filed Aug. 20, 1993, Ser. No. 109,581

Int. Cl.<sup>6</sup> B23Q 3/08

U.S. Cl. 269—24

4 Claims



1. A swing apparatus having a double acting fluid operated cylinder with end cap comprising:

- a piston in said cylinder;
  - a centrally disposed elongated unitary cam member of substantially uniform cross-section axially disposed within said cylinder mounted on said end cap;
  - a cam track extending longitudinally about said cam member for substantially the full length of the stroke of said piston;
  - a piston rod having an elongated cavity opening on one end receiving said elongated cam member for sliding movement therein;
  - a mounting on an exterior portion of said piston rod carrying said piston thereon;
  - a cam follower on said piston rod extending into said cavity and into said cam track fixed against longitudinal movement in respect to said piston rod carried forwardly of said piston; and
  - a mounting for an operating member carried by said piston rod;
- whereby swinging of the piston rod and an operator carried thereby occurs during a longitudinal stroke of the piston rod to reduce the length of stroke required to turn said piston rod a given amount.

5,437,441

## MAIL PREPARATION COPIER WITH MAILING ADDRESS IDENTIFICATION

Richard H. Tuhro, and James S. Hutchinson, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

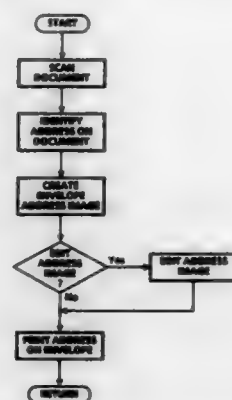
Continuation of Ser. No. 961,772, Oct. 16, 1992, abandoned.

This application Oct. 12, 1993, Ser. No. 134,503

Int. Cl.<sup>6</sup> B41F 13/54; G06K 9/20; G06F 15/20

U.S. Cl. 270—1.1

7 Claims



1. A digital copier having a mail preparation function comprising:

- a document input scanner deriving an electronic representation of an original letter with destination address contained in the scanned image thereof when the document is placed at a scanning position associated with the input scanner;
- a document editor, responsive to operator command from a user interface, to identify in the scanned image a portion including a destination address;
- a document creator, creating an envelope address image from the destination address image portion in the original letter;
- a source of sheets and envelopes to receive printed images thereon;
- means for selectively feeding envelopes from said source to a printer; and
- means for controlling said printer to create an image on the envelope in accordance with the created envelope image, said image including the destination address from the original letter, processed for envelope placement.

5,437,442

## SINGLE OR PLURAL SHEET FOLDING APPARATUS FOR USE WITH ROTARY PRINTING PRESSES

Godber Petersen, Augsburg, Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Germany

Filed Jul. 13, 1993, Ser. No. 90,753

Claims priority, application Germany, Jul. 17, 1992, 42 23 524.3

Int. Cl.<sup>6</sup> B65H 45/12; B41F 13/62

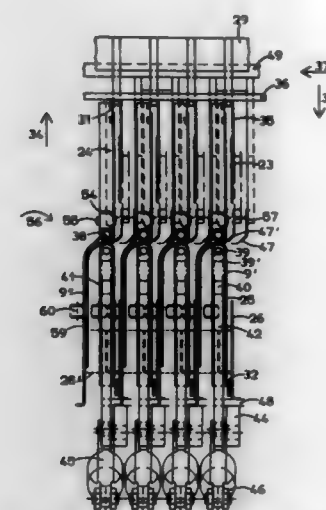
U.S. Cl. 270—45

18 Claims

1. A folding apparatus for a web-fed rotary printing press, to which sheets that are to be folded can be delivered serially in a given direction, comprising:

- a plurality of folding units (8);
- means for delivering a plurality of the folded sheets to the folding units (8) in parallel, respectively, in a direction substantially perpendicular to the given direction of serial delivery so that each folding unit receives at least one sheet arranged to have its surface face a surface of at least one sheet received in an adjacent folding unit; and
- means in the folding units for folding the plurality of sheets

delivered in parallel to the folding units substantially simultaneously, with a maximum number of parallel-deliv-



erable sheets (9) corresponding to the number of said folding units (8).

5,437,443

## CUT SHEET FEEDER FOR IMAGE FORMING APPARATUS

Masakazu Miyata, Ryugasaki; Kosai Adachi, Tsukuba, and Tomoko Nagano, Ibaraki, all of Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Mar. 15, 1994, Ser. No. 213,010

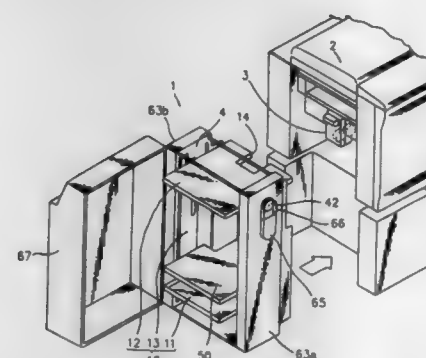
Claims priority, application Japan, Mar. 16, 1993, 5-56034

Int. Cl.<sup>6</sup> B65H 3/44

U.S. Cl. 271—9.06

7 Claims U.S. Cl. 271—22

21 Claims



1. A cut sheet feeder for use with an image forming apparatus, comprising:

- one sheet feed mechanism for picking up one sheet from stacked cut sheets at a single sheet feed position and for feeding each sheet to an image recording portion of the image forming apparatus;
- a sheet feed unit which is vertically movable relative to said sheet feed mechanism;
- a cassette detachably attached to said sheet feed unit, said cassette containing cut sheets to be picked up by said sheet feed mechanism;
- a sheet feed table which is vertically movably situated inside said sheet feed unit and which carries a large number of cut sheets to be picked up by said sheet feed mechanism;
- cassette presence detection means for detecting presence and absence of the cassette on said sheet feed unit and for outputting a signal indicating one of the presence and the absence of said cassette;

a power switch for starting and stopping said cut sheet feeder; and

mode establishment means for establishing one of a cassette feed mode and a table feed mode, said mode establishment means setting the cassette feed mode using said cassette for minority sheet feed if the detection signal from said cassette presence detection means indicates the presence of said cassette when said power switch is turned on, and setting the table feed mode using said sheet feed table for majority sheet feed if the detection signal from said cassette presence detection means indicates the absence of said cassette when said power switch is turned on.

5,437,444

## SHEET SUPPLYING APPARATUS

Hideaki Kawakami, Yokohama; Takehiko Kiyohara, Zama; Tetsuo Suzuki, Yokohama; Junichi Asano, Kawasaki; Soichi Hiramatsu, Yokohama; Masahiro Taniguro, Yokohama; Hiroyuki Saito, Yokohama; Haruyuki Yanagi, Yokohama; Takashi Nojima, Tokyo; Satoshi Saikawa, Inagi, and Hiroyuki Kinoshita, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

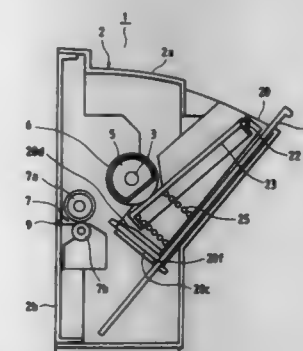
Filed Mar. 10, 1993, Ser. No. 28,818

Claims priority, application Japan, Mar. 12, 1992, 4-087595; Jul. 31, 1992, 4-225143

Int. Cl.<sup>6</sup> B65H 3/30

U.S. Cl. 271—22

21 Claims



1. A sheet supplying apparatus comprising:

- extendible sheet supporting means for supporting sheets;
- sheet supply means for feeding out the sheets supported by said sheet supporting means;
- a separating claw for separating the sheets fed by said sheet supply means one by one by engaging with a front edge of the sheets supported by said sheet supporting means, said separating claw being shiftable between a separate position for separating the sheets by engaging with the front edge of the sheets and a non-separate position not engaging with the front edge of the sheets;
- shifting means for shifting said separating claw between the separate position and non-separate position, in response to extending and shortening movements of said sheet supporting means; and
- second separation means for separating the sheets fed out by said sheet supply means one by one when said separating claw is shifted to the non-separate position by said shifting means.



5,437,445

**METHOD AND APPARATUS FOR DETECTING DOUBLE FED SHEETS**

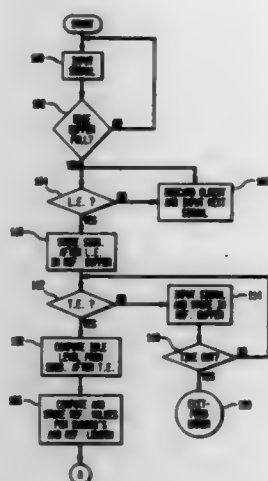
Sung S. Chang, Stamford; Mark A. Gilbertie, Milford, and Andrei Obres, Wilton, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 8, 1992, Ser. No. 970,671

Int. Cl.<sup>6</sup> B65H 7/12

U.S. Cl. 271—263

35 Claims



1. A mechanism for detecting doubled sheets fed from a feeder, comprising:

- first means, responsive to the passage of a sheet fed from said feeder, for generating a sequence of signals representative of the thickness of said sheet at a corresponding sequence of positions on said sheet;
- second means, responsive to said sequence of signals for:
  - determining an average thickness for at least a subsequence of said positions;
  - comparing said average thickness to a predetermined reference value; and
  - if said average thickness is greater than said reference value generating a double detect signal representative of a double fed sheet.

5,437,446

**METHOD FOR ALIGNING A GOLF PUTTING STROKE**

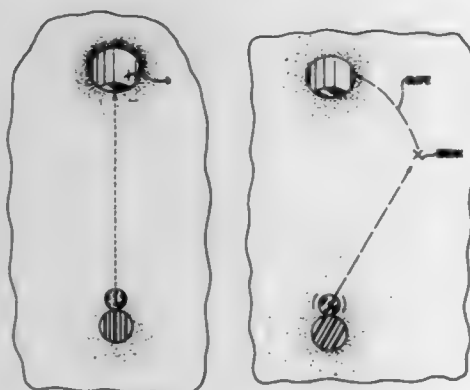
Carroll Youngkin, 11831 Wexwood Dr., Richmond, Va. 23236

Filed Aug. 9, 1994, Ser. No. 288,099

Int. Cl.<sup>6</sup> A63B 57/00

U.S. Cl. 273—32 A

6 Claims



1. A method of aligning a putting stroke for putting a golf ball into a golf green hole wherein the golf ball has dimples and a line of indicia separately discernible from the dimples, said method comprising the steps of:

aligning a ball position marker having a directional indicat-

ing marking on its surface so that said directional indicating marking is aligned with a line of chosen putt to define a desired putting path between said aligner and a hole in a golf green;

placing said golf ball at a position adjacent to said ball position marker so that the line of indicia on said golf ball has the same alignment as said directional indicating marking on said ball position marker; and  
aligning a putter face perpendicular with said line of indicia on said golf ball so that said putter face is perpendicular to said line of chosen putt.

5,437,447

**GOLF PUTTER**

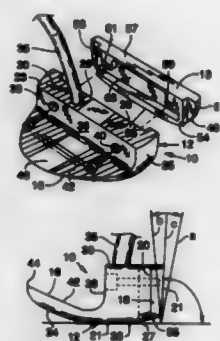
Martin A. Rigutto, 17735 105th Pl. SE, #F-202, Renton, Wash. 98055

Filed Jul. 20, 1993, Ser. No. 94,839

Int. Cl.<sup>6</sup> A63B 69/36, 53/04, 53/06

U.S. Cl. 273—164.1

28 Claims



1. A golf putter comprising:

- a body having a front and rear, and a bottom surface, the bottom surface being upwardly curved toward both the front and the rear of the body;
- the body including a front surface and an upright rear surface spaced from the front surface; and
- the body including a flange which projects rearwardly and upwardly from a position below the upright rear surface.

5,437,448

**TEE SIGHT**

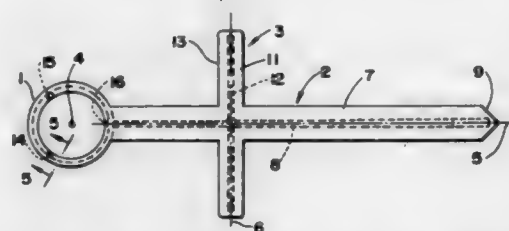
John E. Balson, 227 Lancaster Ave., Devon, Pa. 19333

Filed Mar. 24, 1994, Ser. No. 217,277

Int. Cl.<sup>6</sup> A63B 69/36

U.S. Cl. 273—187.1

6 Claims



1. Golfer-aid sight means for use with a golf tee having a cylindrical head for supporting a golf ball in a position to be struck by the striking head of a golf club and be propelled along an intended path to an intended target and the cylindrical head having an axis arranged to be coaxial with a diameter of a golf ball supported on the cylindrical head, the sight means comprising:

- an attachment ring having an axis, the ring to be placed over the cylindrical head of a golf tee and having means to maintain the ring on the cylindrical head with the axis of the ring and the axis of the head substantially coaxial;
- a target arm connected to said ring and extending radially

outwardly therefrom for use in being pointed by the golfer at the intended target when the sight means and golf tee are positioned on the ground; and

a club face alignment arm connected to said target arm and extending normally outwardly on opposite sides thereof and being spaced from said axis of said ring a distance greater than the radius of a ball supported by the golf tee so that the golfer, at address, can view all of the alignment arm and thereby assist the golfer to position the club to set up the club face parallel to the alignment arm and thereby to be set up normal to the intended flight path of the ball.

5,437,449

**GOLF CLUB HOLDER AND TURF REPAIR TOOL**

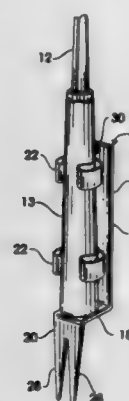
Albert H. Zink, 12502 Skylark Dr., Sun City West, Ariz. 85375

Filed Jul. 29, 1994, Ser. No. 282,889

Int. Cl.<sup>6</sup> A63B 57/00

U.S. Cl. 273—32 B

8 Claims



1. A device for holding a golf club in a generally vertical orientation relative to the ground, wherein the golf club has a head for impacting with a golf ball, an elongated shaft connected at one end to the head, and a grip attached to the other end of the elongated shaft, said device comprising:

- a main body having an upper portion, an intermediate portion extending from said upper portion at substantially a right angle thereto, and a lower portion extending from said intermediate portion generally parallel to said upper portion;
- clamping means attached to said main body upper portion for receiving and holding the grip on the golf club; and
- said main body lower portion including a pair of prongs for penetrating the ground so that the golf club is supported in said generally vertical orientation with the head elevated above the grip and for repairing ball marks and impressions on putting greens.

5,437,450

**GOLF CLUB SHAFT AND PROCESS OF PREPARING SAME**

Tsuneo Akatsuka, Saitama; Yoshihiro Motoki, Misato; Takashi Harada, Soka, and Akira Suzawa, Koshigaya, all of Japan, assignors to Somar Corporation, Japan

Filed Aug. 29, 1994, Ser. No. 297,028

Claims priority, application Japan, Aug. 31, 1993, 5-238964

Int. Cl.<sup>6</sup> A63B 53/10

U.S. Cl. 273—80 B

2 Claims

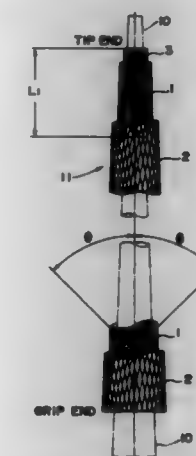
1. A golf club shaft having a grip end, a tip end, an outer diameter gradually decreasing from said grip end to said tip end, and an average weight of not greater than 1.4 g per inch, said shaft comprising:

- an inner tubular layer formed of a hardened, first carbon fiber-reinforced plastic and extending continuously throughout the length of said shaft, said inner layer containing a first carbon fiber group having a modulus of 29,000 kgf/mm<sup>2</sup> or more and a tensile strength of 300 kgf/mm<sup>2</sup> or more and oriented at an angle in the range of

40 to 50 degrees with respect to the longitudinal axis of said shaft;

an outer tubular layer provided contiguously around said inner layer throughout the length thereof and formed of a hardened, second carbon fiber-reinforced plastic material, said outer layer containing a second carbon fiber group having a modulus of 24,000 kgf/mm<sup>2</sup> or more and a tensile strength of 450 kgf/mm<sup>2</sup> or more and oriented at an angle in the range of 5 to 30 degrees with respect to the longitudinal axis of said shaft, and

a tubular, reinforcing layer provided inside of said inner layer and extending from said tip end with a length of 50 to 500 mm, said reinforcing layer being formed of a hardened, reinforcing fiber-reinforced plastic containing a fiber group having a modulus of 20,000 kgf/mm<sup>2</sup> or more and a tensile strength of 500 kgf/mm<sup>2</sup> or more and ori-



ented at an angle in the range of 0 to 5 degrees with respect to the longitudinal axis of said shaft, the weight ratio of said inner layer to said outer layer being in the range of 20:80 to 55:45, the thickness ratio of said inner layer to said outer layer being in the range of 1:3 to 1:1, said inner layer being obtained from a prepreg sheet containing said first carbon fiber groups dispersed within a matrix of a first hardenable resin, said reinforcing layer being obtained from a prepreg sheet containing said reinforcing fiber group dispersed within a matrix of a second hardenable resin, said outer layer being obtained from windings of a roving of said second carbon fiber groups impregnated with a third hardenable resin, said first and second hardenable resins having been hardened before the winding of said roving.

5,437,451

**DRAW STUD POKER-TYPE CARD GAME**

Stanley E. Fulton, Las Vegas, Nev., assignor to DD Stud, Inc., Las Vegas, Nev.

Filed Oct. 1, 1993, Ser. No. 130,646

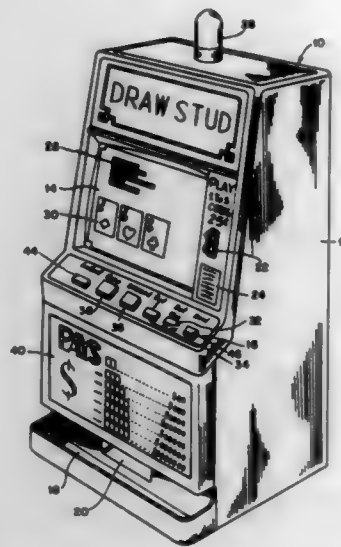
Int. Cl.<sup>6</sup> A63F 9/00

U.S. Cl. 273—138 A

19 Claims

1. An apparatus for playing a card game wherein a player is given an opportunity to build a winning hand comprising:  
means for receiving a wager;  
means for indicating a winning payout schedule;  
means for sequentially displaying a plurality of indicia of cards;  
means for inputting a player's option for at least two of said displayed indicia of cards;  
wherein said displaying means displays said first optional

card indicia and said inputting means provides a player with an opportunity to keep or discard said optional card



before displaying the number of card indicia in the highest winning payout on said payout schedule.

5,437,452

# ROULETTE BOWL HAVING A ROULETTE WHEEL

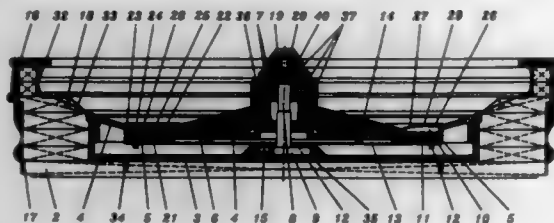
Johann Graf, and Werner Machac, both of Gumpoldskirchen, Austria, assignors to Novo-Invest Development Aktiengesellschaft, Gumpoldskirchen, Austria  
PCT No. PCT/AT92/00004, § 371 Date Jul. 22, 1993, § 102(e) Date Jul. 22, 1993, PCT Pub. No. WO92/12773, PCT Pub. Date Aug. 6, 1992

PCT Filed Jan. 20, 1992, Ser. No. 94,049

Claims priority, application Austria, Jan. 22, 1991, 128/91  
Int. Cl.<sup>6</sup> A63F 5/00

U.S. Cl. 273-142 E

16 Claims



1. A roulette bowl for gambling casinos, comprising a roulette wheel having a recess, a metal ring with integrally formed radially extending fins confining pockets, the metal ring being fixedly mounted in the recess of the roulette wheel.

5,437,453

# GAME CHAIR APPARATUS

Derral Hineman, 792 W. Elmonte Pl., #6, Chandler, Ariz. 85224  
Continuation of Ser. No. 9,921, Jan. 15, 1993, Pat. No. 5,290,034. This application Feb. 28, 1994, Ser. No. 202,528

The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A63B 71/04; A63F 9/22; G09B 9/02

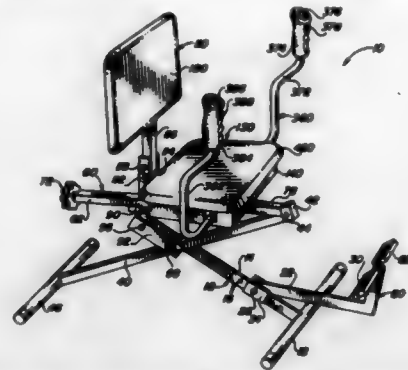
U.S. Cl. 273-148 B

10 Claims

1. Game chair apparatus for use with electronic games, comprising in combination:

- base means for supporting a seat;
- a seat supported by the base means;

joystick means for providing output signals for the electronic games; and



first switch means actuatable in response to movement of the joystick means for providing output signals to the electronic games.

5,437,454

# RECIPROCATING MANIPULABLE BALL PUZZLE

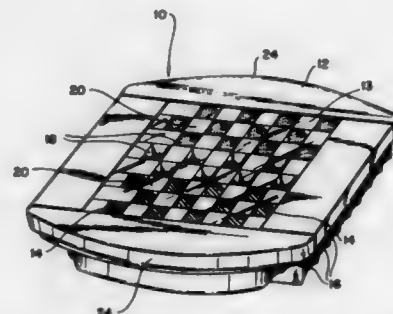
Ira Friedman, West Palm Beach, Fla., assignor to Tri-Tec Industries Ltd., West Palm Beach, Fla.

Filed Apr. 29, 1994, Ser. No. 235,697

Int. Cl.<sup>6</sup> A63F 9/08

U.S. Cl. 273-153 S

13 Claims



1. An puzzle type amusement device, comprising: a plurality of movable pieces;

a housing with a generally planar top member, a generally planar bottom member, two oppositely disposed and spaced apart front and back wall members connecting said top and bottom members where said top, bottom and wall members define a box having generally rectangularly side apertures; and

at least two slider bar members contained by said housing, the at least two slider bar members being contiguous and movable relative to each other and the housing and alignable relative to each other, each of said slider bar members having alternating pockets and teeth, each one of said pockets being dimensioned to receive one of said movable pieces and each one of said pockets being capable of communication of said movable piece to a pocket of said other of the at least two contiguous slider bar members when said pockets of the adjacent slider bar members are aligned, where each of said slider bar members extends through said respective side apertures, and where each is translatable both relative to an immediately adjacent slider bar member and relative to said housing.

5,437,455

Patent Not Issued For This Number

5,437,456

# IRON GOLF CLUB HEAD WITH DUAL INTERSECTING RECESSES AND ASSOCIATED SLITS

Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

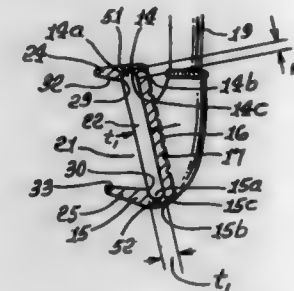
Continuation of Ser. No. 999,250, Jan. 19, 1993, Pat. No. 5,301,946, which is a continuation-in-part of Ser. No. 921,857, Aug. 5, 1992, Pat. No. 5,282,625. This application Apr. 11, 1994, Ser. No. 225,775

The portion of the term of this patent subsequent to Apr. 12, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A63B 53/04

U.S. Cl. 273-169

25 Claims



1. A golf club head having a body defining a heel, toe, top wall, a bottom wall, and a front wall defining an upwardly and rearwardly inclined front face, and comprising

- said body defining a forwardly extending main recess located rearwardly of said front wall,
- said body also defining at least one rearward projection located vertically of said main recess and associated with one of said top and bottom walls,
- said body having at least one slit therein extending in said rearward projection, the slit intersecting an outer surface defined by the body,
- there being an undercut recess extending in said rearward projection proximate said front wall, said undercut recess intersecting said slit and said main recess,
- said rearward projection projecting directly rearwardly of said undercut recess.

5,437,457

# GOLF BALL TRAJECTORY AND SPIN SENSING SYSTEM

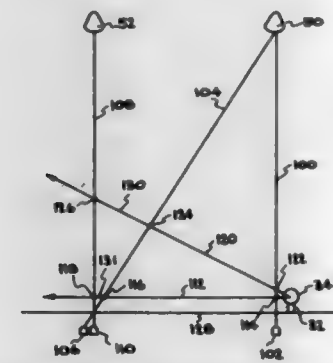
Donald B. Curchod, Portola Valley, Calif., assignor to Virtual Golf, Inc., Mountain View, Calif.

Filed Oct. 4, 1993, Ser. No. 131,489

Int. Cl.<sup>6</sup> A63B 69/36

U.S. Cl. 273-185 A

21 Claims



1. A system for detecting the trajectory of a ball, including: a first light sensor means;

a first light source means directed toward the first light sensor means;  
a second light sensor means;  
a second light source means directed toward the second light sensor means;  
said first light sensor means and said first light source means arranged to form an angle between said second light sensor means and said second light source means;  
means for detecting when the ball interrupts light falling on said first light sensor means;  
means for detecting an initial ball position, prior to passing through light generated by said first and second light source means;  
means for detecting when the ball interrupts light falling on the second light sensor means;  
means for determining the time taken from an initial ball position prior to interruption of the first light sensor means by said ball;  
means for determining the time taken from an initial ball position prior to interruption of the second light sensor means by said ball;  
means for calculating the position of the ball between the second light source means and the second light sensor means when the ball interrupts the second light sensor means, to determine vertical ball height.

5,437,458

# GOLF PUTTING TRAINING DEVICE

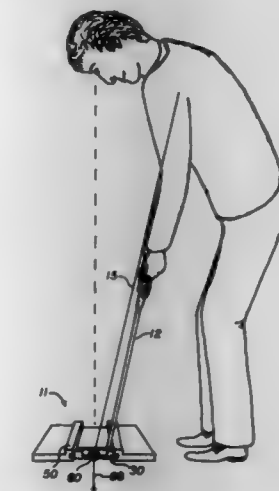
A. L. Springer, 2120 Hillcrest, Pekin, Ill. 61554

Filed Jul. 19, 1993, Ser. No. 56,926

Int. Cl.<sup>6</sup> A63B 69/36

U.S. Cl. 273-192

6 Claims



1. A golf putting training device for improving putting strokes, said device comprising, in combination:

- a golf putter having a shaft and a putter head defined at a first end of said shaft, said putter head having a longitudinal axis;
- a slider;
- a means for attaching said slider to said putter head;
- a guide means adapted to cooperate with said slider so that said longitudinal axis of said putter head is maintained substantially horizontal and normal to a desired path of putter head travel, said guide means terminating at a front end of said device, along said desired path of putter head travel beyond a point of impact of said putter head and a golf ball, allowing said putter head to translate unguided and unrestricted after impact with said golf ball.



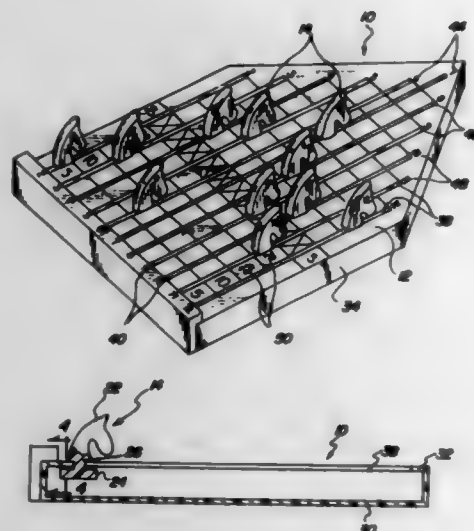
5,437,459

**HORSE RACING GAMES WITH BOARD, PIECES, CARDS AND DICE**  
Gerald Kirby, 7723 Venture Road, Regina, Saskatchewan, Canada S4Y 1C2

Filed Feb. 14, 1994, Ser. No. 195,437  
Int. Cl.<sup>6</sup> A63F 3/00

U.S. Cl. 273-246

1 Claim



1. A horse racing game with board, pieces, cards and dice comprising, in combination:

- a deck of cards;
- a pair of dice;
- a plurality of board pieces in a shape of a horse's head at the upper extents and an enlargement at their lower extents and a narrow neck therebetween, each enlargement having an upwardly facing recess;
- a board having a lower plate with upper and lower surfaces and an upper plate with upper and lower surfaces and of similar shape and with parallel vertical side walls coupling the upper and lower plates, a plurality of parallel slots formed from one end of the upper plate, the upper extent of each board piece extends above said upper plate, the neck of each board piece extends through one of said slots, and only the enlargement of each board piece extends below said upper plate, between said upper plate and lower plate, the opposite end of the upper plate constituting the finish line with the board having a rectangular section at its lower extent and a triangular section at its upper extent whereby the central slot is longer than each adjacent side slot with the shortest side slots located outermost from the central slot adjacent to the side walls, the upper surface being provided with indicia between adjacent slots and additional indicia at both the upper and lower ends of each slot indicating the number of the lane and with point amounts and the starting line adjacent to the midpoint of the rectangular section whereat the pieces are located to start play whereby when the cards are dealt and the dice are rolled, each player in succession may move his piece along the slot toward the finish line where the first player reaching the finish line being the winner; and
- each enlargement consisting of a pair of rollers located within each recess with a pin spanning each recess for rotatably mounting each roller within a recess for rotation about an axis perpendicular to the slots, the rollers being in rolling contact with only the lower surface of the upper plate and no other portion of said enlargement being in contact with said upper or lower plates.

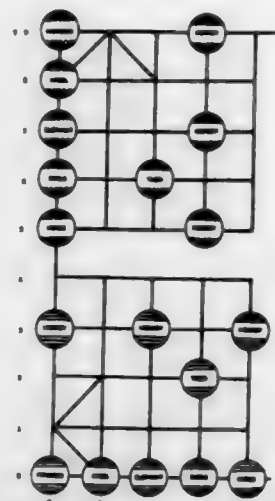
5,437,460

**METHOD OF PLAYING MULTIPLE PLAYER STRATEGY GAME**  
Chin-Kuei Cho, 8805 Saunders La., Bethesda, Md. 20817

Filed Jun. 30, 1994, Ser. No. 269,343  
Int. Cl.<sup>6</sup> A63F 3/02

U.S. Cl. 273-262

2 Claims



1. A method of playing a strategic board game playable by two, three, or four persons comprising the steps of:

- a. providing a four-sided game board defined by ten perpendicularly intersecting horizontal and vertical lines forming 100 intersecting points, said 100 points being divided into four squares that represent four kingdoms, said four kingdoms each having twenty five points being located in the bottom left, upper left, upper right, and bottom right corners separated by two blank rectangles that form a blank cross in the middle, said four kingdoms each having a palace of two by three points, said palace of said bottom left kingdom being located vertically in said kingdom's bottom left corner, said palace of said upper left kingdom being located horizontally in said kingdom's upper left corner, said palace of said upper right kingdom being located vertically in said kingdom's upper right corner, said palace of said bottom right kingdom being located horizontally in said kingdom's bottom right corner, said four palaces each having two diagonal lines that meet at the midpoint of the outer line of said palace;
- b. providing four sets of playing pieces, said sets being distinguishable one from another with characteristics such as color, and comprising the following pieces per set: one princess, one angel, one elephant, one eagle, one horse, one tiger, and three monkeys;
- c. providing predetermined movement abilities for each playing piece;
- d. assigning each set of playing pieces to up to four different players;
- e. positioning said playing pieces on the points of said game board;
- f. players moving one of their playing pieces in accordance to its predetermined movement abilities, said predetermined movement abilities comprising:  
When a playing piece moves to a point occupied by an opposing playing piece, said opposing playing piece is removed from the board;  
moving said princess one point in any horizontal or vertical direction to a point within her respective palace without jumping over said other playing pieces;  
moving said angel one point in any diagonal direction to a point within the palace of her princess's without jumping over said other playing pieces;  
moving said elephant on a two point path in any diagonal

5,437,463

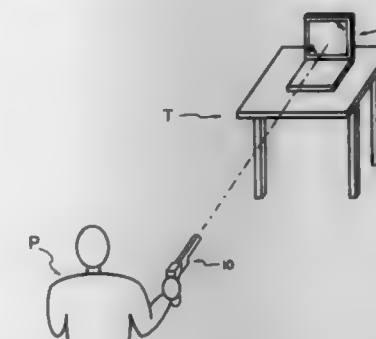
**TARGET GAME APPARATUS**

Wayne G. Fromm, 3500 Bathurst Street, Toronto, Ontario, Canada M6A 2C6

Filed Feb. 14, 1994, Ser. No. 195,389  
Int. Cl.<sup>6</sup> F41J 5/08; F41G 3/26

U.S. Cl. 273-310

8 Claims



1. A target game apparatus comprising the combination of:  
a device for projecting an electromagnetic beam; and  
a target assembly having

- a case the case including a base portion and a movable portion hinged to the base, and the base portion capable of being supported on a table top or the like so that a player may play the game when either standing or sitting;
- a target panel supported by the movable portion of the case, the panel having a front generally planar surface and a back surface,
- a plurality of targets supported on or behind the back surface of the target panel,
- illumination means for illuminating an associated target to cause the associated target to be visible, the target not being visible when the illumination means is not operated,
- first timer means for initiating operation of the target assembly for a first time period,
- first switching means for initiating the operation of selected illumination means during operation of the target assembly, the selected illumination means being operated for a time interval less than the first time period,
- receiving means associated with each target, each receiving means initiating a signal during operation of the associated illumination means when the receiving means is struck by the electromagnetic beam projected by the device, and
- scoring means carried by the target assembly for displaying a score in response to signals received from each receiver.

5,437,464

**DATA READING AND IMAGE PROCESSING SYSTEM FOR CD-ROM**

Junichi Terasima; Toshinori Asai, both of Tokyo, and Masaki Kawahori, Chiba, all of Japan, assignors to Kabushiki Kaisha Sega Enterprises, Tokyo, Japan

Filed Aug. 18, 1992, Ser. No. 931,715

Claims priority, application Japan, Aug. 30, 1991, 3-219677;  
Dec. 12, 1991, 3-351393

Int. Cl.<sup>6</sup> G06F 3/14

U.S. Cl. 273-434

8 Claims

1. A video computer game system that enables an operator to play a game stored as data on a compact disc that is read at a first synchronization time period that is different from a second synchronization time period necessary for processing the data to provide video drive signals including a data processing system comprising:

- a memory unit;
- means for reading data stored on a compact disc;

direction to a point within its own kingdom without jumping over said other playing pieces;  
flying said eagle in any horizontal, or vertical, path to an empty point in any kingdom without flying over said other playing pieces, or flying said eagle in any horizontal, or vertical, path over a teammate or an opponent playing piece to the next point being occupied by an opposing playing piece to replace that piece;  
moving said horse on a three point path to a point in any kingdom, said path consists of either a two-point horizontal segment and a one-point vertical segment, or a two-point vertical segment and a one-point horizontal segment, with the first point on said two-point segment being empty and the second point on said two-point segment being either empty or occupied by any playing piece;  
moving said tiger in any horizontal, or vertical, path to a point in any kingdom without jumping over other said playing pieces;  
moving said monkey one point in any horizontal, or vertical, direction to a point in any kingdom without jumping over other said playing pieces.

5,437,461

Patent Not Issued For This Number

5,437,462

**WAGERING GAME**

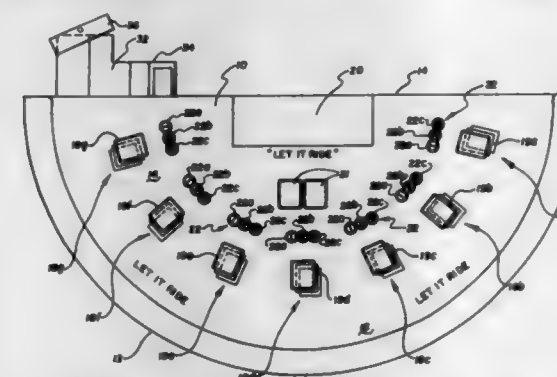
John G. Breeding, St. Louis Park, Minn., assignor to Shuffle Master, Inc., Eden Prairie, Minn.

Continuation of Ser. No. 23,196, Feb. 25, 1993, Pat. No. 5,288,081. This application Feb. 18, 1994, Ser. No. 198,368  
The portion of the term of this patent subsequent to Feb. 22, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A63F 1/00

U.S. Cl. 273-292

13 Claims

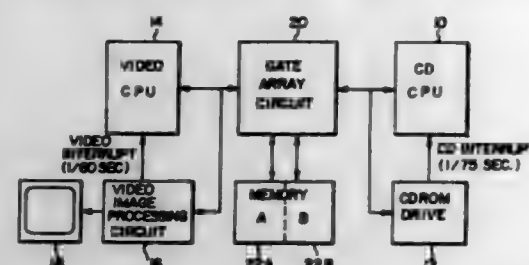


1. A method of playing a wagering card game using actual or representations of standard face playing cards having a standard rank, said game involving standard poker hand rankings and comprising the steps of:  
a player placing a wager to participate in the game;  
providing cards for the player;  
giving the player the chance to examine the cards received by the player and to withdraw at least part of said wager based on the rank of the player's cards;  
showing the player at least one common card, thereby providing a hand for the player, the player's hand comprising said shown at least one common card and the cards the player received; and resolving the player's remaining wager, which was not withdrawn, based on the rank of the player's hand.

a first computer system for controlling the reading of data by the reading means and storing the read data in the memory unit in coordination with the first synchronization time period;

image processing means for processing the read data to provide video drive signals in coordination with the second synchronization time period;

a second computer system for controlling the processing of video drive signals during the second synchronization



time period, the second computer system operating also when the first computer system is operating to provide parallel processing of data; and

control means for coordinating the storage of read data into the memory unit and reading of data out of the memory unit to enable a coordination of the processing of data by the first and second computer systems so that the same data is not being accessed in the memory unit by either the first and second computer systems at the same time period.

5,437,465

# TOOL CHANGING DEVICE ON A HAND-OPERATED MACHINE TOOL

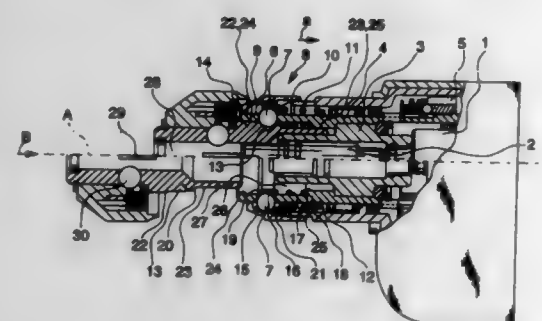
Roland Vögele, and Dieter Hirt, both of Winnenden, Germany, assignors to Atlas Copco Elektrowerkzeuge GmbH, Winnenden, Germany

Filed Oct. 22, 1993, Ser. No. 141,793

Int. Cl.<sup>6</sup> B23B 31/107

U.S. Cl. 279—22

10 Claims



1. A tool changing device for hand-operated machine tools such as a drill hammer for optional operation with a hammer drill or another tool such as a drill or screw bit, comprising:

a spindle sleeve connected to the machine tool, said spindle sleeve being provided for rotary driving;

a riveting die used for impact drive, said riveting die being arranged with respect to the spindle sleeve;

a locking body corotating with the spindle sleeve, said locking body being mounted in at least one perforation of said spindle sleeve;

an adaptor, on which the tool can be fixed, said adaptor being axially inserted with a guide surface into said spindle sleeve, said adaptor having a stop edge adjacent to said guide surface and said adaptor having at least one depression for each locking body for nonrotatable and axially nondisplaceable connection to said spindle sleeve;

an outer sleeve mounted axially displaceably on said spindle sleeve, said outer sleeve being freely exposed on an outside of said tool changing device, said outer sleeve block-

ing movement of said locking body from an associated depression of said adaptor in a locking position and releasing said locking body in a released position of said outer sleeve;

a pocket provided in said outer sleeve, said pocket for accommodating said locking body in said release position; an inner sleeve being moveable from a displaced position into a release position during insertion of said stop edge of said adaptor, said inner sleeve pressing said locking body into said outer sleeve in said displaced position and blocking said locking body in said release position, said inner sleeve being arranged axially displaceably in said spindle sleeve, wherein said locking body is caused to engage said depression of said adaptor by pushing in said adaptor.

5,437,466

# IN-LINE ROLLER SKATE

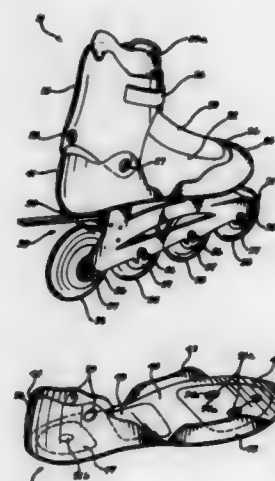
Antonin A. Melbock, Cleveland, Ohio, and John E. Svensson, Seattle, Wash., assignors to K-2 Corporation, Vashon, Wash.

Filed Jul. 19, 1993, Ser. No. 94,576

Int. Cl.<sup>6</sup> A63C 1/02, 17/06

U.S. Cl. 280—11.22

6 Claims



1. In an in-line roller skate having an upper shoe portion and a lower frame portion, said upper shoe portion being adapted to support a skater's foot, and said upper shoe portion being positioned upwardly adjacent said lower frame portion, and said lower frame portion including a plurality of wheels rotatable in a common, longitudinally extending plane of rotation, the improvement wherein said upper shoe portion comprises:

a non-rigid shoe portion adapted to receive a skater's foot, said non-rigid shoe portion formed of a substantially soft, pliable material, said material adapted to allow air to circulate around the skater's foot, said non-rigid shoe portion including a vamp and a vamp fastener coupled to said vamp to secure said non-rigid shoe portion over the top of the skater's foot;

support means positioned adjacent selected areas of said non-rigid shoe portion for provide support to aid the skater in maintaining said in-line roller skate in a substantially vertical position, said support means including an ankle support cuff for surrounding an ankle portion of said non-rigid shoe portion, said support means further including a heel counter for cupping the heel of the skater's foot wherein said heel counter and said ankle support cuff are pivotally interconnected, said support means being positioned adjacent only portions of said non-rigid shoe position, said vamp not being substantially covered by said support means such that air circulates through said non-rigid shoe portion to cool the skater's foot while skating; and

a base portion, said base portion having an upper surface for

receiving the skater's foot and a lower surface for providing a connecting interface between said lower portion and said upper shoe portion, said ankle support cuff and said heel counter vertically extending said support means upward from said base portion, said non-rigid shoe portion being permanently affixed to said base portion, wherein at least a portion of said non-rigid shoe portion extends continuously from said base portion to at least the top of said ankle support cuff.

5,437,467

# STABILIZATION DEVICE FOR VEHICLE

Pierre Patin, 15, rue Buffon, 75005 Paris, France

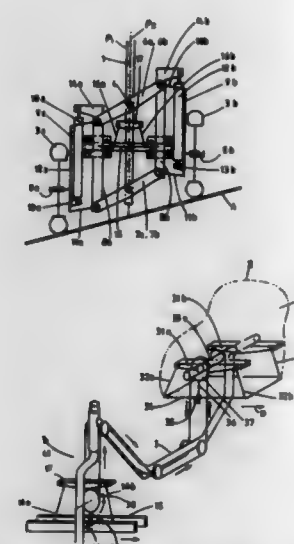
Filed Mar. 10, 1993, Ser. No. 29,245

Claims priority, application France, Mar. 10, 1992, 92 02822

Int. Cl.<sup>6</sup> B62D 61/00

U.S. Cl. 280—112.2

7 Claims



1. Stabilization device for an inclinable vehicle comprising:

(a) a primary part (I) centered on a normally vertical mid-plane (P1) and resting on the ground through a front bearing assembly mounted on a steering column (1) and carrying two spaced wheels (3a, 3b) and a rear bearing assembly carrying at least a third wheel;

(b) a secondary part (II) having a mid-plane (P2) and mounted on said primary part (I) for rotation about a suspension axis parallel to the ground (A) and to said mid-planes of said primary and secondary parts, said secondary part (II) comprising at least a driver's seat (30);

(c) an inclination system comprising a deformable parallelogram and associated with said bearing assembly having two wheels (3a, 3b) for allowing inclination of said primary part and of said wheels relative to the ground, said inclination system comprising two side bars (8a, 8b), parallel to the mid-plane (P1) of said primary part (I) and hinged at ends of said side bars with two parallel equalizers (6a, 6b; 7a, 7b) articulated on a central element of said primary part (I), respectively around two axles (4, 5) located one above the other in said mid-plane (P1) of said primary part and parallel to the ground (A), both wheels of said bearing assembly having axles (Oa, Ob) respectively mounted on both said side bars (8a, 8b) perpendicularly to said mid-plane (P1) of said primary part;

(d) an angular locking system for allowing freely inclination of said secondary part (II) with said primary part (I) whenever their mid-planes (P2, P1) are substantially coincident and for making said secondary part (II) angularly integral with said primary part (I) whenever said mid-plane (P2) of said secondary part moves away from said mid-plane (P1) of said primary part (I) in a direction in which said vehicle is tending to incline;

(e) said angular locking system comprising a cross piece (15)

angularly integral with said secondary part (II) and extending between said side bars (8a, 8b), and two locking carriages (18a, 18b) respectively slidably mounted along said side bars (8a, 8b);

(f) said cross piece (15) having two ends respectively angularly locked with said two carriages, each by a sliding link allowing each end of said cross piece (15) to slide longitudinally on a corresponding locking carriage (18a, 18b) while maintaining its orientation relative to said corresponding carriage (18a, 18b);

(g) said cross piece (15) being suspended from said primary part (I) by a system of two rods (16a, 16b) each having a lower end and an upper end, the lower ends being hinged with said cross piece (15) respectively around two lower articulation points (41a, 41b) symmetrically spaced either side of said mid-plane (P2) of said secondary part (II) and the upper ends being hinged with the primary part (I) respectively around two upper articulation points (42a, 42b) symmetrically spaced either side of said mid-plane (P1) of said primary part (I);

(h) said two rods (16a, 16b) converging in a meeting point (B) constituting an instantaneous center of rotation of said cross piece (15);

(i) said cross piece (15) remaining perpendicular to said mid-planes (P1, P2) and said locking carriages (18a, 18b) sliding freely along the corresponding side bars (8a, 8b) whenever said mid-planes (P1, P2) are substantially coincident;

(j) each of said locking carriages being fitted with a means for locking its sliding movement along the length of the corresponding side bar (8a, 8b) in a downward direction of slide and for allowing the sliding movement remaining uninhibited in an upward opposite direction.

5,437,468

# SKI

Franz Schenner, Mittersill, Austria, assignor to Blizzard Ges.m.b.H., Mittersill, Austria

Filed Dec. 28, 1992, Ser. No. 997,388

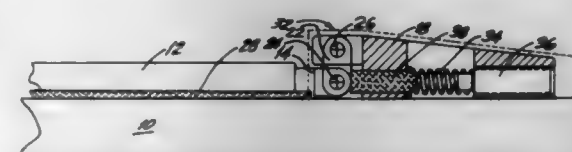
Claims priority, application Germany, Feb. 13, 1992, 9201845

U

Int. Cl.<sup>6</sup> A63C 5/00

U.S. Cl. 280—602

5 Claims



1. A ski having a body, first and second bearing assemblies fixedly secured to an upper surface of the body, a longitudinally extending plate having first and second coupling elements secured to opposite ends thereof, means for pivotally connecting said first coupling element to said first bearing assembly, a pivot lever having one end pivotally connected to said second coupling element and an opposite end pivotally connected to said second bearing assembly, a pin supported for longitudinal movement by said second bearing assembly and longitudinally aligned with said second coupling element, one end of said pin being in abutting engagement with said second coupling element and with said one end of said pivot lever, and adjustable spring means for directing a longitudinal force against an opposite end of said pin.



5,437,469

**REINFORCED FOLDABLE AIRBAG LID**

Katsumori Monden, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

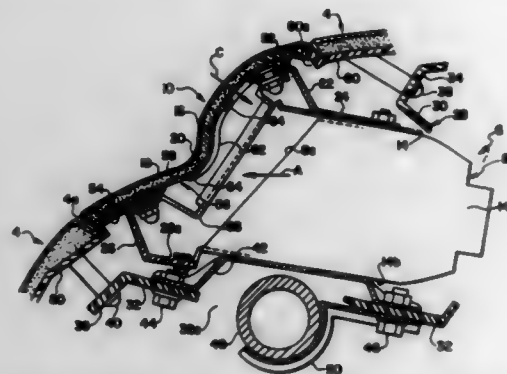
Filed Mar. 22, 1994, Ser. No. 215,781

Claims priority, application Japan, Mar. 25, 1993, 5-066362

Int. Cl.<sup>6</sup> B60R 21/20

U.S. Cl. 280—728.3

12 Claims



8. An automobile airbag system having an airbag, which inflates and expands toward a passenger seat through an opening formed in an instrument panel disposed below a front windshield glass so as to restrain and protect a passenger upon an occurrence of a collision, and an airbag lid, disposed in said opening and hinged at an upper portion thereof to a housing for said airbag so as to be flipped upward by said airbag as said airbag inflates and expands, said airbag lid comprising:

weakened means, transversely extending in said airbag lid, for causing said airbag lid to bend and be folded in two when said airbag lid hits the front windshield glass due to an impact; and

reinforcing means for reinforcing said airbag lid and providing said airbag lid with an increased rigidity, said reinforcing means being disposed at transversely opposite ends of said weakened means and secured to said airbag lid on vertically opposite sides of said weakened means so as to extend in a direction spatially intersecting said weakened means, said reinforcing means being formed with a weakened portion by which said reinforcing means is easily bent following bending of said airbag lid.

5,437,470

**AIR BAG LID STRUCTURE INCLUDING A MAIN LID AND A SUB LID**

Takehiro Terai, Atsugi, and Shigeki Tatsumi, Hiratsuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Apr. 1, 1994, Ser. No. 221,571

Claims priority, application Japan, Apr. 2, 1993, 5-76971; Apr. 2, 1993, 5-76996; Apr. 2, 1993, 5-77004; Apr. 2, 1993, 5-77013

Int. Cl.<sup>6</sup> B60R 21/20

U.S. Cl. 280—728.3

5 Claims

5. A lid structure for an air bag system of a vehicle, comprising:

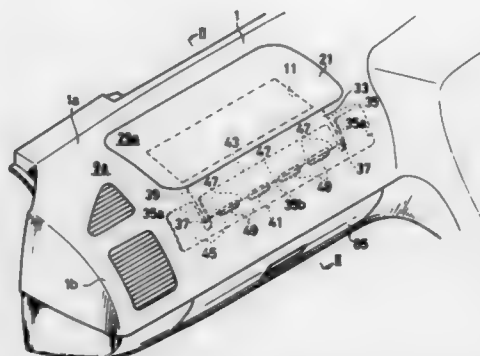
a main opening provided in an instrumental panel for said vehicle, said main opening being adapted so that an air bag of said system passes through said main opening when inflating said air bag;

a main lid provided integral with said instrumental panel for closing said main opening, said main lid being opened by said air bag in the process of inflating;

a sub lid defined by a weakened part of said instrumental panel to be easily broken by said air bag, said sub lid being integral with said instrumental panel, said weakened part extending from said main opening, whereby said weakened part is broken by an inflating force of said air bag acting on said sub lid to thereby cause said sub lid to be

opened to form a sub opening which is integral with said main opening; and

an attachment provided on a back surface of said instrumental panel, said attachment comprising a movable part fixed to said sub lid, an immovable part fixed to said instrumental panel, beaded connecting parts through which said



movable part is connected with said immovable part, said beaded connecting parts protruding from said back surface of said instrumental panel, and a plurality of slits arranged between said movable part and said immovable part, each of said slits being arranged between said beaded connecting parts adjacent said weakened part.

5,437,471

**INFLATOR WITH STARTER FOR SIDE COLLISION AIR BAG DEVICE**

Ryouchi Yoshida; Hiroaki Fujii; Atsushi Tsuji; Tomoko Shimizu; Nobuya Osada, and Takahiro Yamanishi, all of Shiga, Japan, assignors to Takata Corporation, Tokyo, Japan

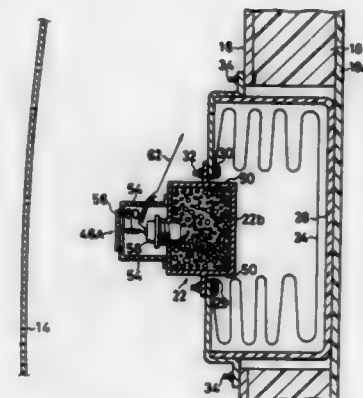
Filed Oct. 20, 1993, Ser. No. 138,258

Claims priority, application Japan, Nov. 4, 1992, 4-294955

Int. Cl.<sup>6</sup> B60R 21/26

U.S. Cl. 280—730.2

6 Claims



6. An inflator for a side collision air bag device to be installed in a vehicle having a side portion with inner and outer plates, comprising,

an inflator casing attached to the inner plate of the vehicle, and containing a gas generating agent therein, and

a starter attached to the inflator casing, said starter including an electric igniter contacting the gas generating agent in the inflator casing; a stay for covering the electric igniter and fixed to the inflator casing; a metal contact member disposed on the stay and facing the outer plate, said metal contact member being spaced apart from the outer plate so that when the outer plate bends, the outer plate contacts the metal contact member; a first electric route for connecting the outer plate to one pole of a power supply; and a second electric route for connecting the

contact member and the other pole of the power supply through the electric igniter so that when the outer plate contacts the contact member, the gas generating agent is ignited by the electric igniter.

5,437,473

**AIR INDUCTION AIRBAG-COLLISION-PROTECTION SYSTEM FOR A MOTOR CAR**

Wolfgang Henseler, Tübingen, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany

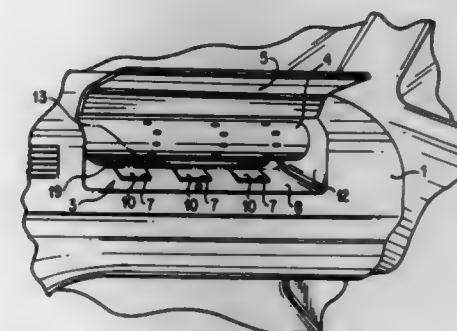
Filed Aug. 27, 1993, Ser. No. 112,329

Claims priority, application Germany, Aug. 28, 1992, 42 28 617.4

Int. Cl.<sup>6</sup> B60R 21/30

U.S. Cl. 280—738

12 Claims



5,437,472  
**INFLATOR AND AIR BAG DEVICE FOR DRIVER**  
Masato Kuretake; Takayasu Zushi; Motonobu Kitagawa; Kazuhiko Yamakawa; Yoshimi Okamoto, and Sawayo Uda, all of Shiga, Japan, assignors to Takata Corporation, Tokyo, Japan

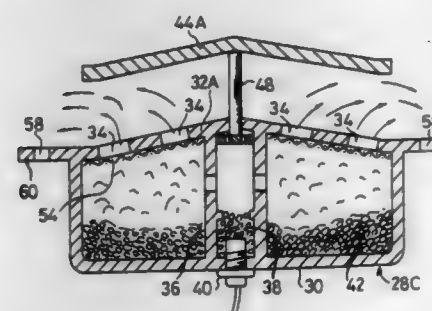
Filed Dec. 15, 1993, Ser. No. 166,814

Claims priority, application Japan, Jan. 6, 1993, 5-000573

Int. Cl.<sup>6</sup> B60R 21/26

U.S. Cl. 280—737

9 Claims



1. An air bag device for a driver, comprising:  
a retainer having a plain outer surface, and an inflator insertion hole therein,  
an air bag attached to and placed on the retainer,  
a module cover placed over the retainer to cover the air bag and having a tear line so that the module cover is torn along the tear line, and  
an inflator inserted into the inflator insertion hole and fixed to the retainer, said inflator including,  
a container having a lower portion, and an upper portion fixed to the lower portion and having a plurality of ejection holes therein,

gas generating agents retained in the container, said gas generating agents, when operated, generating gas which is ejected through the ejection holes,

a plate situated on the container for substantially covering the entire upper portion of the container and being movable in a direction away from the container, said plate having an outer surface with a cone shape projecting toward the module cover and disposed under the tear line so that when the gas is generated by the gas generating agents, the plate is pushed in the direction away from the container by the gas ejected through the ejection holes and an upward pressing force of the plate is concentrated to the tear line to easily tear the module cover, the gas ejected through the ejection holes being deflected by the plate and oriented substantially horizontally downwardly to help opening of the air bag sidewardly, and

connecting means installed between the plate and the container, said connecting means allowing the plate to move from the container for a distance such that the module cover is torn by the plate.

1. Air-induction airbag-collision-protection system for a motor car, comprising:

a receiving housing,

a gasbag casing which is fastened to the receiving housing and is open towards the housing, said gasbag casing being folded and disposed in the receiving housing when in an unexpanded state, and

a gas source in the receiving housing for the filling of the gasbag casing and for its unfolding to an expanded state, an intake of air surrounding the receiving housing into the receiving housing and the gasbag casing being facilitated by apertures in a housing wall of the receiving housing, the cross-sections of which apertures are covered by intake flaps, which intake-flaps can be opened by under-pressure generated in the unfolding of the gasbag casing and by virtue of which an escape of internal gasses from the receiving housing through the apertures is prevented, wherein each intake flap is formed by cutting into the housing wall and is pivotable in a direction of the housing interior about a lateral pivot edge remaining on the housing wall, and

wherein the intake flaps open about a swivel-axis which is formed by a hinged section in the housing wall at the lateral pivot edge, which hinged section has a different thickness than adjacent sections of the housing wall.

5,437,474

**SAFETY-NET CONSTRUCTION, PARTICULARLY FOR USE IN MOTOR VEHICLES**

Eduard Ament, Aichwald, Germany, assignor to Baumeister + Ostler GmbH & Co., Aichwald, Germany

Filed Jul. 25, 1994, Ser. No. 279,999

Claims priority, application Germany, Aug. 26, 1993, 42 28 746.5

Int. Cl.<sup>6</sup> B60R 21/06, 21/02; B60P 7/06

U.S. Cl. 280—749

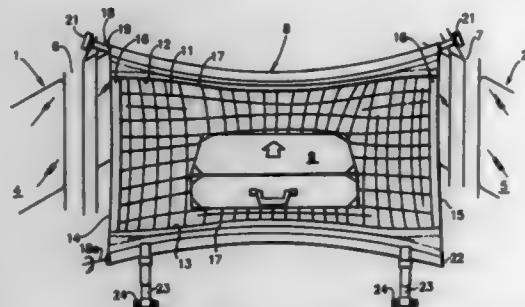
18 Claims

1. Safety net construction, adapted to be mounted in a motor vehicle to separate a cargo space in the vehicle from a passenger compartment therein, and to protect passengers within the passenger compartment with respect to flying objects from the cargo space of the vehicle in case of abrupt deceleration of the vehicle, comprising

a net (8, 11) having four lateral edges (12, 13, 14, 15); first attachment means (18a, 22, 23, 24) coupled to the net at a first one (13) of the edges, and adapted for attachment to a first surface of the vehicle;

second attachment means (18, 21) coupled to the net at a second one (12) of said lateral edges, and which is essen-

tially parallel to and opposite to said first one of said lateral edges, and adapted to be releasably attached to the vehicle, and to stretch the net (11) across the vehicle, and further comprising, in accordance with the invention, a net tearing protection arrangement which increases the size of the net in case of said abrupt deceleration, said tearing protection arrangement including a net size expansion compensation arrangement (17) changing the shape of the net between a first, quiescent, compressed state and a second, operated, expanded



state, said compensation arrangement being coupled to the net at a position intermediate said first and second attachment means; and stress-sensitive and responsive locking means (31, 34) holding the arrangement in said first compressed state while releasing the net size expansion compensation arrangement into at least partially expanded state in case of said abrupt deceleration, to thereby increase the effective size of the net between said first and second attachment means.

5,437,475

# SHOULDER ADJUSTER APPARATUS AND ASSEMBLING METHOD OF THE SAME

Mutsumi Sugimoto, Hamamatsu, Japan, assignor to Yugengai-sha Mutsumichi Kenkyujo, Japan

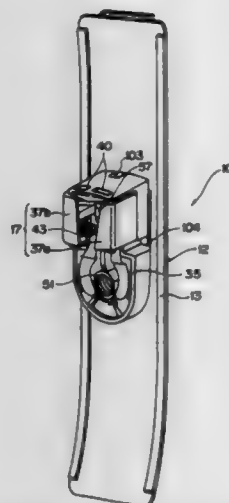
Filed Jul. 28, 1992, Ser. No. 920,995

Claims priority, application Japan, Apr. 20, 1992, 4-099668

Int. Cl.<sup>6</sup> B60R 22/20

U.S. Cl. 280—801.2

12 Claims



1. A shoulder adjuster apparatus to be attached to an attaching portion of a body of a vehicle, comprising: an adjuster rail means to be attached to and along the attaching portion of the vehicle body; a slide garnish for covering a front surface side of the adjuster rail means, the slide garnish having an engaging claw and a latching window; and an integrated slide adjuster assembled body assembled on a

side of the slide garnish comprising a slide assembly accommodated slidably in a guide route formed within the adjuster rail means, said slide assembly comprising a slide anchor base body provided on a back surface side of the slide garnish and a slide anchor cover body overlapping the slide anchor base body, the slide anchor cover body being engageable with the engaging claw and latching window to fix the slide assembly to the slide garnish, latch means for causing the slide assembly to be detachably latched at a predetermined position of the adjuster rail means, an operation mechanism for releasing the latch means from a latched state, and webbing anchor means fixed on the slide assembly for supporting a webbing; wherein said adjuster rail means includes a rail and slider support means for elastically supporting the slide assembly upwardly in an installed state, said slider support means and said rail being fastened together to the attaching portion of the vehicle body, said slider support means including a support plate engageable with the rail of the adjuster rail means and a support spring detachably supported by the support plate, said rail comprising a bottom rail portion attachable to the attaching portion of the vehicle body and a side rail portion provided at its end portion with an engaging notch, and said support plate having an ear-like portion engageable with the engaging notch of the side rail portion of the rail.

5,437,476

# MULTIPAGE BOUND BOOKLET HAVING PRESSURE SEALED BINDING

Wilbur Hutchinson, Mt. Prospect, Ill., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Apr. 13, 1993, Ser. No. 45,221

Int. Cl.<sup>6</sup> B42D 1/00

U.S. Cl. 281—151

9 Claims



1. A booklet comprising: at least one outer sheet folded along an outer fold line and having a first inner pressurized adhesive pattern adjacent to said outer fold line, and at least one inner sheet nested in said outer sheet, said inner sheet folded along an inner fold line aligned with said outer fold line, said inner sheet having an outer pressure seal adhesive pattern juxtaposed with said first inner pressure seal adhesive pattern of said outer sheet, said juxtaposed adhesive patterns binding said sheets after being activated by a sealing pressure.

5,437,477

# LABEL FOR COMPUTER DISK

Alison J. Olivera; Hector J. Olivera, both of Douglasville, Ga., and Craig A. Knudsen, Palm Desert, Calif., assignors to Turbo Upgrade Software, Douglasville, Ga.

Filed Jan. 17, 1992, Ser. No. 823,242

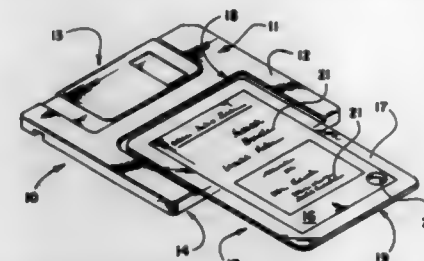
Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 283—81

6 Claims

1. A combination comprising: a storage disk adapted to be placed in a known disk drive in a data processing system; said storage disk comprising a protective casing defining a plane;

a labeling system comprising a card, a lamination substantially surrounding and overlapping the edges of said card with said card and said lamination forming a rigid label; and means for permanently adhering said label on said protective



casing such that one end of said label overlaps said protective casing and whereby a second end of said label extends outwardly and is visible to a user when said disk is inserted in said disk drive and whereby the second end serves as a handle such that a user holding the label may grasp the label to place the disk in the disk drive.

5,437,478

# GIFT CARD WITH RECEIPT

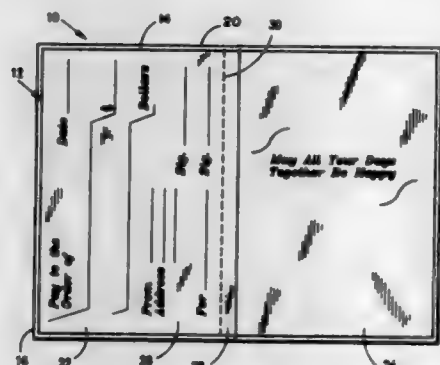
Alfred L. Gaines, 1315 Randolph St., NW., Washington, D.C. 20011

Continuation-in-part of Ser. No. 589,596, Sep. 28, 1990, Pat. No. 5,143,279. This application May 22, 1992, Ser. No. 886,879

Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 283—117

18 Claims



1. A greeting card for containing a gift, comprising: a first card in the format of a greeting card; and a second card in the format of a receipt for recording information concerning the gift being contained in the greeting card, said receipt being detachably connected to said first card.

5,437,479

# FLEXIBLE CONNECTION ARRANGEMENT FOR THE TWO PIPE PORTIONS PARTICULARLY FOR MOTOR VEHICLE EXHAUSTS

Peter Hartling, Geretsried, and Hans Deinhard, Munich, both of Germany, assignors to Feodor Burgmann Dichtungswerke GmbH & Co., Wolfraatshausen, Germany

PCT No. PCT/EP93/02622, § 371 Date May 27, 1994, § 102(e) Date May 27, 1994, PCT Pub. No. WO94/08169, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 27, 1993, Ser. No. 244,503

Claims priority, application Germany, Oct. 6, 1992, 42 33 644.9

Int. Cl.<sup>6</sup> F16L 11/12

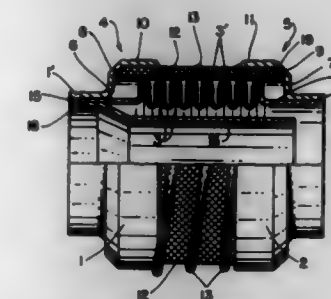
U.S. Cl. 285—49

17 Claims

1. In a flexible connection arrangement for two pipe portions, particularly in motor vehicle exhaust systems, having a

metallic bellows which is connected axially on either side in a gastight manner with connection pieces in the form of substantially cylindrical sleeves, wherein the sides of the connection pieces facing the bellows have radially widened end portions with substantially cylindrical end portions, also having a damping insert which extends coaxially relative to the bellows along its length and is in a working connection therewith, and heat protection means for the bellows acting in the radially inward direction, the improvement comprising:

said damping insert enclosing the bellows radially outwardly such that turns of the bellows contact said damping insert, axial end regions of said damping insert being supported



radially outwardly by cylindrical end regions of said widened end portions of said connection pieces and being held in said widened end portions without being fastened thereto by said bellows and said widened end portions; said connection pieces being connected with one another via a spring which surrounds the damping insert radially outwardly and applies compressive force thereto; and said heat protection means being formed by a pipe segment which extends within the bellows coaxially relative to the bellows at a radial distance from said bellows and which is fastened to the connection piece located in the front as viewed in the direction of flow.

5,437,480

# PRESSURE SEALED CONNECTING APPARATUS FOR CONDUITS CARRYING PRESSURE MEDIA

Hans A. Well, Schipfe 49, CH-8001 Zürich, Switzerland

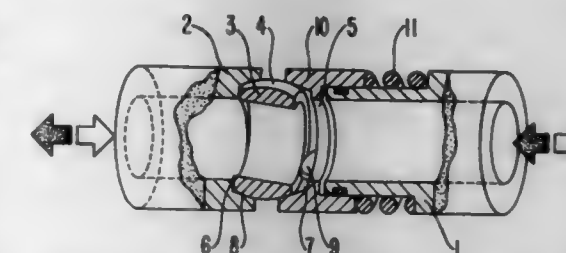
Filed Sep. 13, 1993, Ser. No. 119,970

Claims priority, application Switzerland, Sep. 14, 1992, 02886/92

Int. Cl.<sup>6</sup> F16L 27/04

U.S. Cl. 285—167

7 Claims



1. In a pressure sealed connecting apparatus for the connection of two conduits adapted to carry a pressure medium and to rotate relative to one another, the connecting apparatus comprising:

a first conduit and a second conduit adapted to carry a pressure medium therein and to rotate relative to one another, each of the first conduit and the second conduit having tangentially contacting countersurfaces for contacting spherical surface areas of a rotation body; a rotation body situated between the first conduit and the second conduit and having spherical surface areas adapted to be in rotational and sealing frictional contact with the



tangentially contacting countersurfaces of each the first conduit and the second conduit;  
the improvement wherein:  
the rotation body is sleeve-shaped;  
each of the first conduit and the second conduit has an inner shoulder thereon;  
the tangentially contacting countersurfaces of each of the first conduit and the second conduit are conical ring surfaces axially limited by corresponding inner shoulders on the first conduit and the second conduit;  
the spherical surface areas of the rotation body are zone-like equatorial superficies resting on the conical ring surfaces; and  
the connecting apparatus further comprises:  
a slide cam disposed on the inner shoulder of one of the first conduit and the second conduit for acting on the rotation body to force the rotation body into an inclined position; and  
a stop disposed on the inner shoulder of the other one of the first conduit and the second conduit such that the slide cam forces the sleeve into the inclined position up to the stop.

5,437,481

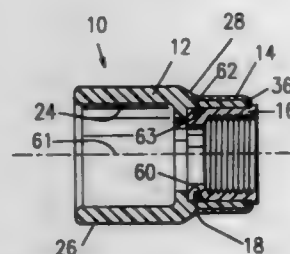
**DURABLE PLASTIC/METAL TRANSITION FITTING**  
Wayne Spears, Sylmar, and Harry Bekerredjian, Van Nuys, both of Calif., assignors to Spears Manufacturing Company, Sylmar, Calif.

Filed Oct. 13, 1993, Ser. No. 136,301

Int. Cl.<sup>6</sup> F16L 55/00

U.S. Cl. 285—174

31 Claims



1. A fitting suitable for coupling a plastic fluid transmission element to an externally threaded metal element, the fitting comprising:

- a plastic, hollow, tubular coupling having (i) a forward metal connection portion and an opposed rearward plastic connection portion, (ii) an internal surface, and (iii) an external surface, (iv) the plastic connection portion being suitable for connection to a plastic fluid transmission element, (v) the metal connection portion having an end edge, and (vi) wherein the external diameter of the plastic connection portion is larger than the external diameter of the metal connection portion with a transition therebetween on the external surface of the coupling;
- an external, metallic reinforcing collar mounted on the external surface of the metal connection portion of the coupling, the collar having (i) a forward end and (ii) a rearward end, and (iii) wherein the rearward end is irregularly shaped with the transition of the coupling having a corresponding shape to interfere with the collar from rotating on the coupling; and
- a tubular, internally threaded, metallic insert retained in the metal connection portion of the coupling.

5,437,482

**PIPE ADAPTER FLANGE**

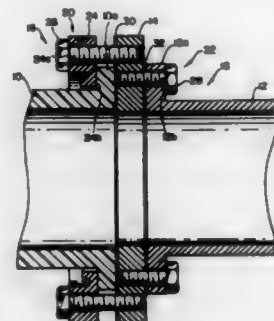
Donald K. Curtis, 20237—149th Pl. NE Woodinville, Wash. 98072

Filed Apr. 7, 1994, Ser. No. 224,310

Int. Cl.<sup>6</sup> F16L 23/036

U.S. Cl. 285—174

2 Claims



1. A pipe adapter flange joint for joining two flanged pipe section ends together so that internal fluid passages in said flanged pipe section ends may be joined in fluid communication with one another which comprises:

- a first flanged pipe section end having a first flange and a first pipe section to which said first flange is connected, said first pipe section being fabricated of plastic material and having a relatively large outer diameter; a second flanged pipe section end having a second flange and a second pipe section to which said second flange is connected, said second pipe section being fabricated with a smaller outer diameter than said first pipe section, said first flange having a relatively large outer diameter and said second flange having a smaller outer diameter than said first flange;
- an adapter ring comprising a disk having first and second sides and being positioned between opposing inner sides of said first and second flanges of said flanged pipe section ends so that a transverse axis of said adapter ring is generally coincident with a longitudinal axis that extends through said flanged pipe section ends, said adapter ring having:
  - an aperture through said disk in fluid communication with the fluid passages in said flanged pipe section ends, and
  - a first outer set of bolt holes extending through said disk, and
  - a second inner set of bolt holes extending through said disk, said second inner set of bolt holes being threaded and located radially inward of said first set of bolt holes relative to said transverse axis;
- first clamping means for clamping only said first flanged pipe section end to said adapter ring; second clamping means for clamping only said second flanged pipe section end to said adapter ring;
- first seal means positioned between said first flange of said first flanged pipe section end and said adapter ring to effect a fluid seal therebetween; and second seal means positioned between said second flange of said second flanged pipe section end and said adapter ring to effect a fluid seal therebetween;
- said first clamping means comprising:
  - a compression ring having outer and inner sides, the inner side of said compression ring being constructed to bear against an outer side of said first flange, and
  - a first plurality of bolts extended through said compression ring and into the bolt holes of said first outer set of bolt holes in said adapter ring, said bolts being cooperatively constructed and arranged with respect to said adapter ring for clamping only the inner side of said first flange to said first side of said adapter ring with said first seal means therebetween, so that a fluid seal is effected by said first seal means being contacted by and com-

pressed between the inner side of said first flange and the first side of said adapter ring;  
iii) each of said bolts having bolt heads with said bolts being oriented so that said first flange can be clamped to and unclamped from said adapter ring independently of said second flange and so that said bolts can be removed from said first flange and adapter ring independent of said second flange; and  
f) said second clamping means comprising:

- a second plurality of threaded bolts extended through said second flanged pipe section end and threaded into the threaded bolt holes of said outer set of bolt holes in said adapter ring for clamping only the inner side of said second flange to said second side of said adapter ring with said second seal means therebetween, so that a fluid seal is effected by said second seal means being contacted by and compressed between the inner side of said second flange and the second side of said adapter ring;
- each of said bolts having bolt heads with said bolts being oriented with their heads adjacent the outer side of said second flange so that said second flange can be clamped to and unclamped from said adapter ring independently of said first flange and so that said bolts can be removed from said second flange and adapter ring independent of said first flange.

5,437,483

**FLEXIBLE HOSE JOINT**

Katsushi Umezawa, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan

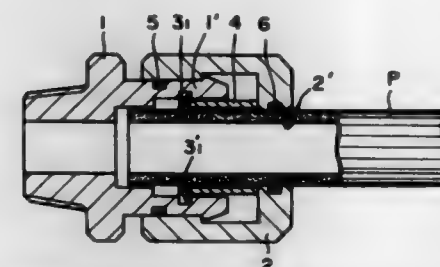
Filed Aug. 19, 1993, Ser. No. 109,389

Claims priority, application Japan, Aug. 26, 1992, 4-250744

Int. Cl.<sup>6</sup> F16L 37/18, 19/08

U.S. Cl. 285—308

6 Claims



1. A flexible hose joint for a flexible hose having an end and an outer surface, said joint comprising:

- a joint body having opposed front and rear parts, a cylindrical opening extending in an axial direction between said front and rear parts, said cylindrical opening being radially enlarged at the rear part of the joint body for receiving the end of the hose;
- a clamp disposed in said radial enlarged section of said joint body and having a biting section for engagement with the outer surface of the hose;
- a cover member having a generally tubular side wall with opposed front and rear ends, said front end being disposed over the rear part of said joint body and being dimensioned to move axially in a certain distance range with respect to the joint body, a rear wall extending inwardly from said rear end of said side wall, said rear wall having a hose insert hole at the center thereof, said hose insert hole being dimensioned to slidably receive said end of said flexible hose therein, a release member integral with said rear wall and projecting forwardly toward said clamp, said release member having a tapered front end for urging said clamp out of biting engagement with said hose in response to the axial movement of said cover member relative to said joint body;
- a first annular seal interposed between the cover member and the joint body;
- a second annular seal in the cover member adjacent the hose

5,437,484

**LOCK HANDLE ASSEMBLY WITH DETACHABLE HANDLE**

Kenichi Yamada, Tokyo, Japan, assignor to Takigen Manufacturing Co. Ltd., Tokyo, Japan

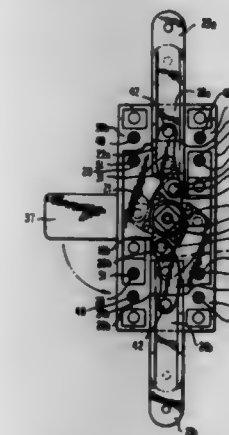
Filed Feb. 16, 1994, Ser. No. 197,062

Claims priority, application Japan, Mar. 31, 1993, 5-096904

Int. Cl.<sup>6</sup> E05B 65/44; E05C 1/08

U.S. Cl. 292—36

4 Claims



1. A lock handle assembly with a detachable handle (43), comprising:

- a main body (1) provided with a handle-insertion hole (2) in its front surface;
  - a cover (9) slidably mounted on said front surface of said main body (1);
  - a mounting plate (34) for fixedly mounting said main body (1) on a door (56);
  - a rotor (12) which is provided with a handle-receiving hole (13) in its front surface and a square hole (14) in its rear surface, and is rotatably mounted in a cylindrical portion (3) of said main body (1);
  - a cam (16) which is provided with a square-column portion (17a) and a threaded hole (18a) in its front-end portion, and a square-column portion (17b) and a threaded hole (18b) in its rear-end portion, and has its intermediate portion formed into a pair of flat-plate portions (19a, 19b) which are diametrically opposed to each other, said flat-plate portions (19a, 19b) being provided with through-holes (20a, 20b), respectively;
  - links (22a, 22b) connected with said through-hole (20a, 20b) of said cam (16), respectively;
  - arms (23a, 23b) connected with a front end of said link (22a) and a front end of said link (22b), respectively;
  - a casing (25) provided with guides (26a, 26b) for said arms (23a, 23b) in its inner portion, said casing (25) receiving said cam (16), said links (22a, 22b), and said arms (23a, 23b) therein; and
  - a catch plate (37) fixedly mounted on a rear-end portion (17b) of said cam (16);
- wherein said main body (1) abuts on a front surface (56a) of a door (56); said mounting plate (34) abuts on a rear surface (56b) of said door (56); a screw (33) passes through a through-hole (35) of said mounting plate (34) and a through-hole (37) of said door (56), and is threadably connected with a threaded hole (5) of a rear wall (4) of said main body (1) so that said main body (1) is fixedly mounted on said door (56); said square-column portion (17a) of said cam (16) projecting from a front surface (32) of said casing (25) is inserted in said square hole (14) of said cam (16).

said rotor (12) having been mounted in said cylindrical portion (3) of said main body (1), and then a screw (51) passing through a through-hole (28) of a rear wall (27) of said casing (25) is threadably connected with a threaded hole (36) of a rear surface of said mounting plate (34), so that said main body (1) is fixedly mounted on said casing (25); and, said catch plate (37) is fixedly mounted on said square-column portion (17b) of said cam (16) projecting from a rear surface (33) of said casing (25).

5,437,485

**LOCKING MECHANISM FOR WINDOWS OR DOORS**

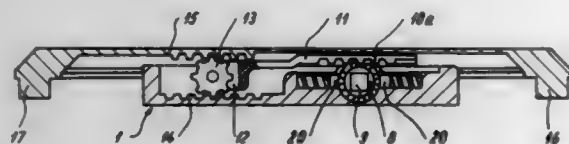
Hans-Gerd Goldschmidt, Heiligenhaus, Germany, assignor to Schüco International KG, Bielefeld and Gebr. Goldschmidt Baubeschläge GmbH, Heiligenhaus, both of Germany  
Filed Mar. 17, 1994, Ser. No. 214,940

Claims priority, application Germany, Mar. 19, 1993, 43 08 810.4

Int. Cl.<sup>6</sup> E05C 9/18

U.S. Cl. 292—142

7 Claims



1. A locking mechanism for driving a lock bolt comprising: a housing;
- a pinion having an outer circumference and being rotatably mounted in said housing, said pinion having a plurality of teeth and tooth gaps disposed between adjacent teeth, a predetermined number of said tooth gaps having an abutment that extends outwardly substantially to the outer circumference of said pinion;
- a slider having a plurality of teeth, said slider meshing with said pinion;
- a toothed rod being coupled to said lock bolt, said toothed rod being engaged by said slider with said pinion, said slider having a recess to receive said abutment; and
- spring loaded detent means for arresting the rotational movement of said pinion in a switching position of said lock bolt.

5,437,486

**ADJUSTABLE WINDOW OR DOOR LOCK**

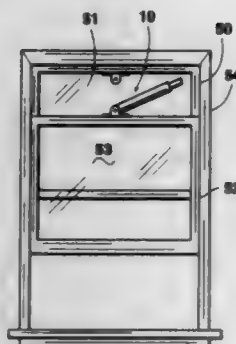
Larry D. Hoffman, Rte. 1, Box 2360, Stigler, Okla. 74462

Filed Mar. 24, 1994, Ser. No. 216,974

Int. Cl.<sup>6</sup> E05C 17/54

U.S. Cl. 292—339

5 Claims



1. A safety lock for single hung windows comprising: (1) first and second tubes, said second tube slidably movable into and out of a first end of said first tube;
- (2) a plurality of holes positioned lengthwise of said first tube;
- (3) means to support a second end of said first tube adapted

to present rotation of said tube about its axis but to permit movement through at least 90 degrees from right angle to said means;

- (4) a hole near an end of the second tube which is inserted into said first tube;
- (5) a spring loaded push button adapted to extend through said hole in said second tube and a selected hole in said first tube; and
- (6) means to support a bar to a window frame, a second end of said second tube being provided with two L-shaped slots which releasably engage said bar.

5,437,487

**GOLF BALL RETRIEVER**

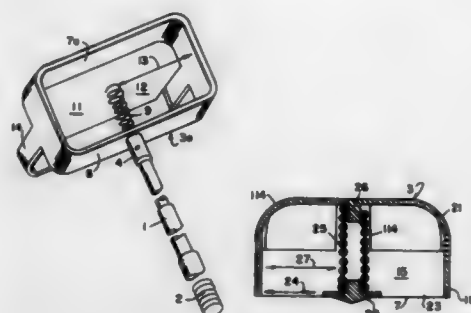
Charles Fulop, 17664 Candlewood Ter., Boca Raton, Fla. 33487

Filed May 31, 1994, Ser. No. 250,540

Int. Cl.<sup>6</sup> A63B 47/02

U.S. Cl. 294—19.2

15 Claims



1. A retriever for removably engaging a golf ball having a predetermined diameter, the retriever comprising: a handle affixed at one end to a rigid frame means; said frame means defining an entrance plane for passage of a golf ball therethrough, said entrance plane having dimensions so much greater than said predetermined ball diameter that said frame means may be positioned over said ball without difficulty for subsequent passage of said ball through said entrance plane;
- a single elongate elastic member extending sufficiently across the center of said entrance plane to divide said entrance plane into areas, each of said areas having at least one dimension that is less than the diameter of said ball, said elastic member having an unattached first end, and being attached at a second end to said frame means;
- an elongate hoop member having two ends attached to said frame means and extending away from said entrance plane, said hoop member and said frame means defining a ball-retaining chamber having large openings, none of which are great enough to permit passage of said ball therethrough, said elastic member being arranged to be readily displaced by said ball when said frame means is forced onto said ball to permit ball passage into said ball-retaining chamber and said elastic member being arranged to resiliently return to a position dividing said entrance plane into areas having dimensions which prevent free passage of said ball from said ball-retaining chamber.

5,437,488

**PORTABLE GOLF BALL RETRIEVER**

Harvey Richmond, and Janet E. Richmond, both of 5166 D Lake Catalina Dr., Boca Raton, Fla. 33496

Filed Jul. 25, 1994, Ser. No. 280,222

Int. Cl.<sup>6</sup> A63B 47/02

U.S. Cl. 294—19.2

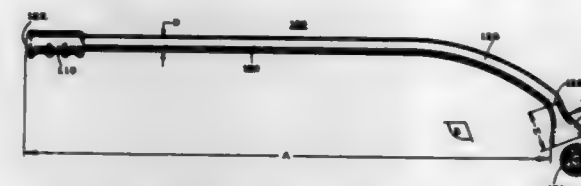
5 Claims

1. A portable device for allowing a person sitting in a golf cart to retrieve golf balls from the ground while staying seated in the golf cart comprising: a golf cart occupied by a person sitting therein;

an elongated hollow tube having a first end and second end and a length of approximately thirty inches, the tube including a curved bend of approximately 45 degrees adjacent to the second end;

a gripping handle wrapped about the first end of the tube;

a suction cup having a closed end and an open end, the



closed end being attached to the second end of the tube and the open end pointing away from the tube in the direction of a golf ball that needs to be picked up, wherein the person sitting in the golf cart holds the gripping handle and is able to pick up the golf ball with the open end of the suction cup while staying seated and without bending over.

5,437,489

**FLUID-OPERATED PIPE CLAMP**

Jesse R. Sanders, 906 Whitestone, Houston, Tex. 77073, and

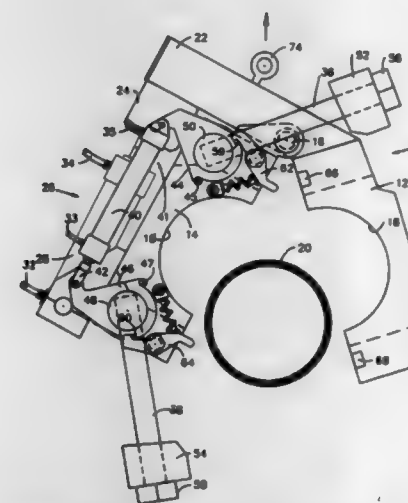
Larry R. Russell, 6710 Stroud, Houston, Tex. 77074

Filed Dec. 3, 1993, Ser. No. 161,311

Int. Cl.<sup>6</sup> F16L 55/168

U.S. Cl. 294—88

5 Claims



1. A hydraulically-actuated pipe clamp for manipulation by a robot, comprising: a split block, having a bore, said split block consisting of two hinged-together jaws;
- a first double-acting hydraulic means for spreading apart the hinged-together jaws of said split block to allow positioning said split block over a desired portion of a pipe having a preselected diameter and for clamping the hinged-together jaws of said split block around said pipe;
- a second double-acting hydraulic means for rotating a first and a second latching means over said jaws when clamped around said pipe to confine said jaws to a clamped configuration.

5,437,490

**FINGER MODULE, FINGER MODULE STRUCTURE, AND ROBOT HAND**

Nobuharu Mimura; Masao Kawase; Akihiko Kanamori; Shinji Naruoka, and Osamu Toyama, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi; Toyota Jidosha Kabushiki Kaisha, Toyota and Toyoda Koki Kabushiki Kaisha, Kariya, all of Japan

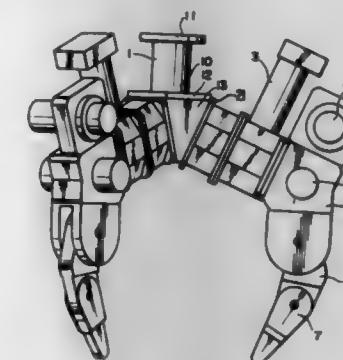
Continuation of Ser. No. 942,453, Sep. 9, 1992, abandoned. This application May 18, 1994, Ser. No. 246,468

Claims priority, application Japan, Sep. 14, 1991, 3-262795

Int. Cl.<sup>6</sup> B25J 15/10

U.S. Cl. 294—106

18 Claims



1. A finger module comprising: a first link module rotating around a first joint shaft provided on a base module;
- a first drive module having a first drive motor fixed to the first link module for driving and rotating the first link module around the first joint shaft, first reduction means for reducing a rotation of the first drive motor, and first output means connected to the first link module for outputting the reduced rotation of said first drive motor;
- a second drive module having a second drive motor fixed to the first link module, second reduction means for reducing a rotation of the second drive motor, and second output means for outputting the reduced rotation of said second drive motor;
- a third drive module having a third drive motor fixed to the first link module, third reduction means for reducing a rotation of the third drive motor, and third output means for outputting the reduced rotation of said third drive motor;
- a second link module driven and rotated around a second joint shaft provided in the first link module by second driven means engaging with the second output means of the second drive module; and
- a third link module driven and rotated around a third joint shaft provided in the second link module by third driven means engaging with the third output means of the third drive module, wherein all of said link modules are driven and rotated through gear means by said drive modules.

5,437,491

**FUEL DOOR HOUSING**

Ralph G. Nedbal, Orland Park, and John F. Nelson, New Lenox, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Apr. 7, 1994, Ser. No. 224,511

Int. Cl.<sup>6</sup> B60K 15/05

U.S. Cl. 296—97.22

18 Claims

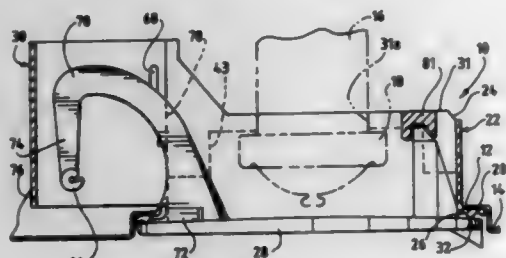
1. A fuel door housing for readily attaching a neck of a fuel tank with respect to an aperture defined within a body panel of a vehicle, comprising:

a hollow sleeve having a cross-sectional dimension which is less than that of said aperture, and first and second ends, said first end extending a predetermined distance away from said aperture within an interior portion of said body



panel for connection with said fuel tank neck, and said second end extending a slight distance through said aperture, and defining therewith an annular space as a result of the difference between said cross-sectional dimensions of said sleeve and said aperture, to an exterior portion of said body panel;

a flange connected to said second end of said sleeve and having means defined thereon for resiliently and flexibly



engaging said exterior portion of said body panel so as to move radially and axially with respect to said exterior portion of said body panel and thereby permit positional adjustment of said sleeve with respect to said aperture of said body panel, upon installation of said sleeve, as well as movement adjustments between said sleeve and said body panel that may occur during use of said vehicle; and a door hingedly connected to said housing for covering said aperture of said body panel as desired.

5,437,492

**MAGNETIC BOOT UMBRELLA**

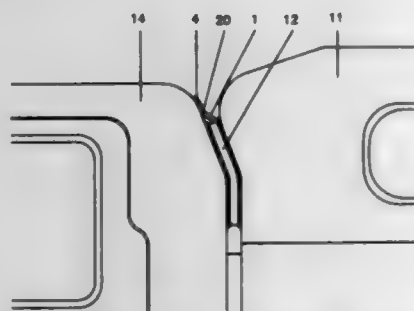
Michael Pascoe, 680 Lighthouse Ave., Pacific Grove, Calif. 93950

Filed May 18, 1993, Ser. No. 63,236

Int. Cl.<sup>6</sup> B60P 3/32

U.S. Cl. 296—166

17 Claims



1. Apparatus for preventing leakage between the cabin of a truck and the existing boot of a camper in operative combination with said truck, said boot and said cabin forming a joint therebetween, said apparatus comprising magnetically attachable flashing for attachment to said cabin in proximity to said joint, for overlying at least a portion of said joint, and for diverting the flow of fluids from said joint to the body of said boot and thence away.

5,437,493

**COLLAPSIBLE STROLLER TRAY**

Toni Weisleder, 1739 Certainty Dr., Point Pleasant, N.J. 08742

Filed Jul. 20, 1993, Ser. No. 95,097

Int. Cl.<sup>6</sup> A47B 49/00

U.S. Cl. 297—150

16 Claims

1. A stroller comprising: stroller means for collapsing and folding to a compact shape; and tray means releasably securable to said stroller means, wherein said tray means includes: a tray portion comprising first and second sections, each section defining a substantially planar surface, and hinge

means pivotably connecting said sections, said sections being foldable between a first condition in which said substantially planar surfaces are in parallel relationship and a second condition in which said substantially planar surfaces are in coplanar relation;

fluid trap means for substantially preventing the passage of fluid between said first and second sections of said tray



portion, said fluid trap means comprising a pair of complementary S-shaped interlocking surfaces, each one of said pair of S-shaped interlocking surfaces being a unitarily formed portion of one of said first and second sections of said tray portion; and coupling means for detachably coupling said first and second sections to said stroller means.

5,437,494

**REARWARD MOVING SEAT**

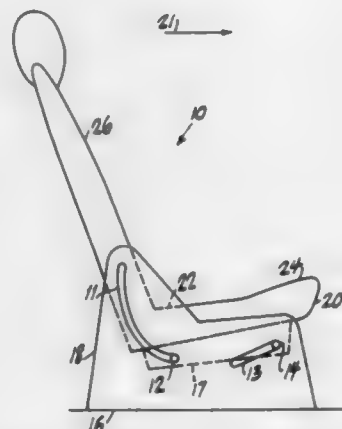
Randall R. Beauvais, Fenton, Mo., assignor to Life Force Associates, L.P., Imperial, Mo.

Filed Oct. 29, 1992, Ser. No. 968,108

Int. Cl.<sup>6</sup> B60N 2/42

U.S. Cl. 297—216.19

16 Claims



1. A seat for supporting a passenger in a vehicle comprising a seat base including front and rear portions, wherein the front portion of the seat base is movably coupled to a vehicle by a first linkage and the rear portion of the seat base is movably coupled to the vehicle by a second linkage such that, upon a sudden acceleration of the vehicle, at least a portion of the acceleration being directed from rearward to forward relative to the orientation of the seat base and having a magnitude greater than a first predetermined threshold level, the seat base moves rearward away from a rest position, the first linkage controlling the movement of the front portion of the seat base along a first predetermined path and the second linkage controlling movement of the rear portion of the seat base along a second predetermined path, wherein the first and second paths are oriented such that, as the seat base travels further from the rest position, the elevation of the rear portion of the seat base increases relative to the elevation of the front portion of the seat base wherein one of the first and second paths is oriented so that one of the front and rear portions of the seat base does not rise.

5,437,495

**FLEXIBLE MULTI-DIRECTION BEAUTY SALON CHAIR**

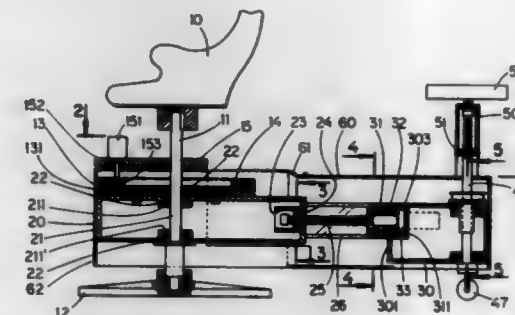
Jung-Te Wu, No. 6, Lane 56, Woa-Yau Road, Dah-Li Shiang, Taichung, Taiwan

Filed Dec. 30, 1993, Ser. No. 176,568

Int. Cl.<sup>6</sup> A47C 15/00

U.S. Cl. 297—241

1 Claim



1. A flexible multi-directional beauty salon chair comprising: a chair, a first vertical rod extending downwardly from a seat of said chair and a horizontal base supporting the opposite end of said rod, the central portion of said rod forming an axle portion; a supporting arm rotatably mounted on and extending horizontally from the axle portion of said first vertical rod said supporting arm having a first internal horizontal ring gear surrounding said axle portion, first motor means mounted on a partition board connected to said rod and having an output gear in meshed engagement with the internal ring gear for driving said arm in rotational movement around said rod; a column extending horizontally from an end thereof from said supporting arm, a second threaded rod rotatably mounted horizontally within said column, a second ring gear fixedly mounted within said column adjacent said supporting arm and in meshed engagement with and surrounding an end portion of said second threaded rod, and second motor means engaging said second threaded rod for rotating the same relative to said second fixed ring gear; a hanging arm mounted at an end of said column opposite said supporting arm and coupled to an end of said second threaded rod opposite said second ring gear, a third rod rotatably and vertically mounted on said hanging arm, said third rod coupled to said hanging arm at one end portion of said third rod the opposite end of said third rod portion being threaded, third motor means engaging said third rod for rotating said rod; a working seat disposed above the threaded end portion of said third rod and a third internal ring gear fixed to the underneath of said working seat and in mesh with the threaded end of said third rod whereby activating said first motor means will cause said column, hanging arm and working seat to rotate horizontally about said chair, activating said second motor means will change the horizontal distance between said chair and working seat and activating said third motor means will move said working seat vertically.

5,437,496

**SEATING SYSTEM FOR A MOBILE CHAIR**

Lori Rickard, 143 Jasper Pl., Alexandria, Va. 22304-4905

Filed Nov. 17, 1993, Ser. No. 153,908

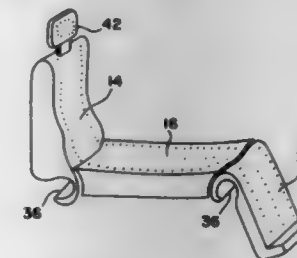
Int. Cl.<sup>6</sup> A47C 7/42

U.S. Cl. 297—283.2

19 Claims

1. A collapsible mobile chair with replaceable cushions comprising: a collapsible frame with wheels and a cross bar extending across a width of the chair; a first set of generally planar back and seat cushions with a

preformed depression therein that conforms to the torso of a chair occupant of a first predetermined height; a second set of generally planar back and seat cushions with a preformed depression therein that conforms to the torso of a chair occupant of a second predetermined height larger than said first predetermined height; each of said cushions having means for removable attachment to said frame;



each of said set of cushions having adjoining edges that overlap so that no substantial gap exists therebetween when the chair is not collapsed, and so that each said set of cushions is substantially coplanar when the chair is collapsed; and at least one of said back and seat cushions of each of said sets of cushions having a hook-shaped member at said adjoining edge that mates with said cross bar when said set of cushions is attached to said frame.

5,437,497

**HEIGHT ADJUSTABLE WHEELCHAIR SEAT**

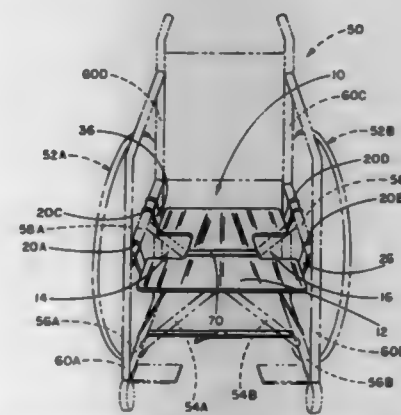
Kelly Hutson, 7006 N. 65th Ave., Omaha, Nebr. 68152

Filed Jul. 11, 1994, Ser. No. 272,595

Int. Cl.<sup>6</sup> A47C 3/20, 3/32

U.S. Cl. 297—338

10 Claims



1. A vertically adjustable seat for a wheelchair having a pair of horizontally spaced seat support bars running front to back of the wheelchair and which are supported in position by a pair of cross-bars, the seat comprising: a substantially flat support surface having top and bottom surfaces; a plurality of belt means positioned adjacent said bottom surface and adapted to support said support surface; locking means connected to each of said belt means for releasably locking said belt means at a desired length said desired length for positioning said substantially flat support surface a distance below the support bars and thereby corresponding to a specific height position of said substantially flat support surface; and a plurality of hook means adapted to be slidably received on said belt means and adapted to releasably engage the seat support bars and support said substantially flat support surface in cooperation with said belt means such that upon said belt length is adjusted to be desired length, and said

substantially flat support surface is placed on said belt means for positioning the seat support bars, said hook means may be releasably engaged with the bars thereby allowing gravity to settle said hook means against the support bars thereby supporting said substantially flat support surface at the desired height.

5,437,498

### VEHICLE SEAT WITH SIDE BOLSTER REINFORCEMENT

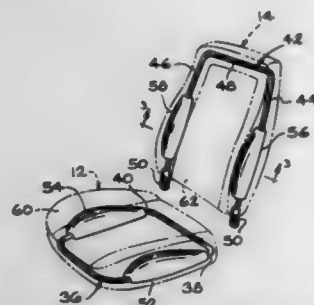
Todd W. Waelde, Canton, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Feb. 22, 1994, Ser. No. 199,755

Int. Cl.<sup>6</sup> A47C 7/20

U.S. Cl. 297-452.34

6 Claims



1. A component for a vehicle seat comprising: a foam pad having a first portion and a second portion which is raised relative to said first portion; a support frame upon which said pad is carried, said frame having a frame member disposed along said second portion of said foam pad; and a rigid hollow plastic body attached to said frame member and extending into and being embedded within said second portion of said foam pad to reinforce said foam pad at said second portion with a constant amount of support.

5,437,499

### CONVERTIBLE TRUCK BODY

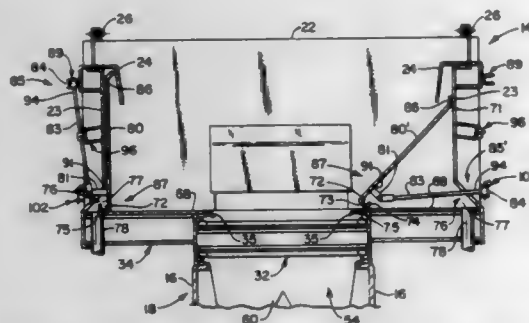
Tom W. Musso, Bath, N.Y., assignor to Air-Flo Mfg. Co. Inc., Prattsburg, N.Y.

Filed Dec. 6, 1993, Ser. No. 163,139

Int. Cl.<sup>6</sup> B60P 1/36

U.S. Cl. 298-26

21 Claims



18. In a truck having an elongated truck frame, a truck body mounted on the truck frame, the truck body having a bottom, a front wall, a pair of opposed, laterally spaced side walls and a rear tailgate opening and having a rear tailgate pivotal between an open position thereof and a closed position thereof closing the tailgate opening, the truck body having a longitudinally extending endless conveyor between the side walls of the truck body and operable for longitudinally conveying the material contents of the truck body for dispensing the material therefrom; the improvement wherein the truck body has at least one laterally moveable panel extending longitudinally

nally within the truck body, said one panel extending longitudinally along one of said side walls; and panel shift means for shifting said one panel between an upright storage position next to said one side wall and an inclined hopper position extending downwardly and laterally inwardly between said one side wall and the bottom of the truck body and toward the conveyor, the panel shift means comprising an external, longitudinally extending handle bar on the outside of said one side wall and a bank of a plurality of longitudinally spaced, generally parallel connecting rods connecting the handle bar to the panel at longitudinally spaced locations along the panel and extending laterally outwardly from the panel through said one side wall to the external handle bar for manually shifting the panel, with the handle bar, between its said storage and hopper positions.

5,437,500

### TUNNELING MACHINE WITH CENTER CUTTER AND DEBRIS REMOVING MEANS

Gebhard Lehmann, Lahr; Rolf Heerssen, Pinneberg, and Martin Herrenknecht, Schwabau, all of Germany, assignors to Herrenknecht GmbH, Schwabau, Germany

PCT No. PCT/DE92/00047, § 371 Date Dec. 20, 1993, § 102(e) Date Dec. 20, 1993, PCT Pub. No. WO92/18751, PCT Pub. Date Oct. 29, 1992

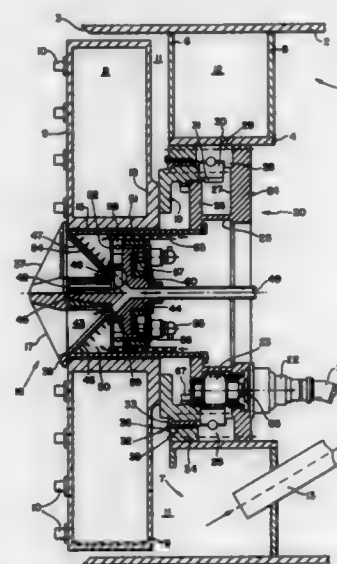
PCT Filed Jan. 25, 1992, Ser. No. 137,102

Claims priority, application Germany, Apr. 23, 1991, 41 13 208.4

Int. Cl.<sup>6</sup> E21D 9/08

U.S. Cl. 299-60

7 Claims



1. A tunneling machine for boring a tunnel into soil, comprising: a shield which is drivable into the said soil; a rotatable cutting wheel disposed in said shield, said cutting wheel having a plurality of ripping tools and defining a hub area; a crusher space; a center cutter disposed in said hub area, said center cutter rotatable relative to said cutting wheel, said center cutter including a plurality of ripping tools for loosening the said soil, and a central cutting wheel, said central cutting wheel having at least one inlet opening for permitting entry of the said loosened soil into said crusher space; and a conduit connected to said crusher space to provide one of flushing action and suction action.

5,437,501

### ANTILOCK MODULATOR

Teruhisa Kohno, and Taro Segawa, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

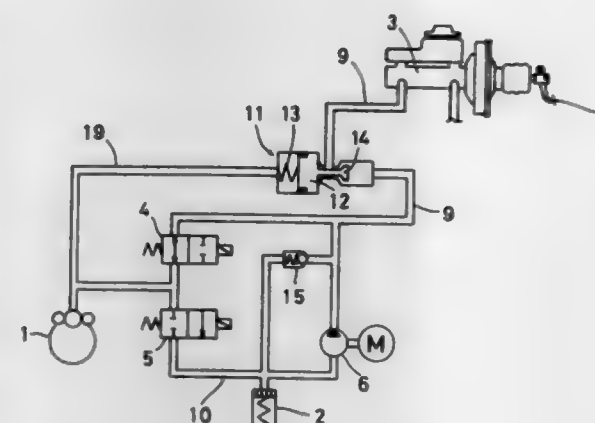
Filed Feb. 15, 1994, Ser. No. 196,568

Claims priority, application Japan, Feb. 16, 1993, 5-004725 U

Int. Cl.<sup>6</sup> B60T 8/32

U.S. Cl. 303-116.2

17 Claims



1. An antilock modulator, comprising: a master cylinder; a main fluid line connected to said master cylinder, said main fluid line having a return point therein; a wheel brake for receiving brake fluid therein for the application of braking pressure; a reservoir for storing brake fluid discharged from said wheel brake during antilock control; a control valve arrangement connected with said wheel brake, said reservoir and said main fluid line for controlling the brake pressure of said wheel brake by selectively connecting said wheel brake with said reservoir and said main fluid line connected to said master cylinder; a pump fluidly connected between said reservoir and said return point in said main fluid line for sucking brake fluid from said reservoir and returning the brake fluid under pressure to said return point of said main fluid line; a shutoff means in said main fluid line between said return point and said master cylinder for checking brake fluid flow from said pump toward said master cylinder; and a relief valve for directing brake fluid discharged from said pump toward said reservoir when the brake fluid discharge pressure of said pump exceeds a predetermined level; wherein said shutoff means comprises a fixed valve seat and a movable valve body, and wherein said valve body comprises a differential pressure-responsive means for closing fluid communication between said master cylinder and said pump when the pressure difference between the pressure on a first side of said control valve between said control valve and said wheel brake and the pressure at a second side of said control valve between said control valve and said master cylinder exceeds a predetermined value and for allowing fluid flow in both directions through said differential pressure-responsive means when said pressure difference is not higher than said predetermined value.

5,437,502

### UTILITY HOLDER

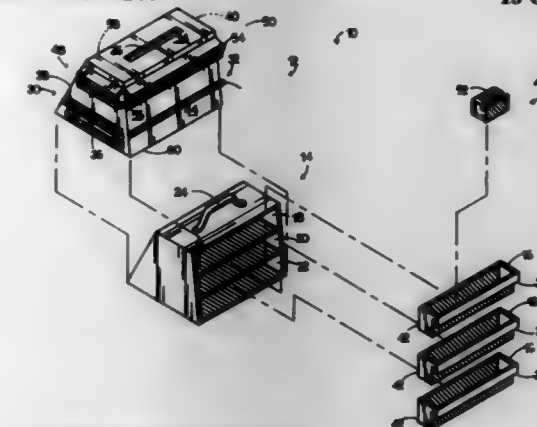
John D. Warnick, R.R.1 Box 149, White Heath, Ill. 61884, and Steve B. Hanners, R.R. 3 Box 310, Decatur, Ill. 62526

Filed Aug. 3, 1994, Ser. No. 283,178

Int. Cl.<sup>6</sup> A47B 81/00

U.S. Cl. 312-244

13 Claims



1. A utility holder comprising: a frame; a jacket dimensioned and configured to removably cover said frame, said jacket having an interior and an exterior, said interior substantially forming a cavity; at least one hanging device affixed to said exterior of said jacket; and at least one drawer removably from and retractable into said frame, said at least one drawer having an attachment mechanism removably securable to said at least one hanging device.

5,437,503

### MODULAR STORAGE DRAWER ASSEMBLY FOR USE IN A REFRIGERATOR

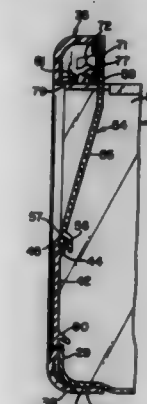
Phillip D. Baker, Morganton, N.C., and Claude L. Blake, Lanesville, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 1, 1993, Ser. No. 69,602

Int. Cl.<sup>6</sup> A47B 96/00; F25D 25/00

U.S. Cl. 312-404

14 Claims



1. A storage drawer assembly for use in a refrigerated compartment, said assembly including: an integrally molded drawer body formed with a bottom wall, a pair of spaced apart side walls, a rear wall and a front wall, said front wall extending between said side walls and projecting upwardly from said bottom wall only a portion of the height of said side walls and including a top edge; a molded drawer front module including a rectilinear frame, said frame and said drawer body including cooperating means latching said module in position across the front of said body; said frame defining a generally rectilinear opening having a bottom, top and sides, said frame including a vertically disposed, generally planar lower wall with a top edge



forming the bottom of the opening and positioned higher than said top edge of said drawer body front wall;  
said module also including a panel positioned over the frame opening in said front flange and including a bottom edge having an interfitting junction with said top edge of said lower wall, said panel including a first elongated rib extending horizontally across said panel proximate said panel bottom edge and projecting inwardly and downwardly of said panel within said drawer body to overlap said top edge of said frame lower wall for protecting said junction of said lower wall and said panel;  
said panel including a top portion permanently attached to said frame adjacent the top of said opening to form an unitary structure.

5,437,504

## DISPLAY LIGHTING FIXTURE AND METHOD OF USING SAME

George Halvatzis, 316 Princeton Ave., Jersey City, N.J. 07305  
Filed Sep. 9, 1993, Ser. No. 118,927

Int. Cl.<sup>6</sup> A47F 11/10

U.S. Cl. 362—125

4 Claims



1. A display case lighting fixture supportable between the inner opposing wall surfaces of a display case, said display lighting fixture comprising:

a housing having a longitudinal extent and first and second housing end portions;

light producing means disposed in said housing for producing light;

lighting focusing means disposed in said housing and operably associated with said light producing means for focusing said produced light to form a lighting pattern defined with respect to said housing;

first and second housing support elements extending substantially along said axial extent from said first and second housing end portions, respectively, said first and second housing support elements having first and second wall engaging portions, respectively, each said wall engaging portion being adapted to engage one said inner opposing wall surface; and

adjustment means for adjusting the position of said first and second housing support elements along said longitudinal extent so that the distance between said first and second wall engaging portions is substantially equal to the distance between said inner opposing wall surfaces so that each said wall engaging portion engages one said inner opposing wall surface so as to support said display case lighting fixture therebetween.

5,437,505

## SPRING-COMPENSATED BAIL RETAINING DEVICE

Brian C. Sanders, Salem, and Peter F. Cram, Merrimack, both of N.H., assignors to Ultrablend Systems, Inc., Londonderry, N.H.

Filed Jan. 10, 1995, Ser. No. 370,688

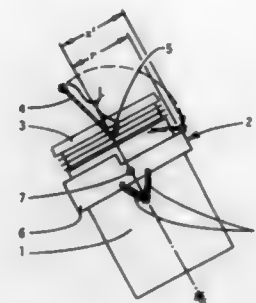
Int. Cl.<sup>6</sup> B01F 15/00

U.S. Cl. 366—209

3 Claims

1. In a material mixing device having a mixing bucket of a diameter sized to hold a standard size can of paint or the like, said can having a carrying bail, said bail having a length and a thickness, a spring-compensated, carrying bail retaining device comprising a retaining ring movably attached to said bucket,

said ring having a loading/unloading position and a neutral, retaining position, said ring further having a radius that is slightly greater than the radius of said mixing bucket plus the thickness of said carrying bail, wherein, when said ring is displaced from its neutral retaining position into its loading/unloading position, sufficient clearance is created to allow



said bail to swing into a mixing position where it is at rest against said mixing bucket and, when said ring is returned to its neutral, retaining position, said bail is secured in said mixing position as a result of a lack of sufficient clearance to allow said bail to swing away from its mixing position where it is at rest against said mixing bucket.

5,437,506

## SYSTEM FOR MEASURING THE TRANSFER TIME OF A SOUND-WAVE IN A GAS AND THEREBY CALCULATING THE TEMPERATURE OF THE GAS

Antonio Gray, Segrate, Italy, assignor to ENEL (Ente Nazionale per l'Energia Elettrica) & CISE S.p.A., Italy

PCT No. PCT/EP92/01244, § 371 Date Feb. 5, 1993, § 102(e) Date Feb. 5, 1993, PCT Pub. No. WO93/00577, PCT Pub. Date Jan. 7, 1993

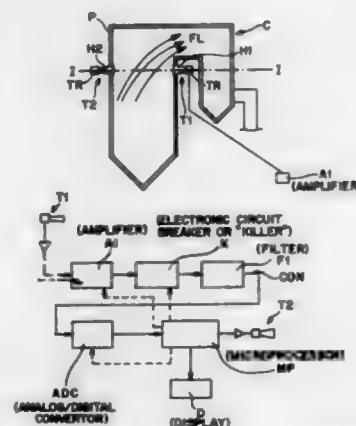
PCT Filed Jun. 4, 1992, Ser. No. 978,709

Claims priority, application Italy, Jun. 24, 1991, MI91A1729

Int. Cl.<sup>6</sup> G01K 11/24

U.S. Cl. 374—119

5 Claims



1. A system for measuring the transfer time of a sound wave in a gas, the velocity of said sound wave in the gas and thus the temperature of the gas using the relation between the temperature of the gas and the velocity at which said sound wave propagates through the gas, and, to this purpose, consisting of a current controlled emitter (T2) stimulated by a first electric signal to generate sound at a specific point in the gas, a receiver (T1) to receive said sound after the sound has traveled a given distance through the gas, a transducer for converting said sound into a second electric signal, a means of comparing said first and second electrical signals by means of a suitable algorithm and thus defining the transfer time of said sound, an indicator of the temperature of said gas being a function of the transfer time, wherein:

the current controlled emitter (T2), generates a sound of coherent phase and substantially of a single or a group of frequencies; the receiver (T1) is followed by a self-correlating decoder, both associated to said emitter in order to send the sound received to a band-pass filter system with narrow band and extremely high stability FI; said system further comprising an electronic circuit breaker (K), that acts on the signal entering the filter system FI and which is driven by a microprocessor (MP) by means of an iterating algorithm so as to allow always a pre-set number of n first waves of the signal entering the filter system (FI); and wherein the signal out-going from the filter system FI forms a Hamming wave shape within a Time-Amplitude diagram, which is processed by said microprocessor (MP) in order to find the absolute maximum of the oscillations making up said Hamming wave shape, so as to determine therefrom the transfer time and, by reference to known characteristics of the gas, calculate the temperature of the gas.

5,437,507

## BAG WHICH IS MADE BY STITCHING OPAQUE FABRIC MATERIAL

Jorge L. Blumenkron, 12 Sur 2916, El Mirador, 72530 Puebla, Mexico

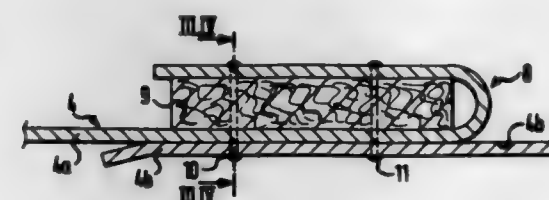
Filed Jul. 13, 1993, Ser. No. 90,776

Claims priority, application Germany, Jul. 14, 1992, 42 23 034.9

Int. Cl.<sup>6</sup> B65D 30/10, 33/00

U.S. Cl. 383—107

12 Claims



1. A bag comprising:

side and bottom panels;

a top panel provided with a filling opening;

the side and bottom panels stitched together with a stitching material to form seams;

upper edges of the sides stitched to edges of said top panel with a stitching material to form seams;

each seam having at least one upturned edge and a sealing strip inserted into each upturned edge;

said sealing strips comprising a resilient material having a substantially isotropic structure.

5,437,508

## SACK OR BAG WITH BOTTOM PORTION

Richard Feldkämper, Lengerich, Germany, assignor to Windmoller & Holscher, Lengerich, Germany

Filed May 2, 1994, Ser. No. 236,840

Claims priority, application Germany, Jun. 17, 1993, 43 20 030.3

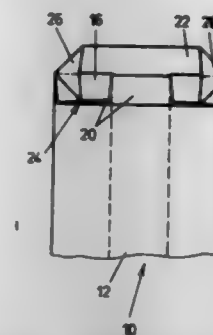
Int. Cl.<sup>6</sup> B65D 30/10

U.S. Cl. 383—123

4 Claims

1. A sack or bag (10), comprising a front wall (12) and a rear wall (14), which are mutually connected by side folds (16), a strip (20) of the front wall (12) being folded together with the side folds (16) around a first folding line (18) running transverse to a longitudinal axis at least one of the two presently open ends while a corresponding strip (22) of the rear wall (14) remains in place, wherein the folded-over strip (20) of the front wall (12) and the strip (22) of the rear wall (14) that remained in place are folded once again around the outer edge (24) of the

folded-over strip (20) and attached in this position to an outside surface of the sack or bag (10), wherein:



a corner tuck (26) on each side is formed between the strip (22) of the rear wall (14) that initially remained in place and the side folds (16) folded over together with the folded-over strip (20).

5,437,509

## BEARING AND SEAL ASSEMBLY FOR TRENCHER ENDLESS CHAIN DRIVES

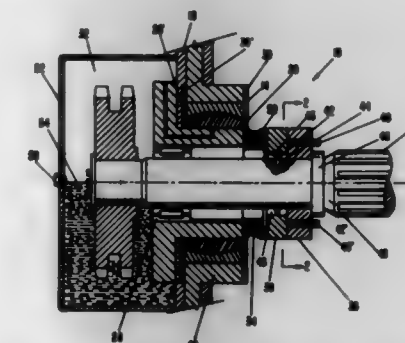
Joe B. Templeton, Farmington, N. Mex., assignor to James C. Casey, Farmington, N. Mex.

Filed Nov. 18, 1993, Ser. No. 154,278

Int. Cl.<sup>6</sup> F16C 33/72

U.S. Cl. 384—142

9 Claims



1. A hood bearing and seal assembly for an endless digging chain drive of a trencher comprising:

hood bearing means for rotatably holding a drive shaft to a hood housing;

hood bearing cover plate means for holding said hood bearing means in place;

dual-cone sealing means for keeping lubricating fluid on a drive assembly and for keeping dirt and debris from entering the drive assembly; and

lubricating means for lubricating said hood bearing means.

5,437,510

## FIXING DEVICE OF BICYCLE PEDAL AXLE

Jin-Chyr Jeng, 101, Chu-Shuei, Shi-Pyng Village, Yuan-Li Township, Miau-Lih County, Taiwan

Filed Mar. 30, 1994, Ser. No. 220,181

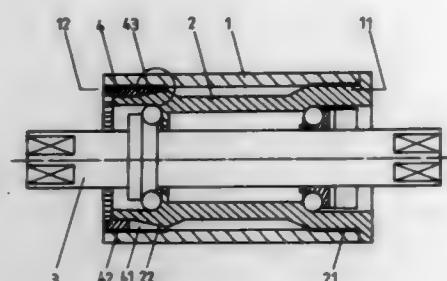
Int. Cl.<sup>6</sup> F16C 19/28

U.S. Cl. 384—538

1 Claim

1. A fixing device of a bicycle pedal axle comprising an axle tube, an inner sleeve, and a threaded casing; wherein said inner sleeve is fitted into said axle tube and provided peripherally at the front end thereof with a bevel tapered surface, and wherein said threaded casing is fitted into said axle tube such that an outer threaded portion of said threaded casing engages a threaded end of said axle tube, said threaded casing being

further provided peripherally at the inner end thereof with a plurality of tangent slots, said threaded casing being still fur-



ther provided therein with an inner cone engageable with said bevel tapered surface of said inner sleeve.

5,437,511

## TAPE PRINTING APPARATUS

Andrew R. Halket, Cambridge; Richard W. Ware, Welwyn Garden City, and Charles R. Sims, Royston, all of United Kingdom, assignors to Esselte Dymo N.V., St. Niklaas, Belgium

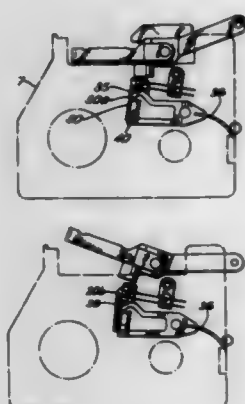
Filed Jan. 11, 1994, Ser. No. 180,210

Claims priority, application United Kingdom, Jan. 13, 1993, 9300586

Int. Cl.<sup>6</sup> B41J 29/38

U.S. Cl. 400—54

10 Claims



1. A tape printing apparatus comprising:  
a cassette receiving bay having a base and being arranged to receive a cassette of printing tape therein;  
a cover member for covering the cassette receiving bay; and  
a switching mechanism operable between first and second positions, being located below the base of the cassette receiving bay, and including:  
first and second switching terminals which are in contact in the first position and which are spaced apart in the second position;  
first switch actuating means actuated by the cover member and associated with said first switching terminal, whereby the position of the cover member influences the position of the first switching terminal; and  
pivotally mounted second switch actuating means associated with said second switching terminal and having a protrusion which extends above the base of the cassette receiving bay, said protrusion arranged to engage in a slot of a cassette, and when inserted, thereby cause pivotal movement of said second switch actuation means to influence the position of the second switching terminal, whereby one of the first and second positions of the switching terminals is only attained when said cover member covers the cassette receiving bay and a cassette is in the cassette receiving bay, said printing apparatus only operating

when said switching terminals are in said one of the first and second positions.

5,437,512

## TRANSPORT DEVICE FOR SEPARATED SECTIONS OF A CONTINUOUS RECORDING SUBSTRATE FROM A RECORDING MECHANISM

Peter Güll, Berlin, Germany, assignor to Siemens Nixdorf Informationssysteme Aktiengesellschaft, Paderborn, Germany  
PCT No. PCT/EP92/00528, § 371 Date Jul. 26, 1993, § 102(e)  
Date Jul. 26, 1993, PCT Pub. No. WO92/16377, PCT Pub. Date Oct. 1, 1992

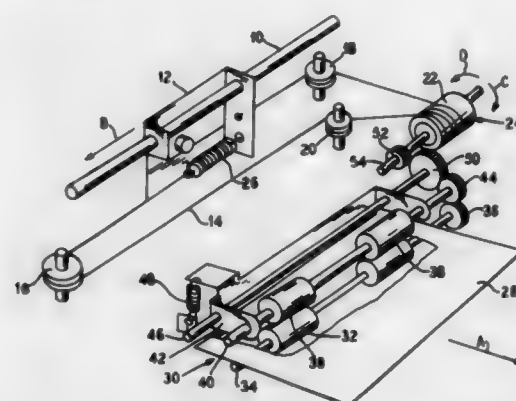
PCT Filed Mar. 10, 1992, Ser. No. 90,210

Claims priority, application Germany, Mar. 12, 1991, 41 07 899.3

Int. Cl.<sup>6</sup> B41J 11/68

U.S. Cl. 400—621

7 Claims



1. A device for transporting separated sections of a continuous recording substrate from a recording mechanism, comprising:  
said recording mechanism having a cutting unit for separating sections from the recording substrate, which cutting unit is movable, in a cutting stroke and in a return stroke, transversely to a direction of transport of the recording substrate back and forth across a width of the recording substrate; transport elements disposed downstream of the cutting unit which can be moved together to create a driving nip for a respective separated section and to create a transport motion for advancement of the separated section; the transport elements coupled by means of a gear arrangement to the cutting unit such that the transport elements are moved by the return stroke of the cutting unit to create the driving nip and transport separated section.

5,437,513

## COSMETIC CONTAINER CONSTRUCTION

Bernard Favre, Sceaux, France, assignor to Lir France, Chevilly-Larue, France

Filed Mar. 17, 1994, Ser. No. 214,385

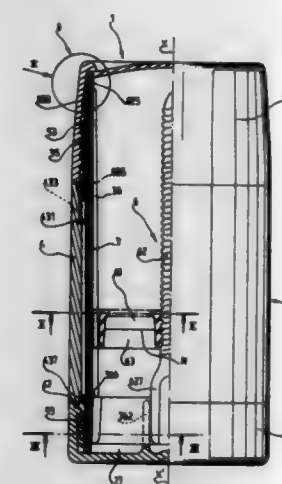
Claims priority, application France, Mar. 29, 1993, 93 03619  
Int. Cl.<sup>6</sup> A45D 40/06, 40/16

U.S. Cl. 401—68

12 Claims

1. In a dispensing packing for stick-shaped pasty products such as deodorants or lipstick, including  
an elongate hollow body having first and second opposed ends and an interior for receiving a pasty stick,  
means for moving the stick in a longitudinal direction of said body between a retracted position in which the stick is contained with said body and a position of use in which the stick projects from said first end of said body, said means including a sliding piston connected to the stick, a screw adapted to cooperate with said piston: for moving said piston in said longitudinal direction and a drive cap for rotating said screw, said piston comprising through passages such that the pasty stick is molded in said body

upon solidification of stick constituting product cast into said body through said passages from said second end of said body prior to mounting of said drive cap,  
a closure cap for closing said first end of said body, and  
a tightness system arranged between said closure cap and said body,  
the improvement comprising:  
said body comprises  
an elongate internal jacket formed from a material compatible with the pasty stick product, said internal jacket comprising a tubular shell having open, opposed longitudinal ends,  
a stationary external case comprising a rigid material surrounding said internal jacket such that ends of said internal jacket extend beyond said external case and constitute said first and second ends of said body, and  
assembly means for fixedly coupling said internal jacket to said external case,



said screw having a main portion and an end portion arranged closer to said second end of said body, said end portion of said screw having a diameter larger than the diameter of said main portion and including through passages for enabling casting of the product within said body, said end portion of said screw being rotatably supported on a surface of said internal jacket,  
said drive cap being coupled to said end portion of said screw and mounted on said second end of said body to close said second end of said body and thus a respective one of said open, longitudinal ends of said internal jacket,  
said drive cap and one end of said internal jacket comprising respective locking means for locking said drive cap to said end of said internal jacket while allowing rotation between said drive cap and said internal jacket, whereby upon rotation of said drive cap with respect to said external case and said internal jacket, said piston is displaced relative to said body.

5,437,514

## PHOTOGRAPHIC ALBUM LEAF

Paul A. Minch, Lakewood, Ohio, assignor to The Chilcote Company, Cleveland, Ohio

Filed Nov. 18, 1994, Ser. No. 342,424

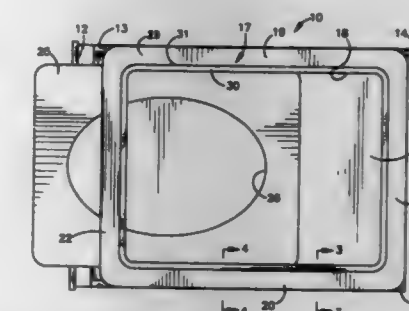
Int. Cl.<sup>6</sup> B42F 13/00

U.S. Cl. 402—79

6 Claims

1. A photographic album leaf, which comprises:  
a backing layer upon which a photograph may be mounted;  
a frame layer on the backing layer, the frame layer having a central opening within which the photograph may be mounted on the backing layer, the frame layer having four side segments, each side segment of the frame layer having a base portion, a raised portion and a transitional portion, the base portion being located around the outer portion of the frame layer and being attached to the backing layer

along three of the four side segments leaving a fourth side segment in which the frame layer is not attached to the backing layer, an access passageway being formed between the backing layer and the fourth side segment of the frame layer, the raised portion being located around the inner periphery of the frame layer adjacent to the central opening, the raised portion being spaced from the backing layer to form a slot therebetween, the transitional portion connecting the base portion and the raised portion;



a mat layer adapted to be inserted through the access passageway, the mat layer having an aperture through which a photograph mounted on the backing layer may be viewed, the outer edges of the mat layer being held within the slots formed by the raised portions, the mat layer being locked in position by engagement with the transition portions on all four side segments of the frame layer.

5,437,515

## CONNECTING PIN

Kikuzo Kuramoto, Chiba, and Yoshiyuki Suzuki, Ibaragi, both of Japan, assignors to Nisso Sangyo Co., Ltd., Chiba, Japan  
Filed Oct. 26, 1993, Ser. No. 143,477

Claims priority, application Japan, Oct. 28, 1992, 4-080722 U  
Int. Cl.<sup>6</sup> F16B 19/00

U.S. Cl. 403—154

7 Claims



1. A connecting pin comprising:  
a bar with a first and second end, said bar including a flange at said first end and said bar defining a passage at said second end;  
a pivot shaft intersecting said passage;  
a locking piece rotatably supported by said pivot shaft in said passage, said locking piece defining a plurality of depressions;  
positioning means for selectively engaging with said depressions on said lock piece, said positioning means being positioned substantially parallel with said pivot shaft;  
said bar defining an access slot at said second end, said access slot being contiguous to said passage.



5,437,516

## SURFACE DRAINAGE APPARATUS

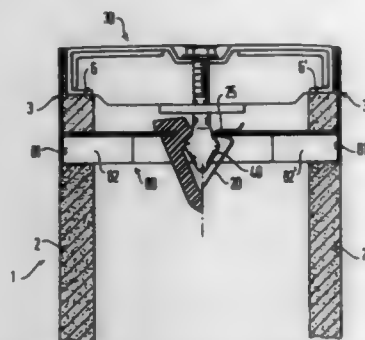
Heinrich Sauerwein, Nubbel; Wolfgang Arm, Rendsburg, and Jan Witt, Eckerfurde, all of Germany, assignors to ACO Severin Ahlmann GmbH & Co., KG, Rendsburg, Germany  
Filed Dec. 3, 1993, Ser. No. 161,223

Claims priority, application Germany, Dec. 10, 1992, 42 41 706.6

Int. Cl.<sup>6</sup> E01C 11/22

U.S. Cl. 404-2

11 Claims



1. Surface drainage apparatus comprising a channel body defining a drainage channel, a cover disposed within an opening in the drainage channel, a fixing means for attachment of said cover to said channel body and comprising a first fixing element attached to said channel body and a complementary second fixing element attached to said cover,

one of said first and second fixing elements comprising a clamping spring defining a receiving opening, the other of said first and said second fixing elements comprising a peg formed with an enlarged end that is a leading end for insertion of said peg into said clamping spring, and said peg having a transverse dimension greater than said receiving opening, thereby elastically deforming the spring upon insertion of said enlarged end into said receiving opening, and said peg being retained within said clamping spring after insertion in a direction substantially perpendicular to the plane of the cover.

5,437,517

## METHOD FOR AUTOMATICALLY REPAIRING UNDERWATER PIPELINES, PARTICULARLY SUITABLE FOR GREAT DEPTHS, AND THE RELATIVE APPARATUS

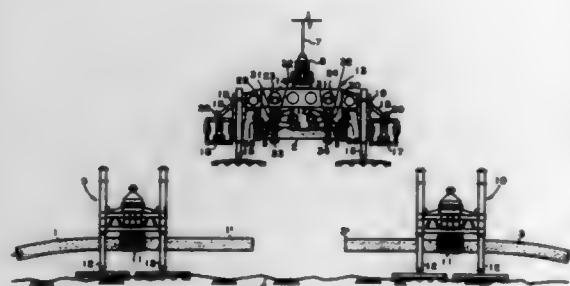
Paolo Carrioli, and Massimo Montesi, both of Ancona, Italy, assignors to Suamprogetti S.p.A., San Donato Milanese, Italy  
Filed Mar. 18, 1994, Ser. No. 215,198

Claims priority, application Italy, Feb. 22, 1993, MI93A0535

Int. Cl.<sup>6</sup> F16L 1/26

U.S. Cl. 405-169

5 Claims



1. A method, using a crane-equipped depot ship, for automatically repairing an underwater pipeline even if installed at great depth, comprising lowering onto the sea bed by said crane, using a cable provided with a quick coupling/uncou-

pling device, a support frame provided with a gripping clamp and telescopically adjustable legs, tightening said support frame clamp about said pipeline for example upstream of its damaged piece, raising the pipeline into the predetermined position by operating said legs of said frame and uncoupling said cable by operating its quick coupling/uncoupling device, then repeating all said steps for raising said pipeline into the predetermined position by a second support frame clamped downstream of said damaged pipe piece, and cutting off the damaged pipe piece, then lowering two connectors onto the sea bed, mounting and fixing them on the facing ends of the cut pipeline, lowering the replacement pipe piece and installing it by locking it into said previously installed connectors, repositioning the thus repaired pipeline on the sea bed, retracting the legs, opening the clamps of said support frames and recovering the utilized apparatus on board said depot ship, characterized in that said cutting of the damaged pipe piece is achieved by lowering onto the sea bed, using said cable provided with a quick coupling/uncoupling device, a working module provided at its ends with legs telescopically adjustable independently of each other, with two outer removable swivel clamps fitted with instruments, and with two vertically movable internal quick-coupling systems each provided with at least one horizontal operating means and to which there has been fixed a cutting apparatus consisting of two small internal clamps each acting as a support for its own cutting tool, then positioning said working module along the pipeline so that the damaged pipe piece lies between said two cutting tools of said cutting apparatus, clamping said external clamps of said working module about said pipeline, resting the working module on the sea bed by suitably elongating its telescopic legs, setting said module parallel to the pipeline by acting on said independently adjustable legs on the basis of the information provided by the instruments on said external clamps, then vertically lowering said internal clamps of said cutting apparatus and clamping them about said pipeline, cutting through said damaged pipe piece using said cutting tools of said cutting apparatus, opening said external clamps of the working module and raising onto said depot ship the working module together with said damaged pipe piece clamped between said internal clamps or said cutting apparatus; said lowering of two connectors onto the sea bed and their mounting and fixing on the facing ends of the cut pipeline are achieved by lowering onto the sea bed, using said cable provided with the quick coupling/uncoupling device, said working module to the two said internal quick-coupling systems of which there has been fixed a longitudinal guide for a concrete removal apparatus consisting of a cutter slidable along a circumferential guide, itself slidable along a second longitudinal guide, and an expansion-centering head coaxial with said circumferential guide, positioning said working module on one of the two facing ends of the cut pipeline so that said centering head faces and is in proximity to the edge of said end, clamping the relative external clamp of said working module about said end, resting the working module on the sea bed by suitably elongating its telescopic legs, setting said module parallel to said end by acting on said independently adjustable legs on the basis of the information provided by the instruments on said external clamps, sliding said concrete removal apparatus along said longitudinal guide fixed to said internal quick-coupling systems of said working module until said centering head has been completely inserted in said end of the cut pipeline, expanding said centering head until it presses symmetrically against the inner surface of said pipeline end, longitudinally advancing said cutter along said second guide for the entire length of the guide so as to longitudinally groove the concrete along the lower generator of the pipeline end, rotating said cutter along said circumferential guide to circumferentially groove the concrete, longitudinally withdrawing said cutter to its initial position to longitudinally groove the concrete along the upper generator of said pipeline end so that the concrete of said end separates in the form of two blocks, closing said centering head and extracting it from the pipeline, opening said external clamp of the working module, raising said working module onto said depot ship, re-lowering onto

5,437,518

## DEVICE FOR MOUNTING A FLEXIBLE LINE COMPRISING A CURVATURE LIMITER

René Maloberti, Champigny, and Alain Contarel, Paris, both of France, assignors to COFLEXIP, Boulogne Billancourt, France

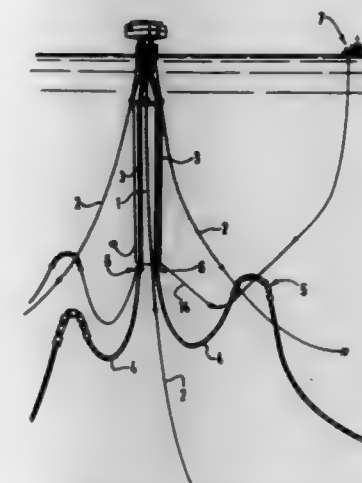
Filed Apr. 7, 1993, Ser. No. 43,874

Claims priority, application France, Apr. 7, 1992, 92 04229

Int. Cl.<sup>6</sup> F16L 1/04; E21B 43/013

U.S. Cl. 405-169

12 Claims



1. A device for mounting a flexible line on a structure, comprising:

- a hollow rigid member having one end with a mouth zone and a second end forming part of said structure or being fixed to said structure;
- a pull cable fixed to one end of said flexible line for pulling said flexible line through said hollow rigid member;
- a curvature limiter engaged on said flexible line;
- first fixing means secured to said curvature limiter;
- second fixing means secured to said hollow rigid member;
- wherein said first and second fixing means interact for fastening the curvature limiter to the hollow rigid member, by pulling the flexible line with said pull cable to bring the curvature limiter to the level of said mouth zone of said hollow rigid member, said device further comprising means for immobilizing movement of said curvature limiter along said flexible line during pulling of said flexible line; and
- wherein said first and second fixing means and said immobilization means allow said flexible line to be pulled by said pull cable through said hollow rigid member thereby allowing said one end of said flexible line to be connected to said structure.

5,437,519

## PILES AND PILE FORMING METHODS

Roger A. Bullivant, Newton Solney, England, assignor to Roger Bullivant of Texas, Inc., Grand Prairie, Tex.

Filed Aug. 17, 1993, Ser. No. 108,116

Claims priority, application United Kingdom, Aug. 26, 1992, 9219153

Int. Cl.<sup>6</sup> E02D 5/34

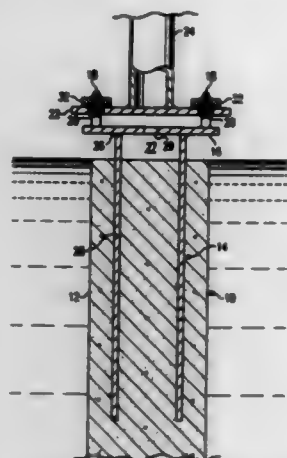
U.S. Cl. 405-239

24 Claims

1. A method for supporting a vertical member having a base at its lower end, said method comprising:
- forming a pile hole in the ground,
  - pouring a settable mixture into the pile hole thus formed to form a pile,
  - before the thus poured settable mixture sets, accurately positioning a pile cap assembly in the top portion of the pile, said assembly comprising a mounting plate having a tubular member attached thereto and projecting down-



wardly therefrom and a plurality of fixing elements extending upwardly therefrom for securing the base of the vertical member to said mounting plate, wherein said positioning is accomplished by inserting said tubular mem-



ber into the thus poured settable mixture and manoeuvring said tubular member in the thus poured settable mixture prior to the thus poured settable mixture setting such that the plurality of fixing elements is accurately positioned when the thus poured settable mixture sets.

5,437,520

## SEALING SYSTEM FOR IN-GROUND BARRIER

John A. Cherry, and Enoch S. Vales, both of Waterloo, Canada, assigns to University of Waterloo, Waterloo, Canada  
PCT No. PCT/GB92/02057, § 371 Date May 4, 1994, § 102(e) Date May 4, 1994, PCT Pub. No. WO93/09298, PCT Pub. Date May 13, 1993

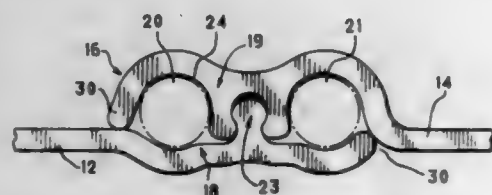
PCT Filed Nov. 6, 1992, Ser. No. 232,293

Claims priority, application United Kingdom, Nov. 8, 1991, 9123771; Sep. 17, 1992, 9219652

Int. Cl. E02D 5/08

U.S. Cl. 405—279

16 Claims



1. A barrier, which comprises a series of elements of sheet material, wherein, upon installation of the barrier into the ground:

- each element has a senior edge form which interlocks with a junior edge form of a next adjacent element;
- the configurations of interlocking pairs of senior and junior edge forms are such that the configurations thereof jointly form the circumferences of two enclosed cavities;
- in respect of each of the two cavities, a portion of the circumference of the enclosed cavity is constituted by a portion of the senior edge form, and another portion of the circumference of that same enclosed cavity is constituted by a portion of the interlocking junior edge form;
- in respect of each one of the two enclosed cavities, the edge forms are so shaped that each enclosed cavity includes a respective open circular space, which is defined by and inscribed wholly within the enclosed cavity, the inscribed circle being clear and open in that no portion of the material of either of the elements encroaches into the said inscribed circle;
- the interlocking senior and junior edge forms are so arranged that potential leakpaths to the leakage of water

through the barrier are created therebetween, and are so arranged that each and every leakpath starting from in front of the barrier and finishing behind the barrier is in communication with the said two enclosed cavities; the interlocking edge forms are so arranged that all the potential leakpaths traverse through both the cavities, in series;

characterised in that:

the elements are so arranged as to include an interlocking dove-tail connection, being a connection which is effective to prevent displacement of the senior edge form in the horizontal sense relative to the junior edge form, and thereby to prevent consequent distortion of the cavities, the interlocking edge forms being so arranged that the two cavities, each independently of the other, are clear, open, and directly accessible from the top of the barrier, from top to bottom of the barrier;

each of the two cavities is open and accessible to the extent that a hose pipe can be passed from the top of the barrier right down inside the cavity to the bottom of the barrier; and the two cavities are sealably independent of each other to the extent that one of the cavities can be sealed, and the potential leakpaths communicating with that cavity can be sealed, from top to bottom, independently of whether the other cavity is sealed.

5,437,521

## AIR CONVEYOR FOR BOTTLES

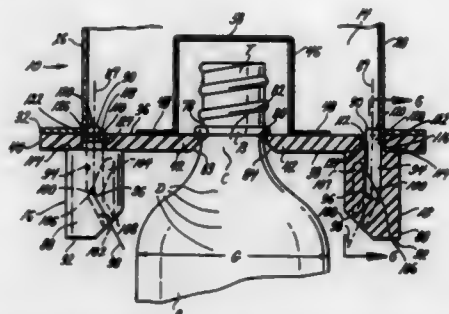
Joseph F. Ouellette, Glendale, Mo., assignor to Ouellette Machinery Systems, Inc., Fenton, Mo.

Filed May 13, 1993, Ser. No. 62,939

Int. Cl. B65G 51/02

U.S. Cl. 406—88

32 Claims



1. A conveying apparatus for conveying articles forward in a longitudinal direction of the apparatus wherein each article has an intermediate enlargement and an upper portion thereabove and a lower portion therebelow, the conveying apparatus comprising:

- a pair of elongated members providing opposed inner edges and upper surface margins adjacent the inner edges, the inner edges defining a central slot that extends in the longitudinal direction, the upper surface margins providing slidable support for the intermediate enlargements;
- the elongated members having portions on opposite sides of the slot for supporting a plurality of nozzle ends below the upper surface margins;
- each nozzle end having an outlet recessed therein and each nozzle end being a part of an individual nozzle removably engaged with one of the elongated members;
- air blower means for supplying the outlets with pressurized air; and
- means associated with each outlet for directing the air discharged from each outlet in a stream that is forward, inward, and downward relative to said longitudinal direction; wherein
- the articles are moved forwardly through the slot by the force of the air streams thereagainst.

23. A conveyor for conveying containers, each container

having a neck ring and a shoulder below the neck ring, each neck ring having a maximum external dimension, the conveyor comprising:

a pair of laterally spaced flanges extending in a longitudinal direction, the pair of flanges having laterally opposed inner edges defining an elongated longitudinal slot therebetween, the slot having a length extending in the longitudinal direction and a substantially constant lateral width defined by the opposed inner edges of the flanges, the lateral width of the slot being less than the maximum external dimension of each container neck ring, the pair of flanges being configured to guide the containers along the slot between the inner edges of the pair of flanges with the neck ring positioned above the pair of flanges and the shoulder positioned below the pair of flanges;

a plurality of nozzles depending from each of the pair of flanges along substantially the entire length of the slot, each of the nozzles having an exterior side wall and each nozzle having an air inlet bored partly through an interior of the nozzle and an air outlet that extends through the nozzle interior from the air inlet and emerges from the nozzle interior through the nozzle side wall, the air outlet having a configuration of a diverging orifice configured for discharging an air stream from the air outlet and toward the container shoulders suspended in the slot to push the containers along the slot, the air outlet having a cross-sectional area which increases as the air outlet extends from the nozzle air inlet to the nozzle exterior side wall; and

air blower means for supplying air to the air inlets of the plurality of nozzles.

5,437,522

## MILLING CUTTER WITH OVERLAPPING EDGE INSERT

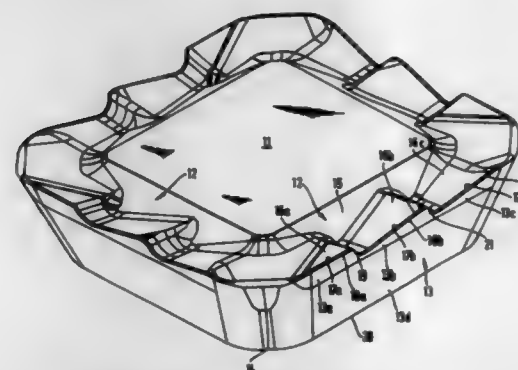
Amir Satran, Kfar Havradim, and Carol Smilovici, Acre, both of Israel, assigns to Iscar Ltd., Migdal Tefen, Israel  
Continuation-in-part of Ser. No. 940,083, Sep. 3, 1992, Pat. No. 5,232,319, which is a continuation-in-part of Ser. No. 756,303, Sep. 6, 1991, Pat. No. 5,158,402. This application Apr. 19, 1993, Ser. No. 49,117

Claims priority, application Israel, Apr. 17, 1992, 101636

Int. Cl. B23C 5/20, 5/02

U.S. Cl. 407—42

12 Claims



1. A rotary milling cutter tool having a rotational axis and at least one cutting insert provided with a cutting edge defined between a cutting rake surface and a relief flank and having a base edge defined between said relief flank and a base surface; said cutting edge comprising a plurality of successive component cutting edges and intermediate edges respectively located between successive component cutting edges; each component cutting edge having respective leading and trailing extremities, the trailing extremity of one component cutting edge merging with the leading extremity of the succeeding component cutting edge via said intermediate edge, said intermediate edge being directed from said trailing extremity of said one component cutting edge towards said base edge; successive compo-

nent cutting edges overlapping so that during a milling operation successive component cutting edges overlap in the direction of cutting motion; said successive component cutting edges being substantially located on a curved envelope defined by rotation of a generator about the rotational axis of said milling cutter tool.

5,437,523

## HAND BURR REMOVER

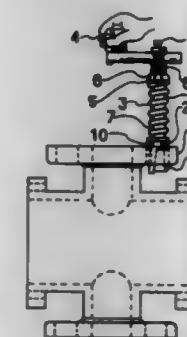
Isamu Tomino, 12-27, Kitayama-cho, Hyogo-ku, Kobe 652, Japan

Filed Dec. 17, 1993, Ser. No. 169,146

Int. Cl. B23B 51/10

U.S. Cl. 408—81

1 Claim



1. A tool for removing burrs from around both upper and lower openings of a drilled hole in a flange, comprising a hollow cylindrical collar fitting into said drilled hole for positioning said collar in predetermined relation thereto, a rod-shaped main body slidable within said collar and projectable and retractable with respect to said collar, an upper tip having a cutting edge on an outer wall of said collar soldered thereonto and protruding laterally thereof, in which a back end of said upper tip protrudes laterally and inwardly from an inner wall of said collar and engages slidably into a key flute carved axially in said rod-shaped main body, a lower tip having a cutting edge on a side of a lower end of said rod-shaped main body soldered thereonto and protruding laterally thereof, a coiled spring held in compression interposed between an upper end of said collar, and a washer on a lower face of an adjusting nut screwed at an upper part of said rod-shaped main body to normally urge said rod-shaped main body into a retracted position and to maintain both said cutting edges of the upper and lower tips in predeterminate pressure engagement with said upper and lower openings of said drilled hole, and a handle put on an end of a rod protruding from the upper part of said rod-shaped main body, whereby to enable to remove burrs from around the upper and lower openings of said drilled hole by rotation of said upper and lower tips simultaneously around said drilled hole.

5,437,524

## TORQUE-ADJUSTMENT CONTROLLER

Jin-Tarn Huang, No. 39, Lane 240, Lijen Road, Tarli City, Taichung Hsien, Taiwan

Filed Jun. 2, 1994, Ser. No. 253,078

Int. Cl. B23B 31/38; B25B 23/157

U.S. Cl. 408—139

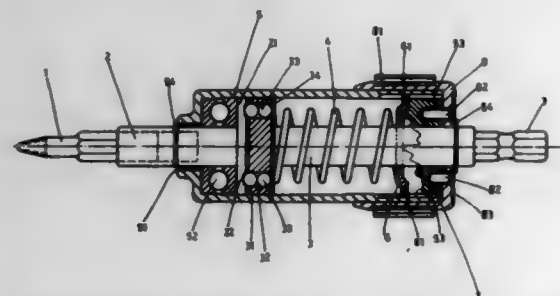
1 Claim

1. A torque-adjustment controller for use with a drilling, fastening tool, etc. to provide adjusted torque of the tool, comprising a housing, an output shaft having a first disc portion and being disposed at a front outlet of said housing, an input shaft having a second disc portion and being disposed inside said housing behind said output shaft, a stepped ring disposed at a rear outlet of said housing, a movable member having radially extended lugs and being disposed in front of and contacting said stepped ring, a torque spring disposed over said input shaft with one end pressing against said second disc



portion and another end thereof pressing against said movable member, and a compression-adjusting ring covering said rear outlet of said housing;

said housing having a plurality of grooves axially formed on a part of an inner wall near said rear outlet thereof to each receive one of said lugs of said movable member therein; said grooves and said lugs being of the same number; said first disc portion of said output shaft being formed at a rear surface with a plurality of recesses which corresponds to the same number of through holes formed on said second disc portion of said input shaft, allowing a plurality of steel balls disposed in said through holes to engage into said recesses in a rolling manner, such that force can be transmitted from said input shaft to said output shaft via the engagement of said steel balls with said recesses; said steel balls disengaging from said recesses in the instant said torque produced by said torque spring and transmitted to said input shaft via said steel balls encounters an even higher resistance from a work-piece under fabrication, safely protecting said workpiece from damaged by an overly large torque of said tool; and



said compression-adjusting ring and said stepped ring being joined together by means of screws, such that when said compression-adjusting ring is rotated, said stepped ring is turned simultaneously; said stepped ring being formed with multiple sets of high- and low-profile steps which provide different head drops, such that when said lugs of said movable member contacting said steps of said stepped ring are displaced by said rotating stepped ring within the range relative to the head drops provided by said steps, said movable member is shifted forward or backward along said grooves on said housing, and thereby compress or releases said torque spring disposed between said movable member and said second disc of said input shaft, allowing said compressed or released torque spring to produce a stronger or a weaker torque, respectively, working on said second disc and accordingly said steel balls, through which said torque produced by said torque spring is transmitted to said output shaft to complete a drilling, fastening or other operation via a tool bit connected to said output shaft.

5,437,525

# ASSEMBLY COMPONENT HAVING A FORCE SENSOR

Serge M. Bras, 19, rue du Picard, 91 330 Yerres, France

Filed Sep. 9, 1993, Ser. No. 118,937

Claims priority, application France, Sep. 25, 1992, 92 11459

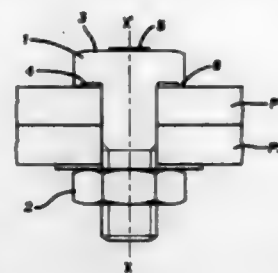
Int. Cl.<sup>6</sup> F16B 31/02; G01L 5/00

U.S. Cl. 411-14

8 Claims

1. An assembly component for use in connecting together two or more parts, said component having first and second faces, a sensor means for measuring in a reproducible manner variable tightening tensions or compression forces applied to

said assembly component, said sensor means being positioned on the first face of the component and fixed by bonding or



brazing to the first face and stable support means for the component provided on the second face.

5,437,526

# ARRANGEMENT FOR ANCHORING A ROD-SHAPED TENSION MEMBER OF COMPOSITE FIBER MATERIAL

Thomas Herbst, Wesling; Berthold Bolmer; Hartmut von Grolman, both of Haren; Anton Lägering, Meppen, and Lorenz Schnitzler, Pücking, all of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich and Rochling Haren KG, Ems, both of Germany

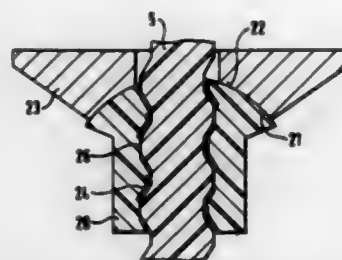
Filed Dec. 18, 1992, Ser. No. 993,716

Claims priority, application Germany, Dec. 21, 1991, 41 42 713.0; Mar. 21, 1992, 42 09 265.5

Int. Cl.<sup>6</sup> F16B 35/00, 35/04; E21D 20/02

U.S. Cl. 411-366

26 Claims



1. An anchoring arrangement comprising a rod-shaped tension member of composite fiber material comprised of unidirectional fibers embedded in a matrix of synthetic resin, the tension member having, at least over an anchoring portion thereof, a helically extending continuous external thread, the external thread comprising ribs formed by impressing valleys into the tension member, the thread having sides extending between the ribs and the valleys, and an anchoring member adapted for resting against a support surface for tensioning the tension member, the anchoring member being stiff with respect to circumferential tension and having an internal thread essentially corresponding to the external thread of the anchoring portion of the tension member, the anchoring member being screwed onto the anchoring portion of the tension member, the tension member having a longitudinal axis, the sides of the external thread having an angle of inclination relative to the longitudinal axis of the tension member, wherein the angle of inclination is smaller than 45° for obtaining a radial pressure acting on the tension member when the tension member is tensioned.

5,437,527

# ARRANGEMENT IN A PIPE HANDLING SYSTEM

John McGill, Stavanger, and Bjorn A. Eilertsen, Hundvag, both of Norway, assignors to Hitech A/S, Forus, Norway  
Continuation of Ser. No. 793,418, Nov. 4, 1991, Pat. No. 5,244,329. This application Jun. 21, 1993, Ser. No. 80,560  
Claims priority, application Norway, May 12, 1989, 891944  
Int. Cl.<sup>6</sup> B66D 1/82

U.S. Cl. 414-22.51

3 Claims



1. Arrangement in a pipe handling system for use with a top drive drilling system characterized in that it comprises a side-step retraction system (18-22) forming a second hydraulic cylinder skid mechanism and including a wire guide apparatus (20) located in the area of a top block (18) mounted in a standard derrick (24) provided with a drill block (11) which can be retracted by wires (17) running to and from said top block (18) and through joint connections (22) connected to said top block (18) to transport equipment units (13) on a wagon (15) guided by vertical guide rails (16), said wagon (15) being supported on a first hydraulic cylinder skid mechanism (19), and said drill block (11) being retractable from its central position over drill pipe (14) and parallelly shiftable sideways on said second hydraulic cylinder skid mechanism and said wire guide apparatus (20) activating said wires (17) by pressure to move said wires (17) in the same direction as said drill block (11).

5,437,528

# DEVICE FOR HARVESTING AND LOADING OR UNLOADING AND INSTALLING LARGE ROLLS OF SOD

Henry F. Decker, Ostrander, Ohio, assignor to Buckeye Bluegrass Farms, Ostrander, Ohio

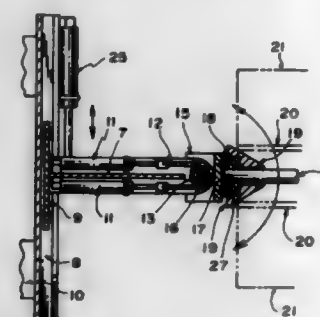
Continuation of Ser. No. 858,641, Mar. 27, 1992, abandoned.

This application Feb. 14, 1994, Ser. No. 195,016

Int. Cl.<sup>6</sup> A01D 87/12

U.S. Cl. 414-24.6

13 Claims



1. A device for handling large rolls of sod, operable by one person and comprising:

- a) a heavy duty horizontal beam member having upper and lower surfaces and proximal and distal ends,
- b) a clevis, pivotally attached to the distal end of said heavy duty beam member by a pin means extending through the upper and lower surfaces of the distal end thereof,
- c) a pivoting means for said clevis, located between the upper and lower surfaces of said heavy duty beam member,
- d) a bracket means attached directly to a utility vehicle,
- e) a roller plate to which the proximal end of said horizontal beam member is attached, movably connected by upper and lower rolling means to said bracket means, and
- f) a spear having proximal and distal ends, attached at its proximal end to said clevis.

5,437,529

# CONVEYING SYSTEM

Takuya Kakida; Shoiti Okada; Yoshiaki Nakamura; Akira Mikami; Akiyoshi Kimura, all of Kurashiki, and Yuji Watanabe, Kojima, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP92/01255, § 371 Date Jul. 27, 1993, § 102(e)

Date Jul. 27, 1993, PCT Pub. No. WO93/07042, PCT Pub.

Date Apr. 15, 1993

PCT Filed Sep. 30, 1992, Ser. No. 66,011

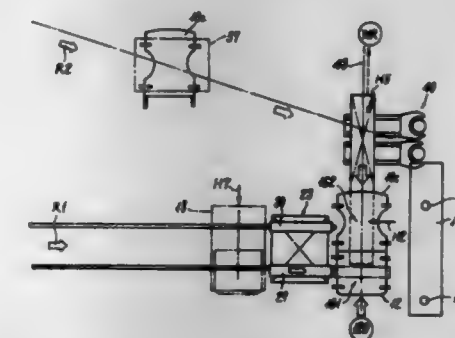
Claims priority, application Japan, Sep. 30, 1991, 3-079300 U;

Sep. 30, 1991, 3-079304 U; Sep. 30, 1991, 3-079305 U

Int. Cl.<sup>6</sup> B65H 5/00

U.S. Cl. 414-225

5 Claims



1. A conveying system for conveying in a combined manner a plurality of types of first body components having different shapes from a first supply means and one type of second body component from a second supply means, comprising:

- a first lift which is disposed near the first supply means and is operable between a component receiving area for receiving the first body component from the first supply means, a first transfer area for delivering the first body component of a first type and a second transfer area for delivering the first body component of a second type;
- a first carrier for conveying the second body component from the second supply means;
- a first fork lift which receives the first body component of the first type from the first lift at the first transfer area and transfers the first body component onto the first carrier, and is disposed near the first lift;
- a second lift for receiving the first body component of the second type from the first lift at the second transfer area, the second lift being disposed near the first lift;
- a second carrier for conveying the first body component of the second type from the second lift, the second carrier being disposed near the second lift;
- a third lift for conveying the first body component of the second type from the second carrier, the third lift being disposed above a running path of the second carrier;
- a second fork lift for receiving the first and second components from the first carrier, the second fork lift being disposed from the running path of the first carrier; and
- a fourth lift for receiving the first body component of the

first type and the second body component form the first carrier, delivering the components to the next processing station from the second fork lift, the fourth lift delivering, by using the second fork lift, the second component from the first carrier and the first component of the second type from the third lift to a predetermined destination.

5,437,530

## HIGH-SHELF STORAGE APPARATUS

Harald Beckmann, Gevelsberg, Germany, assignor to Maschinenfabrik Alfred Schmeemann GmbH & Co., Gevelsberg, Germany

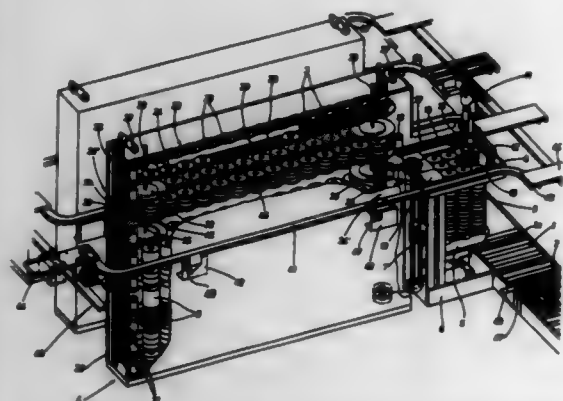
Filed Mar. 30, 1993, Ser. No. 40,260

Claims priority, application Germany, Mar. 31, 1992, 42 10 592.7

Int. Cl.<sup>6</sup> B65G 1/00, 1/133

U.S. Cl. 414—331

20 Claims



1. A multi-tier system for the temporary storage of consumable stackable products which are utilized at a rate of consumption, stacks of products being delivered to said system on reusable carriers, the products having an axis, the carriers having a maximum capacity defined by the maximum number of products that can be carried, and each carrier and stack of products having a height, said storage system comprising:

a plurality of storage tiers situated in a vertical array to define a shelf unit having plural storage tiers for the products, each of said tiers defining a single generally horizontal product support surface comprising a rotary conveyor having a plurality of horizontally adjacent product support positions, each of said rotary conveyors comprising a drive means, each of said rotary conveyors having a capacity, said conveyor capacity being definable by the maximum capacity of a carrier wherein said rotary conveyor capacity is greater than the maximum capacity of a carrier, said conveyors having vertically aligned loading positions and vertically aligned unloading positions, said loading and unloading positions being horizontally displaced and being oppositely disposed relative to said shelf unit;

first transfer means for delivering products to said rotary conveyors, said first transfer means comprising:

supply conveyor means for delivering stacks of products to be stored to a said loading position of said plurality of storage tiers; and

means for transferring the products from said supply conveyor means to selected ones of said rotary conveyors; second transfer means for retrieving products from said rotary conveyors, said second transfer means being adjacent a said unloading position of said plurality of storage tiers, said second transfer means comprising:

a plurality of distributor means, each of said distributor means including a plurality of product receivers and means defining a path of movement for said receivers, each of said path defining means being located intermediate an uppermost and a lowermost rotary conveyor of said

plurality of tiers, each of said path defining means locations defining a vertical position, the vertical position of each of said path defining means being an integral multiple of the vertical height of said plurality of tiers divided by the number of said distributor means increased by one; and means for selectively engaging products stored on said rotary conveyors and moving said products from said conveyors to said distributor means receivers; wherein products are stored as a function of product throughput rate such that the lower the rate of throughput the further the product will be stored from said plurality of distributor means.

5,437,531

## VEHICLE FOR REACHING, LIFTING, RETRACTING, STACKING AND CARRYING LOADS

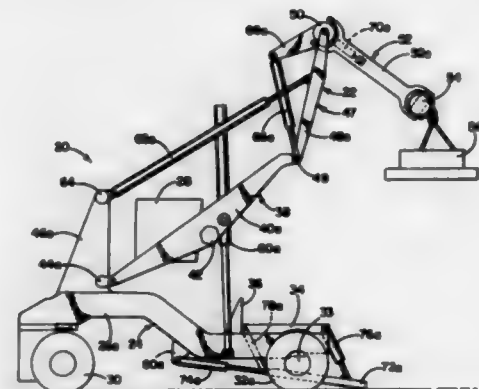
Edward S. Kress, Brimfield, Ill., assignor to Kress Corporation, Brimfield, Ill.

Filed Jun. 16, 1993, Ser. No. 78,607

Int. Cl.<sup>6</sup> E02F 3/36

U.S. Cl. 414—555

14 Claims



1. A load handling vehicle, comprising, in combination, a main frame, a plurality of wheels supporting said main frame and defining the wheelbase of said vehicle,

lift means including a lift frame pivoted to said main frame and power means for pivotally raising and lowering said lift frame relative to said main frame,

reach and retract means including an articulated tilt frame pivotally connected to said lift frame and an articulated swing frame pivotally connected to said tilt frame, said swing frame including at least one generally rearwardly projecting swing arm,

load securing and releasing means carried by said swing frame for connecting a load thereto,

articulating power means including tilt power means for pivoting said tilt frame relative to said lift frame and swing power means for swinging said swing frame outwardly relative to said tilt frame for securing or releasing a load located outboard of said main frame and said wheelbase and for swinging said swing frame inwardly relative to said tilt frame for carrying said load inboard of said wheelbase,

said swing power means including at least one hydraulic piston and cylinder combination interconnected between said swing arm and said tilt frame,

said swing frame including a transversely extending portion mounted on said tilt frame for pivotal movement thereon about a generally horizontal transverse axis, said swing arm being connected to said transverse portion for imparting and resisting pivotal movement thereof and including at least one generally downwardly extending strut connected to said transverse portion for supporting said load securing means for lateral swinging movement about a

generally longitudinally extending axis substantially perpendicular to said transverse axis, and power shift means for laterally shifting the depending end of said strut about said longitudinal axis.

5,437,532

## CONTROL SYSTEM FOR LATCH THAT SECURES LOADER YOKE MEMBER TO TRACTOR FRONT-END WEIGHT BRACKET OR BUMPER

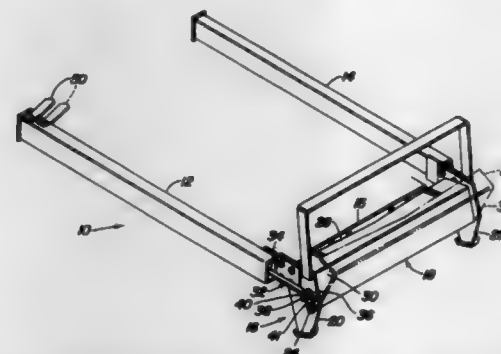
Edward T. Kaczmarezyk, Welland, and Roger A. Noyes, Stevensville, both of Canada, assignors to Deere & Company, Moline, Ill.

Filed Apr. 28, 1994, Ser. No. 234,451

Int. Cl.<sup>6</sup> B66F 9/00

U.S. Cl. 414—686

12 Claims



5. In a tractor-mounted loader including a U-shaped yoke member having a bight portion joining forward ends of opposite yoke legs and carrying a latch of L-shaped cross section mounted for pivotal movement about a horizontal transverse axis and being selectively movable, through means of an actuator assembly including a rod extending along one of the legs, between closed and open positions, the improvement comprising: means coupling a forward end of said rod to said latch so as to effect forward pivoting movement of said latch from said closed position in response to forward movement of said rod and to effect rearward pivoting movement of said latch from said open position in response to rearward movement of said rod; said actuator assembly further including a lock member mounted to a rear end of said rod; a fore-and-aft extending slot being located in said one of the legs and including an enlarged rear end portion; and said lock member having first and second sections respectively of a cross sections complementary to said enlarged rear end portion of said slot and to an adjoining portion of said slot extending forwardly from said enlarged rear end portion; said first section of said lock member being selectively locatable in said enlarged rear end portion of said slot to establish a locked condition in said rod corresponding said closed position of said latch, the second section of the lock member being registrable with said adjoining portion of slot for movement to a forward end thereof to establish an unlocked condition corresponding to the open position of said latch.

5,437,533

## THRU-FLOW PALLETIZER/DEPALLETIZER

Richard H. VanderMeer, and Donald J. Simkowski, both of Loveland, Colo., assignors to Goldco Industries, Inc., Loveland, Colo.

Filed Mar. 11, 1993, Ser. No. 29,554

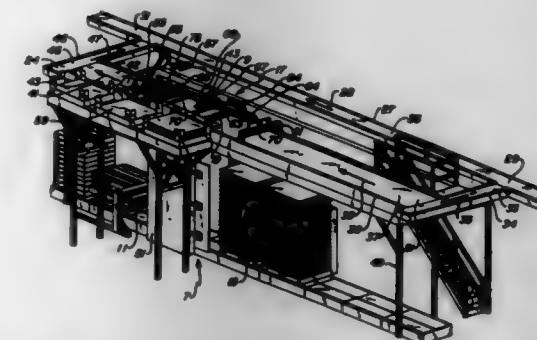
Int. Cl.<sup>6</sup> B65G 60/00

U.S. Cl. 414—789.5

20 Claims

11. A method for diverting and storing cans in conjunction with conveying of cans along a predetermined continuous path that includes a first location and a second location spaced along said predetermined continuous path from said first location, said method comprising:

diverting cans from said predetermined continuous path at said first location; moving said diverted cans to a pallet at a storage area and placing said cans on said pallet;



removing cans stored on said pallet and moving said removed cans toward said second location of said predetermined continuous path; and inserting said removed cans into said predetermined continuous path at said second location.

5,437,534

## LIFT INDEX TABLE

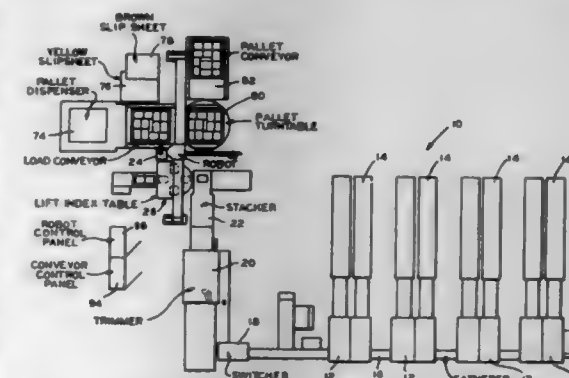
Charles C. Gales, Landisville, Pa., assignor to R. R. Donnelley & Sons Company, Lisle, Ill.

Filed Jan. 21, 1992, Ser. No. 822,881

Int. Cl.<sup>6</sup> B65G 57/00, 47/26; B42C 13/00

U.S. Cl. 414—789.9

15 Claims



1. In a binding line with means to make books with a backbone, and a stacker adapted to form a loose lift of said books wherein the improvement comprises:

a horizontal rotary index table with a plurality of separate lift index stations and spaced infeed and outfeed index positions, each of said lift index stations includes horizontal support means adapted to receive and support a loose lift of said books from said stacker at said infeed index position, each of said lift index stations also including means for minimizing relative motion between the books in a loose lift as said lift index stations are moved in an index fashion from said infeed index position to said outfeed index position remote from said stacker, and means for driving said horizontal rotary index table in said index fashion;

means for compressing a loose lift of said books to decrease the backbone buildup at an intermediate index position between said infeed and outfeed index positions; means for horizontally ejecting loose lifts of books from said lift index stations of said rotary index table at said outfeed index position; and

said means for minimizing relative motion between the books in a loose lift includes a loose lift rear support means and a pair of loose lift side support means, and means for



adjusting the positions of at least said side support means to receive different sizes of said loose lifts of books.

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## BRICK DEHACKER

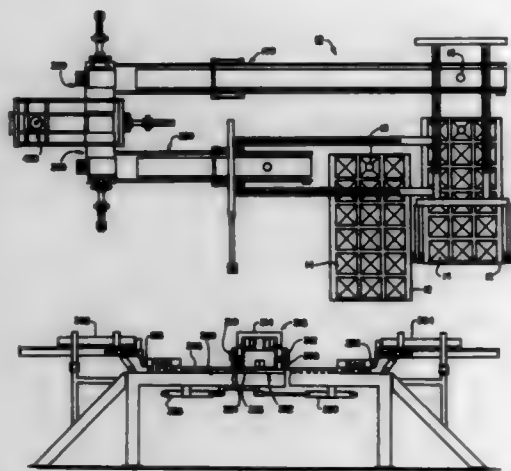
Harry D. Leeds, Clarksville, Ark.; Thomas M. Fisher, Enka, and Paula S. Fana, Asheville, both of N.C., assignors to Artech, Clarksville, Ark.

Filed May 28, 1993, Ser. No. 69,011

Int. Cl.<sup>6</sup> B65G 57/32

U.S. Cl. 414—790.3

21 Claims



1. An apparatus for selectively combining and alternating courses of brick removed from at least two kiln cars in preparation for stacking and strapping, said apparatus comprising:

- (a) a first split table having a stop along one edge for accumulating and moving a predetermined number of brick arranged in at least one row removed from a first kiln car;
- (b) a second split table having a stop along one edge for accumulating and moving a predetermined number of brick arranged in at least one row removed from a second kiln car, wherein the stops of said first and second split tables are generally parallel and aligned with respect to one another; and
- (c) a discharge pusher assembly located transversely to said first and second split tables for selectively discharging brick from said first split table, said second split table, and said first and second split tables, wherein said discharge pusher assembly includes: a frame; a fluid operated cylinder attached at one end to said frame; and a plate attached to the other end of said cylinder, wherein said plate includes at least one aperture which may be selectively opened to permit said plate to pass over said stops located along one edge of each of said split tables.

5,437,536

## VEHICLE PARKING APPARATUS AND METHOD FOR ITS OPERATION

Edoardo G. Bianca, Zollikon, Switzerland, assignor to Sotefin S.A., Schmelbach, Switzerland

Filed Nov. 3, 1993, Ser. No. 147,378

Claims priority, application Switzerland, Nov. 3, 1992, 83410/92

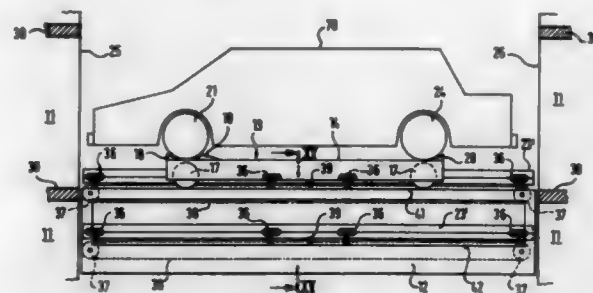
Int. Cl.<sup>6</sup> B65G 1/04

U.S. Cl. 414—239

50 Claims

1. Vehicle parking apparatus for use in a multi-story car park having a plurality of stories and parking boxes (11) provided in rows in said stories, the apparatus comprising at least one lift platform (12) movable between said stories, a plurality of pallets (13) each adapted to carry a vehicle to be parked, said lift platform (12) being adapted to carry at least one of said pallets, pallet drive means (32) provided on said lift platform for shifting a pallet in a direction of travel from said lift plat-

form into a parking box and for shifting a pallet (13) in a parking box (11) in a direction opposite to said direction of travel onto said lift platform (12), each said pallet (13) comprising first and second wheel supporting beams (14) for wheels of said vehicle, each wheel supporting beam extending parallel to said direction of travel, having front and rear ends and a substantially inverted U-shape and forming a wheel carrying top surface, first and second side flanks with respective first and second lower longitudinal edges and respective outwardly directed angled flanges (15) at each of said first and second longitudinal edges, the apparatus further comprising a plurality of plates (16) connecting said first and second longitudinal edges at intervals along each wheel carrying beam and cooper-



ating therewith to form box sections, wheel means (17) at each of said front and rear ends permitting rolling of said pallet in said direction of travel and in said direction opposite thereto, and front and rear cross-beams (18, 19) secured to said wheel carrying top surfaces of said first and second wheel supporting beams and connecting them together at a desired lateral spacing from each other, said wheel supporting beams (14) each having a length between said front and rear ends corresponding to a maximum wheel base of a vehicle to be carried, said lateral spacing corresponding to a track width of a vehicle to be carried and said front cross-beam (18) forming an abutment for front wheels of a vehicle on said pallet and said rear cross-beam (19) forming an abutment for rear wheels of a vehicle on said pallet.

5,437,537

## CART LOADING MACHINE

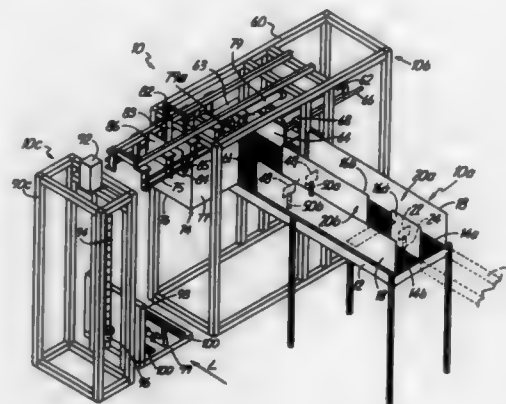
Robert P. Sweet, Red Wing; Mark R. Rosa, Inver Grove Heights; Alexander Vigdorovich, St. Paul; James E. Kovacs, and Patrick J. Geraghty, both of Minneapolis, Minn., assignors to Cannon Equipment Company, Cannon Falls, Minn.

Filed Jun. 6, 1991, Ser. No. 711,675

Int. Cl.<sup>6</sup> B65G 67/04

U.S. Cl. 414—400

32 Claims



1. An apparatus for loading successive layers of objects onto cart means, comprising:

- arranging means for arranging and delivering a plurality of the objects to a first loading position in a loading means, the arranging means including conveying means having a

drive means and first and second separate conveying lanes extending parallel to each other for conveying the objects from intake ends thereof to the first loading position, the first lane intake end for receiving the objects from a conveyed source thereof and the conveying means having a first regulating means at the first lane intake end for regulating the progression of the objects along the first lane, and the conveying means having transfer means intermediate the first regulating means and the first loading position for selectively transferring individual objects from the first lane to the second lane for permitting the formation at the first position of a symmetrically arranged group of the objects consisting of one or more pairs of the objects;

the loading means including moving means and carrier means, the moving means for moving the arranged group from the first loading position onto the carrier means when the carrier means is located at a second loading position, the carrier means operable to move the arranged group from the second loading position to an unloading position, and the carrier means and the moving means operable in a common linear direction transverse to the direction of travel of the objects along the conveying means,

lift means for providing lifting and lowering of the cart means to a plurality of positions, the cart means having an interior volume for holding one or more layers of the arranged group, and the lift means positioned with respect to the carrier means and the cart means positioned on the lift means so that the carrier means is movable into the cart means interior volume wherein when the carrier means is in the unloading position the arranged group is located substantially within the cart means interior volume,

and the loading means including retaining means for retaining the arranged group in the cart means when the carrier means moves from the unloading position back to the second loading position so that the arranged group of objects is deposited in the cart means, and control means connected to the first regulating means, the transfer means, the moving means, the carrier means, the retaining means and the lift means for providing controlled operation thereof so that successive layers of the arranged group can be loaded onto the cart means.

5,437,538

## PROJECTILE SHIELD

Stephen C. Mitchell, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 52,804, Apr. 26, 1993, abandoned,

which is a continuation of Ser. No. 826,299, Jan. 27, 1992, abandoned, which is a continuation of Ser. No. 539,243, Jun. 18, 1990, abandoned. This application Oct. 28, 1993, Ser. No. 144,098

Int. Cl.<sup>6</sup> F01D 25/24; F04D 29/40

U.S. Cl. 415—9

18 Claims

1. A projectile shield comprising a ballistic fabric including a plurality of interlaced ballistic strands and a plurality of mutually parallel ballistic strands interlaced with said interlaced strands, said interlaced ballistic strands being interlaced in an overlapping pattern wherein each of interlaced strands is positioned under two adjacent ones of said interlaced strands in turn and disposed diagonally with respect to said parallel ballistic strands, wherein said ballistic fabric is able to absorb the energy of an impact upon said fabric by a projectile through the scissoring action of adjacent interlaced ballistic strands, whereby said adjacent interlaced ballistic strands move toward each other and decrease the space therebetween.

9. A blade containment structure for surrounding a rotatable disk including a plurality of blades extending radially outward therefrom in a gas turbine engine, comprising:

- an annular inner casing surrounding said blades; and
- an annular projectile shield disposed radially outwardly of said inner casing, said projectile shield further comprising

a ballistic fabric including a plurality of interlaced ballistic strands and a plurality of mutually parallel ballistic strands interlaced with said interlaced ballistic strands, said interlaced ballistic strands being interlaced in an overlapping pattern wherein each or said interlaced strands is positioned under two adjacent ones of said interlaced strands and over two adjacent ones of said interlaced strands in



turn and diagonally with respect to said parallel ballistic strands, wherein said ballistic fabric is able to absorb the energy of an impact upon said fabric by a projectile through the scissoring action of adjacent interlaced ballistic strands, whereby said adjacent interlaced ballistic strands move toward each other and decrease the space therebetween.

5,437,539

## APPARATUS FOR THE DYNAMIC CONTROL OF ROTATING STALL AND SURGE IN TURBO MACHINES AND THE LIKE

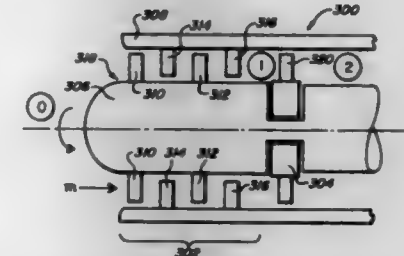
Daniel L. Gysling, Newton, and Jonathan S. Simon, Somerville, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 918,510, Jul. 22, 1992, abandoned. This application Feb. 17, 1994, Ser. No. 197,657

Int. Cl.<sup>6</sup> F04D 19/02, 27/02

U.S. Cl. 415—68

20 Claims



1. A compressing turbo machine comprising:

- a. a rotatably mounted axial blade row rotor carrying a first compressing blade row; and
- b. at least one free-rotor, the at least one free-rotor:
  - i. spaced from the compressing blade row so as to provide aerodynamic feedback to the compressing blade row;
  - ii. mounted freely rotatably with respect to the compressing blade row; and
  - iii. having a blade row of angled blades, with the stagger angle of the blades such that the magnitude of the rotational speed of the free-rotor at its steady state maximum mass flow operating conditions is at least 0.5 times

the magnitude of the rotational speed of the compressing blade row rotor at its steady state maximum mass flow operating conditions.

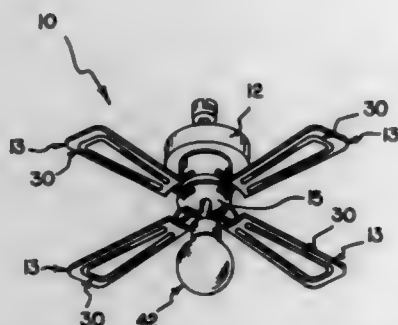
5,437,540

**ILLUMINATED BLADE, CEILING FAN APPARATUS**  
Blaine T. Blocker, and Eva B. Blocker, both of 37-33 29th St.,  
#17, Long Island City, N.Y. 11101

Filed Sep. 27, 1993, Ser. No. 127,183  
Int. Cl.<sup>6</sup> F04D 29/00

U.S. Cl. 416-5

8 Claims



1. An illuminated blade, ceiling fan apparatus which includes a stationary housing assembly which houses a fan motor and which is adapted to be supported by a ceiling and which includes a rotatable support assembly, driven by the fan motor, for supporting a plurality of fan blade assemblies which support respective sources of illumination, said apparatus comprising:

a circular planar electrical contact assembly which includes a first circular planar conductor and a second circular planar conductor spaced from said first planar conductor such that said first planar conductor and said second planar conductor are not in electrical contact with each other, and

a brush contact assembly which includes brushes for providing sliding electrical contact with said first planar conductor and said second planar conductor when there is relative rotation between said circular planar electrical contact assembly and said brush contact assembly,

wherein the respective sources of illumination supported by the fan blade assemblies are in circuit with said circular planar electrical contact assembly and said brush contact assembly, such that said sources of illumination are energized when said brush contact assembly is in electrical contact with said first circular planar conductor and said second circular planar conductor,

wherein:

said circular planar electrical contact assembly rotates with the fan blade assemblies and is supported by the rotatable support assembly, and

said brush contact assembly is stationary and is supported by the stationary housing assembly.

5,437,541

**BLADE FOR AXIAL FAN**

John Vainrub, Apartado 80790, Caracas 1080A, Venezuela  
Filed Dec. 30, 1993, Ser. No. 175,768

Int. Cl.<sup>6</sup> F01D 5/12

U.S. Cl. 416-223 R

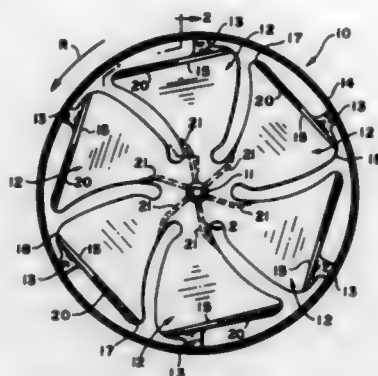
18 Claims

1. A blade for an axial fan comprising:

a central hub;

a plurality of vanes extending radially outward from said central hub, each of said plurality of vanes having a front face, a back face, a leading edge, a trailing edge, an outer edge, a winglet disposed on said front face and extending outwardly therefrom, said winglet having a length so as to extend along said outer edge, and said winglet having a

width and a height which decrease along said length from said leading edge toward said trailing edge; and



an outer ring being disposed radially outward from and being connected to said vanes.

5,437,542

**POSITIVE DISPLACEMENT PUMP SYSTEM**

James H. Ewing, Lexington, Mass., assignor to MKS Instruments, Inc., Andover, Mass.

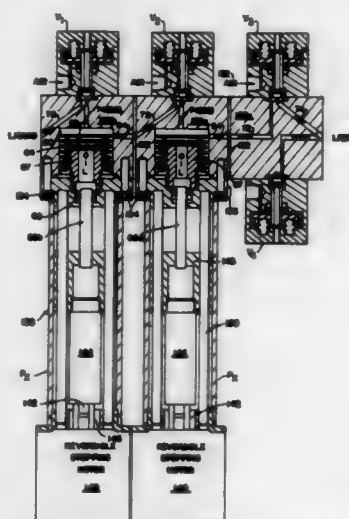
Division of Ser. No. 96,685, Jul. 23, 1993, abandoned, which is a division of Ser. No. 751,173, Aug. 28, 1991, Pat. No. 5,371,828.

This application Mar. 22, 1994, Ser. No. 216,490

Int. Cl.<sup>6</sup> F04B 3/00

U.S. Cl. 417-258

22 Claims



1. A positive displacement pump system for delivering liquid at a substantially continuous and constant volumetric rate and pressure, said pump system comprising (a) first and second reciprocal pump means each reciprocally operable between delivery and filling phases, said first and second pump means being interconnected to one another so that the first pump means fills with liquid while said second pump means is delivering liquid, and the first pump means delivers liquid to the second pump means while said first pump means is delivering liquid, said first pump means delivering a predetermined volume of liquid at a faster rate during its delivery phase than the second pump means fills during its filling phase, so that the first pump means simultaneously fills the second pump means and delivers liquid during its delivery phase, and (b) valve means, including a valve connected between the first and second pump means, for controlling the delivery of liquid from the first pump means to the second pump means to insure that the liquid is at a predetermined pressure before the liquid is delivered by the first pump means to the second pump means in

order to insure delivery of liquid from said pump system at a substantially continuous and constant volumetric rate and pressure.

5,437,543

**SCROLL TYPE REFRIGERANT COMPRESSOR WITH MEANS FOR IMPROVING AIRTIGHT SEALING OF COMPRESSION CHAMBERS**

Kunifumi Goto; Shinya Yamamoto; Tetsuhiko Fukunuma; Yasushi Watanabe, and Kiyohiro Yamada, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

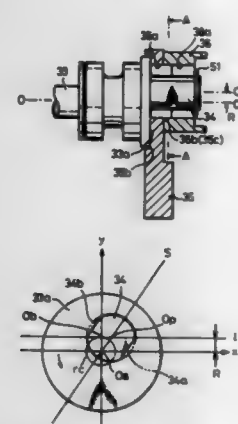
Filed Nov. 24, 1993, Ser. No. 157,829

Claims priority, application Japan, Nov. 26, 1992, 4-317101; Mar. 31, 1993, 5-073376

Int. Cl.<sup>6</sup> F01C 1/04

U.S. Cl. 418-55.5

5 Claims



1. A scroll type refrigerant compressor adapted for use in, for example, a vehicle refrigerating system, comprising:

an axial housing means forming an outer casing of the compressor and defining a refrigerant suction passage means, a discharge chamber and a compression organizing chamber receiving therein a compressing means, said housing means having an axis thereof extending axially at a substantially center portion thereof;

a stationary scroll means stationarily encased in said housing means and including a stationary spiral member and a stationary end plate member attached to an end of said spiral member;

a movable scroll means engaged with said stationary scroll means and moving along a predetermined orbiting path with respect to said stationary scroll means to thereby define compression chambers between both scroll means;

a drive shaft supported in said housing means via a bearing means so as to be rotated about an axis of rotation thereof, and having an axial shaft portion and a large diameter portion formed at an innermost portion of said axial shaft portion;

a drive key member projecting from an end of said large diameter portion of said drive shaft; and,

a drive bushing member slidably engaged with said drive key member of said drive shaft and having a central axis thereof parallel with the axis of rotation of said drive shaft, said drive bushing member operatively engaged with said spiral member of said movable scroll means via a bearing means so as to drive said movable scroll means to move along the predetermined orbiting path in cooperation with means for preventing rotation of said movable scroll means about its own central axis during rotation of said drive shaft, and;

said stationary scroll means, said movable scroll means, said axial drive shaft, said drive key member, and said drive bushing member forming said compressing means suc-

cceedingly for compressing the refrigerant gas in said compression chambers;

wherein said drive key member is formed as an axial columnar mechanical member having a central axis thereof parallel with the axis of rotation of said drive shaft and a diametrical axis thereof intersecting the central axis of the drive key member at a predetermined point, said diametrical axis of said drive key member being arranged so as to intersect the axis of rotation of the drive shaft and be angularly shifted by a predetermined angle in a direction reverse to a rotating direction of said drive shaft with regard to a predetermined axis passing through the axis of rotation of said drive shaft, said predetermined point of said drive key member being arranged in an area extending in a direction reverse to the rotating direction of said drive shaft with regard to a line connecting the axis of rotation of said drive shaft and the central axis of said drive bushing member, said drive key member further having planar faces disposed on both sides of the diametrical axis thereof, and two spaced ends extending so as to interconnect between said planar faces, each of said two spaced ends being some distance from the central axis of said drive shaft.

5,437,544

**FLATTENING AND REMOVING DEVICE FOR A PLASTIC TUBULAR FILM WEB PRODUCED IN A BLOWING PROCESS**

Fritz Achelpohl, Lienen, Germany, assignor to Windmüller & Hölscher, Lengerich/Westf., Germany

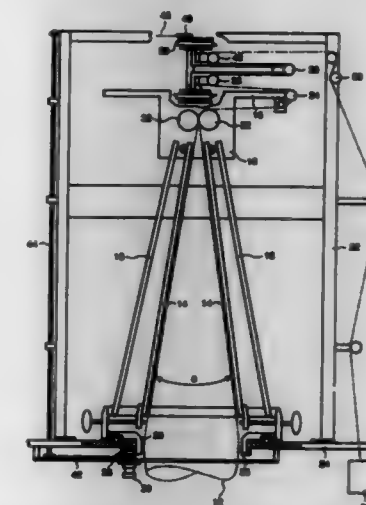
Filed Dec. 17, 1993, Ser. No. 168,255

Claims priority, application Germany, Dec. 18, 1992, 42 43 106.9; Feb. 10, 1993, 43 03 952.9

Int. Cl.<sup>6</sup> B29C 47/08

U.S. Cl. 425-72.1

5 Claims



1. A flattening and removing device for a plastic tubular film web produced by a stationary film blowing head in a blowing process, said device comprising:

flattening plates and squeezing rollers which are guided reversibly about an axis of a fed tubular film,

a stationary treatment device mounted downstream of said squeezing rollers, and

first and second radially outward reversing deflecting rollers and first and second radially inward turning bars, over which the tubular film is led between the squeezing rollers and the treatment device,

wherein the deflecting rollers are each spaced from a respective rotating axis thereof at a greater distance than a distance of the turning bars from a swivel axis thereof and each said deflecting rollers is able to swing to every posi-



ble swinging position along its rotating axis without being impeded; and

- a) the first deflecting roller (34) and the squeezing rollers (32) are mounted parallel to each other between mounting plates (16), wherein the mounting plates are mounted rigidly to a turntable (20), said turntable being rotatably mounted in a frame floor (24),
- b) the second deflecting roller (38) is connected to a retainer (66) by way means of a support frame (70), with ends of the retainer (66) being eccentrically connected to first and second gearwheels (62, 68),
- c) the first and second turning bars (36, 40) are respectively connected to third and fourth gearwheels (56, 80) by support frames (60, 84),
- d) center lines of each of the gearwheels (56, 62, 68, 80) are aligned with each other and with an imaginary swivel axis of the deflecting rollers (34, 38) and turning bars (36, 40), and
- e) the first gearwheel (62) of the second deflecting roller (38) and the fourth gearwheel (56) of the second turning bar (40) are each driven by a pinion (52, 54) arranged unrotatably a shaft and the third gearwheel (80) of the first turning bar (36) meshes with a pinion (79) having a rotary movement which is transmitted by means of a pinion (76) of the second gearwheel (68) of the second deflecting roller (38).

5,437,545

#### METHOD AND APPARATUS FOR EXTRUDING POWDERED MATERIAL

Yoshiaki Hirai, Tokyo, Japan, assignor to Hitachi Powdered Metals Co., Ltd., Chiba, Japan

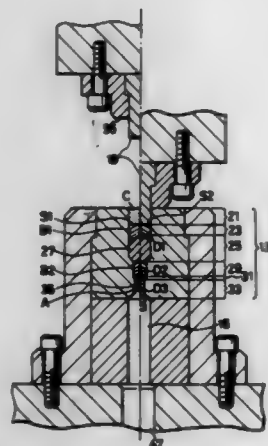
Filed May 28, 1993, Ser. No. 68,084

Claims priority, application Japan, Jun. 5, 1992, 4-170029

Int. Cl.<sup>6</sup> B29C 47/00

U.S. Cl. 425—79

11 Claims



1. An extrusion apparatus for extruding a powdered material, including a longitudinal die cavity into which the powdered material is charged, and a punch being adapted to be applied to an inlet of the die cavity for longitudinally pressing the powdered material charged in the die cavity to extrude the powdered material from an outlet of the die cavity, in which the die cavity comprises:

- a constriction passage with an inclined surface for narrowing the constriction passage, said constriction passage constricting the powdered material by means of pressure from the punch longitudinally applied to the charged powdered material so that the powdered material is laterally compressed through the constriction passage into a consolidated mass product of the powdered material; and
- a core piece arranged between the inlet and the constriction passage and spaced from the constriction passage, for distorting the powdered material as the powdered material passes over the core piece so that border surfaces

which are formed between two successively charged portions of the powdered material when the powdered material is repeatedly charged are broken, whereby said two successively charged portions of the powdered material are continuously connected to each other at the constriction passage while said two successively charged portions are compressed.

5,437,546

#### APPARATUS FOR COOLING OF A FILM, FOIL OR SHEET

Raymond Dupraz, Aix-les-Bains, France, assignor to Darlet Marchante Technologie S.A., Le Bourget du Lac, France

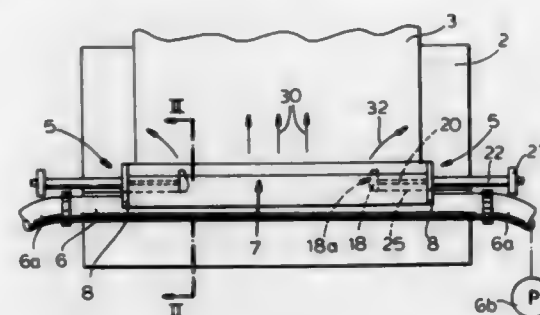
Filed Oct. 26, 1993, Ser. No. 143,568

Claims priority, application France, Oct. 26, 1992, 92 13072

Int. Cl.<sup>6</sup> B29D 7/00

U.S. Cl. 425—223

5 Claims



1. An apparatus for cooling a layer, comprising a cooling drum having a horizontal axis and a cylindrical exterior surface upon which a layer to be cooled can be deposited; and means above said drum for directing a sheet of air against said exterior and said layer thereon, said means for directing said sheet of air including: a duct extending horizontally above said drum and said layer along at least a maximum width of said layer, means for connecting said duct to a source of air under pressure, a nozzle formation on said duct having end walls and converging toward a discharge slit, defined between a pair of longitudinally extending lips, directing said sheet of air against said layer, and a pair of flow deflectors each affixed to a respective means for adjusting a position of the respective deflector along the width of said layer relative to the respective end wall and extending from the respective end wall, said flow deflectors being of cross sections corresponding to that of said nozzle formation on said duct but received with play in said formation enabling shifting of the deflector therealong, said flow deflectors having surfaces turned toward one another which are convex toward one another and curved with a cross sectional profile of each deflector conforming generally in shape to an upper airfoil face of an aircraft wing, said surfaces of said flow deflectors having polar curves inclined toward respective outer edges of the layer for progressively deflecting air outwardly without flow separation of air flowing along the surface from the surface.

5,437,547

#### APPARATUS FOR INJECTION MOLDING

Donald Holton, Narragansett, R.I., and Antony Gill, Rochester, Mich., assignors to Becker Group, Inc., Warren, Mich.

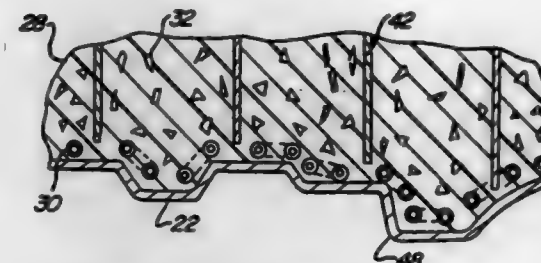
Division of Ser. No. 714,483, Jun. 13, 1991, Pat. No. 5,260,014.

This application Nov. 1, 1993, Ser. No. 146,933

Int. Cl.<sup>6</sup> B29C 45/73

U.S. Cl. 425—548

18 Claims



1. An injection mold comprising, in order, (a) a thin metallic layer forming an interior surface of the mold for molding an article; (b) a first thermoset plastic layer which contains (1) metal chips and (2) heat transfer tubing for the circulation of a heat transfer medium through the mold, wherein the tubing is adjacent to the metallic layer; (c) a second thermoset plastic layer; and (d) a plurality of metal plates embedded within both the first and second thermoset plastic layers, said plates approximately perpendicular to the metallic layer.

5,437,548

#### FUEL IGNITION SYSTEM AND METHOD OF MAKING THE SAME

Jay R. Katchka, Cypress, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 5,590, Jan. 19, 1993, Pat. No. 5,314,328.

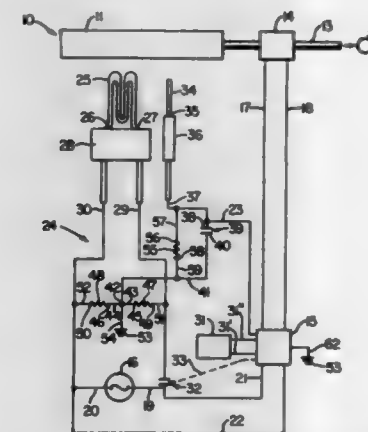
This application Apr. 21, 1994, Ser. No. 230,728

The portion of the term of this patent subsequent to May 24, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> F23N 5/00

U.S. Cl. 431—66

12 Claims



1. In a method of making a fuel ignition system for a burner means comprising an igniter having opposite ends, a source of alternating current having two power source leads for being respectively electrically interconnected to said opposite ends of said igniter for heating said igniter to ignition temperature thereof whereby said igniter emits electrons therefrom in relation to the temperature thereof, feeding means for feeding fuel from a source thereof to said burner means, and detecting means for detecting the condition of said igniter and being operatively associated with said feeding means to feed fuel to said burner means only when said detecting means detects that

said igniter is at ignition temperature, said detecting means comprising a member for receiving at least some of said emitted electrons, determining means operatively associated with said member for determining from the received electrons an emission rate of said electrons from said igniter, and operating means operatively associated with said determining means for operating said feeding means to feed said fuel only when the determined emission rate is at a certain level, the improvement comprising the steps of forming a lead means to have opposite ends one of which is electrically interconnected to said member and the other of which is electrically interconnected to ground, and electrically interconnecting a pair of resistors respectively to said two power source leads and to said lead means at a point thereof intermediate said ends thereof whereby said member is adapted to develop an electrical voltage that has a present magnitude that is related to the amount of emitted electrons that are being received by said member at that time.

5,437,549

#### GAS LIGHTER WITH SAFETY DEVICE

Masaki Saito, Shizuoka, Japan, assignor to Tokai Corporation, Shizuoka, Japan

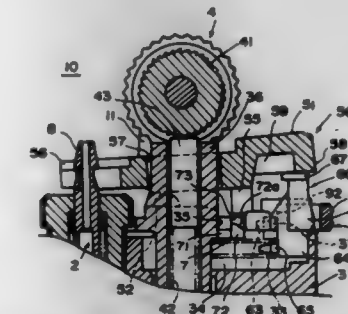
Filed Jun. 7, 1993, Ser. No. 72,775

Claims priority, application Japan, Jun. 12, 1992, 4-179067; Dec. 9, 1992, 4-329471

Int. Cl.<sup>6</sup> F23D 11/36

U.S. Cl. 431—153

2 Claims



1. A gas lighter with a safety device comprising: a lighter body having a fuel supply means which supplies fuel; an ignition means supported by the lighter body for igniting supplied fuel; an actuating lever having a pivot axis and first and second ends and engageably supporting the fuel supply means at the first end and a finger board part at the second end and provided with a skirt extending toward the lighter body along the periphery of the second end, the second end of the actuating lever having a recess surrounded by the skirt, and having a leg projecting toward the lighter body near one end of the skirt wherein the actuating lever causes the fuel supply means to give off fuel upon motion of the finger board part toward the lighter body; a locking means slidably supported for motion in a path extending perpendicular to the pivot axis at an end of the lighter body between a locking position at one end of the path and a release position between the locking position and the pivot axis, the locking means having an engaging partial recess formed adjacent to the lighter body and having a blocking end at a side opposite from the lighter body; a spring means operably disposed between the locking means and the lighter body to urge the locking means toward the locking position; and a holding means including a cantilever arm extending from a wall of the lighter body toward the path of motion of the locking means, the cantilever arm being provided with an angled engaging part for engaging the engaging recess of the locking means.

the locking means when the locking means is positioned at the release position and having a protuberance part capable of abutting against the projecting leg of the actuating lever when the actuating lever is positioned to cause release of fuel; and

an operating member which is transversely movable relative to the path of motion of the locking means toward and away from the finger board,

whereby a contact between the skirt of the actuating lever and the blocking end of the locking means prevents the actuating lever from moving to a position causing release of fuel when the locking means is situated at the locking position, and when the locking means is in the release position, the locking means is maintained stationary by the engagement of the recess of the locking means with the angled engaging part of the holding means, and the engagement of the blocking end of the locking means with the recess of the actuating lever enables the actuating lever to be moved to a position causing release of fuel which, in turn, causes the projecting leg of the actuating lever to engage the counterpart protuberance part of the holding member, thereby releasing the locking means, and the operating member engages a stopper protuberance of the lighter body when the operating member is moved to a position away from the finger board so that a further motion of the operating member is obstructed, and the operating member allows the locking means to be moved to the release position when the operating member is moved to a position adjacent to the finger board, and the operating member returns from the position adjacent to the finger board to the position away from the finger board upon motion of the actuating lever to a position causing release of fuel.

5,437,550

# METHOD AND MEANS FOR AFFIXING A COMPONENT TO A DENTAL IMPLANT

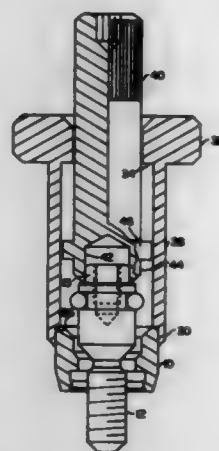
Keith D. Beatty, and Thomas S. Heylman, both of West Palm Beach, Fla., assignors to Implant Innovations, Inc., West Palm Beach, Fla.

Continuation-in-part of Ser. No. 16,538, Feb. 11, 1993, Pat. No. 5,322,443. This application Mar. 1, 1994, Ser. No. 208,212

Int. Cl.<sup>6</sup> A61C 3/00

U.S. Cl. 433-141

29 Claims



1. A tool for affixing a component to a support having a receiver member adapted to receive an attaching member for affixing said component, said tool forming an assembly comprising a first part for holding said component and a second part for holding said attaching member, and means to fix said parts in a substantially coaxial relation with said second part rotatable within first part, said second part having manipulator means at a first end of said second part, and holder means fixed to said first part and overlying said manipulator means for carrying said assembly and for holding said first part against

said support while rotating said second part within said first part with said manipulator means.

5,437,551

# DENTAL IMPLANT POST AND PROSTHESIS CONSTRUCTION

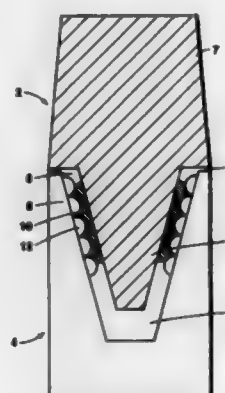
Paul R. Chalifoux, Wellesley, Mass., assignor to Wellesley Research Associates, Inc., Wellesley, Mass.

Continuation-in-part of Ser. No. 896,602, Jun. 10, 1992, Pat. No. 5,312,253, which is a continuation-in-part of Ser. No. 814,507, Dec. 30, 1991, Pat. No. 5,197,881. This application Jun. 14, 1993, Ser. No. 75,809

Int. Cl.<sup>6</sup> A61C 8/00

U.S. Cl. 433-173

26 Claims



1. A dental system for insertion into a bore of a jaw bone of a patient which comprises:

- a dental implant adapted to fit in a bore of said jaw bone, said dental implant having a central bore extending from a top surface of said implant through a portion of the vertical height of said implant,
- at least one first extension extending from and directly attached to a first wall of said central bore,
- a dental post having a stem section shaped to fit into said central bore and having a second wall with at least one second extension attached directly to said post and positioned to frictionally fit with said first extension to retain said dental post within said central bore.

5,437,552

# INTERACTIVE AUDIO-VISUAL WORK

Ralph H. Baer, Manchester, N.H., and Phillip E. Orbanes, Topsfield, Mass., assignors to Western Publishing Co., Inc., Racine, Wis.

Filed Aug. 13, 1994, Ser. No. 106,422

Int. Cl.<sup>6</sup> G09B 5/00

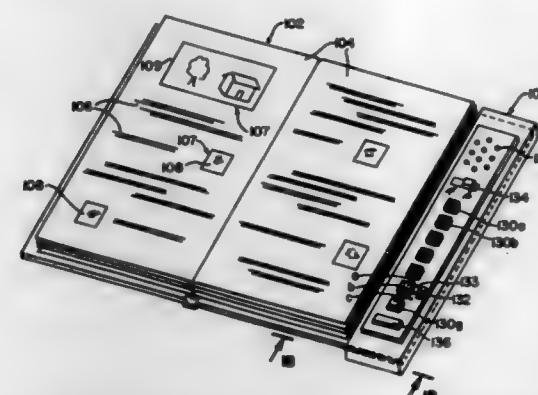
U.S. Cl. 434-317

30 Claims

1. Apparatus for use in conjunction with a book containing intermixed text and symbols, said apparatus comprising:

- (A) a microprocessor;
- (B) a randomly accessible sound storage-and-playback memory having addressable storage locations;
- (C) a plurality of actuatable selectors, each selector being associated with a respective symbol corresponding to a symbol in the book;
- (D) means for selecting between a recording mode of operation and a playback mode of operation;
- (E) means for recording at respective addressable storage locations in said memory respective sounds produced by the user, said recording means being active during the selected recording mode of operation; and

(F) means for playback from said memory of a respective recorded sound, said playback means being active upon



actuation of a respective one of said selectors during the selected playback mode of operation.

5,437,553

# METHOD AND APPARATUS FOR AUTOMATED LEARNING AND PERFORMANCE EVALUATION

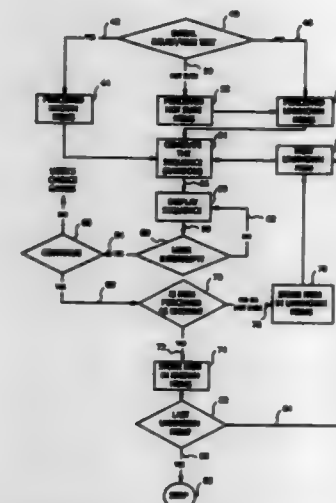
Deborah L. Collins, P.O. Box 667, Woodland Park, Colo. 80866, and Anne S. Blocker, 1422 Harbor View, Galveston, Tex. 77550

Filed Apr. 8, 1991, Ser. No. 682,428

Int. Cl.<sup>6</sup> G09B 5/00

U.S. Cl. 434-322

17 Claims



1. A method for teaching to a user a group of items where each of said items has a paired response, said method comprising:

- querying said user as to whether an item is perceived known or unknown;
- sorting each of said items into a first group of perceived known items and a second group of perceived unknown items;
- generating a sequence of subjective items including at least one of said first group and one of said second group; and
- displaying said sequence of subjective items with said respective paired response.

5,437,554

# SYSTEM FOR PROVIDING PERFORMANCE FEEDBACK TO TEST RESOLVERS

Jay V. Clark, West Liberty; William L. Bramlett, Jr., Swisher, and Judith Moyer, Iowa City, all of Iowa, assignors to National Computer Systems, Inc., Eden Prairie, Minn.

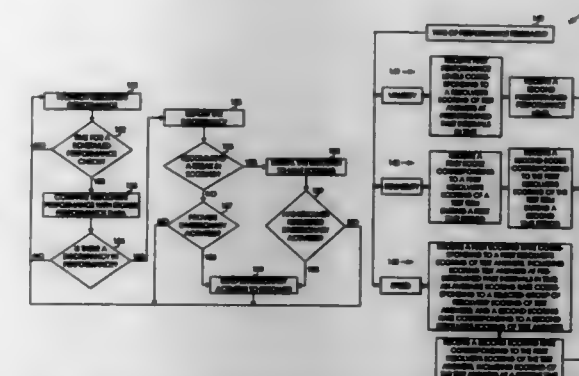
Filed Feb. 5, 1993, Ser. No. 14,176

The portion of the term of this patent subsequent to Jun. 14, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G09B 7/00

U.S. Cl. 434-322

24 Claims



1. A system for electronically providing performance feedback based upon a comparison of a test resolver's performance in scoring test answers to predetermined performance criteria, the system comprising:

- a) receive means for electronically receiving information related to a first performance level of a first resolver's scoring of test answers, and a predetermined performance level;
- b) comparison means for electronically comparing the first performance level and the predetermined performance level; and
- c) feedback means for electronically reporting a discrepancy based on predefined criteria between the first performance level and the predetermined performance level.

5,437,555

# REMOTE TEACHING SYSTEM

Jakob Ziv-El, Herzliya, Israel, assignor to Discourse Technologies, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 694,650, May 2, 1991, Pat. No. 5,263,869. This application Aug. 26, 1993, Ser. No. 112,103

The portion of the term of this patent subsequent to Nov. 23, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> G09B 7/00

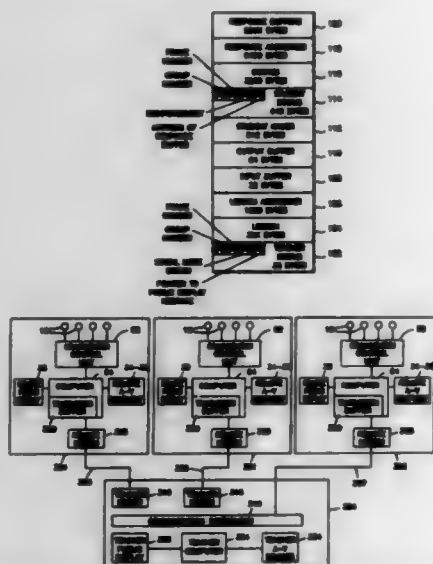
U.S. Cl. 434-336

21 Claims

- 18. An electronic teaching system, comprising:
  - (a) at least one group leader terminal;
  - (b) a plurality of participant terminals connected to the group leader terminal, wherein the participant terminals collectively address a frame without a particular programmed correct response;
  - (c) communication control means for receiving multi-character responses from the participant terminals;
  - (d) means for storing student responses in a student response storage means;
  - (e) data processing logic means for simultaneously displaying the participant terminal multi-character responses on the group leader terminal as the participant terminal multi-character responses are received by the communication control means; and
  - (f) means for selecting from the group leader terminal one of the displayed participant terminal multi-character responses and immediately comparing the participant terminal multi-character response with other responses from the student response storage means, the responses being scored correct where a match occurs.



21. An electronic teaching system comprising:  
 (a) at least one group leader terminal;  
 (b) a plurality of participant terminals connected to the group leader terminal;  
 (c) subject matter storage means for storing a lesson program comprising a plurality of frames;  
 (d) communication control means for receiving multi-character responses from the participant terminals;  
 (e) means for storing student responses in a student response storage means;



- (f) data processing logic means for simultaneously displaying the participant terminal multi-character responses on the group leader terminal as the responses are received by the communication control means; and  
 (g) means for selecting from the group leader terminal one of the participant terminal multi-character responses and storing it as part of a frame in the subject matter storage means.

5,437,556

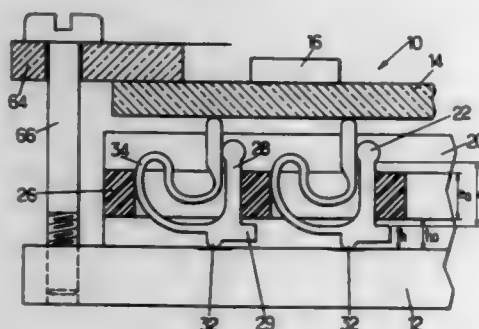
# INTERMEDIATE CONNECTOR FOR USE BETWEEN A PRINTED CIRCUIT CARD AND A SUBSTRATE FOR ELECTRONIC CIRCUITS

Raymond Bargain, Sartrouville; Jean Riverie, Limours, and Jean-Francois Ollivier, Versailles, all of France, assignors to Framatome Connectors International, Courbevoie, France  
 Filed Apr. 11, 1994, Ser. No. 225,730

Claims priority, application France, Apr. 9, 1993, 93 04264  
 Int. Cl.<sup>6</sup> H01R 23/72

U.S. Cl. 439—66

5 Claims



1. An intermediate connector intended to be mounted on a printed circuit card with a first face of the connector in contact with the card and to receive an electronic substrate on a second face thereof, said connector for interconnecting contact

areas provided on a surface of the substrate which confronts the card and tracks on the card, said connector comprising:  
 an insulating support in which regularly spaced passages are formed; and  
 a plurality of electrical signal contacts, each to connect a contact area to a track, and each disposed in one of at least some of the passages,  
 wherein at least some of the contacts are each constituted by a cut out piece of metal sheet and each having a rigid fastening branch for securing it to the support and an S-shaped flexible branch whose proximal end merges with the rigid branch and whose distal end projects beyond an upper face of the support, the flexible branch having such curvatures at rest that said distal end is then offset from the rigid branch and wherein each said passage has dimensions such that, on insertion of the contact into the passage, said passage deforms the flexible branch and brings a distal end portion thereof into electrical connection with the rigid branch, thereby constituting a short circuit, wherein each said passage is defined by a partition slidably receiving said rigid branch and having abutment shoulders that are spaced apart by a determined interval  $e_0$ , the abutment shoulder closest to the first face of the connector being at a first predetermined height  $h_0$  therefrom;  
 wherein the rigid securing branch extends along the passage includes two mutually facing abutment shoulders that are spaced apart by a determined interval  $e$  greater than the determined interval  $e_0$ ; and  
 wherein the distance  $h$  through which the contact projects from the shoulder of said rigid fastening branch which is closest to the second face is less than  $h_0$ .

5,437,557  
IC SOCKET

Hideki Sagano, Kawasaki, Japan, assignor to Yamaichi Electronics Co., Ltd., Tokyo, Japan

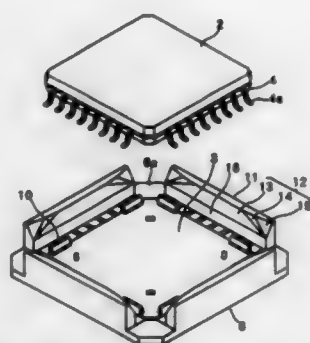
Filed Dec. 23, 1993, Ser. No. 172,174

Claims priority, application Japan, Dec. 25, 1992, 4-358431

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—72

14 Claims



1. An IC socket comprising:  
 a generally horizontal IC platform having an IC accommodation portion;  
 a restriction wall projecting upwardly from said IC platform at a periphery of said IC accommodation portion, said restriction wall having a vertical guide surface and a slanted guide surface;  
 wherein said slanted guide surface of said restriction wall includes a first slant portion inclined relative to said vertical guide surface, and a second slant portion inclined relative to both said vertical guide surface and a vertical plane which is perpendicular to said vertical guide surface; and  
 wherein said second slant portion of said slanted guide surface constitutes a means for correcting a horizontal orientation of a horizontally misoriented IC as the IC is being

inserted in said IC accommodation portion of said IC platform.

5,437,558

# CONNECTOR HAVING SKIRT WITH HOLES TO RECEIVE PLUG PINS AND ALIGNMENT PIN

Masahiko Sakuraoka; Kouichi Hara; Kiyoshi Kuwabara, and Misao Umematsu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

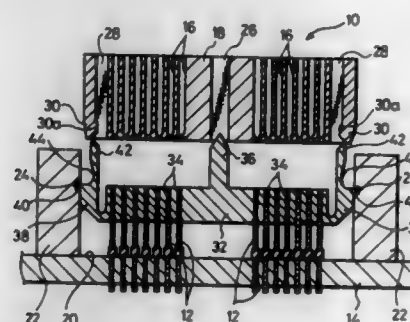
Filed Aug. 20, 1993, Ser. No. 109,264

Claims priority, application Japan, Feb. 1, 1993, 5-014784

Int. Cl.<sup>6</sup> H01R 13/44

U.S. Cl. 439—140

9 Claims



1. A connector comprising:  
 a plug member having a plurality of pin-like male contacts having free end portions;  
 a jack member having a plurality of female contacts for engagement with the pin-like male contacts; and  
 a skirt movably arranged in the plug member so that the skirt can be pushed by the jack member when the jack member is inserted into the plug member, the skirt having a plurality of holes for receiving the pin-like male contacts, respectively, and to hold the free end portions of the pin-like male contacts before the jack member is inserted into the plug member;  
 wherein the plug member has at least one locking groove means for supporting the skirt at a predetermined position, the skirt having at least one locking wall means engageable with the locking groove means of the plug member, the jack member having at least one engaging wall means engageable with the locking wall means of the skirt to release the engagement of the locking wall means from the locking groove means when the jack member is inserted into the plug member;  
 wherein the skirt has an alignment pin and the jack member has a locating hole to receive the alignment pin;  
 wherein the plug member comprises a bottom wall portion having the pin-like male contacts fixed thereto, and an annular wall portion surrounding the pin-like male contacts, the annular wall portion having an inner surface and the locking groove means being arranged on the inner surface, and the skirt comprises a generally flat plate, the locking wall means comprising an elastically deformable portion integrally formed with the plate and laterally extending toward the annular wall portion, whereby the locking wall means is disengaged from the locking groove means, with the elastically deformable portion being pushed and deformed by the engaging wall means of the jack member when the jack member is inserted into the plug member;  
 wherein the locking wall means slides along the inner surface of the annular wall portion of the plug member after the locking wall means is disengaged from the locking groove means; and  
 wherein the locking wall means comprises a first tongue extending outwardly toward the annular wall portion of the plug member to engage with the locking groove means, and a second tongue extending in the opposite direction from the bottom wall portion of the plug mem-

5,437,559

# ELECTRICAL CONNECTOR ASSEMBLY WITH AN IMPROVED OPERATING LEVER

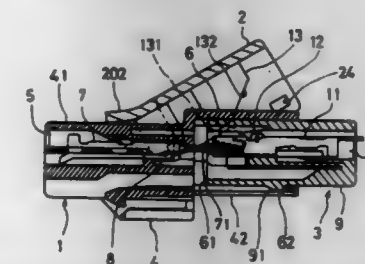
Hitoshi Okumura, and Yuichi Nankou, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan  
 Filed Sep. 27, 1994, Ser. No. 312,992

Claims priority, application Japan, Sep. 28, 1993, 5-265731

Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439—310

8 Claims



1. An electrical connector assembly comprising:  
 a) first and second connector housings fitted with each other;  
 b) a pair of terminals provided in the first and second connector housings respectively to be connected together when the first and second connector housing are fitted with each other;  
 c) an operating lever rotatably mounted on the first connector housing to be movable between a lying state in which the lever lies along an outer face of the first connector housing and a rising state in which the lever rises up relative to the outer face of the first connector housing;  
 d) a cam block provided in the second connector housing;  
 e) a cam projection provided on the operating lever for pushing the cam block of the second connector housing when the operating lever has been moved from the rising state to the lying state in the case where the first and second connector housings are fitted with each other, thereby displacing the second connector housing in a direction in which the first and second connector housings are fitted with each other; and  
 f) an elastic member provided on either the operating lever or the first connector housing to be elastically deformed when the operating lever is moved from the lying state to the rising state to urge the operating lever so that the operating lever returns to the lying state.

5,437,560

# CIRCUIT BOARD ELECTRICAL CONNECTOR WITH A DOUBLE CANTILEVERED LATCH

Shinji Mizuguchi, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 142,142, Oct. 28, 1993, abandoned.

This application Mar. 2, 1995, Ser. No. 397,719

Claims priority, application Japan, Apr. 9, 1993, 5-017992 U

Int. Cl.<sup>6</sup> H01R 9/09

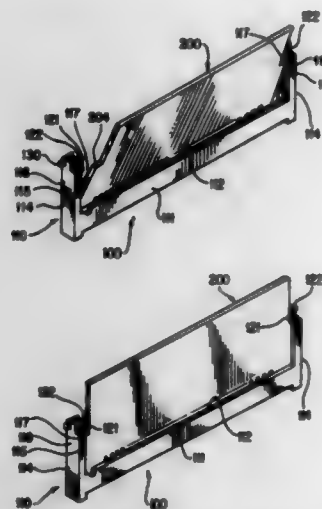
U.S. Cl. 439—326

3 Claims

1. A circuit board electrical connector with a double cantilevered latch, comprising:  
 an insulating housing including a base section with an elongated groove having a plurality of contact elements arranged therein;  
 a pair of side posts extending forwardly from opposite ends of said base section, each being divided into a fixed outer arm and a cantilevered movable inner arm;  
 a cantilevered movable latch arm consisting of a fixed intermediate portion extending inwardly from a portion of said cantilevered movable inner arm and a movable free end

portion extending upwardly from said fixed intermediate portion so as to extend in a plane parallel to that of said inner arm; and

a latch member projecting inwardly from an upper end portion of said movable free end portion of said cantilevered



ered movable latch arm so that when a circuit board is inserted into said elongated groove from upper front and then turned downwardly, said circuit board snaps between said cantilevered movable latch arms of said electrical connector while both said movable inner and latch arms are flexed outwardly sharing an insertion load.

5,437,561

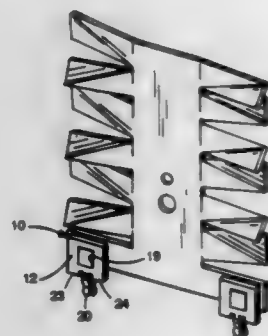
## SELF-LOCKING TAB

George F. Earl, Meredith; Jack Churchill, Laconia; Jeffrey J. Panek, Laconia, and Allen F. Hillman, Jr., Laconia, all of N.H., assignors to Aavid Engineering, Inc., Laconia, N.H. Continuation of Ser. No. 227,581, Apr. 14, 1994, abandoned, which is a continuation of Ser. No. 136,491, Oct. 14, 1993, abandoned, which is a continuation of Ser. No. 63,114, May 17, 1993, abandoned, which is a continuation of Ser. No. 978,198, Nov. 18, 1992, abandoned, which is a continuation of Ser. No. 804,804, Dec. 9, 1991, abandoned. This application Jul. 29, 1994, Ser. No. 283,216

Int. Cl.<sup>6</sup> H01R 13/60

U.S. Cl. 439—567

5 Claims



1. A connector for attaching a heat sink to a printed circuit board comprising:

an attachment means,

said attachment means comprising a single, integral piece which is folded along a fold to form a first plate and a second plate, said plates being disposed adjacent to each other and contacting each other along their respective adjacent surfaces, at least one said plate having a means for connecting said plate to the heat sink, and

extension means,

said extension means comprising a first leg and a second leg, said first leg being integral with one end of said first plate and having a first projection with a first engagement surface at its opposite end, said second leg being integral with one end of said second plate and having a second projection with a second engagement surface at its opposite end, said legs being disposed adjacent to but apart from each other and being adapted to flex towards each other,

whereby said connector holds the heat sink to the board by directing said first and second projections into a hole in the board so that said legs are compressed together and when said first and second projections have passed through said hole so that said attachment means is on the other side of the board, said legs flex back to a position whereby said first and second engagement surfaces contact the board opposite the heat sink thereby holding the heat sink to the board

and at least one stand-off leg extending from at least one of said plates, which is adapted to engage the printed circuit board when said connector and the heat sink are in place.

5,437,562

## LOW PROFILE EDGE MOUNT CONNECTOR

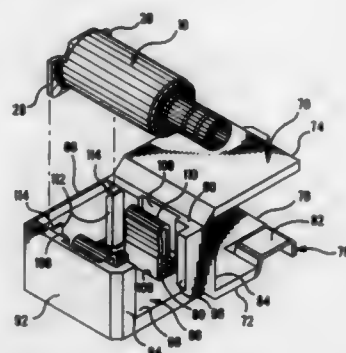
George W. Michael, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 38,739, Mar. 26, 1993. This application Nov. 30, 1993, Ser. No. 159,180

Int. Cl.<sup>6</sup> H01R 9/05

U.S. Cl. 439—581

8 Claims



1. A low profile coaxial cable connector assembly for edge mounting to a planar electronic device, such as a printed circuit board, having electrical circuitry thereon for electrically interconnecting to said assembly, said assembly comprising

a dielectric housing having at one end thereof a pair of spaced apart, parallel walls adapted to straddle and be secured to said planar electronic device, and at the opposite end thereof a cavity for the reception of an electrically terminated coaxial cable, where said other end includes a grounding contact clip having a pair of spring metal arms extending parallel to one another for receiving said terminated coaxial cable, and a signal contact for mating with said terminated coaxial cable, where said grounding clip and said signal contact include extensions therefrom for electrically interconnecting to said planar electronic device.

5,437,563

## WATER-PROOF SHIELDED CONNECTOR

Soji Kihira; Fumiyoshi Tanigawa, and Masahide Hio, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Continuation of Ser. No. 994,695, Dec. 22, 1992, abandoned.

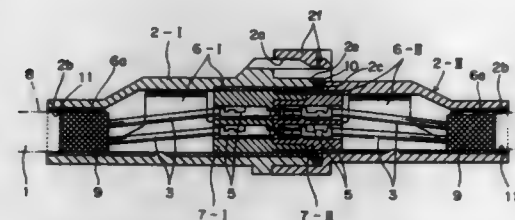
This application Jun. 3, 1994, Ser. No. 253,583

Claims priority, application Japan, Dec. 25, 1991, 3-106918 U

Int. Cl.<sup>6</sup> H01R 13/648

U.S. Cl. 439—607

7 Claims



a first sealing member provided in a water-proof sealing relationship between respective said outer and inner periphery portions of said first and second connector housings, wherein said first sealing member is compressed in a radial direction, and

a second sealing member provided in a water-proof sealing relationship between the shielded wire and a wire inserting portion of the connector housing.

5,437,564

## ELECTRICAL CONNECTOR PROVIDED WITH A PLURALITY OF CONNECTION MODULES

Jacky Lignelet, Coudoux, France, assignor to Eurocopter France, Marignane, France

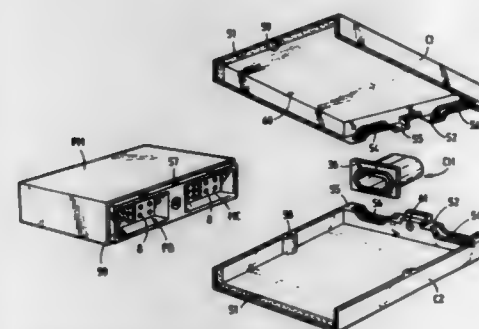
Filed Apr. 1, 1994, Ser. No. 221,882

Claims priority, application France, Apr. 5, 1993, 93 03976

Int. Cl.<sup>6</sup> H01R 13/502

U.S. Cl. 439—701

10 Claims



a module carrier having a plurality of connection modules, which form a front plug-in face enabling said connector to be connected to a complementary electrical connector and a rear connection face for the ends of electrical conductors, said modules being provided with connection members passing through said modules in order to provide the electrical connection between said front plug-in face and said rear connection face;

a wiring chamber adjacent said module carrier on the side of said rear connection face, said wiring chamber consisting of two shells which can be joined by fastening means;

ducts surrounding electrical conductors penetrating into said wiring chamber through a wall of said wiring chamber, said ducts consisting of two half-ducts which can be joined longitudinally;

said fastening means, when joining said two shells together, simultaneously acting for:

solidly fastening said shells to said module carrier;

solidly fastening together said two half-ducts of each duct;

and

solidly fastening said ducts to said wiring chamber, said ducts being trapped between said joined shells.

5,437,565

## CONNECTOR

Keigo Atsumi, and Eiji Saijo, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Mie, Japan

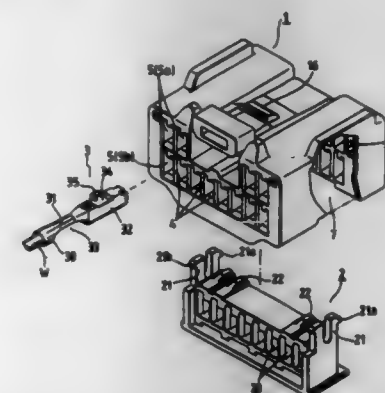
Filed Dec. 9, 1993, Ser. No. 163,718

Claims priority, application Japan, Jan. 14, 1993, 5-003848

Int. Cl.<sup>6</sup> H01R 13/436

U.S. Cl. 439—752

8 Claims





corresponding one of said terminal receiving chambers, said one of said terminals engages said slanting guide surface and urges said retainer into said provisionally-retained position during terminal insertion.

5,437,566

## ELECTRICAL CONTACT ELEMENT

Bernd Zinn, Ennepetal, and Sreboslav Lolic, Wuppertal, both of Germany, assignors to Grote & Hartmann GmbH & Co. KG, Germany

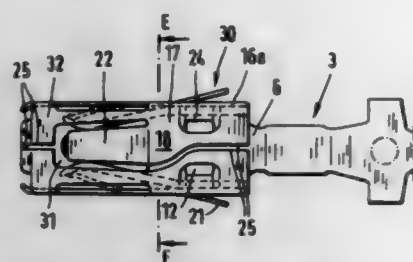
Filed Apr. 27, 1993, Ser. No. 53,457

Claims priority, application Germany, Jul. 7, 1992, 9209097 U; Sep. 2, 1992, 9211819 U

Int. Cl.<sup>6</sup> H01R 4/48

U.S. Cl. 439—839

6 Claims



1. Electrical contact element comprising: a perforated piece of sheet metal that has a connection region (3) on one end for an electrical connection and a contact region (2) with a polygonal cross-sectional spring-arm base (7) with smooth walls on the other end; the walls of the spring arm base (7) having front edges facing away from the connection region (3); spring arms (14) extending from the front edges to form a contact casing (1) with a polygonal plug hole (15) defining contact sites; the spring arms (14) extending toward each other as far as the location of the plug hole (15) so as to form the plug hole, and then bending away at an angle to the outside to form a positioning funnel (10) for a contact plug pin in a front free end region of the spring arms; an outer protruding spring (16) sitting on the spring arm base (7) of the contact casing (1); the outer protruding spring (16) having an outwardly bent snap tension spring (21) formed by a U-shaped open cut pointing in the direction of the contact region (3) in at least one wall of the protruding spring arm base (17); a box-like protruding spring arm base (17) having a rectangular cross section with a cover wall (18), two side walls (19) and one base wall (20) where one snap spring tongue (21) is provided in each of the two side walls (19); the spring arm base (7) being bent along longitudinal bending edges in a longitudinal middle portion of the spring arm base (7) in the bottom and cover wall (8, 11); in the region of each longitudinal bending edge of the spring arm base (7), one locking hole (12) is punched out; and in the region of the locking hole (12), proceeding from a corresponding longitudinal bending edge of the protruding spring arm base (17), one U-shaped cut locking tab (24) whose width corresponds to the width of a locking hole (12) is cut into a base and covering wall (20, 18) of the protruding spring arm base and is bent away to engage a corresponding locking hole (12).

5,437,567

## FEMALE ELECTRICAL TERMINAL

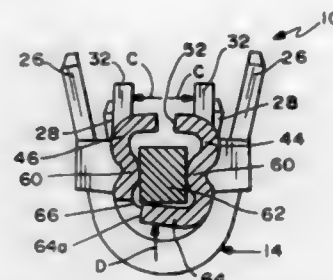
Bruce A. Peterson, Schaumburg, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Aug. 9, 1993, Ser. No. 104,223

Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439—851

3 Claims



1. In a generally elongate female electrical terminal which includes an improved torsional mating portion having a terminal-receiving passageway adapted to receive a male terminal, including two longitudinally spaced generally U-shaped cross sectional portions defining the front and rear of the passageway, and each U-shaped cross sectional portion being defined by a pair of legs joined by a bight portion, wherein the improvement comprises:

- two spaced apart side walls extending lengthwise of the passageway and connecting the legs of the cross sectional portions, each side wall having inwardly projecting terminal-contacting means for engaging a male terminal received in the passageway, the distance between said contacting means being less than the width of the male terminal; and
- a bottom wall extending generally perpendicular from one of the side walls toward and generally perpendicular to the other side wall, with a free end of the bottom wall forming a transverse opening with the other side wall intermediate the U-shaped cross sectional portions, front and rear portions of the bottom wall being spaced from the cross sectional portions; whereby said side walls are resiliently flexed outwardly away from each other about generally longitudinal axes when a male terminal is inserted into the passageway causing the free end of said bottom wall to flex upwardly forcing the male terminal, inserted into the passageway, upwardly so that the male terminal is in more centered alignment with the terminal contacting means.

5,437,568

## WATER JET PROPULSION UNIT

Noboru Kobayashi, Iwata, Japan, assignor to Yamada Hatsudoki Kabushiki Kaisha, Shizuoka, Japan

Division of Ser. No. 61,859, May 14, 1993, Pat. No. 5,310,369.

This application Mar. 25, 1994, Ser. No. 218,751

Claims priority, application Japan, Mar. 8, 1989, 1-057589; Mar. 8, 1989, 1-057590; Mar. 10, 1989, 1-058985; Mar. 16, 1989, 1-065274; Apr. 21, 1989, 1-103253

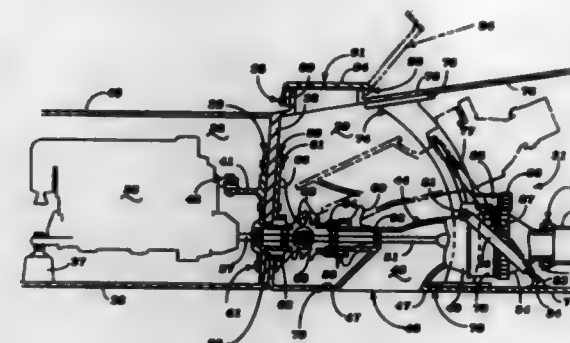
Int. Cl.<sup>6</sup> B63H 11/00

U.S. Cl. 440—38

18 Claims

1. A watercraft having a hull, a jet propulsion unit having a generally downwardly facing water inlet portion, an impeller portion containing an impeller for drawing water through said water inlet portion and a discharge nozzle portion for discharging water from said impeller portion for powering said watercraft, an engine supported by said hull, drive means for driving said impeller from said engine, said jet propulsion unit being supported for pivotal movement of at least said water inlet position about a generally horizontally extending pivot axis disposed contiguous to said water inlet portion and transverse to said hull and for rotation about a rotational axis extending longitudinally of said hull, said drive means including

a universal joint lying on said axes, and a flexible boot assembly having a first flexible portion fixed at one end relative to said hull, a second flexible portion affixed at one end relative to said water inlet portion of the jet propulsion unit and an intermedi-



- ate portion interconnecting the other ends of said first and said second flexible portions and encircling said universal joint, said first and said second flexible portions having sufficient flexibility for accommodating said pivotal and rotational movements.

5,437,570

## APPARATUS FOR MAKING CUTOUPS IN THE ENDS OF TUBULAR WORKPIECES

Jan J. Landhuis, Vriezenveen, Netherlands, assignor to ALMI Machinefabriek BV, Vriezenveen, Netherlands

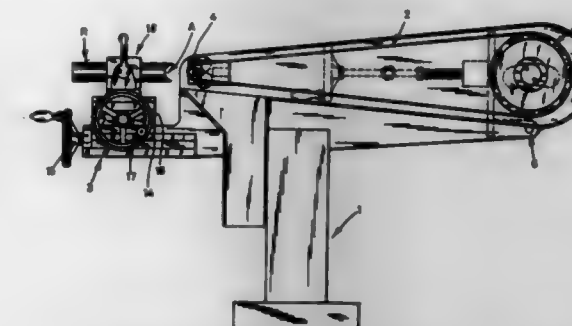
Continuation-in-part of Ser. No. 71,562, Jun. 3, 1993, Pat. No. 5,357,714. This application Mar. 31, 1994, Ser. No. 221,820

Claims priority, application Germany, Apr. 2, 1993, 43 10 887.3

Int. Cl.<sup>6</sup> B24B 21/12

U.S. Cl. 451—296

9 Claims



1. An apparatus for shaping ends of workpieces, comprising: means for gripping an elongated workpiece to be shaped; means for moving said gripping means towards and away from a shaping location; means for shaping an end of the workpiece at said shaping location so as to form a recess therein, said gripping and moving means cooperating with each other for bringing said end of the workpiece towards and away from said shaping location, said shaping means including a driving pulley, an interchangeable pulley, and an endless abrasive element passing around said pulleys, one of said pulleys having opposed ends and a shaft segment projecting from each of said ends; means for interchangeably mounting said interchangeable pulley at said shaping location, said means for interchangeably mounting comprising a bearing element on each of said segments and a pair of carriers at said shaping location for the respective bearing elements, each of said carriers being provided with an opening designed to receive one of said bearing elements, and each of said openings having an open end for insertion of the respective bearing element therein and a closed end spaced from the respective open end; at least another pulley that is interchangeable with said interchangeable pulley at said shaping location, said another pulley also having opposed ends and a shaft segment projecting from each of said ends, said means for interchangeably mounting comprising a bearing element on each of said segments of said another pulley that are identical to those on each of said segments of said interchangeable pulley, said interchangeable pulley having a diameter about which said endless abrasive element passes that differs in dimension from that of said another pulley; and an arresting device situated at each of the respective openings.

5,437,569

## MULTIPURPOSE FLOATABLE BLANKET

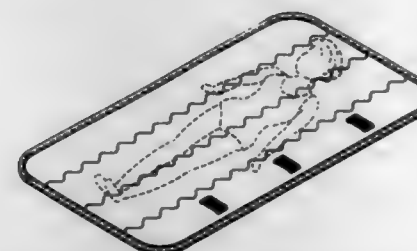
Cheng C. Ming, Taipei, Taiwan, assignor to Eurogear Corporation, Taipei Hsien, Taiwan

Filed Sep. 12, 1994, Ser. No. 302,972

Int. Cl.<sup>6</sup> B63C 9/08

U.S. Cl. 441—129

2 Claims



1. A floatable blanket made in a substantially flat, rectangular configuration, comprised of a top layer, a bottom layer, and a plurality of intermediate layers retained between said top and bottom layers, said top and bottom layers being made of a water proof material, said intermediate layers being made of foamed polyethylene consisted of a plurality of air cells, said top and bottom layers and said intermediate layers being peripherally sealed, said bottom layer and the adjacent intermediate layers being fastened together by longitudinal seam lines of zigzag stitches and formed into a lower structure, the other intermediate layers and said top layer being fastened together by longitudinal seam lines of zigzag stitches and formed into an upper structure, said upper and lower structure having a plurality of vents in communication with said air chamber, said top layer comprising a series of loops longitudinally aligned on the outside.

5,437,571

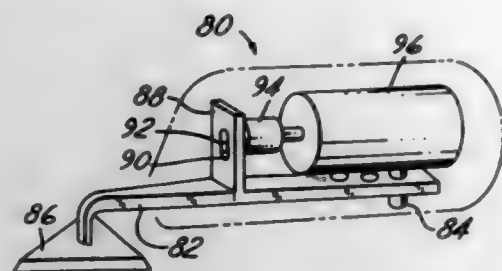
## DETAIL SANDER

Robert G. Everts, Chandler, Ariz.; Nobuto Kai, Fuchu, Japan, and John E. Nemazi, Bloomfield Hills, Mich., assignors to Ryobi North America, Corp., Easley, S.C.  
Continuation of Ser. No. 940,979, Sep. 4, 1992, abandoned, and a continuation of Ser. No. 930,008, Aug. 14, 1992, abandoned.  
This application May 10, 1994, Ser. No. 240,386

Int. Cl.<sup>6</sup> B24B 23/00

U.S. Cl. 451-344

26 Claims



1. A detail sander comprising:  
an elongated body having a longitudinal axis, a forward end, a rearward end and an internal cavity therein;  
a motor located in said cavity and having a motor shaft rotatable about a motor axis generally aligned with said longitudinal axis;  
a crank affixed to said motor shaft, said crank having an offset crank pin spaced from and rotatable about said motor axis;  
an elongated lever arm generally coaxially aligned with said motor axis and having a spaced apart first end, a central pivot region and a second end, said pivot region pivotally affixed to said body enabling said lever arm to rotate about a pivot axis generally perpendicular to said longitudinal axis, said first end cooperating with said crank pin to cause the lever arm second end to cyclically oscillate transversely in a side to side manner in response to rotation of said motor shaft; and  
a pad support having a planar surface adapted to receive a planar work member, said pad support affixed to said lever arm second end and cyclically oscillated transversely thereby said pad support planar surface located forward of said pivot axis and having a slope symmetrical about a longitudinal center line with a pointed forward most tip region formed by two rearwardly extending facet edges forming a substantially 90° corner and a pair of straight side edges extending rearwardly from the facet edges, each being outwardly inclined from the pad support longitudinal center line 10°-30°.

5,437,572

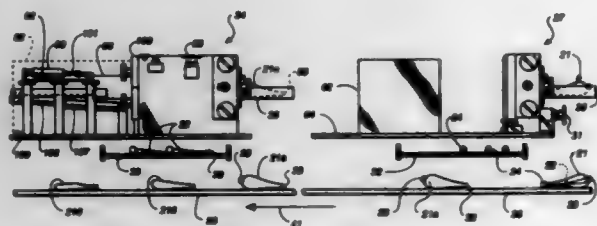
## METHOD AND APPARATUS FOR DEBONING MEAT

Charles J. Billington, III, Modesto, Calif., assignor to Billington Welding & Manufacturing, Inc., Modesto, Calif.  
Filed Oct. 27, 1993, Ser. No. 143,917

Int. Cl.<sup>6</sup> A22C 21/00, 17/04

U.S. Cl. 452-136

11 Claims



1. A process for removing the bone from a piece of meat having an elongated bone extending therein, said bone further

having enlarged bone portions proximate opposite ends thereof, comprising the steps of:

- severing one of said enlarged bone portions from said bone by cutting through said bone proximate said one enlarged portion to create a severed end; and
- removing said meat from said bone by relative displacement of said meat and said bone to remove meat from said bone over said severed end.

5,437,573

## STRUCTURE FOR CHILDREN'S GAMES

José M. Rodríguezferre, Polígono Industrial Derramador, Alhacete s/n-03440-IBI, Alicante, Spain

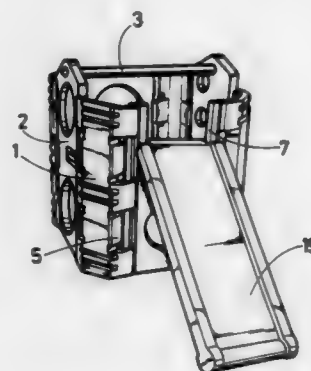
Filed Dec. 16, 1993, Ser. No. 167,090

Claims priority, application Spain, Dec. 24, 1992, 9202609

Int. Cl.<sup>6</sup> A63G 21/00

U.S. Cl. 472-116

16 Claims



1. A modular play structure formed of a plurality of parts of rigid molded material, in which there are integrated respective mating means to provide for the connection of parts to form a prismatic precinct open at the top and bottom of said structure, said structure including an upper bar connecting two opposite sides, a horizontal part, attached on three sides to the structure and situated at mid-height thereof, and an elongate rectangular part, provided with a longitudinal depression forming a track for a child to slide along, when said elongate rectangular part is situated on the outside of the structure and supported thereby, at the height of the horizontal part, in a sloping position, characterized essentially in that said modular play structure comprises

- a plurality of corner components and a plurality of side parts corresponding in number to said plurality of side components, the corner components being constructed by vertically extending rectangular parts, provided at the longitudinal edges thereof with oblique extensions of material having an alternate slope, the free edges of the oblique extensions curving inwards in opposite directions, forming longitudinal guideways on both sides of said corner component adapted axially to receive respective side component edges of a section appropriate to the cross section of the longitudinal guideway, said side component edges extending longitudinally parallel to the vertical edges of the side components, and connected thereto by a connecting member of a smaller thickness than each of said side component and said side component edge.

5,437,574

## TOP SEALING CHIMNEY CAP

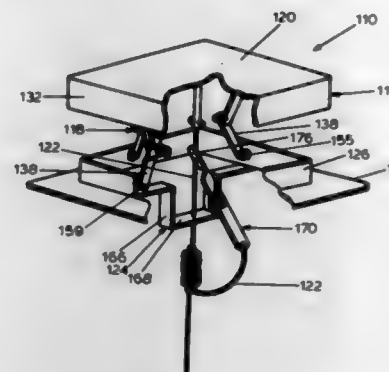
Walter Sexton, Foster, Ky., assignor to Lyemance International, Inc., Jeffersonville, Ind.

Division of Ser. No. 115,896, Sep. 1, 1993, Pat. No. 5,387,151, which is a continuation-in-part of Ser. No. 924,730, Aug. 3, 1992, Pat. No. 5,295,901. This application May 23, 1994, Ser. No. 247,307

Int. Cl.<sup>6</sup> F23L 17/10

U.S. Cl. 454-4

7 Claims



1. A chimney damper and chimney cap system for use with a chimney flue comprised of  
(a) a support base, with support arm, securable to the top of the chimney flue;  
(b) a plurality of brackets, each with first and second ends, the first end of each is secured to the support base;  
(c) a plurality of springs connected to the brackets;  
(d) a chimney cap secured to the second end of the brackets; and  
(e) a lever means for levering open the chimney cap if stuck closed, wherein said lever means is secured to the support arm of the support base.

5,437,575

## BINGO METHOD OF SCORING BOWLING

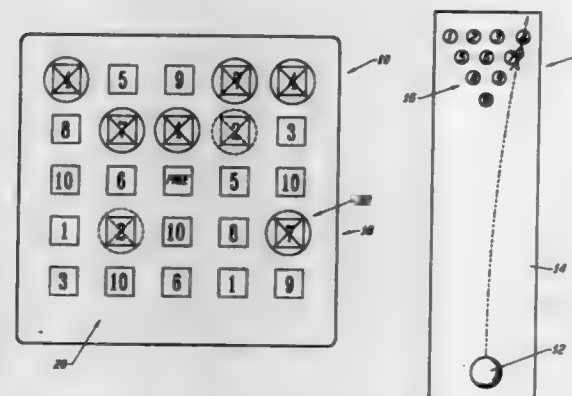
John Douglass, Jr., 7907 Ridgmont Dr., Fair Oaks, Calif. 95628

Filed Jun. 30, 1994, Ser. No. 269,442

Int. Cl.<sup>6</sup> A63F 3/06

U.S. Cl. 473-54

3 Claims



1. A game method of using a bowling surface including bowling pins and a bowling ball in combination with the steps of:  
a. setting a particular number of bowling pins in a formation on the bowling surface;  
b. repeatedly rolling the bowling ball along the bowling surface in an effort to contact and topple the bowling pins;  
c. determining a particular number selectively representing a numeric assignment of each of the bowling pins toppled

- with each roll of the bowling ball and noting the total number of pins toppled by each roll of the bowling ball;
- d. providing a game board with a plurality of spaces each having a number corresponding to a possible particular number determined in said step of determining a particular number, said game board spaces being arranged in a particular pattern on said game board;
- e. repeatedly placing an indicia on a space of said game board corresponding to each particular number determined in said step of determining a particular number; and
- f. collating said repeated placements of indicia on said game board according to an arrangement forming a selected portion of said game board pattern.

5,437,576

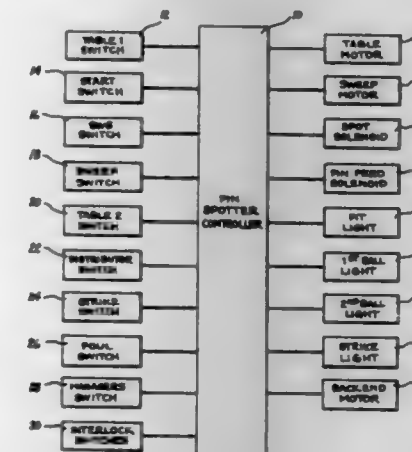
## COMBINATION BOWLING PINSPOTTER AND PINSPOTTER CONTROL SYSTEM AND METHOD THEREFOR

William J. Tuten, and Kenneth D. Crosby, both of Scottsdale, Ariz., assignors to Creative Technology, Inc., Scottsdale, Ariz.  
Filed Nov. 8, 1993, Ser. No. 148,317

Int. Cl.<sup>6</sup> A63D 5/00

U.S. Cl. 473-65

20 Claims



1. A combination bowling pinspotter and pinspotter control chassis system comprising, in combination:  
a bowling pinspotter having circuit means therein for permitting the spotting of bowling pins; and  
control chassis means having all solid state components and being coupled to said pinspotter for controlling the operation of said pinspotter comprising, in combination:  
means coupled to said control chassis for executing a short strike cycle;  
means coupled to a back end motor of said pinspotter for conserving the energy consumed by said back end motor by securing power to said back end motor after it has operated for a predetermined amount of time during which no pins are picked up by said back end motor;  
means coupled to a remote control console for permitting said pinspotter to complete a current cycle prior to executing a shut down command for said pinspotter from said remote control console; and  
means coupled to said control chassis for permitting said control chassis to retain status and position data for said pinspotter during a power interrupt.



5,437,577

## CHAIN FOR A BICYCLE WITH DERAILEUR

Chia L. Wu, No. 734, Chung Shan Rd., Kuei Ren Hsiang, Tainan Hsien, Taiwan

Filed Jan. 21, 1994, Ser. No. 184,961

Int. Cl.<sup>6</sup> F16G 15/10

U.S. Cl. 474-218

1 Claim



1. A bicycle drive chain comprising a plurality of alternating pairs of links and outside links; each inside link being substantially dumbbell-shaped and including first and second ends each of which has a smooth curvature and both of which are of the same diameter, each pair of outside links being substantially dumbbell-shaped and having first and second ends each of which has a smooth curvature; a roller disposed between each end of each of said pairs of inside links; each end of said pairs of inside and outside links having a pin hole formed there-through; a pin disposed in each of said pin holes and rotatably connecting corresponding ends of alternating pairs of inside and outside links; ends of the chain being connected by a connector to form a loop, the connector including a pair of links having a structure substantially the same as that of a respective pair of outside links,

each of the first ends of the respective outside links and first ends of the links of the connector having a diameter the same as that of the second end of the respective inside link, and each of the second ends of the outside links and second ends of the links of the connector having a diameter greater than that of the first end of the inside link; and wherein, when mounted on gears of a bicycle, the first end of each said outside link and of each of the links of the connector is a leading end of the outside link and the link of the connector with respect to the direction in which the chain is driven through the gears, and the second end of each said outside link and of each of the links of the connector is a trailing end of the outside link and the link of the connector with respect to the direction in which the chain is driven through the gears.

5,437,578

## SET OF BOWLING BALLS HAVING SIMILAR PROPERTIES AND CORES THEREFOR

William Wasserberger, Muskegon, Mich., and Raymond M. Edwards, Matteson, Ill., assignors to Brunswick Bowling &amp; Billiards, Muskegon, Mich.

Filed Nov. 4, 1993, Ser. No. 147,689

Int. Cl.<sup>6</sup> A63B 37/10

U.S. Cl. 473-126

11 Claims

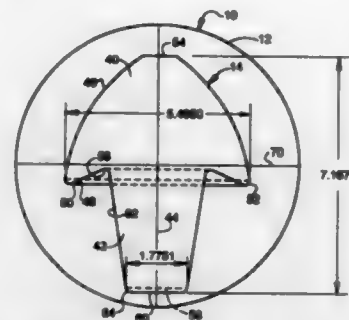
1. A family of bowling balls having nearly identical reaction characteristics comprising:

a plurality of bowling balls, each of the same nominal diameter and each nominally differing in weight from the others by about one pound or more;

each ball including a cover and a core of a material different from the cover with the covers on all balls being made of the same material;

each core being constructed and arranged within its cover to produce a first radius of gyration about a first axis and a second, different radius of gyration about a second axis generally transverse to said first axis;

the first radius of gyration of all said balls being substantially identical;



the second radius of gyration of all said balls being substantially identical.

5,437,579

## SPIN AXIS WEIGHTED BOWLING BALL

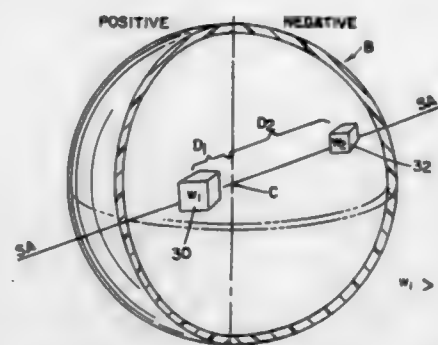
Carmen M. Salvino, 65 Stevens Dr., Schaumburg, Ill. 60173

Continuation-in-part of Ser. No. 540,838, Jun. 20, 1990, Pat. No. 5,058,901. This application Aug. 1, 1991, Ser. No. 739,109

Int. Cl.<sup>6</sup> A63B 37/06

U.S. Cl. 473-126

2 Claims



1. A bowling ball, said ball having thumb and finger holes for gripping said ball, said ball having a geometric center and when thrown consistently having a ball track plane and a spin axis, said spin axis being perpendicular to said ball track plane, said ball comprising:

a first weighting means located within said ball along said spin axis on a positive side of said ball, said first weighting means having a weight of  $W_1$  and being located a distance  $D_1$  from said geometric center; and,

a second weighting means located within said ball along said spin axis, said second weighting means having a weight  $W_2$  and being located a distance  $D_2$  from said geometric center,  $W_1$  being greater than  $W_2$ ,  $D_1$  being less than  $D_2$ , said first and second weighting means being on opposite sides of said geometric center along said spin axis, said first and second weighting means placed along said spin axis so that  $W_1 D_1 = W_2 D_2$ .

5,437,580

## DOOR DRIVE MEANS WITH CORRUGATED TRANSMISSION BELT

Erich Düring, Im Hölzeli, CH 9442 Bernegg, Switzerland

Filed Nov. 29, 1993, Ser. No. 158,239

Claims priority, application Germany, Nov. 27, 1992, 42 39 963.7

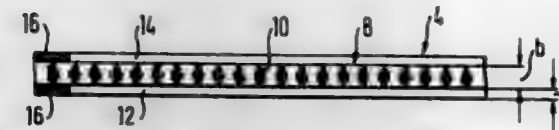
Int. Cl.<sup>6</sup> F16H 7/02

U.S. Cl. 474-153

4 Claims

1. A door drive means for wing-, panel-, sectional- or overhead type doors, which doors have a movable door leaf, in particular for automobile garages or workrooms, comprising a

motor driven drive gear and a corrugated transmission belt made of plastics having along its longitudinal extension transversely extending corrugations of approximately sinusoidal or tooth shaped configuration having wave crests and wave troughs, which belt passes around a return gear, and further comprising means by which the drive force for opening and



closing of the door leaf is derived from the return gear or from the belt and transmitted to the door leaf, wherein the belt is made of a plastic strip permanently deformed by embossing, and the belt comprises a laterally projecting side strip at least at one side of the corrugated portion, approximately at mid-level between the wave crests and wave troughs to accommodate longitudinal pull.

5,437,581

## PHASED CHAIN ASSEMBLIES

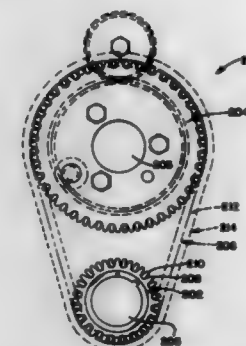
Timothy J. Ledvina, Groton, and Philip J. Mott, Dryden, both of N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Division of Ser. No. 131,473, Oct. 4, 1993, Pat. No. 5,397,280, which is a continuation-in-part of Ser. No. 855,194, May 19, 1992, abandoned. This application Oct. 25, 1994, Ser. No. 328,702

Int. Cl.<sup>6</sup> F16H 7/24

U.S. Cl. 474-85

9 Claims



1. An engine timing system drive, comprising:

first and second crankshaft sprockets connected to an engine crankshaft, said first and second crankshaft sprockets having a plurality of spaced teeth, said crankshaft sprockets being disposed in parallel relationship along said engine crankshaft, the location of said first crankshaft sprocket teeth being offset with respect to the teeth of said second crankshaft sprocket,

first and second camshaft sprockets connected to an engine camshaft, said first and second camshaft sprockets having a plurality of spaced teeth, said camshaft sprockets being disposed in parallel relationship along said camshaft, the location of said first camshaft sprocket teeth being offset with respect to the teeth of said second camshaft sprocket, said first crankshaft sprocket being aligned with said first camshaft sprocket and having a first timing chain assembly drivingly connecting said first crankshaft sprocket with said first camshaft sprocket, said second crankshaft sprocket being aligned with said second camshaft sprocket and having a second timing chain assembly drivingly connecting said second crankshaft sprocket with said second camshaft sprocket,

said first and second chain assemblies having a plurality of interleaved sets of inverted tooth links, said links being adapted to contact the teeth of at least one of said sprock-

ets, pivot pins connecting adjacent sets of links, each link defining apertures for receiving said pivot pins.

5,437,582

## SPROCKET ASSEMBLY FOR BICYCLES

Antonio Romano, Padova, Italy, assignor to Campagnolo S.r.l., Vicenza, Italy

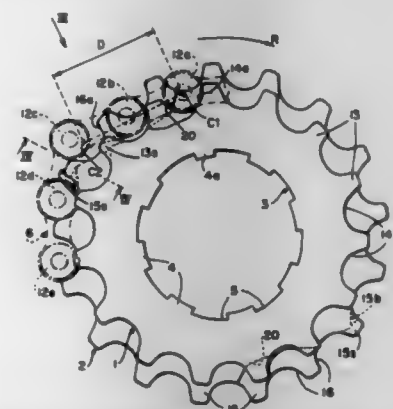
Filed Apr. 4, 1994, Ser. No. 222,527

Claims priority, application Italy, Jun. 3, 1993, TO93A0391

Int. Cl.<sup>6</sup> F16H 55/30

U.S. Cl. 474-156

3 Claims



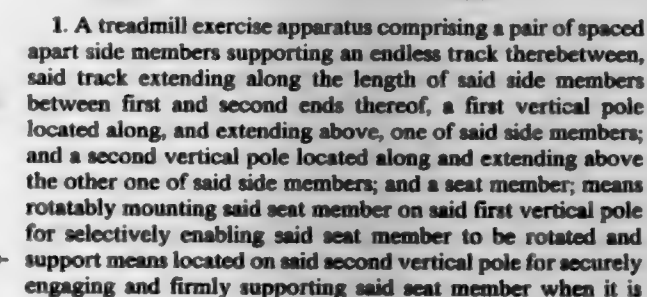
1. Sprocket assembly for bicycles, comprising a plurality of sprockets arranged coaxially and side by side to each other, said sprockets having diameters increasing from one end to the other of the assembly, said sprockets being designed to be selectively engaged by a drive chain comprising pairs of plates pivotally connected to each other by articulation pins carrying respective rollers, the plates of each pair being arranged alternatively at the outside and the inside of the next pair of plates so as to define alternatively large chain links and narrow chain links,

in which said sprockets are so shaped and mounted relative to each other that during the chain displacement from one smaller diameter sprocket to one larger diameter sprocket, the chain disengages from the smaller diameter sprocket at a first predetermined recess between two adjacent teeth of the smaller diameter sprocket and comes in contact with the larger diameter sprocket in proximity of a second predetermined recess between two adjacent teeth of the larger diameter sprocket,

in which the centres of said first recess and said second recess lie on a straight line substantially tangent to the smaller diameter sprocket and in which the distance between said centres is substantially smaller than an integer multiple of the chain pitch, so that during said displacement, the chain comes into engagement with the larger diameter sprocket (2) at a tooth which follows, with reference to the direction of rotation of the sprockets, said second recess, said chain being held up by said tooth until the respective roller is completely received within said second recess,

wherein said sprockets are shaped and mounted relative to each other so that the chain is held up by a single tooth of the larger diameter sprocket until the chain shift is completed and wherein said chain supporting tooth has, on its side opposite to that facing the smaller diameter sprocket, a stepped support surface for supporting the edge of a plate of a large chain link.

### 6 Claims





fully rotated and disposed directly over said track; said seat member when fully extended and rotated over said track for enabling a user of the treadmill exercise apparatus to sit on said seat member and, while seated, to either push or pull the track with the user's feet; said seat member being firmly supported and securely held in place on said first and second vertical poles wherein when a user sits on said seat member when it is fully rotated and engaged and either pushes or pulls the track with the user's feet there is no forward or rearward movement of said seat member and no sagging or tilting across the length of the seat member; and

said seat member being rotatably mounted for selectively enabling the seat member to be rotated away from the track to enable a user to use the treadmill exercise apparatus while standing on the track.

5,437,589

## UPPER BODY EXERCISE MACHINE

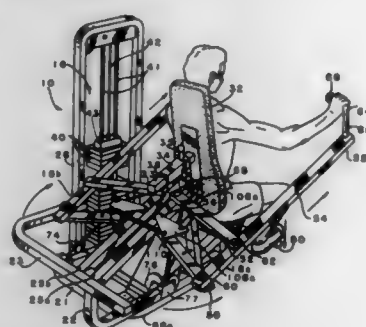
Theodore J. Habing, 6600 W. Katella Ave., Cypress, Calif. 90630

Filed Dec. 20, 1993, Ser. No. 170,374

Int. Cl.<sup>6</sup> A63B 21/22, 23/12

U.S. Cl. 482-72

49 Claims



1. An exercise machine comprising:
  - a frame;
  - a seat mounted on the frame; said seat having a front portion defining a forward direction;
  - a pair of articulated arm assemblies, each of said articulated arm assemblies including a handle portion;
  - means for pivotally coupling the articulated arm assemblies to the frame such that the handle portions are constrained to move within a pair of symmetric arcuate paths lying in a plane, each of said arcuate paths having a first position laterally displaced from a longitudinal center line of the exercise machine and curving forwardly and inwardly, concave with respect to the seat, to a second position substantially forward and inward from the first position; and
  - means for resisting movement of the articulated arm assemblies.

5,437,590

## MULTIDIRECTIONAL COMBINATION BOXING AND KICKING BAG

Louis D'Alto, 11434 Ayrshire Rd., Brentwood, Calif. 90049

Continuation-in-part of Ser. No. 152,827, Nov. 16, 1993, abandoned. This application Feb. 14, 1994, Ser. No. 202,692

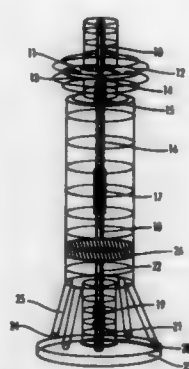
Int. Cl.<sup>6</sup> A63B 69/00

U.S. Cl. 482-90

14 Claims

1. A physical training device simulating an opponent's body and for receiving blows from a trainee, the device comprising:
  - a base for supporting the device on a supporting surface;
  - a central support structure having a plurality of substantially rigid rod members and a plurality of spaced apart elastomeric elongated members, wherein the plurality of rigid rod members are alternately spaced and coupled in co-linear alignment by the plurality of elastomeric elongated

members, and wherein the central support structure is coupled to and vertically supported above the base; a plurality of padded sections of various sizes and shapes to simulate the body of the opponent, the plurality of padded sections being disposed along and surrounding the central support structure such that the plurality of padded sections are supported by the central support structure, wherein each of the plurality of padded sections responds differently to the received blows, wherein the central



- support structure and the plurality of padded sections bend and flex to simulate a feel and a motion of the body of the opponent when a blow is received; and
- a plurality of resilient restoring cords coupled between the base and one of the plurality of padded sections to adjust the flexibility of the physical training device and to restore the central support structure and the plurality of padded sections to a pre-blow receiving orientation after receiving blows from the trainee.

5,437,591

## CHEST EXPANDER

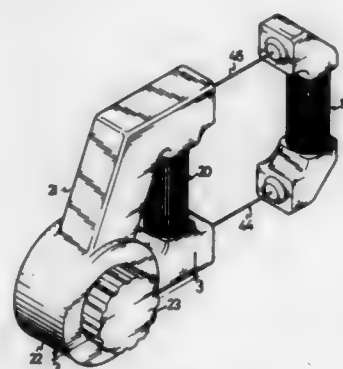
Chih-Liang Chen, No. 10, Lane 1431, Kuanghsin Rd., Peteh Hsiang, Taoyuan Hsien, Taiwan

Filed Oct. 28, 1994, Ser. No. 330,447

Int. Cl.<sup>6</sup> A63B 21/045, 21/018

U.S. Cl. 482-127

2 Claims



1. A chest expander comprising
  - a first handle having two distal ends;
  - a substantially U-shaped tubular housing including a first line and a second line extended from two limb ends thereof and connected to two distal ends of the first handle;
  - a second handle connected between the two limbs of the U-shaped tubular housing;
  - a load adjusting mechanism received in one corner of the U-shaped tubular housing and including a positioning plate fixed in the housing, a unidirectional bearing including an outer wheel, an inner wheel, and a shaft firmly connected to and extending from the inner wheel, a pulley which has two tracks for the two lines to be wound there-

around, a torsional spring engaged between an inner periphery of the pulley and the shaft of the unidirectional bearing, a rotatable means partially received in the corner of the housing, a frictional ring retained between the outer wheel of the unidirectional bearing and the rotatable means;

whereby the rotatable means is rotated to urge or release the frictional ring thereby increasing or decreasing a resistance between the outer wheel of the unidirectional bearing and the frictional ring, whereby when the pulley is rotated in a first direction via the two lines by manually extending the two handles, the shaft of the unidirectional bearing is driven to rotate in a first direction via the torsional spring which in turn drives the inner wheel and the outer wheel to rotate in the first direction, when the two handles are retracted, the two lines are retracted around the two tracks of the pulley by a tension from the torsional spring, causing the shaft and the inner wheel of the unidirectional bearing to rotate in a second direction counter to the first direction, while the outer wheel of the unidirectional bearing does not rotate.

5,437,592

## MACHINE TOOL CHANGER

Udo Klepser, Pfronten, and Bernd Schleiter, Eichingen, both of Germany, assignors to Schiess Kopp Werkzeugmaschinen GmbH

PCT No. PCT/DE93/00100, § 371 Date Jul. 27, 1994, § 102(e) Date Jul. 27, 1994, PCT Pub. No. WO93/15874, PCT Pub. Date Aug. 19, 1993

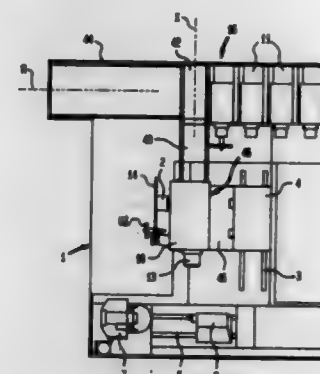
PCT Filed Feb. 5, 1993, Ser. No. 256,855

Claims priority, application Germany, Feb. 8, 1992, 9201595 U

Int. Cl.<sup>6</sup> B23Q 3/157

U.S. Cl. 483-40

27 Claims



1. Device for metal cutting a workpiece in a clamping fixture by tools which are removable from a tool magazine and positionable in alternating sequence into their working position, comprising

- A.1 a control unit for clocked sequence control of the algorithmically preset machining steps until reaching the finished size of the workpiece;
- A.2 a tool spindle unit changing apparatus, with the tool spindle unit (10) which respectively occupies the working position being inserted in a holding fixture and removable therefrom and exchangeable for a tool spindle unit (11) readied in stand-by position and
- A.3 a tool changing unit for turning tools, drilling tools, milling tools and grinding tools, comprised of a power-operated movable and rotatable as well as pivotable tong-type grab with openable and closable grab jaws which are alignable to the respective tool removal axis and spindle axis (X), characterized in that
  - B.1 the grab jaws (28, 29) has a jaw profile (30) which are mirror images of each other for receiving tools (WZ) with more than two different shape sizes or taper sizes, and
  - B.2 with each jaw profile (30) having at least three adjoining

arched sections (a, b, d), the radii thereof matching the different diameters of at least three shank sizes or taper sizes.

5,437,593

## ROLLER FOR PLANAR FLOORING

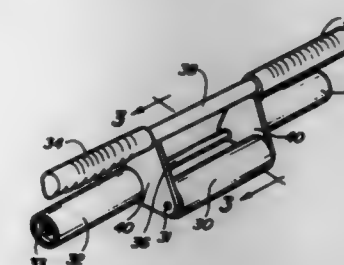
Willard Gustavsen, 12142 Range Rd., P.O. Box 37, Berrien Springs, Mich. 49103

Filed Jan. 24, 1994, Ser. No. 185,309

Int. Cl.<sup>6</sup> B09C 7/02

U.S. Cl. 492-13

16 Claims



1. A roller assembly for use on planar flooring comprising:
  - a pair of spaced roller sections;
  - a first of said roller sections rotating on a first axis;
  - a second of said roller sections rotating on a second axis laterally spaced from said first axis;
  - a handle extending along an axis which is non-coaxial to both said first and second axes; and
  - said second roller section including a single central roller, and said first roller section including a pair of outer rollers spaced axially outwardly from the location of said central roller.

5,437,594

## PROCESS FOR APPLYING A HANDLE

Larry J. Mattson, Charlotte, N.C.; John T. Roberts, Clover, S.C.; Claude E. Monsees, Charlotte, N.C., and Les J. Kanna, Lancaster, S.C., assignors to Roberts Systems Inc., Charlotte, N.C.

Continuation of Ser. No. 49,152, Apr. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 964,790, Oct. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 978,123, Nov. 18, 1992, Pat. No. 5,318,218. This application May 13, 1994, Ser. No. 242,696

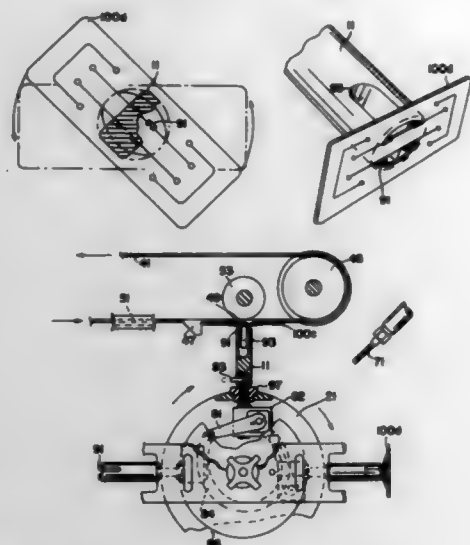
Int. Cl.<sup>6</sup> B31B 1/86

U.S. Cl. 493-88

3 Claims

1. A process of installing a handle having an aperture to a carton comprising:
  - supplying a handle;
  - providing a handle pick-up arm, a terminus of said pick-up arm defining a template for mated insertion through an aperture of said handle;
  - positioning said handle in a first position in proximity to said pick-up arm;
  - inserting said terminus of said pick-up arm through said handle;
  - frictionally engaging said handle to said pick-up arm by:
    - inserting a first pair of prongs and a second pair of prongs defined by said terminus through said handle, said handle having a strap traversing said handle aperture, said strap engaging a gap defined by each pronged pair;

rotating said pick-up arm carrying said handle to a second position in proximity to a carton;



placing said handle on said carton;  
disengaging said handle from said pick-up arm.

5,437,595

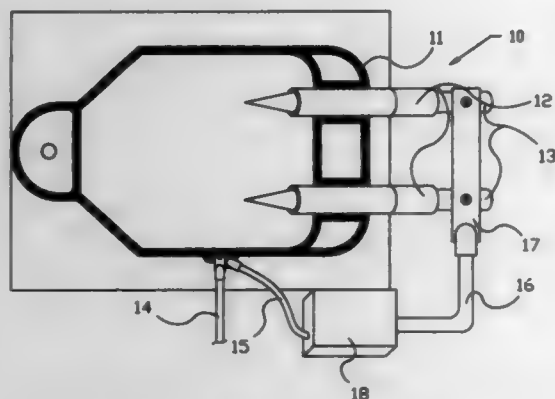
# METHOD AND APPARATUS FOR PRODUCING MEDICAL POUCHES

Olly V. Smith, Greenville, S.C., assignor to W. R. Grace & Co.,  
Duncan, S.C.

Filed Jul. 8, 1993, Ser. No. 88,693  
Int. Cl.<sup>6</sup> B31B 1/84, 1/64

U.S. Cl. 493-213

14 Claims



1. A method of making flexible film pouches having fitment tubes attached thereto comprising the steps of:

- introducing a web of flexible film into an open film sealing means for forming the peripheral seams defining at least one pouch;
- introducing at least one fitment tube, mounted on fitment tube sealing means between the layers of the web of flexible film within the open film sealing means;
- closing the film sealing means;
- forming the peripheral pouch seals and sealing the fitment tubes to the layers of the web of flexible film in the thus formed pouch using RF energy sealing;
- introducing said pouch to a cutting means and contouring the pouch and removing it from the web of flexible film; the improvement comprising using a single RF energy source for supplying said RF energy to both the film sealing means and the fitment sealing means, said RF energy source having a phase shift device for phase shifting said RF energy such that the RF energy supplied to the film sealing means is 90 degrees out of phase with the

energy supplied to the fitment sealing means, thereby producing a flexible film pouch having fitment tubes attached thereto in a single sealing operation.

5,437,596

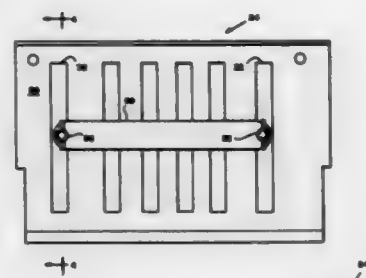
# COMPRESSION PLATE ASSEMBLY FOR A FOLDER BUCKLE CHUTE

Vjekoslav Bogdan, Bethel, and Steven W. Marcello, Southbury, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 17, 1993, Ser. No. 122,087  
Int. Cl.<sup>6</sup> B65H 45/14

U.S. Cl. 493-420

2 Claims



2. The method of controlling the location of a fold by a buckle chute folder, comprising the steps of:

- providing a pair of feed rollers;
- providing a buckle chute having upper and lower chute plates and a plurality of stops therein for causing a sheet fed therein by the feed rollers to buckle;
- providing a pair of fold rollers for folding the sheet at the buckle location on the sheet;
- providing a pair of compression plates mounted on the outer surfaces of the upper and lower chute plates;
- adjusting the longitudinal position of the compression plates on the outer surface of the upper and lower chute plates; and
- adjusting the tightness of the compression plates to adjust a gap between the upper and lower chute plates.

5,437,597

# DOCUMENT INVERTER FOR BUCKLE CHUTE FOLDER

Richard D. Boughton, Newton; Carlos L. DeFigueiredo, Sandy Hook, and Helen Rose, Seymour, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

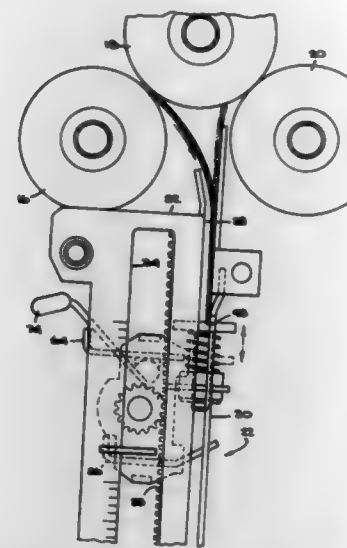
Filed Jun. 10, 1994, Ser. No. 257,976  
Int. Cl.<sup>6</sup> B65H 45/14

U.S. Cl. 493-420

4 Claims

1. A buckle chute for folding a sheet of paper, comprising:
  - a first plate having a longitudinally extending slot;
  - a second plate opposing said first plate and defining a paper path therewith;
  - a paper stopping tab extending through said longitudinally extending slot;
  - a paper inverting tab extending through said longitudinally extending slot and situated between said paper stopping tab and the opening at the chute, said inverting tab being pivotable between an operative position in said paper path

and an inoperative position out of said paper path, wherein said inverting tab includes an aperture; and a plunger seated in said aperture;



a lever operatively connected to said paper inverting tab and extending beyond the side edge of said first plate for pivoting said tab between said operative and inoperative positions.

5,437,598

# AUTOMATION OF PLASMA SEQUESTRATION

G. Delbert Antwiler, Lakewood, Colo., assignor to COBE Laboratories, Inc., Lakewood, Colo.

Filed Jan. 21, 1994, Ser. No. 185,487  
Int. Cl.<sup>6</sup> B04B 9/10; A61M 1/36

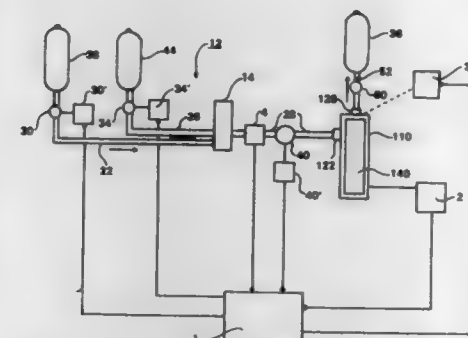
U.S. Cl. 494-1

23 Claims

U.S. Cl. 494-82

Int. Cl.<sup>6</sup> B04B 9/14

8 Claims



1. A system for plasma sequestration from red blood cells in whole blood in a centrifuge apparatus to produce a separated plasma having a desired cumulative hematocrit or a desired cumulative platelet harvest, said system having in sequence a fill cycle, during which whole blood is supplied to said centrifuge, said plasma is separated from said red blood cells such that a red cell pack is formed in said centrifuge and said separated plasma is collected, and an empty cycle, during which said separated blood cells remaining in said centrifuge are removed therefrom and collected, which comprises:

- means for supplying a controlled flow of whole blood to said centrifuge;
- means for monitoring the volume of whole blood supplied to said centrifuge;
- means for collecting said separated plasma;
- means for removing and collected said separated red blood cells;
- means for determining the volume of whole blood,  $V_m$ , that was supplied to said centrifuge to generate a predeter-

mined fixed volume of red blood cell pack in said centrifuge;  
means for controlling the rotational speed of said centrifuge;  
control means for terminating said fill cycle and thereafter initiating said empty cycle actuated when the monitored volume of whole blood being supplied to said centrifuge equals a calculated maximum fill volume,  $V_f$ ;  
automated means for calculating said maximum fill volume,  $V_f$ , operatively associated with said control means, said volume monitoring means and said means for determining  $V_m$ , which employs an empirically predetermined equation relating  $V_m$  to  $V_f$ , where said equation is determined in trial plasma sequestrations where  $V_f$  is selected as the centrifuge fill volume that results in separated plasma having a desired cumulative hematocrit or a desired platelet harvest.

5,437,599

# DAMPED HYDRAULIC BEARING SUPPORT FOR CENTRIFUGE

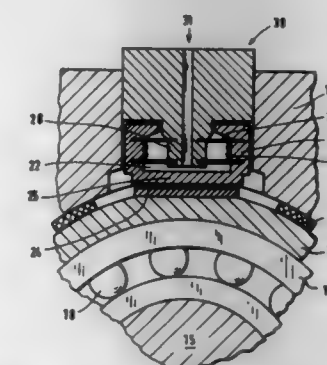
Bernward Feldkamp, Wesel-Buederich; Peter Stelter, and Harald Adam, both of Cologne, all of Germany, assignors to Klockner-Humboldt-Deutz AG, Cologne, Germany

Filed Jan. 18, 1994, Ser. No. 181,789

Claims priority, application Germany, Jan. 21, 1993, 43 01 485.2

Int. Cl.<sup>6</sup> B04B 9/14

8 Claims



1. A centrifuge for the separation of substances differing in density, having a centrifuge drum with a drum shaft supported by bearings for rotation about an axis, said centrifuge comprising:

- one of said bearings having an outer bearing ring (12);
- at least one variable pressure hydraulic bearing support (10) supporting said one bearing, said bearing support (10) including a bearing housing (13) enclosing said outer bearing ring (12), said bearing housing (13) including at least one chamber (14) filled with a pressure fluid said chamber having a side nearest said drum shaft;
- a servo valve connecting said chamber (14) to a supply of pressure fluid;
- a membrane (16) closing the side of said chamber nearest said drum shaft (15), said membrane having an effective force transmitting area lying directly against said outer bearing ring (12).



5,437,600

**METHOD AND APPARATUS FOR THE TREATMENT OF CANCER**

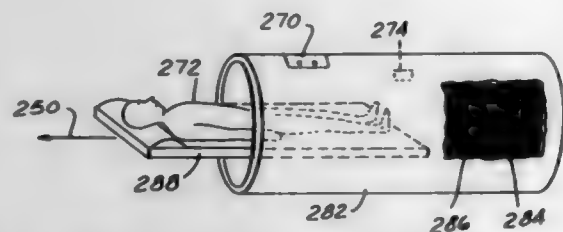
Abraham R. Liboff, Birmingham, Mich.; Bruce R. McLeod, Bozeman, Mont., and Stephen D. Smith, Lexington, Ky., assignors to Life Resonances, Inc., Bozeman, Mont.

Continuation of Ser. No. 3,787, Jan. 13, 1993, abandoned, which is a continuation of Ser. No. 902,929, Jun. 23, 1992, Pat. No. 5,183,456, which is a continuation of Ser. No. 703,383, May 21, 1991, Pat. No. 5,211,622, which is a continuation of Ser. No. 437,485, Nov. 15, 1989, Pat. No. 5,045,050. This application Jun. 27, 1994, Ser. No. 268,061

Int. Cl.<sup>6</sup> A61N 2/04

U.S. Cl. 600—9

2 Claims



1. A method of treating cancer comprising of steps of:
  - (1) determining a desired composite magnetic flux having a static field component for treatment of a cancer;
  - (2) placing a patient afflicted with cancer inside a container, and associated magnetic field generator;
  - (3) applying a fluctuating magnetic flux to the patient in with said associated magnetic field generator along an axis;
  - (4) sensing the actual composite magnetic flux along the axis in the patient, wherein the actual composite magnetic flux includes a component of the fluctuating applied magnetic flux and a component of the naturally existing static magnetic flux; and
  - (5) comparing the actual composite magnetic flux to the desired composite magnetic flux, determining an error value, and modifying the applied magnetic flux to correct the error value.

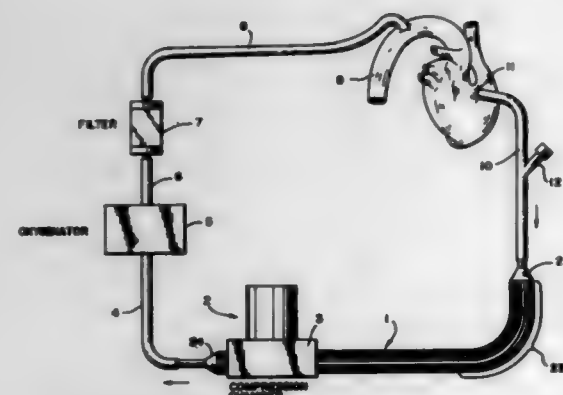
5,437,601

**BLOOD CONDUIT AND PULSATILE CARDIOPULMONARY BYPASS PUMP SYSTEM**  
 Thomas M. Runge, 2630 Exposition Blvd., Austin, Tex. 78703  
 Continuation-in-part of Ser. No. 845,017, Mar. 2, 1992, Pat. No. 5,300,015. This application Feb. 17, 1994, Ser. No. 197,877

Int. Cl.<sup>6</sup> A61M 1/10

U.S. Cl. 600—16

3 Claims



1. A cardiopulmonary bypass system comprising in combination a valveless blood conduit and a pulsatile cardiopulmonary bypass pump, said pump having an inlet end, an outlet end and a compression chamber between said inlet end and said outlet end, and a compression plate having a first end portion and a

second end portion in said compression chamber, said conduit extending through the inlet end, underneath said compression plate in said compression chamber and outwardly of the outlet end of the bypass pump, said conduit comprising a disposable tube of biocompatible polymer having a smooth internal wall and dimensioned to provide a surge chamber positioned at the outlet end of said pump, a reservoir portion positioned at the inlet end of said pump, and a pumping chamber portion positioned in the compression chamber of said pump, said conduit having a diameter of 3.5 cm, the surge chamber extending from the first end portion of said compression plate a length of 8 cm, the pumping chamber portion extending between the first and second end portions of said compression plate a length of 22 cm and the reservoir portion extending from the second end portion of the compression plate a length of 40 cm, whereby adequate and optimal stroke volume is supplied to a medium sized adult patient, without employing large venous reservoirs in the system, thereby diminishing hemodilution and the exposure of blood to air and to non-endothelialized surfaces, while the blood is transmitted to the patient through a smooth walled, valveless bypass system.

5,437,602

**ISOLATOR BAG FOR THERAPEUTIC TREATMENTS OF HUMAN LIMBS**

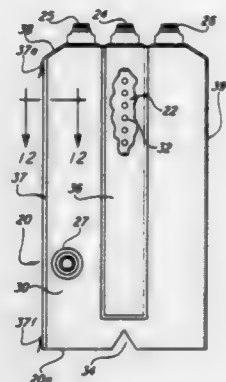
Gregory M. Polyakov, Richmond; James I. Symons, New Westminster; Allen I. Bain, and Michael J. A. Walker, both of Vancouver, all of Canada, assignors to ATM Wound Management, Inc., Vancouver, Canada

Filed Aug. 13, 1993, Ser. No. 107,324

Int. Cl.<sup>6</sup> A61B 19/08

U.S. Cl. 600—21

14 Claims



1. An isolator bag unit comprising:
  - a flexible bag having a closed end, an open end, and a discharge port,
  - said bag being adapted to loosely surround part of the length of a patient's limb starting beyond the extremity of the limb, and being adapted to be attached by adhesive adjacent its open end to the limb such that a treatment chamber is provided between the bag and the limb; and
  - a flexible manifold section secured to said bag in overlapping relation to collectively with the bag provide an intake manifold chamber therebetween,
- said manifold chamber having an infed port exposed outside the bag and having multiple inlet openings exposed to the interior of the bag for introducing a therapeutic gas to the interior of said treatment chamber at multiple locations for circulating in said treatment chamber and discharging therefrom through said discharge port.

5,437,603

**APPARATUS AND METHOD FOR IMPLANTING PROSTHESES WITHIN PERIURETHRAL TISSUES**  
 David E. Cerny, Lilburn, Ga., and Christopher J. Brooks, Glen Head, N.Y., assignors to C.R. Bard, Inc., Murray Hill, N.J.

Filed Sep. 14, 1993, Ser. No. 120,943

Int. Cl.<sup>6</sup> A61F 2/00

U.S. Cl. 600—29

5 Claims

1. A method for effecting coaptation of a urethra of a patient, comprising the steps of:
  - forming a first working channel through the periurethral tissues of said patient to a first target location in predetermined relation to said urethra;
  - forming a second working channel through the periurethral tissues of said patient to a second target location in predetermined relation to said urethra and to said first target location;
  - introducing a first inflatable prosthesis through said first working channel to said first target location;
  - introducing a second inflatable prosthesis through said second working channel to said second target location;
  - subsequent to said step of forming said second working channel, inflating said first inflatable prosthesis; and
  - inflating said second inflatable prosthesis, said first and second prostheses being inflated such that coaptation of said urethra results.

5,437,604

**NONSURGICAL INTRAURETHRAL BLADDER CONTROL DEVICE**

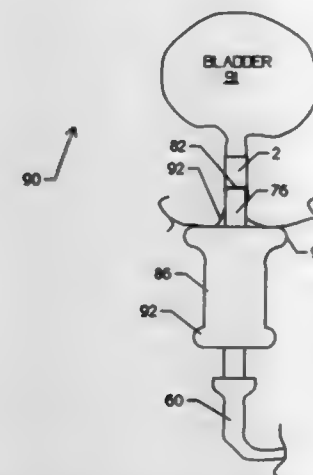
Andre A. Kulisz, and Valery Migachyov, both of San Antonio, Tex., assignors to HK Medical Technologies, Incorporated, San Antonio, Tex.

Continuation-in-part of Ser. No. 173,636, Dec. 23, 1993. This application Aug. 30, 1994, Ser. No. 298,033

Int. Cl.<sup>6</sup> A61F 2/02

U.S. Cl. 600—30

8 Claims



6. In bladder control apparatus adapted to be placed in a urethra and including a valve block having a valve with open and closed positions and a fluid flow path through the valve block, apparatus adapted for inserting and removing said valve block from the urethra comprising:
  - a pressure apparatus means for providing lubricant under pressure, said pressure apparatus means having a pressure gauge for determining the lubricant pressure; and
  - an elongated retriever having a proximal end and a distal end, said distal end having a shoulder formed around the circumference thereof, said retriever also having a lumen extending from the proximal end thereof to said shoulder, said shoulder having a number of holes about the circumference thereof communicating with said lumen; said retriever also having attachment means for attaching the distal end of said retriever to the proximal end of a mount

such that the retriever is aligned with the mount; said retriever further having attachment means for attaching said pressure apparatus to the proximal end of said retriever, and

- c. a sleeve having a proximal end, a distal end and a lumen extending from the proximal end to the distal end, said lumen being sized such as to slideably engage said retriever, said distal end of said sleeve having a flange around the circumference thereof, said flange and said lumen being sized such that when said retriever is placed within the urethra of a patient and said sleeve is forced against the patient, said flange will essentially seal the urethral opening around said retriever.

5,437,605

**REMOTE CONTROLLABLE PENILE PROSTHETIC SYSTEM**

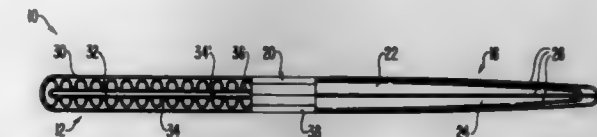
Ali M. Helmy, Bokami Building, Palestine Street, Makarona Cross Flat 304, Jeddah 21414, Saudi Arabia

Filed May 27, 1993, Ser. No. 67,950

Int. Cl.<sup>6</sup> A61F 2/26

U.S. Cl. 600—40

22 Claims



1. A remote controllable penile prosthetic system, comprising:
  - an implantable penile prosthesis including,
    - first fluid chamber means located adjacent a distal end of said prosthesis, and being inflatable with pressurizing fluid,
    - second fluid chamber means for selectively storing fluid and located adjacent a proximal end of said prosthesis opposite said first fluid chamber means,
    - fluid transfer means coupled to and cooperating with said first and second chamber means and selectively transferring fluid between said first and second chamber means in response to remote control operation thereof, so as to cause an erect condition of the penis in one mode and to permit withdrawal of the fluid therefrom to effect a flaccid condition of the penis in a second mode, said transfer means including,
      - a displaceable plunger,
      - energizable electromagnetic means for selectively displacing said plunger within said fluid transfer means in response to energization of said electromagnetic means,
      - valve means associated with said fluid transfer means for allowing fluid flow between said first and second chamber means; and,
      - energizing means for energizing said energizable means from a remote location.

5,437,606

**ULTRASONIC SYSTEM FO ALLEVIATE TOOTHACHES**  
 Kenichi Tsukamoto, Beltec Industrietechnik, Rilkestrasse 69, 40668 Meerbusch, Germany

Filed Mar. 28, 1994, Ser. No. 218,421

Int. Cl.<sup>6</sup> A61B 17/22

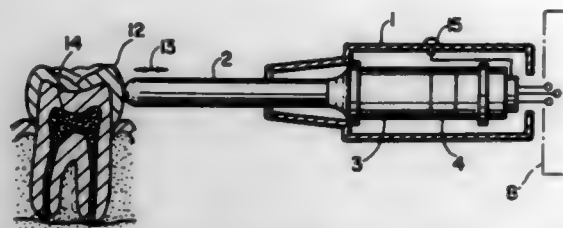
U.S. Cl. 601—2

3 Claims

1. An improved method of administering local anesthesia to the gum surrounding a decayed tooth comprising injecting a local anesthesia into the gum surrounding a decayed tooth wherein the anesthesia is injected through a hypodermic syringe and needle, applying ultrasonic vibration to said hypodermic syringe and needle containing said local anesthesia by contacting said syringe and needle with an ultrasonic probe as

said syringe and needle penetrate said gum, to increase the diffusion of said local anesthesia into said gum surrounding said

including pulse generator means for generating a train of electric rectangular shaped pulses, counter means for converting the train of pulses into a series of pulses on multiple output



decayed tooth, said increase in diffusion of said local anesthesia acting to reduce the amount of said anesthesia required to alleviate pain.

5,437,607

## VIBRATING MASSAGE APPARATUS

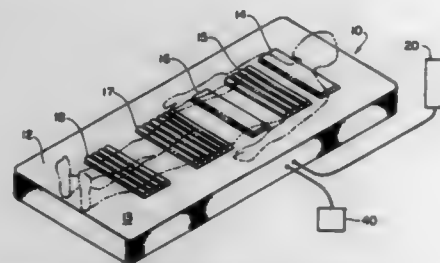
Charles Taylor, San Francisco, Calif., assignor to HWE, Inc., North Hollywood, Calif.

Filed Jun. 2, 1992, Ser. No. 892,176

Int. Cl.<sup>6</sup> A61H 1/00

U.S. Cl. 601-49

3 Claims



1. A vibrating massage apparatus comprising:
  - (a) a resilient pad having a top and bottom surface and a plurality of apertures partially disposed in the top surface thereof along the longitudinal axis of said resilient pad;
  - (b) a plurality of vibrating members, each being secured within said pad and aligned with a respective one of said apertures, each of said vibrating members comprising:
    - (i) an electrically activated vibrating motor having a pair of rotatable shafts extending therefrom in axial opposition to one another and equal, fixed eccentric cams being mounted upon each of said shafts; and
    - (ii) a motor housing securing said vibrating motor therein and including a planar flange extending therefrom, said flange being imbedded within said resilient pad in parallel spaced relation to the top and bottom surfaces of said resilient pad; and
  - (c) operating means for sequentially activating and deactivating adjacent pairs of said plurality of vibrating motors, the mechanical vibrations of said vibrating motors being rapidly increased and slowly decreased, the mechanical vibrations of each adjacent pair of vibrating motors partially overlapping one another, said operating means being coupled to each of said vibrating motors.

5,437,608

## MASSAGING APPARATUS WITH SEQUENTIAL VIBRATION

Stanley Cutler, Van Nuys, Calif., assignor to JB Research, Inc., Los Angeles, Calif.

Filed Oct. 19, 1992, Ser. No. 963,285

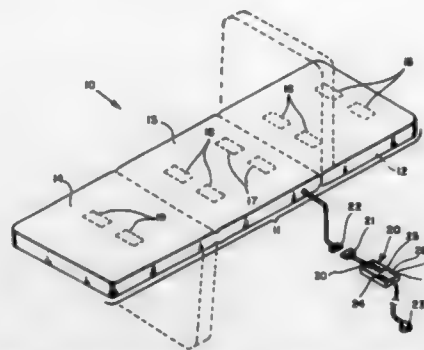
Int. Cl.<sup>6</sup> A61H 1/00

U.S. Cl. 601-49

22 Claims

1. A massaging apparatus comprising a cushion, a plurality of vibrators coupled to said cushion for imparting vibratory energy thereto and to a user, a control means for automatically and sequentially energizing said vibrators, said control means

lines, and a power level interface between the lines and said vibrators, whereby the pulses are selectively and sequentially applied to independent ones of said vibrators.



5,437,609

## CHIROPRACTIC ARTICULATING TRACTION CHAIR

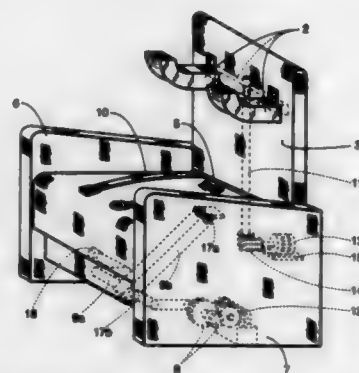
David K. Leonard, 27 Holland Dr., Castle Hayne, N.C. 28429, and John B. Bland, 4903 Oleander, Wilmington, N.C. 28403

Filed Sep. 17, 1993, Ser. No. 122,151

Int. Cl.<sup>6</sup> A61H 1/02

U.S. Cl. 601-91

7 Claims



1. An articulating traction chair adapted to raise and lower the lower torso of a user while the user's upper torso is in a state of traction comprising:
  - (a) a backrest;
  - (b) an articulating seating assembly movable between a raised position and a lowered position;
  - (c) a hinge attaching said seating assembly to said backrest;
  - (d) a vertically adjustable, underarm support assembly projecting from said backrest above said seating assembly;
  - (e) a seat belt attached to said chair to secure a user in said chair;
  - (f) means attached to said underarm support assembly for vertically adjusting said underarm support assembly between raised and lowered positions; and
  - (g) means attached to said seating assembly for continuously articulating said seating assembly at said hinge between horizontal and raised positions while said underarm support assembly is in a raised position.

5,437,610

## EXTREMITY PUMP APPARATUS

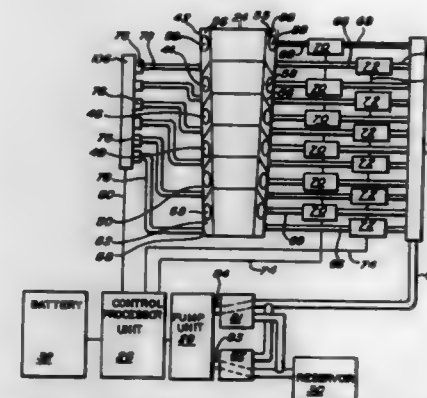
Vikram Cariapa, Franklin; Dean C. Jeutter, Grafton, and Shih-Kang Liang, Milwaukee, all of Wis., assignors to Spinal Cord Society, Fergus Falls, Minn.

Filed Jan. 10, 1994, Ser. No. 179,519

Int. Cl.<sup>6</sup> A61H 9/00

U.S. Cl. 601-152

18 Claims



12. A hydraulic extremity compression apparatus for application on an extremity, the device comprising:
  - a. a flexible compression unit to wrap around and engage an extremity;
  - b. a plurality of prefill bladders, each prefill bladder is configured and positioned in the compression unit to extend circumferentially around the extremity, the prefill bladders sequentially and vertically arranged in the compression unit, the bladders expandable when hydraulically pressurized;
  - c. a plurality of compression bladders sequentially and vertically arranged in the compression unit, each compression bladder substantially contained within a prefill bladder, the compression bladders expandable when hydraulically pressurized;
  - d. a pump unit for hydraulic pressurization and expansion of the prefill bladders and the compression bladders, the pump unit connected to the bladders;
  - e. a fluid source connected to the pump;
  - f. a plurality of valves with at least one valve inserted intermediate the pump unit and each bladder, the valves operational for controlling the hydraulic pressurization of the bladders;
  - g. a control processor connected to the valves for controlling the hydraulic pressurization of the bladders.

5,437,611

## DYNAMIC BRACE JOINT

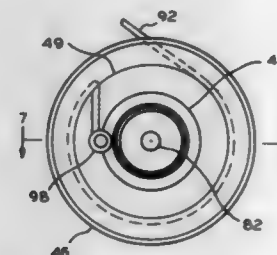
Elliot L. Stern, Auburn, Ala., assignor to Orthotic Rehabilitation Products, Inc., Tampa, Fla.

Filed Dec. 1, 1993, Ser. No. 160,389

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-16

22 Claims



20. A dynamic brace joint comprising:

- (a) a pair of members pivotally connected to each other to form a pivot axis;
- (b) a rotatable member having a peripheral groove around the edge thereof, the rotatable member being mounted to and axially displaceable from the pivotally connected members;
- (c) means for releasably securing the rotatable member in a fixed angular position relative to the pivotally connected members; and
- (d) a tensioning member having one end connected to one of the pivotally connected members, the tensioning member being aligned with and partially received in the groove; the tensioning member being adjustable by axially displacing and rotating the rotatable member to receive more or less of the tensioning member.

5,437,612

## ANTIDECUBITUS IMMOBILIZATION CERVICAL COLLAR

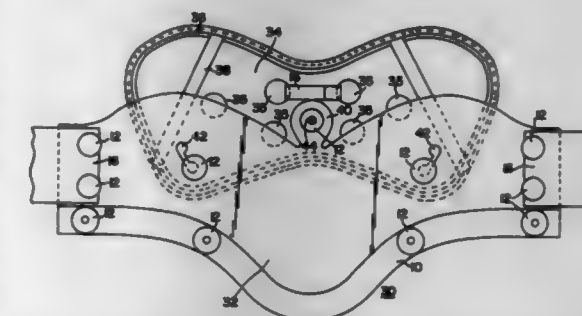
George E. Moore, Jerrersontown, Ky., and Lisa A. G. Tweardy, Mt. Laurel, N.J., assignors to The Jerome Group, Mt. Laurel, N.J.

Continuation of Ser. No. 619,040, Nov. 28, 1990, Pat. No. 5,180,361. This application Jul. 7, 1992, Ser. No. 909,963

Int. Cl.<sup>6</sup> A61F 5/055

U.S. Cl. 602-18

7 Claims



1. A cervical collar comprising:
  - front and back semi-rigid portions, each having a fixed height;
  - said front portion comprising a semi-rigid preformed jaw support contoured to follow the jaw line of a patient, and a preformed sternum brace contoured to contact the sternum and upper trapezius of the patient and support said jaw support;
  - said back portion contoured to follow the curve of and to support the back of the neck and occiput;
  - said sternum brace having right and left sections, adapted to rest upon the upper trapezius of the patient and to contact and support the patient's jaw when the head of said patient is in a preferred, predetermined alignment;
  - said sternum brace also having a central section adapted to rest upon the patient's sternum and to contact and support said jaw support while said jaw support contacts and supports the patient's jaw, when the head of said patient is in a preferred, predetermined alignment; and
  - said jaw support including a removable foam pad.

5,437,613

## NECK BRACE

David Reggio, 4810 Longfellow, and Donald Riley, 4819 Longfellow, both of New Orleans, La. 70127

Filed Aug. 23, 1993, Ser. No. 110,520

Int. Cl.<sup>6</sup> A61F 5/00

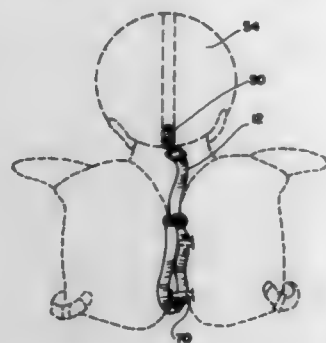
U.S. Cl. 602-18

4 Claims

1. A neck brace device, comprising:
  - an elongated flexible non-stretchable strap having a first end and a second end;
  - means for securing the first end of the strap on a headgear of



a user, said securing means comprising a hook-shaped bracket having an upper end adapted for a fixed attachment to headgear of the user and a hook-shaped lower end which extends downwardly from said upper end and is adapted to fit under a lowermost edge of the headgear, so as to prevent the bracket from being pulled away from the headgear, said bracket being provided with an elongated narrow opening, said securing means further comprising a buckle which is secured to the first end of the strap, said buckle having a T-shaped pin which engages the bracket by being fitted through said opening;



means for preventing disengagement of the pin from said bracket, said means comprising a spring plate having an upper portion which is adapted for engagement to said upper end of the bracket and the headgear of the user and a hook-shaped lower portion which extends downwardly a distance away from said lower end of the bracket to cover substantially the entire opening of said bracket and thereby prevent accidental disengagement of the pin from the bracket; and means for securing the second end of the strap to a body harness of the user.

5,437,614

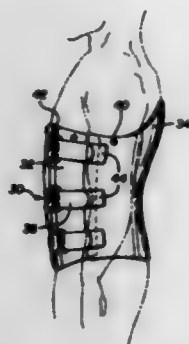
# SOFT-GOODS TYPE, CUSTOM "IN SITU" FORMABLE BACK SUPPORT

Tracy E. Grim, Broken Arrow, Okla., assignor to Royce Medical Company, Camarillo, Calif.

Filed Feb. 16, 1993, Ser. No. 17,817  
Int. Cl.<sup>6</sup> A61F 5/02

U.S. Cl. 602-19

29 Claims



1. An orthopaedic soft-goods "in situ" formable back support assembly comprising:

a front component generally dimensioned to extend circumferentially around the front torso and at least a portion of the sides of the torso, said front component including a water impervious sealed enclosure containing a gas or

liquid permeable matrix impregnated with an activatable, hardenable material;  
a rear component generally dimensioned to extend circumferentially around a patient's back and at least a portion of the sides of the torso, said rear component including a water impervious sealed enclosure containing a gas or liquid permeable matrix impregnated with an activatable, hardenable material;  
fastening means for releasably coupling said front and rear components together and to the torso; and  
at least one inlet port provided on each of said component for introducing liquid into said water impervious sealed enclosure to activate said activatable, hardenable material contained therein, said front and rear components containing the activatable, hardenable material generally defining the shape of said back support assembly;  
whereby said formable back support assembly may be coupled to the torso of a patient and subsequently activated to conform said front and rear components to the torso configuration of a patient.

5,437,615

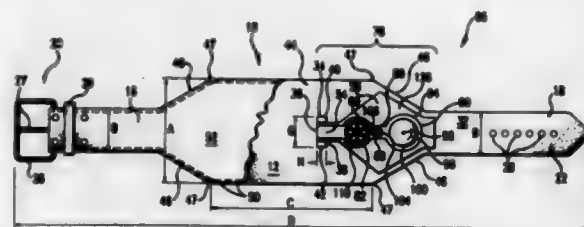
# INFLATABLE SUPPORT DEVICE

Robert W. Pekar, Florence; Paul E. Litchfield, Cerafont; Steven F. Smith, Taunton, and Stephen J. Cardillo, Everett, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass.

Filed Oct. 19, 1993, Ser. No. 137,792  
Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-19

20 Claims



1. An article of manufacture, comprising:  
a rigid support having a first side and a second side defining an aperture located at a first position within said support which extends between said first side and said second side;  
a bladder disposed on said first side of said support having a portion which extends from said first side of said support through said aperture to said second side of said support; and  
an inflation mechanism positioned on said portion of said bladder disposed on and supported by said second side of said support at a second position different from said first position of said aperture;  
wherein said inflation mechanism is supported by a surface of said second side of said rigid support during inflation of said bladder.

5,437,616

# VALGUS BIG TOE RECTIFYING SUPPORTER

Iwao Kasahara, 3734-6, Totokacho, Totoku-ku, Yokohama-shi, Kanagawa, Japan

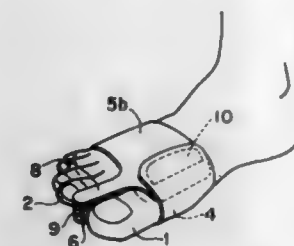
Filed May 21, 1993, Ser. No. 65,825  
Claims priority, application Japan, Jun. 5, 1992, 4-045236 U; Jul. 28, 1992, 4-058348 U; Jul. 28, 1992, 4-058349 U  
Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-30

11 Claims

1. A valgus big toe rectifying supporter comprising a metatarsophalangeal joint securing band adapted to be wound around the metatarsophalangeal joint, said securing band having a top portion adapted to be disposed about the top of a person's foot and a bottom portion adapted to be disposed

about the bottom of a person's foot, said top portion having a top front edge which includes a first top front edge section adapted to be disposed at the root of the big toe and a second top front edge section adapted to be juxtaposed to the roots of the second toe, the third toe, the fourth toe, and the little toe, said bottom portion of said securing band having a bottom front edge which includes a first bottom front edge section adapted to be disposed at the root of the big toe and a second bottom front edge section adapted to be juxtaposed to the roots of the second toe, the third toe, the fourth toe, and the little toe, said top portion of said securing band having a top forward



projection projecting forwardly from said top front edge between said first and second top front edge sections, said top forward projection being adapted to generally overlie the space between the big toe and the second toe, said bottom portion of said securing band having a bottom forward projection projecting forwardly from said bottom front edge between said first and second bottom front edge sections, said bottom forward projection underlying said top forward projection, a resilient member jointed to said top forward projection and said bottom forward projection, said resilient member being adapted to be disposed and retained between the big toe and the second toe.

5,437,617

# ELECTROMECHANICAL BACK BRACE APPARATUS

Thomas J. Heinz, Flintridge; Tom Walker, Ojai, and Eric D. Plambeck, Ventura, all of Calif., assignors to Bio Cybernetics International, Pasadena, Calif.

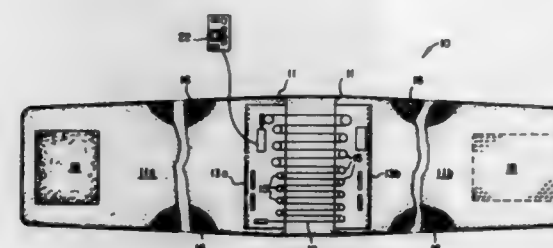
Continuation of Ser. No. 197,850, Feb. 17, 1994, abandoned, which is a continuation of Ser. No. 965,305, Oct. 23, 1992, Pat. No. 5,346,461. This application Aug. 29, 1994, Ser. No. 297,413

The portion of the term of this patent subsequent to Sep. 13, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-19

13 Claims



1. A back brace apparatus comprising:  
a brace body adapted to be wrapped around the trunk or a patient, said brace body comprising two segments;  
means at the end of each brace segment for allowing the two ends to be detachably connected together around the patient's trunk; and  
means for automatically tightening the brace comprising a cable operatively connected to said two segments, a motor operatively connected to apply tension to said cable, and means for controlling said motor, said means for controlling said motor including a microprocessor operatively associated with said motor and programmable to control

the motor thereby tightening the brace to a predetermined setting.

5,437,618

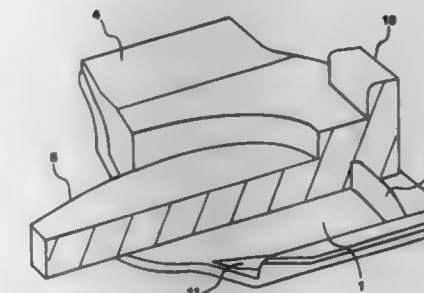
# DEVICE AND METHOD FOR HIP PROTECTION AND STABILIZATION

W. David Sikes, Gainesville, Fla., assignor to Homeostatics Design Group, Inc., Starke, Fla.

Continuation-in-part of Ser. No. 122,076, Sep. 14, 1993, Pat. No. 5,383,920. This application Sep. 14, 1994, Ser. No. 306,075  
Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-19

24 Claims



1. A device for the protection of a joint and surrounding area against an injury due to contact with a hard surface, wherein said device comprises an outer rigid shield having an outer and inner face, a cushion comprising a plurality of cross-sectionally tiered pad components affixed to the inner face of said shield wherein said plurality of pad components comprises a first pad component centrally disposed on the inner face of said shield, a second pad component disposed around the periphery of said first pad component, and a third pad component disposed cranially to said first and second pad components, wherein said second pad component has a thickness greater than said first pad component wherein said second pad component is adapted to directly [contacts] contact a wearer of said device in use, thereby holding said centrally disposed first pad component away from the wearer, and wherein said third pad component protrudes medially beyond the first and second components so as to apply pressure to a gluteus muscle of the wearer when in use.

5,437,619

# RANGE-OF-MOTION SPLINT WITH ECCENTRIC SPLITTING

Andrzej Malewicz, Minneapolis, and Yuri Belman, Plymouth, both of Minn., assignors to Empl, Inc., St. Paul, Minn.

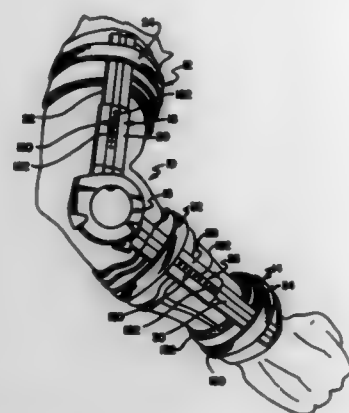
Continuation-in-part of Ser. No. 85,758, Jun. 30, 1993. This application Mar. 4, 1994, Ser. No. 205,837  
Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-20

20 Claims

13. A range-of-motion splint for applying torque to a joint undergoing rehabilitative therapy, including:  
a first brace section figured to engage a portion of a body on a first side of a joint, the first brace section including a first arm;  
a second brace section figured to engage a portion of a body on a second side of a joint, the second brace section including a second arm;  
a first pivot mechanism for pivotally connecting the first and second arms about a first splint pivot axis corresponding to a primary axis of joint motion;

a spiral spring having inner and outer ends, for applying torque between the first and second brace sections; and



an eccentric mount for eccentrically mounting the spiral spring with respect to the first splint pivot axis.

#### 5,437,620 WRIST SPLINT

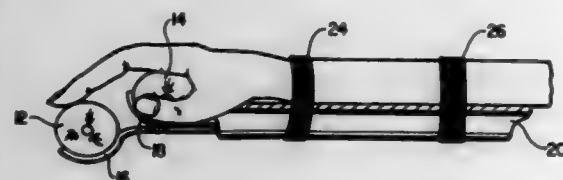
Randy L. Shelly, De Soto, Tex., assignor to Bio Tex Ltd., Inc., Cedar Hill, Tex.

Filed Feb. 24, 1993, Ser. No. 21,998

Int. Cl.<sup>6</sup> A61F 5/10

U.S. Cl. 602-21

15 Claims



1. A wrist splint for correcting contracture of a hand, comprising:

- a splint platform;
- at least one rigid bladder receptacle member slidingly engaged with said splint platform; and
- at least one air bladder, each said air bladder coupled to one of said at least one rigid bladder receptacle member.

#### 5,437,621 MEDICAL DRESSING OF A MULTILAYERED MATERIAL

Warren L. Andrews, Chicago, and C. Robert Hammett, Palatine, both of Ill., assignors to Marmon Holdings, Inc., Chicago, Ill. Continuation-in-part of Ser. No. 978,556, Nov. 19, 1992, Pat. No. 5,328,449. This application Jan. 12, 1993, Ser. No. 3,359. The portion of the term of this patent subsequent to Jul. 12, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61F 13/00

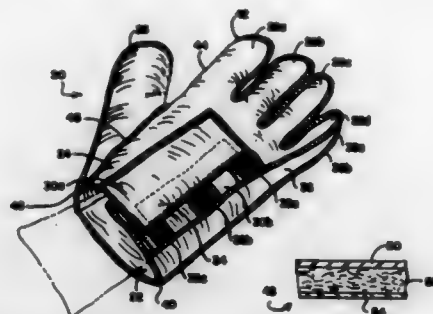
U.S. Cl. 602-42

6 Claims

1. A medical dressing for covering wounds, lesions, burns or similar injuries comprising a material having at least three layers comprising:

- (a) a first inner layer which will contact said injury comprising a porous polyethylene film having a thickness of about 3.5-5.0 mils which enables moisture to be wicked away from the injury and is non-adherent so that the dressing will not stick to the injury;
- (b) a second middle layer comprising an absorbent material for absorbing the moisture from the first layer, said second layer comprising an absorbent needle-punched, non-woven rayon;
- (c) a third outer layer comprising a flexible, waterproof and

breathable polyurethane film which protects the injury from exposure to contaminants from the outer atmosphere while preventing leakage of moisture from the injury; and



(d) adjustable opening and closure means for easy application and removal of said dressing, adjustable fitting of said dressing to the injury and easy inspection or treatment of said injury without requiring removal of said medical dressing.

#### 5,437,622 TRANSPARENT ADHESIVE DRESSING WITH REINFORCED STARTER CUTS

Jean-Pierre Carlon, Nieppe, France, assignor to Laboratoire Hydrex (SA), Montreuil, France

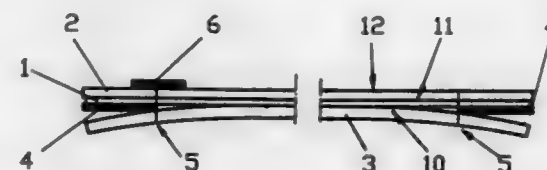
Filed Apr. 22, 1993, Ser. No. 51,484

Claims priority, application France, Apr. 29, 1992, 92 05250

Int. Cl.<sup>6</sup> A61F 13/00, 15/00

U.S. Cl. 602-57

10 Claims



1. A transparent adhesive dressing of synthetic material comprising

- a first layer formed as a sheet of flexible film having an adhesive face and having a non-adhesive face;
- a second layer forming a protective sheet backing covering said adhesive face;
- a third layer formed as a sheet made of a less flexible material disposed on the non-adhesive face of the sheet of flexible film;
- a first strip for grasping disposed at a first lateral edge of the sheet of flexible film, wherein the first strip for grasping adheres to the sheet of flexible film;
- a second strip for grasping disposed at a second lateral edge of the sheet of flexible film, wherein the second strip for grasping adheres to the sheet of flexible film;
- wherein a useful area of the transparent adhesive dressing is extending between the first strip for grasping and the second strip for grasping;
- starter cuts passing through at least two of the three layers and disposed along the first lateral edge of the sheet of flexible film;
- a reinforcing strip disposed on the sheet of less flexible film for protecting said starter cuts.

5,437,623

#### WOUND DRESSING SECUREMENT SYSTEM

Nancy J. McClees, Westerville, Ohio; John L. Blum, South Toms River, and Mark F. Lesko, Jackson, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 2, 1993, Ser. No. 100,828

Int. Cl.<sup>6</sup> A61F 13/00

U.S. Cl. 602-59

19 Claims



1. A wound dressing securement device comprising,

- (a) two flexible base members, each having an adhesive attachment surface and a non-adhesive obverse surface, said base members being adapted to be spaced from each other on opposite sides of a wound,
- (b) a plurality of sheet retention members joined to each of said base members in a predetermined pattern and projecting from the obverse surface of said respective base member, and
- (c) a flexible hold-down sheet member of stretchable material for superposition over a wound dressing, said sheet member having a pattern of openings for receiving respective ones of said sheet retention members for stretchable engagement of said sheet retention members by said sheet member.

5,437,624

#### SINGLE NEEDLE RECIRCULATION SYSTEM FOR HARVESTING BLOOD COMPONENTS

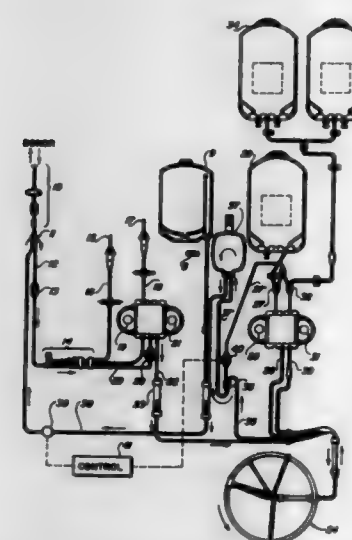
Robert W. Langley, Westminster, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Aug. 23, 1993, Ser. No. 110,432

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604-4

43 Claims



1. A system for separating and collecting blood components during both a draw cycle and a return cycle, said system for drawing and returning blood to a donor through a single lumen needle, comprising

- a connector having at least three branches, a first branch connected to said single lumen needle;

a constant volumetric flow rate inlet pump with an inlet and an outlet;

an inlet line connected to a second branch of said connector and to said inlet pump for supplying blood to the inlet side of said pump;

a centrifuge apparatus with a separation vessel connected to the outlet side of said inlet pump for separating blood components into stratified layers within said vessel;

a collection bag connected to said separation channel for receiving and holding a collected component of the donated blood;

a return path including a return line connected to a third branch of said connector;

a flexible storage bag with an inlet connected to said separation vessel for receiving and holding the processed donated blood other than collected components, said storage bag having an outlet connected to said return line;

a pressure application member in communication with said flexible storage bag for applying pressure to the external sides of said storage bag during said return cycle to force the accumulated fluids in said storage bag into said return line;

a return valve in fluid communication with said return line to open said return line during said return cycle to allow a first portion of said accumulated fluids to be returned to said donor, a second portion of said accumulated fluids passing through said connector to said inlet line for establishing and maintaining a recirculation path for blood during said return cycle;

a sensing device in communication with said return path for producing a signal upon detecting an empty storage bag;

a control device connected to said sensing device, said return valve and said inlet pump, said control device including means for minimizing the time duration of said return cycle.

5,437,625

#### APPARATUS FOR INTUBATION OF LACRIMAL DRAINAGE PATHWAY

Katsuaki Kurihashi, 1366-1 Hatsuoi-cho, Hamamatsu-cho, Shizuoka-ken, Japan

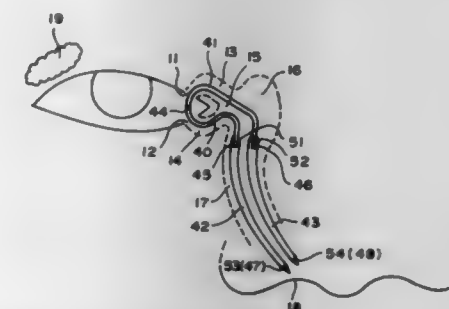
Filed Jan. 14, 1993, Ser. No. 4,589

Claims priority, application Japan, Apr. 6, 1992, 4-129254; Nov. 12, 1992, 4-349676

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604-8

13 Claims



1. A device for intubation of the lacrimal duct comprising: a flexible tube having a pair of cuts permitting insertion of probes, said flexible tube having a length of 50-120 mm, said flexible tube including a central, thinner soft segment and a pair of tubular segments depending from the ends of said soft segment, each of said tubular segments having an outside diameter significantly larger than the outside diameter of said soft segment, and having a free end which is sharp-pointed and sealed closed.



5,437,626

**SHUNT WITH INTERNAL NEUROENDOSCOPE**

Donald Cohen, Irvine; Lance Kuma, Tustin; John Anki, Bellflower; Rith N. Kimm, Rancho Santa Margarita, and Shea Bassett, Newport Beach, all of Calif., assignors to Neuro Navigational Corporation, Costa Mesa, Calif.

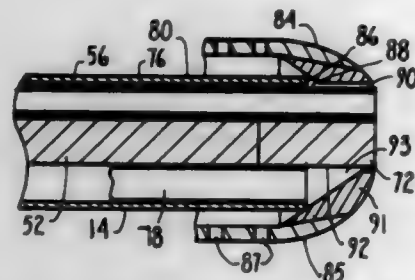
Continuation of Ser. No. 53,075, Apr. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 970,402, Nov. 2, 1992.

This application Aug. 3, 1994, Ser. No. 285,487

Int. Cl.<sup>6</sup> A61M 25/00; A61B 1/07

U.S. Cl. 604—8

14 Claims



1. A device for relieving hydrocephalus in the brain of a patient, comprising:

- a flexible ventricular shunt catheter having a distal segment formed with a plurality of drainage holes, the distal segment including closed distal end formed with a slit, wherein the slit is movable between an advancement configuration, wherein the slit is substantially closed to prevent fluid communication therethrough, and an open configuration, wherein the slit is open;
  - a tubular member positioned within the catheter, the tubular member having a distal end; and
  - a light transmitting member including an optical image fiber positioned within the tubular member, the light transmitting member having a distal end positioned adjacent the distal end of the tubular member,
- wherein the distal end of the tubular member can be advanced through the slit of the ventricular catheter to permit light from beyond the distal end of the catheter to enter the distal end of the light transmitting member.

5,437,627

**IMPLANTABLE VALVE FOR THE TREATMENT OF HYDROCEPHALY**

Alain Lecuyer, Grasse, France, assignor to Cordis Corporation, Miami Lakes, Fla.

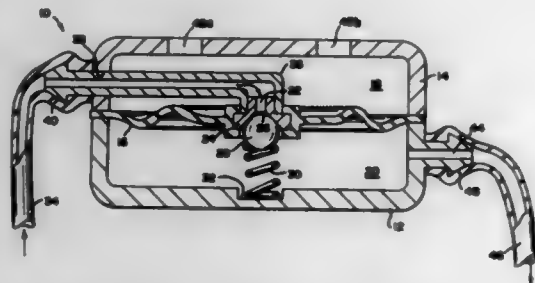
Filed Sep. 14, 1993, Ser. No. 121,159

Claims priority, application France, Sep. 15, 1992, 92 10972

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—9

16 Claims



1. An implantable valve for the treatment of hydrocephaly, comprising:

- a chamber defined by four walls;
- a flexible diaphragm mounted within said chamber and including a fluid flow orifice extending therethrough, said fluid flow orifice is in fluid communication with an inlet

capable of being connected to an area within a living patient for drainage thereof;

- a valve seat surrounding said fluid flow orifice;
- a valving mechanism configured to be seated within said valve seat to prevent the flow of fluid through said fluid flow orifice;
- elastic means for retaining said valving mechanism within said valve seat;
- an outlet port capable of being connected to a drainage area within a living patient; and
- a cover member overlies said diaphragm and has an aperture therein to subject a surface of the diaphragm to subcutaneous pressure and to maintain said surface at subcutaneous pressure.

5,437,628

**CURVED TAMPON APPLICATOR HAVING AN IMPROVED FINGERGRIP**

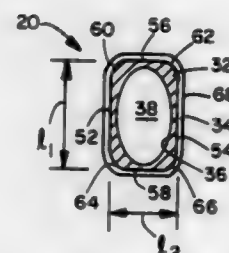
Donald G. Fox, Neenah; Daniel J. Heuer, Larsen; Laurie Couture-Dorschner, Greenville, and Mary S. Semanek, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 10, 1993, Ser. No. 150,678

Int. Cl.<sup>6</sup> A61F 13/28

U.S. Cl. 604—14

21 Claims



1. A curved tampon applicator comprising:

- a) a tubular member having an arcuate shape with a centerline formed on an arc having a predetermined radius of curvature, said tubular member having a stepped outer profile with an enlarged portion designed to house a tampon joined to a smaller fingergrasp portion, said member having a forward end through which said tampon can be ejected and a rearward end through which a plunger is slidable, said fingergrasp portion having a passageway formed therethrough which is sized and configured to receive said plunger and having an exterior periphery;
- b) a first pair of flat surfaces formed on said exterior periphery of said fingergrasp portion which are aligned parallel to a plane coincident with a radius forming said arcuate centerline of said member; and
- c) a second pair of flat surfaces formed on said exterior periphery of said fingergrasp portion which are aligned perpendicular to said first pair of flat surfaces, said second pair of flat surfaces being shorter in length than said first pair of flat surfaces.

5,437,629

**FLUID DELIVERY SYSTEM FOR HYSTEROSCOPIC ENDOMETRIAL ABLATION**

Milton H. Goldrath, Franklin, Mich., assignor to BEI Medical Systems, Hackensack, N.J.

Filed Apr. 14, 1994, Ser. No. 227,724

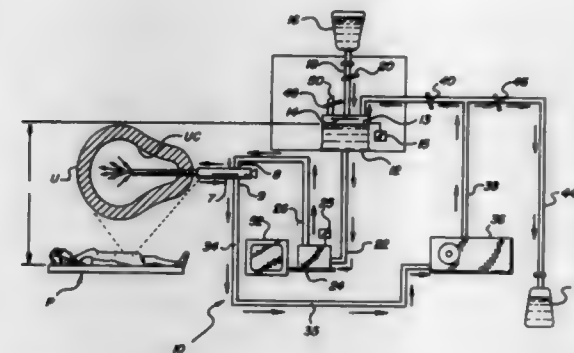
Int. Cl.<sup>6</sup> A61M 3/04

U.S. Cl. 604—21

17 Claims

- 1. A fluid delivery apparatus for use in performing hysteroscopic endometrial ablation, said system comprising:
  - a chamber of known volume having graduated markings indicative of a plurality of fluid levels;
  - a container of physiologically compatible solution in fluid communication with said chamber;

- a first valve for controlling the flow of physiologically compatible solution into said chamber from said container;
- a heater disposed downstream of said chamber for heating a flow of fluid passing therethrough;
- a first conduit disposed between said chamber and said heater;
- a hysteroscopic sheath capable of introducing heated physiologically compatible solution into the uterine cavity of a patient and being provided with an inlet port and an outlet port;
- a fill tube connecting said heater and said sheath inlet port;
- a discharge tube from said sheath outlet port;
- collection means connected to said discharge tube such that fluid discharged from said sheath collects therein;



fluid pumping means in fluid communication with said collection means;

- a second conduit between said pump and said chamber to form a closed loop circulation system;
- a collection bottle containing a quantity of physiologically compatible solution disposed in fluid communication with said second conduit;
- a second valve disposed in said second conduit between said collection bottle and said chamber for controlling the flow of fluid into said chamber; and
- a third valve for controlling the flow of fluid from said collection bottle into said second conduit.

5,437,630

**ARTHROSCOPIC CUTTER HAVING CURVED ROTATABLE DRIVE**

Sean C. Daniel, San Francisco; Andrew J. Juknelis, San Jose, and Barry J. Kauker, Soquel, all of Calif., assignors to Stryker Corporation, Kalamazoo, Mich.

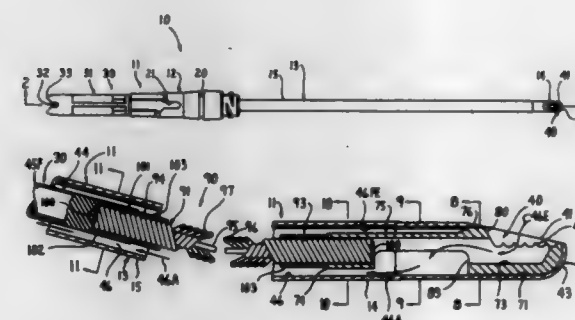
Continuation of Ser. No. 144,195, Oct. 27, 1993, abandoned.

This application Sep. 27, 1994, Ser. No. 313,407

Int. Cl.<sup>6</sup> A61B 17/20

U.S. Cl. 604—22

18 Claims



1. A powered rotatable surgical tissue working tool for chucking in a powered rotating surgical handpiece, comprising:

- a tubular outer member including a proximal base releasably fixable on a powered rotatable surgical handpiece, an

elongate tubular sleeve fixed to and extending forwardly from said base, said sleeve having an intermediate portion and a distal tip portion and an angled portion connecting said intermediate portion and distal tip portion so that said distal tip portion is angled off the central axis of said base;

a driven rotatable elongate inner member extending coaxially and rotatably within said tubular outer member, said rotatable inner member having a proximal end portion defining a hub rotatably drivably engageable by a powered surgical handpiece, said rotatable inner member having an intermediate portion supported for rotation within said intermediate portion of said tubular outer member and a distal tip portion, said outer tubular member and inner rotatable member having their respective distal tip portions cooperable for surgically working tissue at a surgical site, said inner rotatable member having a flexibly bendable portion disposed lengthwise between said distal tip portion and intermediate portion of said inner rotatable member and disposed within said angled portion of said tubular outer member, said rotatable inner member being axially located within said tubular outer member for substantially axially fixing said rotatable inner member with respect to said tubular outer member, said flexibly bendable portion being of outer diameter substantially less than the inner diameter of said outer tubular member and being located therein in a radially loose, non-contacting, frictionless manner, said inner member flexibly bendable portion comprises a wrapped outer wire spiral coil, said flexibly bendable member further comprises means surrounding said outer wire spiral coil for preventing accumulation of flowable solids between adjacent segments of said coil, for avoiding metal to metal contact in the unlikely event that said flexible member brushes against the interior of said outer tubular member, and to tightly confine said coil against unwrapping, said surrounding means comprising a smooth outer sleeve of conventional heat shrink material, heat shrunk thereon to snugly grip and fixedly surround same and extending substantially the length thereof from said head to said shaft.

5,437,631

**PERCUTANEOUS INTRODUCER SET AND METHOD FOR SEALING PUNCTURE WOUNDS**

Ernst Janzen, Laren, Netherlands, assignor to Datascope Investment Corp., Montvale, N.J.

Continuation-in-part of Ser. No. 746,339, Aug. 16, 1991, Pat.

No. 5,391,183, which is a continuation-in-part of Ser. No.

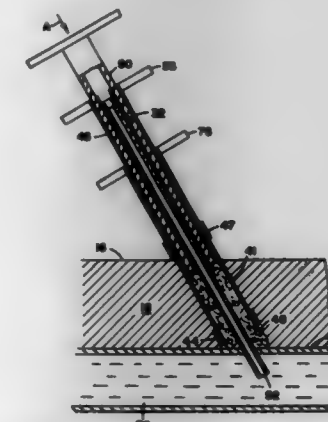
634,478, Dec. 27, 1990, abandoned. This application May 10,

1993, Ser. No. 58,358

Int. Cl.<sup>6</sup> A61M 31/00

U.S. Cl. 604—49

7 Claims



1. A method of stanching the flow of blood from a patient's wound left after completion of a percutaneous medical procedure.

wherein said medical procedure is preceded by the insertion of a first sheath from outside the patient's body, through a puncture in the patient's skin, through the underlying tissue and into an artery through an arterial puncture, said method comprising:

- inserting said first sheath from outside the patient's body, through a puncture in the patient's skin, through the underlying tissue and into an artery,
- passing a sheath-dilator set, comprised of a dilator and a second sheath, each with a front end, over said first sheath, through the patient's skin and through said underlying tissue until the front end of said dilator reaches said artery,
- removing said dilator, leaving an annular space between said first and second sheaths,
- inserting a charge of hemostatic material into said annular space between said first and second sheaths,
- after completion of said medical procedure, withdrawing said first sheath from said artery without withdrawing said hemostatic material,
- permitting said hemostatic material to expand to cover said arterial puncture,
- withdrawing said second sheath without withdrawing said hemostatic material.

5,437,632

## VARIABLE STIFFNESS BALLOON CATHETER

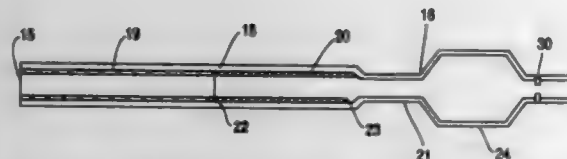
Erik T. Engelson, Menlo Park, Calif., assignor to Target Therapeutics, Inc., Fremont, Calif.

Filed Jun. 2, 1993, Ser. No. 71,284

Int. Cl.<sup>6</sup> A61M 25/10

U.S. Cl. 604—53

14 Claims



1. A single lumen valved balloon catheter for use in combination with a guidewire, said catheter comprising an elongate tubular body having a proximal end and a distal end and a lumen extending between said ends for receiving the guidewire, said body comprising:

- (a) an inflatable balloon segment intermediate said ends, proximate said distal end;
- (b) an outer coaxial tube extending continuously between the proximal end and the balloon having a wall thickness of between about 0.05 to 0.13 mm and being made of a polymer having flexural modulus of about 5,000 to 30,000 psi (35,000 to 210,000 kpa); and
- (c) proximal and distal inner coaxial polymeric tube sections positioned contiguously in tandem proximal to the inflatable balloon segment and located within a portion of the outer coaxial tube; wherein the distal end of the inner coaxial tube is proximal said balloon, the proximal inner coaxial tube section having a wall thickness of about 0.08 to 0.18 mm and being made of a polymer having a flexural modulus of about 220,000 to 260,000 psi (1,500,000 to 1,800,000 kpa), and the distal inner coaxial tube section being less stiff than the proximal inner coaxial tube section but stiffer than the portion of the outer coaxial tube extending from the distal inner coaxial tube section to the balloon.

5,437,633

## SELECTIVE AORTIC ARCH PERFUSION

James E. Manning, Chapel Hill, N.C., assignor to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

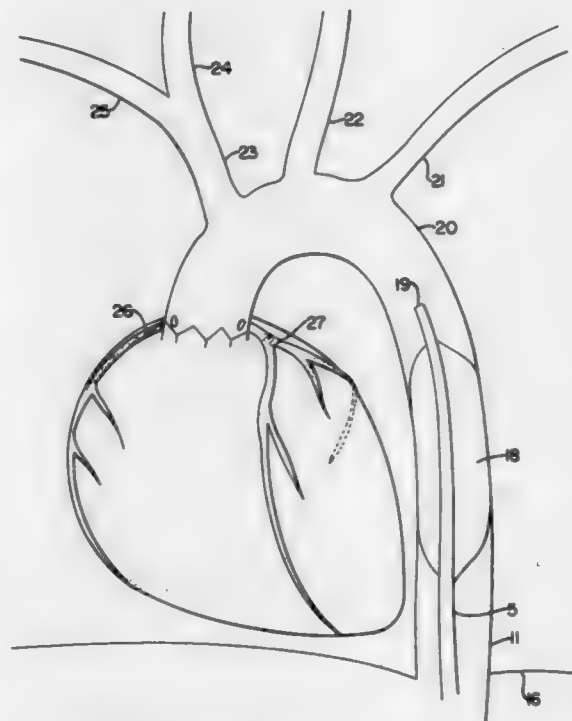
Filed Mar. 30, 1994, Ser. No. 211,374

The portion of the term of this patent subsequent to Jun. 1, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61M 31/00

U.S. Cl. 604—53

20 Claims



1. A method of treating a subject in cardiac arrest, comprising:

- blocking the descending aorta of said subject; and then perfusing the aortic arch of said subject with an oxygen-carrying protective solution in an amount effective to deliver oxygen to the heart of said subject, and concurrently administering said subject an alpha adrenergic receptor agonist in an amount effective to enhance coronary perfusion with said protective solution;
- and wherein said perfusing step is carried out by infusing an initial bolus of protective solution, followed by a less rapid infusion of protective solution.

5,437,634

## MEDICAL PUMP DRIVING DEVICE

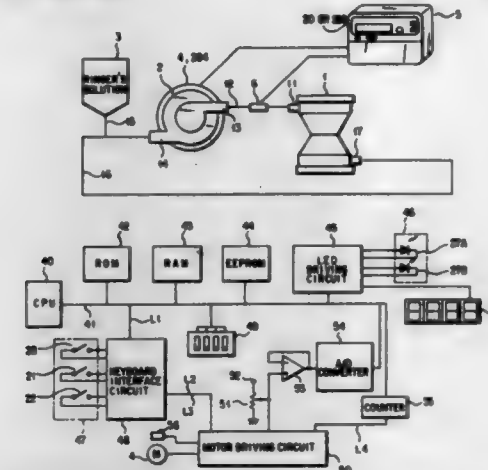
Nobuhiko Amano, Kanagawa, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 963,859, Oct. 20, 1992, abandoned. This application Apr. 22, 1993, Ser. No. 51,567

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—65

18 Claims



1. A medical pump driving device comprising: a pump for transferring liquid in a liquid channel including a medical device;
- a motor for driving said pump;
- dial means for adjusting a number of rotations of said motor;
- an operating unit for operating said dial means;
- a first display for displaying the number of rotations of said motor set by operating said dial means by said operating unit when said pump is stopped;
- detecting means for detecting an actual number of rotations of said motor while said pump is being driven;
- a second display for displaying the actual number of rotations detected by said detecting means;
- a voltage variable device connected to a driving circuit of said motor and to said dial means;
- said operating unit operating said dial means based on the set number of rotations and the actual number of rotations respectively displayed on said first and second displays; and
- a driving voltage of said motor being changed by said voltage variable device so as to adjust the number of rotations of said motor.

5,437,635

## TUBE FLOW LIMITER, SAFETY FLOW CLIP, AND TUBE PINCHER MECHANISM

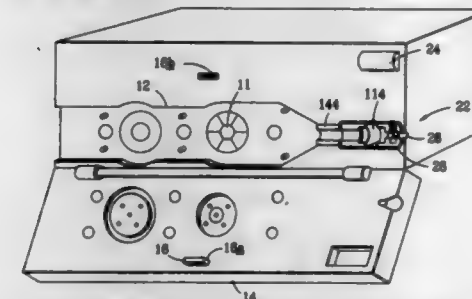
Antony Fields, San Francisco, Calif.; Terry Branson, Round Rock, Tex.; David J. Harrison, Carrollton, Tex.; Dana J. Owens, Irving, Tex.; Aaron T. Raines, Dallas, Tex., and Edward G. Rasmussen, Carrollton, Tex., assignors to McGraw, Inc., Carrollton, Tex.

Continuation-in-part of Ser. No. 880,642, May 6, 1992, abandoned. This application Dec. 14, 1993, Ser. No. 167,413

Int. Cl.<sup>6</sup> A61M 31/00

U.S. Cl. 604—65

14 Claims



1. A flow limiter mechanism in an infusion pump of the type having a channel for receiving a flow tube connected to a disable pumping cassette, said flow limiter mechanism comprising:

- a) a tube pincher operatively associated with said receiving channel, said tube pincher having a clamped position to

stop flow in said flow tube received in said receiving channel, and said tube pincher having an unclamped position to allow flow in said flow tube, and which tube pincher is mechanically retractable to an unclamped position;

- b) electrical controls for selectively operating said tube pincher from said clamped position to said unclamped position while said flow tube connected to said disposable cassette is received in said receiving channel of said infusion pump;
- c) a flow clip attached to said flow tube manually operable between opened and closed clipping positions prior to receiving said flow tube into said receiving channel; and
- d) means cooperatively associated between said flow clip and said receiving channel for preventing removal of said flow tube from said receiving channel when said flow clip is in said opened position and for permitting removal of said flow tube from said receiving channel when said flow clip is in said closed clipping position.

5,437,636

## STEERABLE CATHETER WITH FIBEROPTIC SCOPE INSERTING MEANS

Phillip J. Snook, Atlanta; David S. Rowley; David G. Lincoln, both of Smyrna, and Kirk W. Charles, Austell, all of Ga., assignors to Catheter Imaging Systems, Atlanta, Ga.

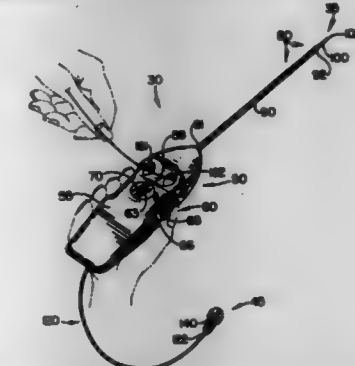
Division of Ser. No. 908,403, Jul. 6, 1992, Pat. No. 5,342,299.

This application Jul. 22, 1994, Ser. No. 279,500

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604—95

8 Claims



1. A catheter for use in body vessels or cavities, comprising: elongate tube means having at least one lumen extending longitudinally through said elongate tube means, said elongate tube means having a flexible distal end portion; a housing of such size as to be readily held in the hand of a user, and connected to said elongate tube means, said housing having at least one access port therein for providing access to said at least one lumen of said elongate tube means;

guide wires having proximal ends connected to said housing and extending outwardly therefrom through said elongate tube means, distal ends of said guide wires being connected to said flexible distal end portion of said elongate tube means;

guide wire control means carried by said housing and cooperating with proximal end portions of said guide wires for controlling the annular attitude of said flexible distal end portion of said elongate tube means; and

fiberoptic scope inserting means longitudinally extending from said access port of said housing, said fiberoptic scope inserting means comprising an elongate first sheath tube having first and second ends and inner and outer tube walls, said inner tube wall being adapted to longitudinally receive a fiberoptic scope through said first end, and an elongate second sheath tube having first and second ends and inner and outer tube walls, said inner tube wall of said second sheath tube having ribs, said second end of said first sheath tube being longitudinally received through said first end of said second sheath tube, said ribs of said inner tube wall of said second sheath tube engaging said outer tube wall of said first tube, and said second end of said second sheath tube engaged with said access port of the housing for longitudinally inserting a fiberoptic scope into at least one lumen of said elongate tube means.



5,437,637

## TRANSPORT CATHETER

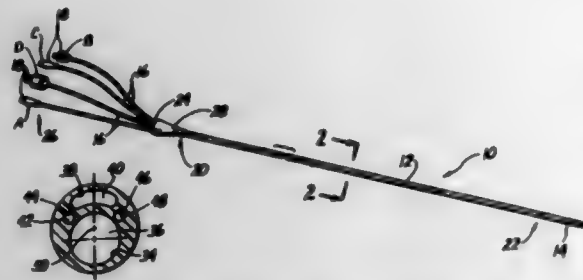
Clement E. Lieber, Yorba Linda; Miriam H. Taimisto, Sierra Madre, and Mark A. Konno, Costa Mesa, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 790,724, Nov. 8, 1991, Pat. No. 5,246,016. This application Jun. 24, 1993, Ser. No. 83,105

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

23 Claims



1. A catheter for accepting probes and for introducing fluid through the catheter and into a body cavity, the catheter comprising:

a catheter body circular in transverse cross-section and defining a central axis and having a continuous outer edge surface with a corresponding maximum outer dimension and having a proximal end and a distal end and a distal inflation balloon,

said catheter body having walls defining, in transverse cross-section, lumens including a first wall defining a first lumen having a first cross-sectional dimension approximately half the maximum outer dimension of the catheter body wherein a substantial portion of the first wall has a thickness greater than shortest distance between the first wall and the outer edge of the catheter body and wherein the first lumen encloses the central axis, and a second wall defining a second, curved lumen wherein the second lumen occupies at least a quarter of an arc around the catheter body, and a third wall defining a third, inflation lumen for inflating and deflating the inflation balloon.

5,437,638

## MULTIFINGER TOPOCATHETER TIP FOR MULTILUMEN CATHETER FOR ANGIOPLASTY AND MANIPULATION

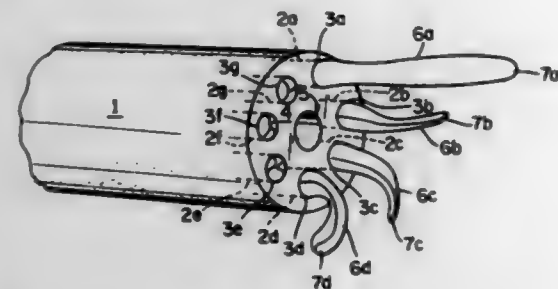
Robert L. Bowman, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 10,695, Jan. 29, 1993, abandoned. This application Dec. 1, 1994, Ser. No. 352,784

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—101

22 Claims



1. A device for opening narrow passageways which comprises:

a catheter having a length and a proximal end and distal end between which ends said length of said catheter extends,

said distal end being defined by a terminal end surface of said catheter

said catheter further having a plurality of internal lumens which extend between said proximal and distal ends; and a plurality of adjacent inflatable tubes which are attached to said plurality of lumens at said terminal end surface of said distal end of said catheter so as to be independently inflatable beyond said terminal end surface of said distal end of said catheter.

5,437,639

## NEEDLE PROTECTIVE SHEATH DEVICE

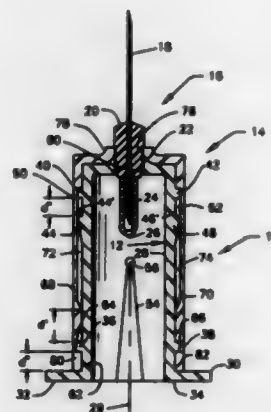
Robert Malenchek, 279 Sunnyside Rd., Somerville, N.J. 08876

Filed Sep. 19, 1994, Ser. No. 308,386

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—110

16 Claims



1. A needle protective sheath device comprising:

a first cylindrical member having a first cylindrical cavity defining a longitudinal axis, said member having proximal and distal ends, said member having first and second openings on and extending radially transverse the axis in communication with the cavity on the respective distal and proximal ends, the second opening on the proximal end being restricted in transverse dimension with respect to the first opening on the distal end, the member including means at the proximal end opening for securing a needle thereto in communication with the cavity, the secured needle extending axially beyond the first member proximal end, the member including finger gripping means on the distal end, said member having a pair of opposed axially extending slits in communication with the distal end arranged such that opposing sides of the distal end can be squeezed together from a normally spaced apart position to a compressed position;

first locking means on the member outer surface external the cavity on each said opposing sides adjacent to said distal end;

second locking means on the member outer surface external the cavity adjacent to said proximal end;

a second cylindrical member having a second cylindrical cavity defining a second longitudinal axis, said second member having proximal and distal ends, said second member having third and fourth openings on and extending radially transverse the second axis in communication with the second cavity at the respective distal and proximal ends, the fourth opening on the proximal end being restricted in transverse dimension with respect to the third opening on the distal end, said second cavity for axially receiving the first member through the third opening with the first and second members in nested concentric relation in a first axial relative position with the members overlapping one another with their respective proximal and distal ends adjacent to each other and in a second extended position wherein the second member distal end is adjacent

to the first member proximal end so the second member proximal end extends beyond the first member for protecting the extended needle; and

third locking means on the second member at the second member distal end for selectively engaging the first and second locking means in accordance with the axial relative position of the first and second members wherein in the first axial position the first locking means are disengaged from the third locking means by said squeezing said opposing sides.

5,437,640

## APPARATUS AND METHOD FOR INSERTING HYPODERMIC, TUBERCULIN AND OTHER NEEDLES AND FOR ADMINISTERING MANTOUX TUBERCULIN TESTS

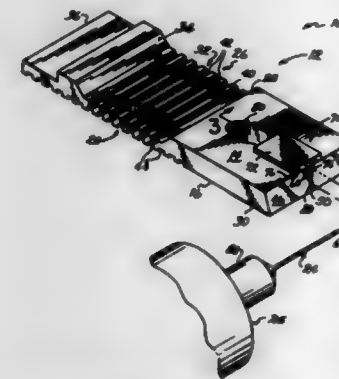
Louis Schwab, 310 Orton Rd., Yellow Springs, Ohio 45387

Filed Jan. 31, 1994, Ser. No. 189,452

Int. Cl.<sup>6</sup> A61M 5/32, 5/42

U.S. Cl. 604—116

39 Claims



1. A device for guiding the insertion of a hollow needle into the body at a prescribed angle, direction and depth for the introduction or removal of fluids from the body comprising:

a platform having a first side and a second opposing side and a channel extending therethrough, said channel having an inlet and an outlet and being sized to receive and guide a hollow needle to guide the insertion of the hollow needle into the body for the introduction or removal of fluids; a thumb stop on said first side of said platform; and gripping means on said platform second opposing side, said thumb stop and said gripping means cooperating to fix the skin of the test subject and prevent movement thereof during insertion of the needle.

5,437,641

## RETRIEVAL SYSTEM FOR A RANGE ANIMAL INJECTION APPARATUS

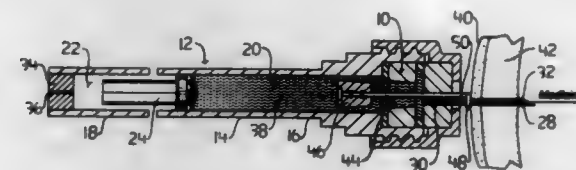
Donald J. Cameron, R.R. #3, Ponoka, Alberta, Canada T4J 1R3

Filed Dec. 14, 1994, Ser. No. 355,978

Int. Cl.<sup>6</sup> A61M 5/20

U.S. Cl. 604—130

1 Claim



1. A retrieval system for a range animal injection apparatus having a syringe positioned along a shaft with a needle having a first end secured to the syringe and a second end projecting past a remote end of the shaft, a pressure source acting upon a plunger in the syringe to force liquid medication from the syringe through the needle upon the second end of the needle

being inserted into a hide of an animal, the retrieval system comprising:

a valve positioned adjacent a first end of the needle, the valve including a passage and a pressure sensitive valve member movable axially in relation to the passage, between an open position in which the valve member is spaced from the passage thereby allowing the free flow of liquids from the syringe to the needle, and a closed position in which the valve member is lodged in the passage thereby precluding the flow of liquids from the syringe to the needle;

a contact member movably axially in relation to the needle between the first end and the second end;

a rigid coupling for coupling the movement of the contact member and the valve member, the valve being in a closed position when the contact member is positioned adjacent the second end of the needle, the valve being in an open position when the contact member is positioned adjacent the first end of the needle, such that when the second end of the needle enters a hide of an animal the contact member is pushed toward the first end of the needle by the hide of the animal forcing the valve into the open position while pressure from the pressure source urges liquid medication in the syringe passed the open valve member through the needle until the liquid medication has vacated the syringe, continued pressure from the pressure source then urging the valve member into the closed position, thereby moving the contact member toward the second end of the needle until the contact member pushes the needle out of the hide of the animal.

5,437,642

## FREE FLOW PREVENTION SYSTEM FOR INFUSION PUMP

Gary A. Thill, Vadnais Heights; Mark A. Toyen, St. Paul; Kent R. Struble, Mahtomedi, and Timothy G. Curran, Ramsey, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

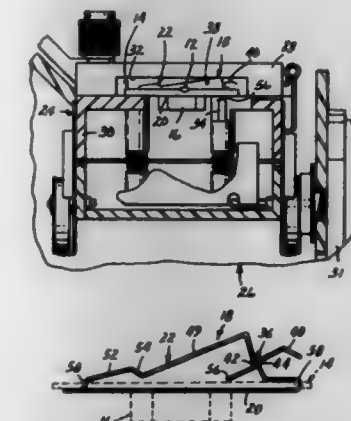
Continuation of Ser. No. 690,819, Apr. 23, 1991, abandoned.

This application Jun. 1, 1993, Ser. No. 70,497

Int. Cl.<sup>6</sup> A61M 1/00

U.S. Cl. 604—153

29 Claims



1. An IV tubing set through which fluid flow is regulated by an infusion pump of the type used to regulate fluid being delivered to a patient; the IV tubing set comprising:

IV tubing having a lumen through which fluid may be pumped for administration to a patient, the IV tubing including a pumping cassette having at least two flexible walls having inner surfaces defining fluid pumping chambers therebetween, the pumping chambers defining a portion of the lumen, the flexible walls defining a flange extending from the fluid pumping chambers and terminating in a peripheral edge of the pumping cassette, and

further defining opposite outwardly-facing major surfaces of the pumping cassette; and  
 a spring clip mounted on the flange of the pumping cassette and having a base and a spring arm extending therefrom along the opposite major surfaces of the pumping cassette and across the lumen, the spring arm being resiliently biased to a closed position in which the pumping cassette is squeezed between the spring arm and the base of the clip to close the lumen to prevent fluid flow, the spring arm being movable against its normal biasing force to an open position wherein the lumen of the pumping cassette is allowed to open to allow flow through the lumen;  
 the spring clip further comprising detent means for releasably holding the spring arm against its normal spring biasing force in a priming position in which the lumen of the IV tubing is open to allow flow through the lumen.

5,437,643

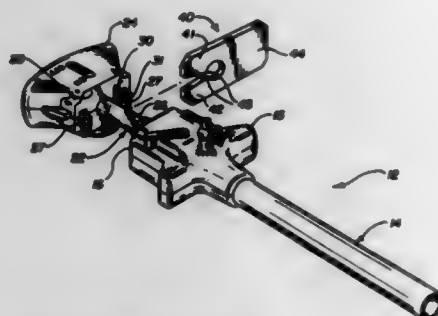
**SAFETY INTERPOSER FOR SURGICAL INSTRUMENTS**  
 Deborah M. Transue, Bridgewater, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 61,973, May 17, 1993. This application Jan. 18, 1994, Ser. No. 183,095

Int. Cl.<sup>6</sup> A61B 17/34

U.S. Cl. 604-164

5 Claims



# 1. A trocar assembly comprising:

- a cannula having: a proximal end and a distal end, the proximal end coupled to a cannula handle having a proximal end;
- an obturator having: a proximal end coupled to an obturator handle having a distal end, a shaft, and a distal end comprising a puncturing tip which is extendable through said cannula and beyond the distal end of said cannula;
- a safety shield slidable relative to said obturator shaft and capable of covering the puncturing tip of said obturator, said safety shield coupled to the obturator handle;
- a safety mechanism coupled to the obturator handle for preventing axial movement of said safety shield relative to said obturator shaft means coupled to said cannula for releasing said safety mechanism by contacting it to permit axial movement of said safety shield to expose the puncturing tip when said obturator handle is coupled to said cannula handle; and
- an interposer means for physically intercepting said means for releasing said safety mechanism to prevent said means for releasing said safety mechanism from contacting said safety mechanism and preventing coupling of the cannula handle and obturator handle.

5,437,644

## METHOD AND APPARATUS FOR REPLACING A CANNULA

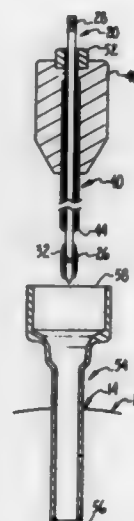
Anthony A. Nobles, Fountain Valley, Calif., assignor to Visioneering, Inc., Fountain Valley, Calif.

Filed May 26, 1993, Ser. No. 68,716

Int. Cl.<sup>6</sup> A61M 5/00, 25/00

U.S. Cl. 604-165

16 Claims



1. A method for installing a replacement cannula in place of an existing cannula in a patient, comprising the steps of: inserting a guide rod into a hollow bore in the existing cannula in the patient; withdrawing the existing cannula from the patient, over a proximal end of said guide rod; mounting a replacement cannula concentrically on the exterior of a hollow trocar; sliding said hollow trocar and said replacement cannula concentrically over said proximal end of said guide rod into the patient; and withdrawing said guide rod and said hollow trocar from the patient through said replacement cannula.

5,437,645

## SURGICAL INSTRUMENT POSITIONING DEVICE

Carl T. Urban, Norwalk; Marc J. Theroux, Bethel; Kourash Azarbarzin, Ridgefield; Maria E. Lopez-Isa, Shelton; Andrew J. McCarthy, and Csaba L. Rethy, both of Fairfield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 8, 1993, Ser. No. 134,121

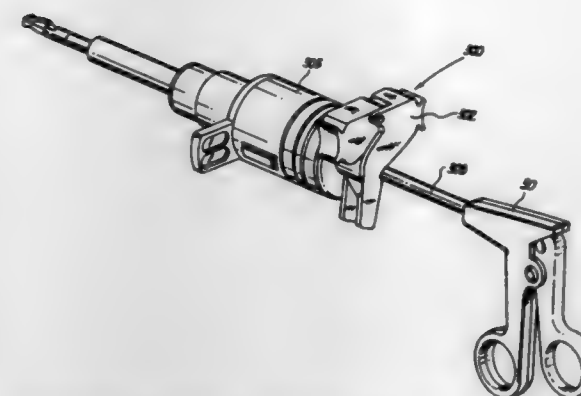
Int. Cl.<sup>6</sup> A61M 5/178, 5/32

U.S. Cl. 604-165

13 Claims

1. A device for positioning a surgical instrument having an elongated portion within a trocar, the device comprising: a first and a second leg pivotally connected at a first end and movable between a first and a second position; a biasing means mounted to said first and second legs for biasing said legs relative to each other and into said second position; an aperture positioned between said first and second legs for receiving the elongated portion of the surgical instrument; and an engagement portion associated with said aperture for frictionally engaging a portion of said instrument elongated portion.

gated portion to prevent movement of the instrument portion positioned therein:



wherein said device is mounted to a proximal end of the trocar.

5,437,646

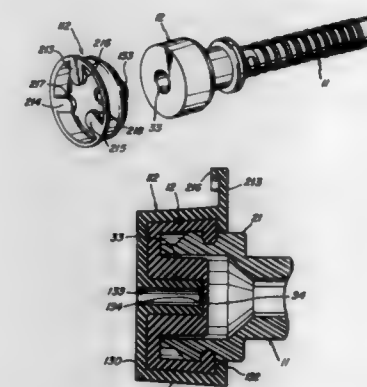
## CANNULA REDUCER

Robert B. Hunt, Dover, and Robert W. Schaefer, Bolton, both of Mass., assignors to Apple Medical Corporation, Bolton, Mass. Continuation-in-part of Ser. No. 776,194, May 15, 1991, Pat. No. 5,273,545. This application May 27, 1993, Ser. No. 68,252

Int. Cl.<sup>6</sup> A61M 5/178

U.S. Cl. 604-167

4 Claims



1. A laparoscopy cannula for allowing external access to an individual's body cavity in one mode where a first cross section elongated medical device is positioned therein, while preventing fluid flow from said cavity at a designated area in said one mode, and also preventing said fluid flow during a second mode where said cavity is sealed without external access, said cannula comprising:

a hollow, substantial tubular cannula body defining a passageway and having an enlargement at one area thereof designed to be positioned outside the individual's body, said tubular cannula body carrying a first tri-cuspid, resilient, leaf valve positioned to close said passageway, yet being yieldable to allow passage therethrough of said first cross section elongated medical device while said device is used in the individual's body, said tubular cannula body further carrying a separate resilient reducer resiliently engaged therewith, said reducer comprising a second tri-cuspid, resilient, leaf valve carried on an end wall of a re-entrant cylindrical collar with said end wall positioned towards said first mentioned leaf valve, said cylindrical collar being mounted on an outer end wall of said reducer with a cylindrical skirt extending from said outer end wall to resiliently and releasably mount said reducer over said

tubular cannula body and to axially align said first and second tri-cuspid, resilient leaf valves, said second tri-cuspid, resilient, leaf valve being designed and dimensioned to form a fluid seal with a second cross section elongated medical device different than said first cross section elongated device, said first and second cross sections having first and second diameters respectively and said second diameter being smaller than said first diameter.

5,437,647

## DISPOSABLE SELF-SHIELDING ASPIRATING SYRINGE

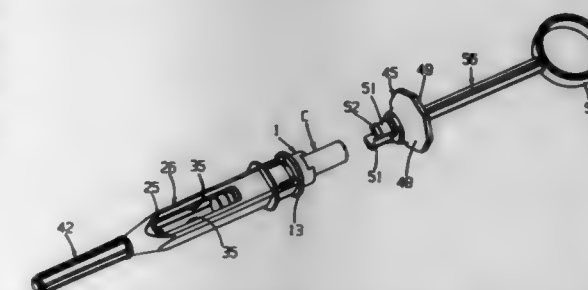
John R. Firth, Wilsonville, Oreg., and Anthony R. Perez, Alhambra, Calif., assignors to Safety Syringes, Inc., Arcadia, Calif.

Continuation-in-part of Ser. No. 783,825, Oct. 29, 1991, Pat. No. 5,279,581, which is a continuation-in-part of Ser. No. 581,734, Sep. 12, 1990, Pat. No. 5,108,378, which is a continuation-in-part of Ser. No. 521,243, May 9, 1990, abandoned. This application Aug. 9, 1993, Ser. No. 104,182

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604-110

37 Claims



1. A disposable self-shielding aspirating syringe comprising a body having a cavity for receiving a medical carpule, the body having a first forward end with a needle for penetrating a carpule and for injecting medicine into a patient, and the body having a second collar end into which the carpule can be inserted, a protector case adapted to slidably fit on the body, and having a first open end through which the needle may extend and a second end wherein the second end of the case and the body have cooperating detents for facilitating placement of the case with respect to the body for uncovering and covering, respectively, an exposed end of the needle, and the case further comprising at least one elongated window opening for allowing the carpule to be viewed in the body through the window, the window having first and second ends, and the body having a tab for extending through and engaging at least one of the ends of the window, and a plug and plunger assembly comprising a plug for cooperatively mating with the collar end of the body and plunger which is movable with respect to the plug and body for causing medicine from the carpule to be administered through the needle.

5,437,648

## LOCKING SAFETY NEEDLE ASSEMBLY

Arinda Graves, White Plains, N.Y., and Niall Sweeney, Rutherford, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 979,959, Nov. 23, 1992, Pat. No. 5,376,073.

This application Aug. 24, 1994, Ser. No. 295,306

Int. Cl.<sup>6</sup> A61M 5/00, 37/00, 5/32

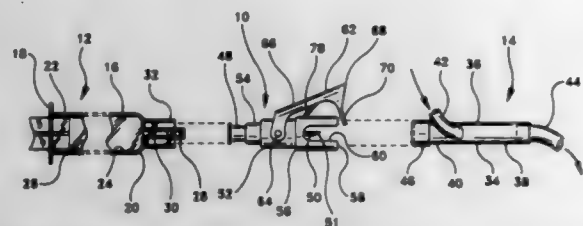
U.S. Cl. 604-263

8 Claims

1. A safety needle assembly for secure connection to an intravenous fitting, comprising: a needle cannula; a protective



shield having a base for secure mounting around said needle cannula, a rigid sheath projecting from said base a sufficient distance for protectively surrounding said needle cannula, said sheath having a distal end dimensioned for receiving at least a portion of said intravenous fitting within said sheath; and a latch having means for lockingly engaging about said intravenous fitting, said latch mounted to said protective shield for pivoting movement between a first position where said latch lockingly engages said intravenous fitting received in said



sheath and a second position where said latch is spaced from said intravenous fitting for enabling relative movement between said fitting and said sheath, said latch including a pivot arm having an end pivotably connected to said protective shield, and a locking flange projecting from a plane defined by said pivot arm at a location spaced from said pivotable connection to said protective shield, said means for lockingly engaging including said locking flange being dimensioned and configured to accept said intravenous fitting within said sheath.

5,437,649

## ADJUSTABLE BODY OPENING DILATOR

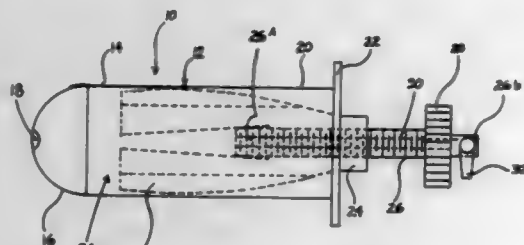
William A. Letchworth, 1101 Peachtree Rd., Wilson, N.C. 27894

Filed Oct. 17, 1994, Ser. No. 323,798

Int. Cl.<sup>6</sup> A61M 31/00

U.S. Cl. 604—278

4 Claims



1. A stoma dilator adapted to be inserted within an opening formed in the human body such as a colostomy opening, comprising:

- (a) an insert having a continuous and closed resilient outer expandable wall, an entry end portion, and an exterior end portion;
- (b) the continuous and closed outer expandable wall of the insert being movable between an expanded state and a relaxed state;
- (c) a tapered flexible expander disposed interiorly within the insert and lying adjacent the expandable wall, the flexible expander being laterally moveable independently of the expandable wall;
- (d) a screw cavity formed interiorly of the flexible expander and extending between the entry end portion and the exterior end portion of the insert;
- (e) an actuating screw extending into and through at least a portion of the screw cavity for directly engaging the surface of the flexible expander and for moving the flexible expander outwardly for engagement with the expandable wall of the insert such that as the actuator screw is turned and the flexible expander moves outwardly, the engagement of the flexible expander with the expandable wall of the insert causes the expandable wall of the insert to expand; and
- (f) an elongated fluid transfer channel formed in the actuator

screw and having an inlet and an outlet end, the fluid transfer channel formed in the actuator screw functioning to direct fluid into the inlet end, through the fluid transfer channel, into the insert and into the human body, and to also channel fluid from the human body through the insert, into the fluid transfer channel and out the inlet end.

5,437,650

## SECURING COLLAR FOR CANNULA CONNECTOR

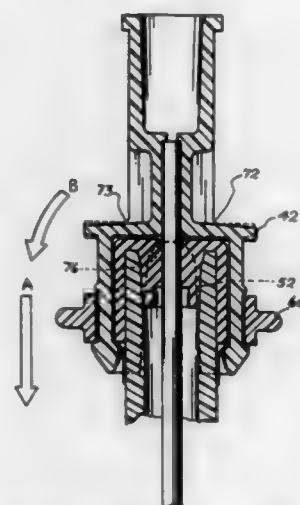
Mark E. Larkin, Lindenhurst; Dvid E. Kramer, Northbrook, and Warren P. Frederick, Wonder Lake, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 129,233, Sep. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 36,005, Mar. 23, 1993, abandoned. This application Jan. 11, 1995, Ser. No. 371,317

Int. Cl.<sup>6</sup> A61M 25/00; F16L 21/06

U.S. Cl. 604—283

15 Claims



1. A securable collar assembly for use with a fluid connector having an axially forward extending cannula for securably connecting the fluid connector to a tubular conduit having a septum at a terminal end and a radial shoulder proximate the septum, the collar assembly comprising:

- a tubular housing axially engaged with the fluid connector so that the cannula of the fluid connector extends axially forward from the housing;
- a generally radially extending, resiliently deflectable flange extending from the housing;
- a hollow generally cylindrical collar extending longitudinally from the flange and coaxially with the cannula to an open forward end;
- the hollow collar having an inner surface defining a bore for receiving the terminal end of the tubular conduit and a radially inward extending lip on the inner surface of the collar at the open forward end of the collar;
- the collar having an outer surface including a first portion adjacent the flange having a first maximum diameter and a second portion between the first portion and the open end of the collar having a second minimum diameter which is larger than the first maximum diameter;
- the collar having two diametrically opposed notches, each notch extending longitudinally rearward from the open forward end of the collar through the first and second portions of the collar to a notch closed end adjacent the flange so as to divide the collar into two longitudinal semi-cylindrical segments; and
- a ring longitudinally slidable along the outer surface of the collar from a first rear position on the first portion to a second forward position on the second portion, the ring having an inner diameter which is smaller than the second minimum diameter of the collar so as to compress the

outer surface of the second portion when the ring is slid to the second forward position so as to pivot the two longitudinal segments of the collar radially inward at the deflectable flange so that the inward lip at the open forward end of the collar engages the radial shoulder of the tubular conduit.

5,437,651

## MEDICAL SUCTION APPARATUS

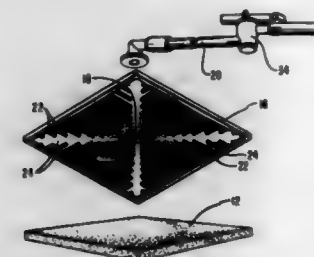
Robert J. Todd; Jaime E. Yagge, both of Salt Lake City, Utah; James E. Lowe, Durham, N.C., and Terry M. Wonder, Salt Lake City, Utah, assignors to Research Medical, Inc., Salt Lake City, Utah

Filed Sep. 1, 1993, Ser. No. 116,201

Int. Cl.<sup>6</sup> A61M 1/00

U.S. Cl. 604—313

33 Claims



1. An apparatus for absorbing and collecting, into a fluid receptacle, blood and other interstitial fluids from a patient during the course of a surgical procedure comprising:

- absorbing means for contacting and absorbing the fluid to be collected;
- backing means, attached to said absorbing means, for supporting said absorbing means, said backing means having a substantially centrally positioned orifice formed therein;
- delivery means, attached to the orifice of the backing means, for receiving suction force a suction source and delivering the suction force to the absorbing means; and
- suction force proportioning means, in communication with said backing means and said absorbing means, for directing distribution of the suction force from said suction means such that absorbed fluid is efficiently extracted from the absorbing means.

5,437,652

## DEVICE FOR COLLECTING SPERM

Pomozov P. Anatolievich, ul. Kavkazaki Boulevard 35 kv. 329, 115516 Moscow, Russian Federation

Filed Oct. 25, 1993, Ser. No. 140,447

Claims priority, application Russian Federation, Apr. 3, 1993, 3011525

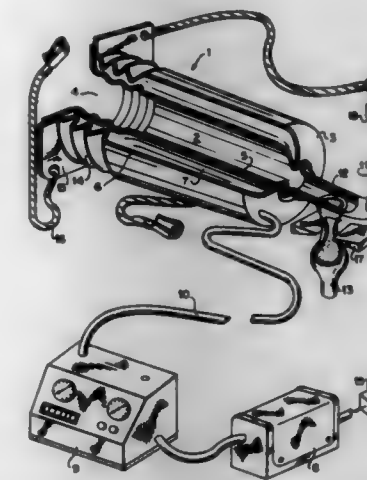
Int. Cl.<sup>6</sup> A61F 5/44

U.S. Cl. 604—349

9 Claims

1. A device for collecting sperm, comprising a sperm collecting receptacle;
- an elastic element formed to receive a penis and having an interior communicating with an interior of said sperm collecting receptacle;
- means for supplying compressed air periodically to said elastic element so as to cause periodical compressions of said elastic element and thereby periodical compressions of the penis in said elastic element to cause ejaculation and sperm supply into said sperm collecting receptacle; and
- a nozzle for withdrawing air from said elastic element, said

nozzle being provided with an opening communicating with the interior of said sperm collecting receptacle to



provide the sperm supply to the latter during air withdrawal from said elastic element through said nozzle.

5,437,653

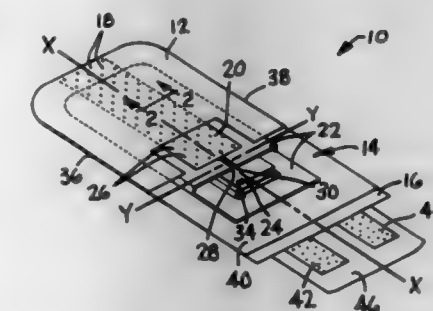
ABSORBENT ARTICLE HAVING TWO COAPERTURED LAYERS AND A METHOD OF MAKING THE ARTICLE  
Thomas H. Gilman, Appleton, and Patricia A. Mitchler, Neenah, both of Wis., assignors to Kimberly-clark Corporation, Neenah, Wis.

Filed May 12, 1993, Ser. No. 58,248

Int. Cl.<sup>6</sup> A61F 13/15, 13/20

U.S. Cl. 604—378

16 Claims



1. A sanitary napkin comprising:

- a body contacting layer formed from a nonwoven material having an open pore structure and having an average denier greater than about 2.5, said body contacting layer having a plurality of apertures formed therethrough;
- a first absorbent layer positioned immediately below said body contacting layer, said first absorbent layer formed from a nonwoven material having a finer pore structure than said body contacting layer, said first absorbent layer having a plurality of apertures formed therethrough which are coaxially aligned with said apertures formed in said body contacting layer; and
- a liquid-impermeable baffle cooperating with said body contacting layer to enclose said first absorbent layer.

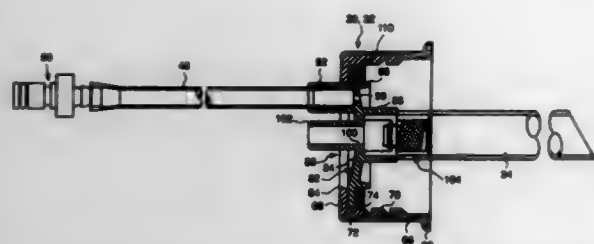
# 5,437,654 IRRIGATION SET

William P. McVay, Ashland, Pa., assignor to Advanced Surgical Products, Inc., Miami, Fla.

Filed Sep. 10, 1993, Ser. No. 118,653  
Int. Cl.<sup>6</sup> A61M 39/00

U.S. Cl. 604-403

7 Claims



1. An irrigation set for use with and endoscopic irrigation pump, comprising:

- a bottle cap having an open mouth, closed-end cup shape being threaded on the inside surface and defining a region just inside the closed end provided with an undercut and an opening defined in the closed end,
- a disk assembly composed of a disk that is received in said region and retained therein by the undercut while allowing relative rotation between the bottle cap and the disk and preventing relative translation between the bottle cap and the disk, the side of said disk inside the cap defining a depending skirt, said disk defining a first opening aligned with the depending skirt, a check valve cartridge and draw tube secured to said depending skirt, a first tubular projection on the disk aligned with the first opening and projecting through the opening in the closed end, a second tubular projection on the disk aligned with a second opening and projecting through the opening in the closed end, a gas tubing secured at one end to the second tubular projections a gas fitting secured to the other end of the gas tubing, an annular gasket secured to the side of the disk inside the cap about the peripheral portion thereof to seal the mouth of a bottle, and
- tubing means for connecting the first tubular projection with an irrigation probe.

# 5,437,655

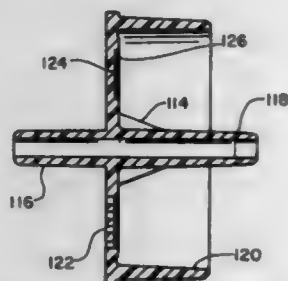
## AIR INLET FILTER FOR BURETTE TOP

Joel Bartholomew, Danielsville, Pa., assignor to B. Braun Medical Inc., Bethlehem, Pa.

Filed Sep. 3, 1993, Ser. No. 115,634  
Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 604-406

5 Claims



1. A burette top for use with a burette in a medical drainage system, comprising

- a cap having a generally planar circular base transfixed by a short integral tube having an upper portion providing a port to which tubing from a source of fluid may be attached and a lower portion from which fluid can drip into the burette,
- said cap having a tapered skirt extending axially downward

from the circumference of the base for engaging the open end of the burette, said base being perforated by an array of slots that permit air to enter the burette, the base having a substantially flat bottom surface having a shallow annular relief intersecting said slots, and a ring-shaped filter disk situated beneath the relief, whereby the relief prevents most of the filter disk from lying flush against the bottom surface of the base.

# 5,437,656

## METHOD AND DEVICE FOR INHIBITING H.I.V. HEPATITIS B AND OTHER VIRUSES AND GERMS WHEN USING A NEEDLE, SCALPEL AND OTHER SHARP INSTRUMENT IN A MEDICAL ENVIRONMENT

Alain H. Shikani, Ruxton, Md., and Abraham J. Domb, Efrat, Israel, assignors to Leonard Bloom, Towson, Md., a part interest

Continuation-in-part of Ser. No. 998,773, Dec. 22, 1992, which is a continuation of Ser. No. 661,699, Feb. 27, 1991, abandoned.

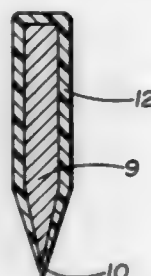
This application Jul. 14, 1993, Ser. No. 92,114

The portion of the term of this patent subsequent to Sep. 6, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 9/22

U.S. Cl. 604-89.1

32 Claims



1. A sharp-edged metal instrument coated with an anti-infective coating comprising said instrument coated with an anti-infective coating which is insoluble in a biological medium and which is able to be bound to said sharp-edged metal instrument during storage, use and initial disposal thereof, the anti-infective coating including a biocompatible, non-hydrogel polymer, said polymer being compatible with and binding to the sharp-edged metal instrument, said polymer being soluble in an organic solvent, and iodine complexed with the polymer coating for programmed rapid release of the iodine from the polymer coating when the sharp-edged instrument penetrates the skin of the patient and contacts blood or other body fluids.

# 5,437,657

## INSTRUMENT FOR OPHTHALMOLOGICAL SURGERY

Robert L. Epstein, 1132 Michigan Ave., Wilmette, Ill. 60091

Continuation of Ser. No. 939,688, Sep. 2, 1992, abandoned. This application Aug. 16, 1993, Ser. No. 107,464

Int. Cl.<sup>6</sup> A61B 17/36

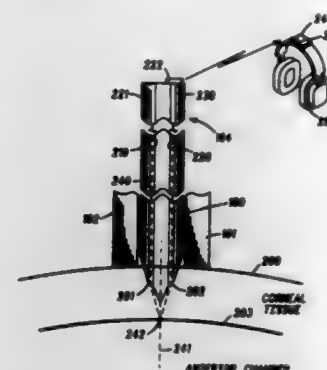
U.S. Cl. 606-4

15 Claims

1. A surgical instrument for cutting tissue, the instrument comprising:

- (a) a blade having a first side, a second side, and light conducting capability, the blade having a light exit point located on the first side and a light entrance point located on the second side;
- (b) a light source substantially aligned with the light exit point such that light from the light source exits the light exit point;
- (c) a light sensor substantially aligned with the light entrance point such that the light from the light exit point, that is

reflected into the light entrance point, will contact the light sensor; and



(d) an alert generator, operatively coupled to the light sensor, for signaling receipt of the reflected light.

# 5,437,658

## METHOD AND SYSTEM FOR LASER THERMOKERATOPLASTY OF THE CORNEA

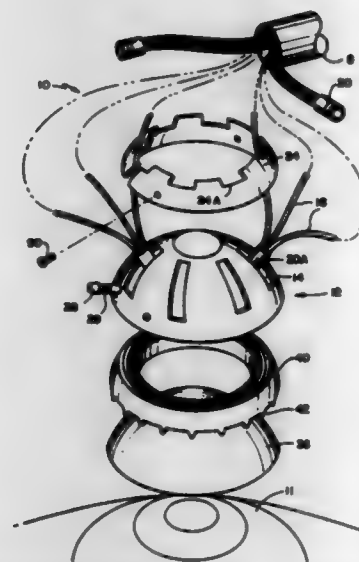
David F. Muller, Boston, and Alex C. Sacharoff, Framingham, both of Mass., assignors to Summit Technology, Incorporated, Waltham, Mass.

Filed Oct. 7, 1992, Ser. No. 957,702

Int. Cl.<sup>6</sup> A61N 5/06

U.S. Cl. 606-5

56 Claims



1. A thermokeratoplasty system for modifying corneal curvature of a cornea by localized thermal shrinkage of collagenous stromal tissue, said system comprising:

- means for inducing localized thermal shrinkage of the collagenous stromal tissue using electromagnetic radiation of a wavelength suitable for absorption in the stroma, said means including a radiation-distributing device that introduces the electromagnetic radiation to a multiplicity of locations on the surface of the cornea according to a predetermined pattern selected to correspond to a desired modification of said cornea, and
- a positioning structure that positions said radiation-distributing device in close, fixed relationship to the cornea and introduces said radiation via said locations to treatment volumes in the stroma below the surface of the cornea to induce localized shrinkage of the collagenous stromal tissue to cause change in the corneal curvature.

# 5,437,659

## ANGIOPLASTY CATHETER AND METHOD OF USE THEREOF

Michael E. Leckrone, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

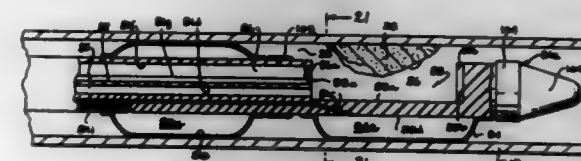
Continuation of Ser. No. 608,206, Nov. 2, 1990, abandoned, which is a division of Ser. No. 321,621, Jul. 26, 1988, Pat. No. 5,026,366, which is a continuation-in-part of Ser. No. 585,112, Mar. 1, 1984, Pat. No. 4,627,436, This application Apr. 6, 1993, Ser. No. 42,759

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606-7

1 Claim



1. A catheter device for use in removing undesired material from a duct within a patient's body comprising:

- a catheter having a proximal end portion and a distal end portion adapted to be inserted within a duct within a patient's body;
- a fiber optic extending within the interior of the catheter from said proximal end portion to said distal end portion, said fiber optic including a distal end to deliver laser energy when the fiber optic is connected to a source of laser energy;
- an upstanding surface at said distal end portion of the catheter and spaced from said distal end of the fiber optic to form a laser application area therebetween that is adapted to receive the undesired material, said upstanding surface being adapted to absorb the laser energy delivered; wherein the laser energy is adapted to cause excision of the undesired material within the duct when the distal end of the fiber optic is disposed adjacent the undesired material.

# 5,437,660

## TISSUE ABLATION AND A LATERAL-LASING FIBER OPTIC DEVICE THEREFOR

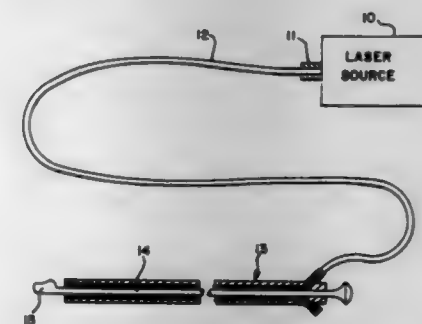
Douglas E. Johnson, Houston, Tex.; Hany M. G. Hussein, Costa Mesa, and Marvin P. Loeb, Huntington Beach, both of Calif., assignors to Trimedyne, Inc., Irvine, Calif.

Filed Dec. 30, 1991, Ser. No. 814,708

Int. Cl.<sup>6</sup> A61B 17/22

U.S. Cl. 606-15

29 Claims



1. A method for the removal of unwanted tissue comprising the steps of:

- positioning an elongated lateral-lasing fiber optic device adjacent a selected region of the tissue to be removed;
- delivering to the selected region a biocompatible fluid at a predetermined rate of flow contiguous with the positioned lateral-lasing fiber optic device; and
- energizing the positioned lateral-lasing fiber optic device at



a predetermined power level to emit continuous wave laser energy in a direction substantially transversely to the longitudinal axis of the lateral-lasing fiber optic device and so as to irradiate the selected region of the tissue to be removed for a predetermined time period to produce a zone of coagulation in the irradiated tissue.

5,437,661

# METHOD FOR REMOVAL OF PROLAPSED NUCLEUS PULPOSUS MATERIAL ON AN INTERVERTEBRAL DISC USING A LASER

Bernhard Rieser, Simmler Str. 4, 75172 Pforzheim, Germany  
Filed Mar. 23, 1994, Ser. No. 216,300

Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606—15

11 Claims



1. A method for removal of prolapsed nucleus pulposus material within a spinal foramen of an intervertebral disc of a patient using a laser, comprising the steps of:

puncturing said patient's skin at an entry point with a leading wire;

inserting said leading wire into said spinal foramen up to said nucleus pulposus material along an entry path, whereby said entry path passes through a section of ligamentum flavum alongside the dural sac;

inserting a blunt tipped dilatator and a cannula over said leading wire down to the ligamentum flavum, wherein said dilatator is located between said leading wire and said cannula;

replacing said dilatator with a sharp tipped trepan;

drilling a hole through the ligamentum flavum;

replacing said trepan with said dilatator;

passing said cannula and said dilatator through said ligamentum flavum into said spinal foramen

removing said dilatator;

removing said leading wire from said cannula;

inserting into said cannula, in place of said leading wire, a laser fiber;

touching said prolapsed nucleus pulposus material with said laser fiber; and

applying a laser beam to said prolapsed nucleus pulposus material with said laser fiber, whereby said prolapsed nucleus pulposus material is thereafter substantially eliminated.

5,437,662

# FLUID COOLED ELECTROSURGICAL CAUTERIZATION SYSTEM

Paul C. Nardella, North Easton, Mass., assignor to American Cardiac Ablation Co., Inc., Taunton, Mass.

Continuation of Ser. No. 975,801, Nov. 13, 1992, Pat. No. 5,342,357. This application Feb. 17, 1994, Ser. No. 197,959

Int. Cl.<sup>6</sup> A61B 17/39

U.S. Cl. 606—40

4 Claims

1. A method for controlling the temperature of an energy delivering, cauterizing electrode, comprising:

providing an elongate electrosurgical probe member having disposed at a distal portion of an outer surface thereof at least one energy delivering cauterization electrode, the probe member having a fluid delivering lumen associated

therewith and being in electrical communication with an electrosurgical generator unit; delivering electrosurgical energy from the generator unit through the probe member to the energy delivering electrode and adjacent tissue; measuring the tissue impedance based on the energy applied thereto and generating a signal representative of measured tissue impedance; comparing the measured tissue impedance with a predetermined maximum impedance value;



transmitting to the electrosurgical generator unit a signal to cease or limit further energy delivery if the measured tissue impedance exceeds the predetermined maximum impedance value;

passing a fluid through the lumen at a desired flow rate to regulate the temperature of the energy delivering electrode; and

regulating the flow rate to maintain the tissue impedance at or below the predetermined maximum impedance value.

5,437,663

Patent Not Issued For This Number

5,437,664

# APPARATUS AND METHOD FOR VENOUS LIGATION

Donald Cohen, Irvine; Derek J. Daw, Costa Mesa, both of Calif.; George F. Kick, Medina, Ohio, and George M. Acosta, Long Beach, Calif., assignors to Endovascular, Inc., Costa Mesa, Calif.

Filed Jan. 18, 1994, Ser. No. 183,994

Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606—42

12 Claims



1. A device for use in less-invasive surgery to inhibit blood flow through a blood vessel of a patient, comprising:

an elongated electrical conductor having a distal end;

a source of electricity electrically connected to electrical conductor, the source of electricity having a variable power output;

an electrode connected to the distal end of the electrical conductor such that the source of electricity can be energized to energize the electrode to thereby cause the lumen

of the blood vessel to collapse when the electrode is positioned in the vessel; and  
a feedback device electrically connected to the source of electricity, the feedback device including a microprocessor and a sensor for sensing a preselected parameter and generating a parameter signal in response thereto, the microprocessor including:  
a comparator for receiving the parameter signal and comparing the parameter signal to a setpoint having a variable value dependent upon at least one of: electrode temperature, electrical output parameters of the source of electricity, and power output of the source of electricity, wherein the comparator determines whether the parameter signal bears a first or second relationship to the setpoint, and whereby the microprocessor causes the power output of the source of electricity to be decreased when the parameter signal bears the first relationship to the setpoint.

5,437,665

# ELECTROSURGICAL LOOP ELECTRODE INSTRUMENT FOR LAPAROSCOPIC SURGERY

Malcolm G. Munro, 4135 Woodman Ave., Sherman Oaks, Calif. 91423

Filed Oct. 12, 1993, Ser. No. 134,106

Int. Cl.<sup>6</sup> A61B 17/39

U.S. Cl. 606—47

9 Claims



3. An electrosurgical selectively controllable loop electrode for laparoscopic surgery comprising:

(a) a housing having a longitudinal axis, a proximate and distal end, and an axially extending cavity forming a passageway therethrough;

(b) a shaft member having a proximate and distal end carried by said housing and slideably mounted within said cavity to permit axial and rotational displacement of said shaft member relative to said housing;

(c) a wire electrode having a first end segment and a second end segment where said first and second end segments are in electrical communication with said shaft member and extend distally of said shaft member, said wire electrode having a bridge segment integrally interconnecting said first and second end segments forming a loop;

(d) bias means carried by said shaft member and in sufficient bearing engagement with said first and second end segments for resiliently biasing said end segments such that external forces exerted by said housing on said bias means during proximate retraction of said electrode wire into said cavity of said housing collapses said loop through a sequence of predetermined shapes of decreasing concavity and upon extension of said wire electrode from said cavity distally of said housing expands said loop through a sequence of predetermined shapes of increasing concavity, said bias means comprises a pair of leaf springs of predetermined curvature having a distal and proximate end where the proximate end of each said spring is rigidly attached to said shaft member adjacent the distal end thereof and where said springs are internally biased to open upon extension of said springs distally from said housing cavity and to close upon external force exerted by said housing against said springs during retraction into said housing cavity.

5,437,666

# EXTERNAL FIXATION DEVICE FOR OSTEOSYNTHESIS

Slobodan Tepic, Davos, Switzerland, and Carel Goelings, Amsterdam, Netherlands, assignors to Synthes (U.S.A.), Paoli, Pa.

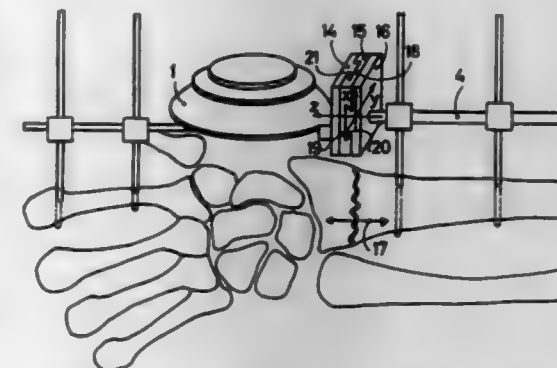
PCT No. PCT/EP92/01936, § 371 Date Sep. 16, 1993, § 102(e) Date Sep. 16, 1993, PCT Pub. No. WO94/04087, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 24, 1992, Ser. No. 119,059

Int. Cl.<sup>6</sup> A61B 17/60

U.S. Cl. 606—55

11 Claims



1. External fixation device for osteosynthesis comprising:  
a first longitudinal bar,  
a second longitudinal bar,  
means on said first and second longitudinal bars for attaching bone fixation devices to said bars,  
a three dimensional arcuate shell attached to an extremity of said first bar,  
a gliding element attached to an extremity of said second bar,  
said gliding element having a recess to retain said shell while permitting relative arcuate movement between said element and said shell, and  
means connecting said first longitudinal bar to said shell for allowing free translation between said first longitudinal bar and said shell along perpendicular axes which are orthogonal to said first longitudinal bar.

5,437,667

# DYNAMIC EXTERNAL FIXATOR FOR THE WRIST

Paul E. Papierski, Redlands, Calif., and Frank J. Hauptmann, Mundelein, Ill., assignors to Innovative Orthopaedics, Manufacturing, Inc., Mundelein, Ill.

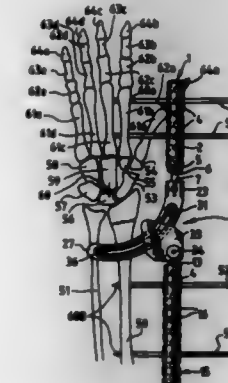
Continuation of Ser. No. 972,996, Nov. 11, 1992, abandoned.

This application Jun. 7, 1994, Ser. No. 255,112

Int. Cl.<sup>6</sup> A61F 5/04

U.S. Cl. 606—55

35 Claims



1. A dynamic external fixation device, adapted to be affixed

to a human lower arm and hand, for use in osteosynthesis of a fracture of the distal radius comprising:

- (a) an elongated proximal leg,
- (b) an elongated distal leg,
- (c) proximal affixation means for securely affixing said proximal leg to the distal shaft of the radius
- (d) distal affixation means for securely affixing said distal leg to the metacarpal bone and
- (e) articulating means connected between said proximal leg and said distal leg which defines a first range of movement of flexion and extension having an axis of rotation that approximately passes through the proximal pole of the capitate bone when affixed to the human arm and hand and a second range of movement of radial and ulnar deviation having an axis of rotation spaced from the device and that approximately passes through the proximal pole of the capitate bone when affixed to the human arm and hand.

5,437,668

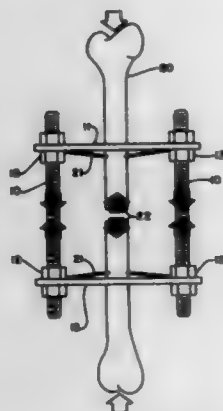
# APPARATUS AND METHOD FOR CLINICAL USE OF LOAD MEASUREMENT IN DISTRACTION OSTEOGENESIS

James Aronson, and John H. Harp, Jr., both of Little Rock, Ark., assignors to Board of Trustees of the University of Ark., Little Rock, Ark.

Filed Feb. 18, 1994, Ser. No. 198,356

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—57



1. A method for the clinical use of load measurements taken during distraction osteogenesis in which an external fixator having moment-free distraction means coupled to cannulated load cells is employed to distract a corticotomy site, comprising the steps of:

- (a) performing a corticotomy at a selected corticotomy site;
- (b) surgically affixing an external fixator having upper and lower fixator rings across said corticotomy site employing transosseous wires;
- (c) coupling, to distractor rod assemblies, cannulated load cells producing analog electrical signals proportional to a load impressed on said load cells;
- (d) using moment-free connections, attaching at least three distraction rod assemblies to said upper and lower fixator rings;
- (e) periodically distracting said corticotomy site;
- (f) processing said electrical signals to derive said load across said corticotomy site;
- (g) adjusting the rate of distraction of said corticotomy site to maintain said load across said corticotomy site within a load range sufficiently high to avoid premature consolidation of said corticotomy site and sufficiently low to avoid nonunion of said corticotomy site.

5,437,669

# SPINAL FIXATION SYSTEMS WITH BIFURCATED CONNECTORS

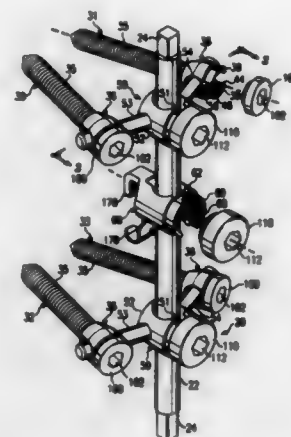
Hansen A. Yuan, Fayetteville; Bruce E. Fredrickson, Manlius, and W. Thomas Edwards, DeWitt, all of N.Y., assignors to AMEI Technologies Inc., Wilmington, Del.

Filed Aug. 12, 1993, Ser. No. 105,974

Int. Cl.<sup>6</sup> A61B 17/70

U.S. Cl. 606—61

28 Claims



1. A vertebra hook assembly for releasably attaching spinal instrumentation having a deformable coupling to selected portions of a patient's spine comprising:
  - a connector body having an opening extending partially therethrough and sized to receive a portion of the spinal instrumentation therein;
  - a hook extending from the connector body opposite from the opening;
  - a recess formed within the opening to receive the deformable coupling carried by the spinal instrumentation;
  - an end closure for blocking the opening in the connector body after the spinal instrumentation and deformable coupling have been disposed therein;
  - the connector body having a generally cylindrical configuration with the opening extending partially therethrough;
  - a pair of slots formed in the connector body and communicating with the opening to allow installation of the spinal instrumentation therein;
  - the lower portion of the opening having spherical surfaces which partially define the recess and correspond to spherical surfaces on the exterior of the deformable coupling; and
  - threads formed above the spherical surfaces on the interior of the opening for engagement with the end closure.

5,437,670

# ATTACHMENT PLATE FOR TOP-TIGHTENING CLAMP ASSEMBLY IN A SPINAL FIXATION SYSTEM

Michael C. Sherman, Memphis; John A. Pafford, Bartlett, both of Tenn., and Richard B. Ashman, Dallas, Tex., assignors to Danek Medical, Inc., Memphis, Tenn.

Filed Aug. 19, 1993, Ser. No. 109,088

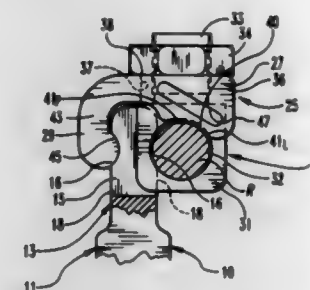
Int. Cl.<sup>6</sup> A61B 17/70

U.S. Cl. 606—61

18 Claims

1. A spinal fixation system for implanting into the spine of a patient comprising:
  - a spinal rod configured for positioning adjacent the spine;
  - a vertebra fixation element, including:
    - a vertebra engaging portion configured for engaging a vertebra of the spine; and
    - a rod engaging portion defined by a post having a pair of opposite lateral surfaces, said post configured to project away from the vertebra when said vertebra engaging portion is engaging the vertebra;

an eyebolt assembly including:  
 an eyebolt body defining an aperture therethrough receiving said spinal rod therein, and having a threaded post projecting from said body; and  
 a threaded nut for engaging said threaded post; and  
 an attachment plate, said plate including:  
 an eyebolt engaging portion defining a slot therethrough for receiving said threaded post therein and having an upper surface for contacting said nut when said nut is threaded onto said post; and  
 a clamping portion for engaging said fixation element, said clamping portion formed by a flange projecting from



said upper surface of said plate and configured to contact one of said pair of opposite lateral surfaces of said fixation element,  
 wherein said rod contacts the other of said pair of lateral surfaces of said fixation element when said rod extends through said aperture of said eyebolt body and when said threaded post of said eyebolt body projects through said slot in said attachment plate, and  
 further wherein said nut is tightenable along said threaded post against said upper surface of said plate to thereby clamp together said clamping portion of said plate, said post of said vertebra fixation element and said spinal rod.

5,437,671

# PERPENDICULAR ROD CONNECTOR FOR SPINAL FIXATION DEVICE

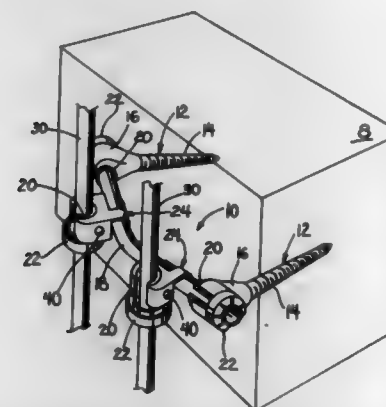
Antony J. Lozier, Warsaw, Ind.; John R. Johnson, and John R. Dimar, II, both of Louisville, Ky., assignors to Zimmer, Inc., Warsaw, Ind., a part interest

Division of Ser. No. 848,904, Mar. 10, 1992, abandoned. This application Mar. 7, 1994, Ser. No. 192,871

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—61

3 Claims



1. A system for functionally connecting a spinal rod to a vertebra, said system comprising a first fixation means connected to said vertebra, said first fixation means includes a bar carried transverse to a longitudinal dimension of a patient's spinal column, said system further including a secondary fixation means carried by said bar, said secondary fixation means being shiftable on said bar relative to said first fixation means,

and means for connecting said spinal rod to said secondary fixation means such that said spinal rod is transverse to said bar, wherein said secondary fixation means comprises a connector having a body with an opening for accommodating said spinal fixation rod, a pair of hooks extend outwardly from a wall of said body, said hooks clampingly engage said bar such that said spinal fixation rod is transverse to said bar.

5,437,672

# SPINAL CORD PROTECTION DEVICE

Neville Alleyne, 9687 Claiborne Sq., La Jolla, Calif. 92037

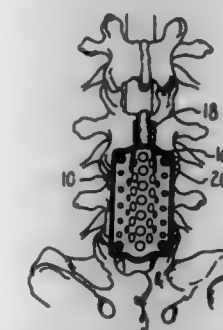
Continuation of Ser. No. 975,106, Nov. 12, 1992, abandoned.

This application Aug. 26, 1994, Ser. No. 296,857

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—61

7 Claims



1. A method for minimizing adhesions to the spinal dura following spinal surgery, comprising the steps of:  
 performing a bony dissection on at least a portion of one vertebrae to expose the spinal dura; and  
 positioning a biocompatible protection device to cover said exposed spinal dura, wherein said device comprises a shield adapted to cover at least a portion of one vertebrae having said bony dissection, an elongate concavity on a first side of the shield, said concavity extending axially from a first axial end of the shield to a second axial end of the shield; a first support plane on the shield, spaced laterally apart in a first direction from the longitudinal axis of the shield; and a second support plane on the shield, spaced laterally apart in a second direction from the longitudinal axis of the shield; wherein placement of said first and second support planes on opposite sides of said spinal dura aligns the longitudinal axis of said concavity generally parallel to the longitudinal axis of the spinal dura, with said first side of the shield spaced apart from the spinal dura, and wherein placement of said device over said dura minimizes adhesions to said dura.

5,437,673

# CLOSED CIRCULATION TISSUE WARMING APPARATUS AND METHOD OF USING THE SAME IN PROSTATE SURGERY

John G. Baust, Candor; Zhao H. Chang, Binghamton, both of N.Y.; Jeffrey Cohen, Pittsburgh, Pa.; Gary Onik, Allison Park, Pa., and George Reyes, Pittsburgh, Pa., assignors to Cryomedical Sciences, Inc., Rockville, Md.

Filed Feb. 4, 1993, Ser. No. 13,307

Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 606—23

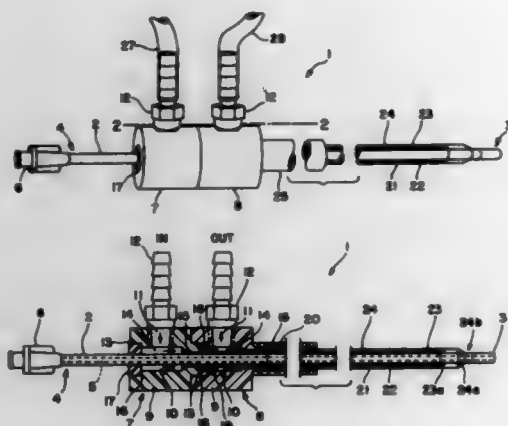
6 Claims

1. A method for performing cryoablation of the prostate while maintaining the temperature of surrounding healthy tissue, including urethral tissues, at near normal body temperature, said method comprising:  
 inserting a multi-lumen catheter through the urethra into the bladder,  
 allowing body liquids to drain from the bladder through a central lumen of said catheter,



pumping a temperature controlled warm liquid from a source of said warm liquid countercurrently through first and second communicating concentric passageways surrounding said central lumen of said catheter and back to said source,

performing transperineal cryoablation of the prostate at a



temperature of less than about  $-60^{\circ}\text{C}$ . until the undesired tissue is destroyed, and maintaining the flow of said warm liquid at a temperature and flow rate through said passageways sufficient to maintain the temperature of the bladder and surrounding healthy tissue at a temperature of about normal body temperature.

5,437,674

## OSTEOSYNTHESIS DEVICE

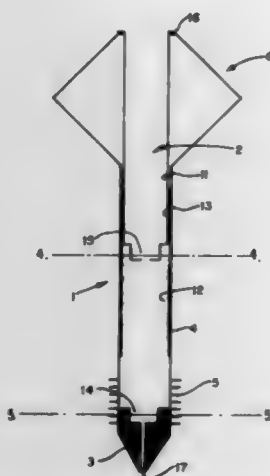
Alexandre Worcel, 76 Rue de Bercy, 75012-Paris, and Eric Kovacs, 1 Rue Michel-Ange, 93600 - Aulnay-Sous-Bois, both of France

Filed Aug. 25, 1993, Ser. No. 111,548

Claims priority, application France, Aug. 25, 1992, 92 10247  
Int. Cl.<sup>6</sup> A61B 17/84, 17/86

U.S. Cl. 606—73

8 Claims



1. An osteosynthesis device for holding together in compression two parts of a fractured bone comprising:  
a screw having a tip which is one of a pyramidal and conical shape and which has a body provided, at the distal end thereof, with an outside thread for engaging the bone, wherein the screw has a head which includes a plurality of foldable wings integral with the body and includes a mechanism which is engaged with said screw and the wings for folding the wings.

5,437,675

## POLYGONAL BONE PUNCH

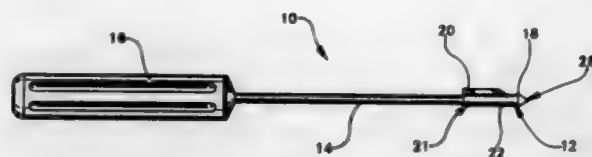
Franklin D. Wilson, 34 TwinShore Ct., Carmel, Ind. 46033

Filed Jun. 11, 1993, Ser. No. 75,983

Int. Cl.<sup>6</sup> A61B 17/16

U.S. Cl. 606—80

14 Claims



1. A bone punch for altering the cross-sectional shape of a tunnel formed in bone, the punch comprising:  
a punch body having a distal region, a proximal region, and a plurality of planar guide faces extending between said distal and proximal regions to define a polygon in cross-section;  
a ridge having a distal portion and a proximal portion and extending along one of said guide faces for providing a channel for an interference screw;  
said distal region terminating in a narrowed leading end; and  
a shaft, connected to said proximal region, through which force is transmittable to drive said punch body into the bone tunnel to alter the cross-sectional shape of the bone tunnel to match the polygonal cross-section of said punch body.

5,437,676

## KNEECAP CUTTING DEVICE FOR THE FITTING OF A TOTAL KNEE REPLACEMENT

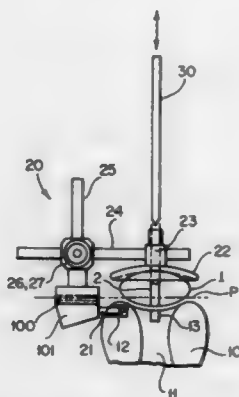
Jean-Pierre Bouraly, Montbellard; Jurg Aebi, Rodez; Philippe Beaufils, Magny les Hameaux; Michel de Lestang, Amiens; Jean-Gilles Gaffuri, Rumilly en Cambresis; Hervé Hourlier, Wignehies; Jean-Jacques Lallement, St Andre les Vergers; Philippe Legroux, Le Bouscat; Jean-Paul Leval, Clermont-Ferrand; Gérald Pondaven, Quimper; Pierre Schuster, Saint Avoird, and Christian Vergnat, Metz, all of France, assignors to Developpement d'Implants Orthopediques et Medicaux and Protek Synthes, both of Etupes Cedex, France

Filed Jan. 27, 1994, Ser. No. 187,287

Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606—88

7 Claims



1. A kneecap cutting guide apparatus for facilitating the fitting of a total knee replacement, comprising: a trial femur component having  
(a) an artificial trochlea;  
(b) at least one side hole made in an edge of the trial femur component;  
(c) a central hole made in the center of the artificial trochlea; an ancillary device having  
(d) a clamping dog-point for engaging the side hole of the trial femur component;

(e) a kneecap plate positionable against the kneecap;  
(f) means for centering the plate in fixed relation to the central hole of the artificial trochlea;  
(g) means for shifting the kneecap plate enabling a crosswise motion with respect to the artificial trochlea as well as axial motion parallel to the central hole;  
(h) means for locking the plate in position; and  
(i) means for guiding a bone cutting blade through the kneecap, parallel to a plane of the artificial trochlea.

5,437,678

## OPHTHALMIC LENS REMOVAL METHOD AND APPARATUS

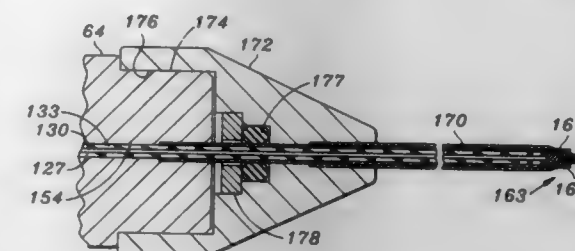
John T. Sorensen, Costa Mesa, Calif., assignor to Neomedix Corporation, Laguna Niguel, Calif.

Filed Nov. 30, 1992, Ser. No. 984,229

Int. Cl.<sup>6</sup> A61F 9/007

U.S. Cl. 606—107

33 Claims



1. Apparatus for endocapsular reduction of the lens of a mammalian eye, the apparatus comprising:  
a handpiece having an axis extending between a proximal end and an opposing distal end of the handpiece;  
an elongate tubular housing included in the handpiece and disposed at the proximal end of the handpiece;  
a probe included in the handpiece and extending from the housing to the distal end of the handpiece, the probe being adapted for insertion into the lens capsule;  
a shaft rotatable within the tubular housing and extending through the probe to the distal end of the handpiece;  
bearing means for supporting said shaft within the housing along at least one line of contact, said bearing means creating a channel extending along the probe;  
a V-ring face seal positioned within said housing in contact with said shaft for sealing said channel;  
reducing means coupled to the shaft at the distal end of the handpiece for reducing the object when the object is in general contact with the reducing means; and  
the reducing means being configured to create a fluid flow within the lens capsule to move the lens into contact with the lens reducing means.

5,437,679

## NAIL SPLITTER DEVICE FOR IMPLEMENTING A WEDGE RESECTION PROCEDURE TO REMOVE AN INGROWN TOENAIL

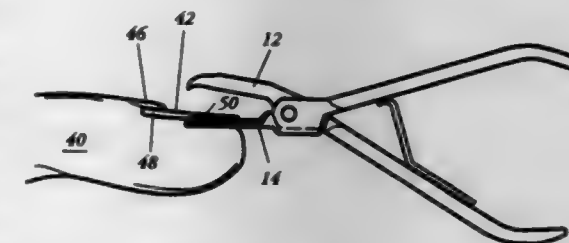
Douglas S. Gaillard, 2820 Hazelwood Dr., No. B-8, Nashville, Tenn. 37212

Filed May 31, 1994, Ser. No. 251,390

Int. Cl.<sup>6</sup> A45D 29/02

U.S. Cl. 606—131

4 Claims



1. A nail splitter including:  
a) a separator tongue and a cutter;  
b) said separator tongue having a proximal end and a distal end;  
c) said cutter having a proximal end and a distal end;  
d) means hingedly connecting said separator tongue and said cutter at their proximal ends whereby said cutter can be moved between an engaged position and a disengaged position relative to said separator tongue;

1. A glenoid alignment guide for aligning a drill bit relative to the glenoid and the glenoid neck of a patient, the glenoid alignment guide comprising:

a retractor plate for displacing the posterior and superior aspect of the deltoid muscle, the retractor plate having a handle, a main body and a curved finger narrower than the main body of the retractor plate defining the forward end of the retractor plate, the finger being adapted for insertion behind the glenoid, the finger having a tip arranged to engage the bone of the glenoid neck to form a fulcrum for levering the muscle and other tissue clear of the glenoid, the main body of the retractor plate having opposite sides including a first side for engagement with the deltoid muscle, and a second side opposite the first side; and

a drill guide slidably carried on the retractor plate only along the second side of the main body of the retractor plate and defining an axial path along which a drill bit is guided, the drill guide being movable along the second side of the main body of retractor plate to a forward position for engagement with the glenoid face, the arrangement being such that the drill guide can be advanced along the second side of the main body while the first side of the main body is engaging the deltoid muscle, and having guide means for guiding a drill bit along the axial path to make a hole from the glenoid face into the glenoid neck along the axis of the glenoid neck to receive fastening or locating means of a glenoid component of a shoulder implant, the tip of the finger of the retractor plate when engaged against the bone of the glenoid neck aligning the axial path defined by the drill guide relative to the glenoid neck.

- e) said separator tongue having an elongated, thin, flat shape;  
 f) the distal end of said separator tongue having a smooth rounded profile;  
 g) said separator tongue having an upper planer surface;  
 h) said cutter having a cutting edge overlying said separator tongue substantially throughout the length thereof and substantially co-planer with the upper planer surface of the separator tongue when said cutter and said separator tongue are in the engaged position and said cutting edge being at an angle relative to said upper planer surface of said separator tongue when the separator tongue and said cutter are in the disengaged position; and  
 i) means for moving the cutter between the engaged position and the disengaged position relative to the separator tongue.

5,437,680

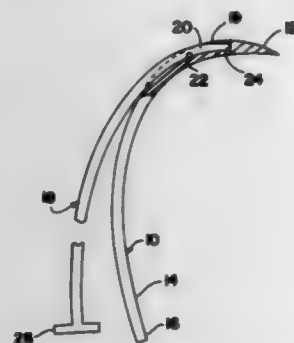
# SUTURING METHOD, APPARATUS AND SYSTEM FOR USE IN ENDOSCOPIC PROCEDURES

InBee Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131  
 Continuation-in-part of Ser. No. 719,281, Jun. 19, 1991, Pat. No. 5,366,459, which is a division of Ser. No. 450,301, Dec. 15, 1989, Pat. No. 5,100,418, which is a continuation-in-part of Ser. No. 49,504, May 14, 1987, abandoned. This application Jan. 6, 1993, Ser. No. 2,479

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—139

41 Claims



1. A method for suturing tissue in an anatomical cavity during an endoscopic procedure comprising the steps of penetrating the tissue at an entry point with a needle having a length of suture material attached thereto until a portion of the length of suture material has passed through the tissue and out of an exit point; providing an anchor unconnected with the length of suture material; engaging the portion of the length of suture material adjacent the exit point with the anchor; backing the needle proximally out of the tissue at the entry point while the anchor holds a portion of the length of suture material at the exit point; tensioning the length of suture material by pulling the length of suture material away from the entry point; and securing the length of suture material in the tensioned position with the anchor in contact with the tissue adjacent the exit point.

5,437,681

# SUTURING INSTRUMENT WITH THREAD MANAGEMENT

John C. Meade, Walpole, and Gerald I. Brecher, N. Andover, both of Mass., assignors to SutureTek Inc., Boston, Mass.  
 Filed Jan. 13, 1994, Ser. No. 180,662

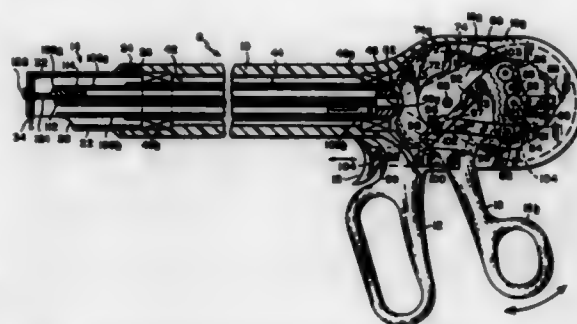
Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—145

29 Claims

1. A suturing instrument comprising a needle/suture cartridge, said cartridge including

- support means having opposite ends and an axis extending between them;  
 a curved suturing needle having a pointed end and a second end;  
 a suture having one end attached to said needle second end;



- track means at one end of said support means for supporting said needle for rotational motion about said axis, and actuator means for releasably holding the other end of said support means, said actuator means including rotary means releasably engaging and rotary said needle through successive revolutions about said axis in a direction to advance the pointed end of said needle.

5,437,682

# MEDICAL KNOT TYING INSTRUMENT AND METHOD FOR USE THEREOF

O. Drew Grice, New Bern, N.C.; Thomas H. Benham, Clearwater, and Michael Buhler, Madeira Beach, both of Fla., assignors to Ideas for Medicine, Inc., Clearwater, Fla.

Filed Jul. 20, 1993, Ser. No. 94,771

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—148

46 Claims



7. A medical instrument for tying two lengths of suture, comprising:  
 an elongate first member having a proximal end, a distal end and a longitudinal axis;  
 gripping means for releasably gripping a first length of suture proximate said distal end of said first member; and  
 holding means, disposed a predetermined distance proximally from said gripping means toward said proximal end of said first member, for releasably holding a second length of suture, said holding means and gripping means having a substantially common longitudinal axis.

5,437,683

# SURGICAL CLOSURE

Martin Neumann, Ruhsteinweg 26, D-8525 Weiher, and Ferdinand Köckerling, Hindenburgstrasse 28a, D-8520 Erlangen, both of Germany

PCT No. PCT/DE91/00849, § 371 Date Apr. 28, 1993, § 102(e) Date Apr. 28, 1993, PCT Pub. No. WO92/07519, PCT Pub. Date May 14, 1992

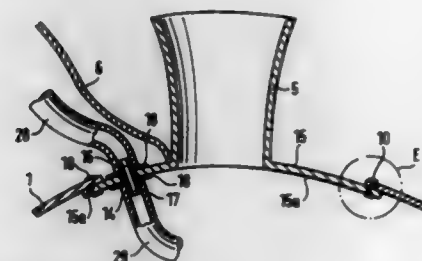
PCT Filed Oct. 31, 1991, Ser. No. 50,048

Claims priority, application Germany, Oct. 31, 1990, 40 34 705.2

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—151

27 Claims



1. Surgical closure comprising a securing element having single edge member for extending around a surgical incision on all sides, said edge member being tightly, detachably securable within body tissue adjacent the incision and being provided with an access opening for providing access to substantially the entirety thereof, and a closure for enabling repeated opening and closing of said access opening, said closure comprising a tube attached to said edge member and through which access to said access opening and the incision is obtainable, said tube surrounding the access opening and extending upwardly therefrom; and wherein said edge member and said tube are formed of a flexible material which forms a means for enabling the size of said access opening to be physically varied to conform to the width of the surgical incision.

5,437,685

# STERNUM BANDING ASSEMBLY

William Blamlik, 1512 Palisade Ave., Fort Lee, N.J. 07024  
 Division of Ser. No. 8,603, Jan. 25, 1993, Pat. No. 5,366,461.

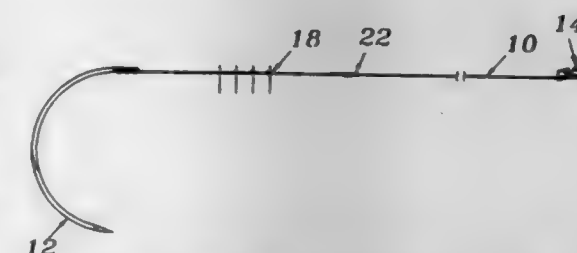
This application Mar. 30, 1994, Ser. No. 219,912

The portion of the term of this patent subsequent to Nov. 22, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61B 17/82

U.S. Cl. 606—151

10 Claims



1. An assembly for banding the sternum for use with a hand held clamp, said assembly comprising an elongated flexible band having first and second ends, a needle at said first end of said band, a buckle proximate said second end of said band, said buckle comprising a surface having first and second sides, means cooperating with said surface for defining a channel into which the band is received, means for locking said band within said channel and means aligned with said channel defining means for engagement by the clamp, permitting said buckle to be retained by the clamp as said band is locked into position by said locking means, said channel defining means comprising first and second substantially upstanding elements extending respectively from said first and said second sides of said surface and said means for engagement by said clamp comprising third and fourth substantially upstanding elements aligned with said first and second upstanding elements, respectively.

5,437,684

# CIRCULAR ANASTOMOSIS DEVICE

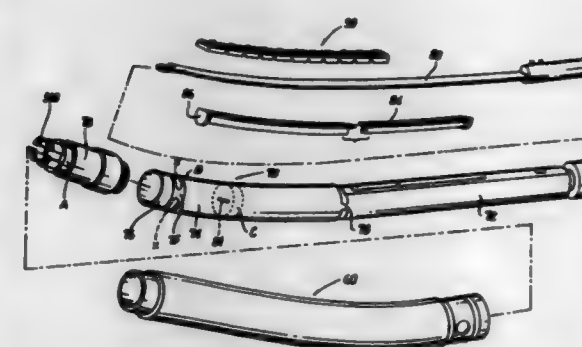
Philip D. Calabrese, Danbury; Frank J. Viola, Sandy Hook, and Stephen W. Gerry, Bethel, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 1, 1993, Ser. No. 130,230

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—153

6 Claims



1. A surgical instrument for performing a circular anastomosis comprising:  
 a shaft assembly having an inner compression member and



# CHEMICAL

## 5,437,686 PEROXYGEN BLEACH COMPOSITION ACTIVATED BY BI AND TRICYCLIC DIKETONES

Robert J. Heffner, and Robert J. Steltenkamp, both of Somerset, N.J., assignors to Colgate-Palmolive Co., New York, N.Y.

Filed May 18, 1994, Ser. No. 245,317

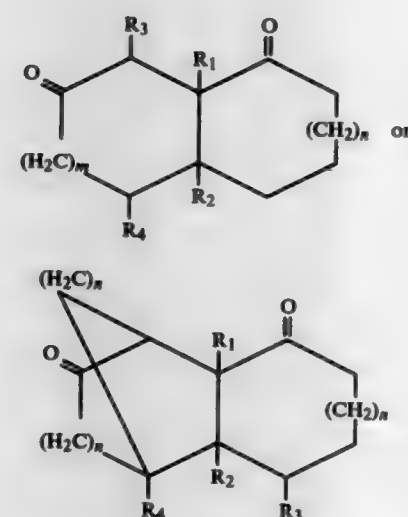
Int. Cl.<sup>6</sup> C07C 49/303; C11D 3/20, 3/395; D06L 3/02

U.S. Cl. 8—111

27 Claims

1. A peroxygen bleaching composition which comprises approximately by weight a mixture of:

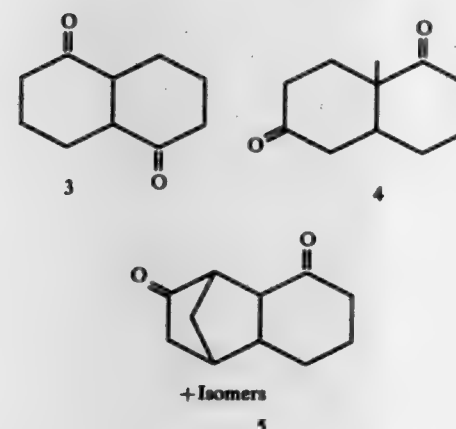
- (a) about 1 to about 75% a peroxygen bleaching compound; and
- (b) about 1 to about 75% of peroxygen bleaching compound activator which is characterized by the formula:



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are each a member selected from the group consisting of hydrogen, alkyl having about 1 to about 8 carbon atoms, aryl having about 6 to about 12 carbon atoms, alkylaryl having 7 to 12 carbon atoms, fluorine, chlorine, bromine, and nitrogen, m is 0, 1, 2 or 3 and n is 0, 1, 2 or 3.

24. A peroxygen bleaching composition which comprises approximately by weight a mixture of:

- (a) about 1 to about 75% of a peroxygen bleaching compound; and
- (b) about 1 to about 75% of a peroxygen bleaching compound activator which has a cyclic structure selected from the group consisting of:



## 5,437,687 WET PROCESS WITH NO HEATING FOR CONTINUOUS TRANSFER PATTERN PRINTING OF A CELLULOSE FABRIC WEB AND ITS BLENDS

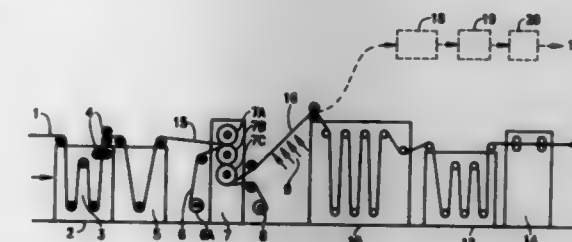
Wu H. Chi, I-Lan Hsien, Jen-Wei Lin, and Rudolf Lee, both of Taipei, all of Taiwan, assignors to Tofo Enterprise Co., Ltd., Taipei, Taiwan

Filed Sep. 19, 1994, Ser. No. 306,441

Int. Cl.<sup>6</sup> D06P 3/60, 7/00

U.S. Cl. 8—467

16 Claims



1. A continuous process for transfer pattern printing on a cellulose fabric web and its blends, comprising the steps of:

- (a) pre-printing a pattern with a dye admixed with a water-soluble and alcohol-soluble hydroxy propyl cellulose or polyvinyl pyrrolidone as a thickening agent, a solvent, and an anti-reduction agent on a printing surface of a corona-treated plastic film or a corona-treated plastic film laminated on a paper web;
- (b) soaking the cellulose fabric web or its blends in an alkali solution and squeezing the soaked cellulose fabric web or its blends to reduce the moisture content to 30-60%; and
- (c) transferring the pattern from the printing surface of the plastic film to the soaked cellulose fabric web or its blends without heating.

## 5,437,688 GRANULAR REACTIVE DYE COMPOSITION AND PRODUCTION PROCESS THEREOF

Noriaki Yamachi, Hirakata; Nobuaki Kawamura, Takarazuka; Tatuo Miura; Shuhei Hashizume, both of Osaka; Isao Nakamae, Hirakata; Kazumi Yoshigoe, Nishinomiya; Hiroyuki Suzuki, Habikino, and Iwao Minami, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 772,783, Oct. 8, 1991, abandoned. This application Dec. 14, 1993, Ser. No. 165,867

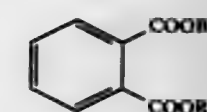
Claims priority, application Japan, Oct. 9, 1990, 2-271302; Jul. 23, 1991, 3-182363

Int. Cl.<sup>6</sup> C09B 62/02, 62/503, 67/24

U.S. Cl. 8—526

12 Claims

1. A dye composition, which comprises a water-soluble reactive dye and a granulating auxiliary agent selected from the group consisting of the compounds represented by the following formula (3),



(3)

wherein R represents  $-C_2H_{2s+1}$ , wherein s represents a number of 5 to 20 and wherein the content of the granulating auxiliary agent is from about 0.01 to 5 parts by weight per 100 parts by weight of the reactive dye.

5,437,689

## COMPOSITION AND PROCESS FOR THE PREPARATION OF ARTICLES HAVING MOULDING STABILITY

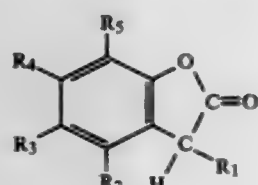
Manfred Rembold, Aesch, Switzerland; Claude Eckhardt, Riedisheim, France, and Peter Nesvadba, Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.  
Division of Ser. No. 969,617, Oct. 30, 1992, Pat. No. 5,322,525.  
This application Mar. 7, 1994, Ser. No. 207,561  
Claims priority, application Switzerland, Nov. 1, 1991, 3194/91

Int. Cl.<sup>6</sup> C09B 67/00; D06P 1/64

U.S. Cl. 8-567

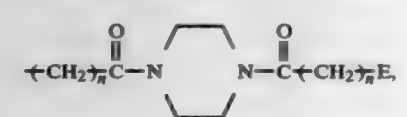
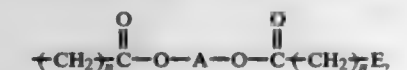
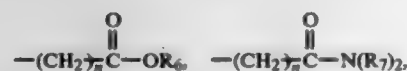
10 Claims

1. A composition comprising a benzofuran-2-one of formula (1)



wherein

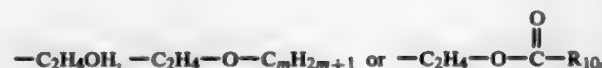
R<sub>1</sub> is unsubstituted or substituted phenyl, wherein the substituents are selected from 1 to 3 alkyl radicals together containing not more than 18 carbon atoms, C<sub>1</sub>-C<sub>12</sub>alkoxy, C<sub>1</sub>-C<sub>18</sub>acyloxy, C<sub>1</sub>-C<sub>8</sub>alkoxycarbonyl, chloro or a mixture of these substituents,  
R<sub>2</sub> is hydrogen or C<sub>1</sub>-C<sub>4</sub>alkyl,  
R<sub>3</sub> is hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl, unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted C<sub>5</sub>-C<sub>7</sub>cycloalkyl, unsubstituted phenyl, C<sub>7</sub>-C<sub>12</sub>phenylalkyl or chloro,  
R<sub>4</sub> has the meaning of R<sub>3</sub> or is a radical of formula



wherein

n is 0, 1 or 2,

R<sub>6</sub> is hydrogen, C<sub>1</sub>-C<sub>18</sub>alkyl, C<sub>2</sub>-C<sub>18</sub>alkyl which is interrupted by oxygen or sulfur, dialkylaminoalkyl containing a total of 3 to 16 carbon atoms, cyclopentyl, cyclohexyl, phenyl or phenyl which is substituted by 1 to 3 alkyl radicals together containing not more than 18 carbon atoms,  
the substituents R<sub>7</sub> are each independently of the other hydrogen, C<sub>1</sub>-C<sub>18</sub>alkyl, cyclopentyl, cyclohexyl, phenyl, phenyl which is substituted by 1 or 2 alkyl radicals together containing not more than 16 carbon atoms, a radical of formula



or, together with the linking nitrogen atom, form a piperidino or morpholino radical,

m is 1 to 18,

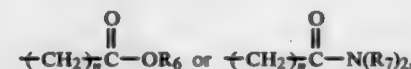
R<sub>10</sub> is hydrogen, C<sub>1</sub>-C<sub>22</sub>alkyl or C<sub>5</sub>-C<sub>12</sub>cycloalkyl,

A is alkylene of 2 to 22 carbon atoms which may be interrupted by nitrogen, oxygen or sulfur,

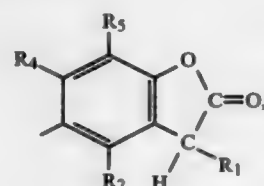
R<sub>3</sub> is hydrogen, C<sub>1</sub>-C<sub>18</sub>alkyl, cyclopentyl, cyclohexyl, phenyl, phenyl which is substituted by 1 or 2 alkyl radicals together containing not more than 16 carbon atoms, or benzyl,

R<sub>9</sub> is C<sub>1</sub>-C<sub>18</sub>alkyl,D is -O-, -S-, -SO-, -SO<sub>2</sub>- or -C(R<sub>11</sub>)<sub>2</sub>-,

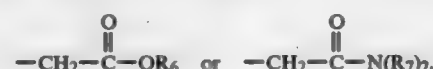
the substituents R<sub>11</sub> are each independently of the other hydrogen, alkyl together containing not more than 16 carbon atoms, phenyl or a radical of formula



wherein n, R<sub>6</sub> and R<sub>7</sub> have the given meanings,  
E is a radical of formula



wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>4</sub> have the given meanings, and  
R<sub>5</sub> is hydrogen, C<sub>1</sub>-C<sub>30</sub>alkyl, cyclopentyl, cyclohexyl, chloro or a radical of formula



wherein R<sub>6</sub> and R<sub>7</sub> have the given meanings, or  
R<sub>5</sub> together with R<sub>4</sub> form a tetramethylene radical, and a fluorescent whitening agent for polyamide or a mixture thereof wherein the ratio of benzofuran-2-one to fluorescent whitening agent is from 100:1 to 1:100.

5,437,690

## METHOD FOR DYEING FIBROUS MATERIALS AND DYE ASSISTANT RELATING TO THE SAME

Melvin A. Caldwell, Kingsport, Tenn., and John R. Holsten, Spartanburg, S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed May 25, 1994, Ser. No. 249,547

Int. Cl.<sup>6</sup> C09B 67/00; D06P 3/04

U.S. Cl. 8-590

18 Claims

1. A method for dyeing fibrous material which is particularly adapted for use in reducing the adverse effect of dyeing methods on the flame resistant properties of fibrous material having inherent flame resistant properties, the method comprising contacting a fibrous material selected from the group consisting of aromatic polyamide fibers, polybenzimidazole fibers, aromatic polyimide fibers, fibers of copolymers of the monomers thereof, or blends thereof, with an aqueous dyebath comprising a mixture of a dye assistant and a dye soluble or dispersed with the dye assistant in the dyebath, the dye assistant comprising an N-alkyl substituted aromatic sulfonamide.

5,437,691

## PRODUCTION OF SPHERICAL SHAPED PRODUCTS OF SUBLIMING SUBSTANCES

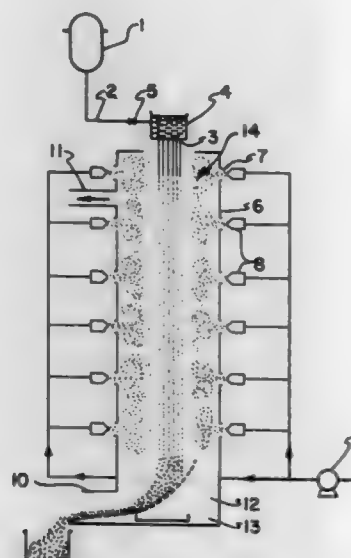
Armin Lauterbach, Antofagasta, Chile, assignor to Chilean Nitrate Corporation, Norfolk, Va.

Filed Aug. 30, 1991, Ser. No. 752,716

Int. Cl.<sup>6</sup> B01D 9/00; C01B 7/14

U.S. Cl. 23-295 R

8 Claims



1. A method for producing a granular spherically shaped product of corrosive, subliming substances, which comprises: discharging a corrosive subliming substance, in a molten condition, through a perforated surface or through nozzles and into an enclosure, so as to form a plurality of molten streams which transform into droplets of 0.5 to 4.0 mm diameter, said enclosure surrounding said streams and formed droplets and provided around its outer periphery with from 3 to 8 evenly spaced perforations per each meter of height;

introducing, through a bottom portion of said enclosure, a flow of air into said enclosure, said flow traveling in a direction countercurrent to said streams and formed droplets to facilitate cooling of said corrosive subliming substance;

introducing, at a plurality of said perforations substantially surrounding a substantial portion of the vertical axis of the enclosure, a mist of a liquid coolant having a boiling point lower than the melting point of said corrosive subliming substance, said mist being distributed throughout substantially the entire height of the enclosure in the form of liquid particles atomized to a size of 10 to 200 μ, said mist being introduced from the outside into said enclosure through said perforations so as to be cooled adiabatically by mixing with the external air, wherein said atomized liquid particles are pressurized to achieve a relatively high rate of speed prior to entry into said enclosure to create a localized area of low pressure at each said perforation so as to suction outside air into said enclosure for facilitating said adiabatic cooling, whereupon said mist, in combination with said countercurrent flow of air, is thereafter transformed into a low temperature turbulent fog by partial evaporation of the incoming liquid particles forming said mist before said droplets pass through the fog; solidifying said droplets of said subliming substance to form spherically shaped particles thereof; and collecting said spherically shaped particles, said spherically shaped particles being substantially free of said liquid coolant.

5,437,692

## METHOD FOR FORMING AN ELECTRODO-ELECTROLYTE ASSEMBLY

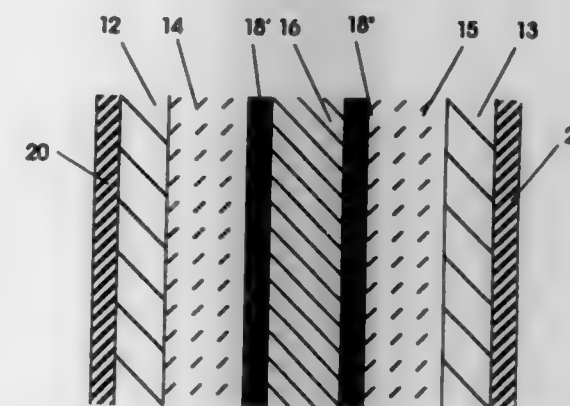
Sankar Dasgupta, c/o Electrofuels Manufacturing Co. 21 Hanna Ave., Toronto, Ontario, Canada M6K 1W8, and James K. Jacobs, c/o Electrofuels Manufacturing Co. Unit 10, 21 Hanna Ave., Toronto, Canada M6K 1W8

Filed Nov. 2, 1994, Ser. No. 332,796

Int. Cl.<sup>6</sup> H01M 10/38

U.S. Cl. 29-623.1

32 Claims



1. A method for forming an electrode-electrolyte assembly for incorporation in a rechargeable lithium battery, comprising the steps of:

- providing a first polymer laminate having embedded therein an electronically conductive carbonaceous substance, said first polymer laminate having parallel faces and being impervious to water, said first polymer laminate being permeable to electrons;
- agglomerating particles of fine carbon capable of intercalating lithium, with a lithium compound containing organic binder, and providing a continuous layer of the agglomerated particles of fine carbon so obtained on one of said parallel faces of said first polymer laminate, said continuous layer having thickness in excess of 0.5 mm, thereby forming a lithium containing negative electrode;
- providing a second polymer laminate having parallel faces, said second polymer laminate being non-conductive of electrons, said second polymer laminate having a lithium compound dissolved therein in a first concentration, said lithium compound being capable of releasing mobile lithium ions, thereby forming a lithium ion-conductive solid polymer laminate electrolyte;
- providing a lithium ion containing fluid adhesive mixture and disposing said fluid adhesive mixture to form a lithium ion containing adhesive coating on at least a portion of one of the parallel faces of said lithium ion-conductive solid polymer laminate electrolyte, said fluid adhesive mixture containing a lithium compound in a second concentration, said second lithium compound concentration being less than said first lithium compound concentration; and
- bringing into contact said lithium ion containing adhesive coating disposed on one of said parallel faces of said lithium ion-conductive solid polymer laminate electrolyte with said continuous layer of fine carbon agglomerated with a lithium compound containing organic binder located on one of said parallel faces of said first polymer laminate comprised in said lithium bearing negative electrode, thereby forming a lithium containing electrode-electrolyte assembly adherent to one another.



5,437,693

**HEAVY OIL EMULSION FUEL COMPOSITION**

Masanori Iizuka; Takao Taniguchi; Kazuo Isobe; Sayuri Tamaki, all of Wakayama; Tadakazu Yamashita, and Shinichi Satake, both of Kanagawa, all of Japan, assignors to Kao Corporation and Nippon Oil Company, Limited, Tokyo, Japan  
Filed Mar. 8, 1994, Ser. No. 207,151

Claims priority, application Japan, Mar. 17, 1993, 5-057086; Aug. 24, 1993, 5-209232

Int. Cl.<sup>6</sup> C10L 1/32

U.S. Cl. 44—302

11 Claims

1. A heavy oil emulsion fuel composition comprising (a) a heavy oil, (b) water, (c) a surfactant and (d) a mixture of a water-soluble compound having two or more hydroxyl groups and a monohydric alcohol having 6 or more carbon atoms.

5,437,694

**PHOSPHORODITHIOATE-DERIVED PYRROLIDINONE ADDUCTS AS MULTIFUNCTIONAL ANTIWEAR/ANTIOXIDANT ADDITIVES**

Liehpao O. Fung, Lawrenceville; Andrew G. Horodysky, Cherry Hill, and Ronald J. Poole, Mullica Hill, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

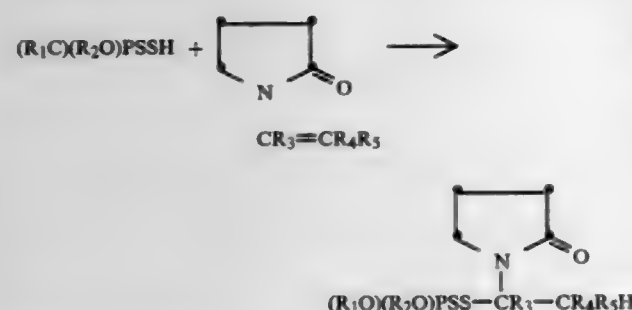
Division of Ser. No. 985,044, Dec. 3, 1992, Pat. No. 5,324,441. This application Jun. 24, 1994, Ser. No. 265,606

Int. Cl.<sup>6</sup> C10L 1/26

U.S. Cl. 44—340

6 Claims

1. An improved fuel composition comprising a major proportion of a liquid hydrocarbyl fuel selected from gasoline, diesel or fuel oil, and a minor proportion of a multifunctional antiwear/antioxidant additive product of reaction prepared by (a) reacting an O,O-dihydrocarbyl phosphorodithioic acid with a vinyl pyrrolidone to form phosphorodithioate-derived pyrrolidones as described below:



where R<sub>1</sub> and R<sub>2</sub> are C<sub>3</sub> to about C<sub>30</sub> hydrocarbyl and where R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> are hydrogen or C<sub>1</sub> to about C<sub>60</sub> hydrocarbyl and wherein the reaction is carried out at temperatures varying from ambient to about 250° C. under pressures varying from ambient to about 100 psi or is autogenous for a time sufficient to obtain the desired additive product of reaction and where the reaction is carried out in molar ratios of reactants which vary from equimolar to more than equimolar to less than equimolar.

5,437,695

**FUELS AND LUBRICANTS CONTAINING N-ALKYLCARBOXAMIDES**

Juergen Mohr, Gruenstadt; Knut Oppenlander, Ludwigshafen; Hans J. Pander, Roedersheim-Gronau; Rolf Schneider, Mannheim; Juergen Thomas, Fussgoenheim, and Peter Schreyer, Weinheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 19, 1993, Ser. No. 47,300

Claims priority, application Germany, Apr. 25, 1992, 42 13 877.6

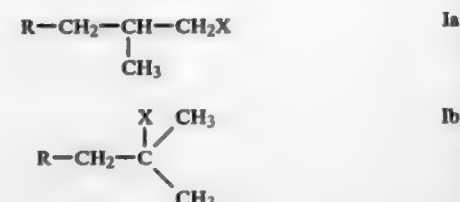
Int. Cl.<sup>6</sup> C10L 1/22

U.S. Cl. 44—418

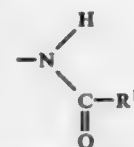
5 Claims

1. A fuel for internal combustion engines containing amounts

having detergent activity of compounds of the formula Ia or Ib



where R is an aliphatic hydrocarbon radical containing alkyl side chains and having a number average molecular weight of from about 800 to about 2,000, X is



and R<sup>1</sup> is hydrogen, C<sub>1</sub>-C<sub>6</sub>-alkyl, phenyl or alkylphenyl of 7 to 14 carbon atoms.

5,437,696

**METHOD OF REMOVAL OF SULFUR FROM COAL AND PETROLEUM PRODUCTS**

John G. Verkade; Thyagarajan Mohan, and Robert J. Angelici, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jun. 22, 1994, Ser. No. 263,553

Int. Cl.<sup>6</sup> C10L 9/00, 9/02

U.S. Cl. 44—622

45 Claims

1. A method for the removal of sulfur from solid sulfur-bearing materials comprising:

- exposing a sample of the solid sulfur-bearing material to a reduced pressure;
- contacting the sample of solid sulfur-bearing material under a reduced pressure with an organophosphorus compound of the formula PR<sub>3</sub> or P(OR)<sub>3</sub>, wherein each R is independently an aliphatic or aromatic group; and
- heating the mixture of the solid sulfur-bearing material and organophosphorus compound at a temperature and for a time sufficient to remove at least a portion of the sulfur.

5,437,697

**METHOD TO IDENTIFY GENETIC MARKERS THAT ARE LINKED TO AGRONOMICALLY IMPORTANT GENES**

Scott A. Sebastian, Hockessin, Del., Scott V. Tingey, Elkton, Md., and Michael K. Hanafey, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 909,833, Jul. 7, 1992, abandoned. This application Jul. 23, 1993, Ser. No. 97,349

Int. Cl.<sup>6</sup> A01H 1/00, 1/02, 5/00; C12N 15/00

U.S. Cl. 47—58

5 Claims

1. A method for identifying alleles associated with agronomic fitness of soybean comprising:

- selecting a sample of current-day elite lines of soybean to form an elite population;
- selecting the predominant and earliest known ancestral lines of said elite lines by considering the pedigrees of said elite lines;
- conducting a genetic marker survey to determine the genotype of said elite lines and said ancestral lines;
- using the pedigrees of said elite lines and genotypes of said ancestral lines to calculate the probability of each elite line inheriting each allele from said ancestral lines;
- calculating the expected allele frequency of each allele

within said elite population by averaging the probabilities calculated in step d) for each elite line;

f) calculating the observed allele frequency within said elite population;

g) comparing said observed allele frequency with said expected allele frequency for each said allele in said elite population to identify alleles at each locus that have been inherited more frequently than expected; and

h) producing soybean plants with superior agronomic fitness;

such that said soybean plants with superior agronomic fitness can be efficiently identified with said genetic markers that are diagnostic of said alleles that have been inherited more frequently than expected.

5,437,698

**PARTICULARLY, A STRUCTURED BODY FOR THE DRAINAGE TREATMENT FOR THE PREPARATION FOR TREE-PLANTING GROUND, AND ITS IMPOUNDING AND FLUSHING SYSTEM**

Sadaishi Furukawa, Tsukuba, Japan, assignor to Yugen Kaisha Clean Up System, Tsukuba, Japan

Division of Ser. No. 997,350, Dec. 28, 1992, Pat. No. 5,373,661.

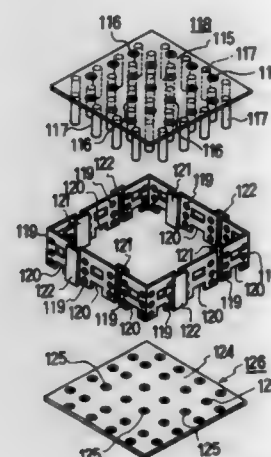
This application Jul. 12, 1994, Ser. No. 273,631

Claims priority, application Japan, Apr. 24, 1992, 4-33911

Int. Cl.<sup>6</sup> A01G 9/02; E04C 2/34

U.S. Cl. 47—66

1 Claim



1. A structured body for drainage treatment, comprising:
- a top panel having plural weep holes and plural downward cylinders;
  - a frame having side panels, plural weep holes in each of the side panels, notch weep holes in a lower edge of each of the side panels and concave and convex connection portions in each of the side panels; and
  - a bottom panel having plural concaves in a top face for receiving the downward cylinders.

5,437,699

**APPARATUS FOR PREVENTING SLAG TAP BLOCKAGE**

Charles V. Sterlaling, 7111 Rancheria Dr., Houston, Tex. 77083  
Division of Ser. No. 369,871, Jun. 22, 1989, Pat. No. 4,979,964.

This application Oct. 19, 1990, Ser. No. 599,955

Int. Cl.<sup>6</sup> C10J 3/52

U.S. Cl. 48—62 R

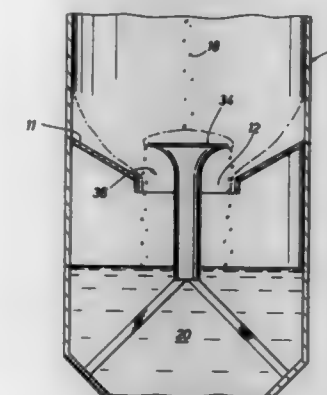
1 Claim

1. An apparatus for preventing slag tap blockage in a gasifier during the conversion of carbonaceous fuels comprising:

- a reaction vessel having a hearth sloping downwardly from the walls of said reaction vessel;
- a burner in said reaction vessel located above said hearth for converting a dry fuel into synthesis gas and a free-flowing liquid mineral waste, said dry fuel comprising finely divided particles;
- a slag tap opening formed in said downwardly sloping

hearth at the lowest part thereof for diverting said liquid mineral waste through said hearth and from said reaction vessel;

blocking means comprising a pedestal fixedly located in said reaction vessel below said burner, raised above said slag tap and at least partially blocking the opening of said slag



tap as seen on a vertical projection thereof, said pedestal being concentrically located with respect to said vertical projection, for preventing unconverted fuel from falling directly through said slag tap; and means for solidifying and collecting said liquid mineral waste.

5,437,700

**POLYESTER/VISCOSE COMPOSITE YARNS AND FABRIC MATERIAL CONTAINING SAID YARNS AS FLEXIBLE COATED ABRASIVE SUPPORT**

Simon Duquesne, Chatou, France, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US91/07320, § 371 Date Apr. 2, 1993, § 102(e)

Date Apr. 2, 1993

PCT Filed Oct. 3, 1991, Ser. No. 30,469

Claims priority, application France, Oct. 3, 1990, 90 12173

Int. Cl.<sup>6</sup> B24D 11/02

U.S. Cl. 51—295

38 Claims

1. A coated abrasive article comprising an abrasive layer on a major surface of a woven fabric backing having warp and weft yarns, wherein at least one of said warp or said weft yarns includes composite polyester-viscose spun yarn such that said fabric backing comprises at least 25 percent by weight of said polyester-viscose spun yarn, based on the total weight of said fabric backing, wherein said polyester-viscose spun yarn comprises staple viscose fibers and staple polyester fibers, wherein said fabric backing has a dry weight up to about 350 g/m<sup>2</sup>, and wherein said warp yarns are sized.

5,437,701

**AIR FILTER AND METHOD OF CONSTRUCTION**

David M. Townsley, McKinney, Tex., assignor to S.T. Technologies, Inc., Plano, Tex.

Filed Aug. 5, 1993, Ser. No. 102,350

Int. Cl.<sup>6</sup> B01D 46/00

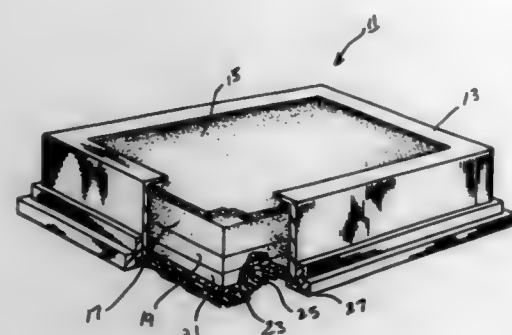
U.S. Cl. 55—486

5 Claims

1. An improved air filter for filtering a dirty incoming stream of air entering a vehicle engine, comprising:

- an outer layer facing the incoming stream of dirty air;
- a plurality of inner treated layers of foam, each of the treated inner layers being coated with a controlled migration treatment medium having a Saybolt Universal viscosity in the range from about 8,500 to 36,000 SUS; and
- wherein the inner treated layers of foam are further characterized as having a residual amount of controlled migra-

tion treatment medium, after removal of solvent, if solvent is present, in the range from about 0.25 to about 2.0 grams



of treatment medium per cubic inch of untreated foam filter material.

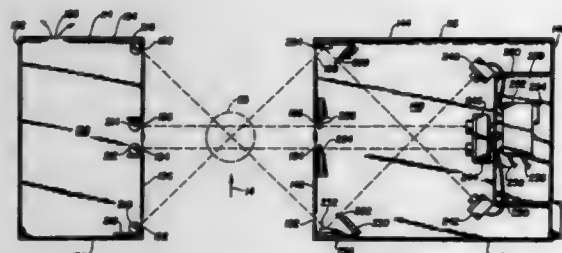
5,437,702

# HOT BOTTLE INSPECTION APPARATUS AND METHOD

John W. Burns, Westminster; Dennis R. Erickson, Arvada; Jack D. McKeehan, Conifer, and James A. Gulka, Arvada, all of Colo., assignors to Coors Brewing Company, Golden, Colo.  
Filed Aug. 24, 1993, Ser. No. 111,115  
Int. Cl.<sup>6</sup> C03B 9/00; G01B 11/30

U.S. Cl. 65—29.12

8 Claims



2. A method of producing glass bottles comprising the steps of:

- forming hot bottles in a bottle mold machine having a series of mold cavities;
- placing hot bottles formed by the bottle mold machine on a conveyor in a predetermined sequence corresponding to the series of mold cavities;
- conveying the bottles from a hot end of the conveyor proximate to the bottle mold machine to a cold end of the conveyor remote from the bottle mold machine;
- non-touchingly, imaginably inspecting the bottles with a bottle inspection apparatus located at an inspection station at the hot end of the conveyor;
- generating a mold signal indicative of said placing of hot bottles on the conveyor;
- generating a bottle detection signal indicative of a passage of a bottle through the inspection station; and
- processing the mold signal and bottle detection signal to determine the mold cavity used to form the bottle passing through the inspection station.

5,437,703

# BENDING GLASS SHEETS

Nell W. Jacques, Burscough; Brian J. Thomas; David Sykes, both of Wigan, and James Boardman, Birmingham, all of United Kingdom, assignors to Pilkington Glass Limited, United Kingdom

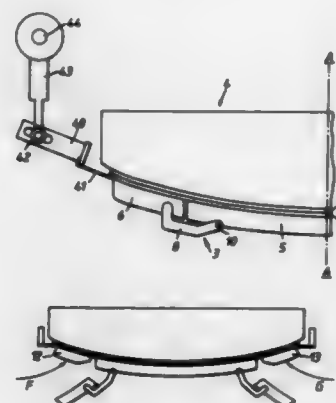
Filed Feb. 25, 1994, Ser. No. 202,367

Claims priority, application United Kingdom, Mar. 3, 1993, 9304286

Int. Cl.<sup>6</sup> C03B 23/023, 23/03

U.S. Cl. 65—106

17 Claims



1. A method of bending a glass sheet on a mould having at least one movable end, comprising the steps of: heating the glass sheet to its bending temperature; subjecting the glass sheet to an initial gravity bending step on the mould, the gravity bending step beginning during the heating step; after the gravity bending step, providing alternative support to a portion of the glass sheet located at the movable end of the mould; while providing said alternative support, lowering said movable end of the mould away from the glass sheet; subjecting the glass sheet to a press bending step, while said portion of the glass sheet is supported by said alternative support; and cooling the bent glass sheet.
10. An apparatus for bending a glass sheet comprising: a lower mould having at least one movable end for supporting at least a portion of the glass sheet, means for lowering and raising said movable end, means for providing alternative support to a portion of the glass sheet located on the movable end of the lower mould, so as to support said portion while said movable end is lowered, an upper mould mounted above the lower mould, means for reciprocating the upper mould relative to the lower mould, at least one pressing wing movably mounted so as to make pressing contact with said portion of the glass sheet and press said portion against the upper mould.

5,437,704

# METHOD AND FURNACE FOR BENDING GLASS SHEETS

Erkki Yli-Vakkuri; Arto Kaonpää; Tapio Salonen, and Jukka Nikkanen, all of Tampere, Finland, assignors to Tamglass Engineering Oy, Tampere, Finland

Filed Oct. 6, 1993, Ser. No. 132,184

Claims priority, application Finland, Oct. 15, 1992, 924666; Jun. 21, 1993, 932861; Jul. 23, 1993, 933318

Int. Cl.<sup>6</sup> C03B 23/025

U.S. Cl. 65—107

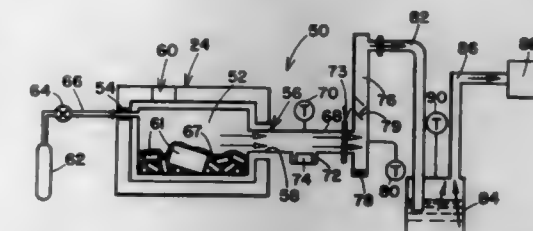
26 Claims

1. A method for bending glass sheets comprising the steps of:

transferring a glass sheet to one or more preheating sections of a furnace;  
preheating the glass sheet by radiation and forced convection in the preheating sections;  
directing the forced convection on an area of the glass sheet in the preheating sections by blowing air through a convection air blasting pipe at the area, thereby intensifying the forced convection, such that a temperature difference between an upper surface of the glass sheet and a lower surface of the glass sheet is reduced;  
transferring the preheated glass sheet to a bending section of the furnace;  
heating the glass sheet by radiation heat in the bending section so that the glass sheet is bent; and  
adjusting a heat distribution of the radiation heat in the bending section during bending.

22. A bending furnace for glass sheets, comprising:  
one or more heating stations including at least one preheating station, the preheating station including a heating element field including a plurality of upper heating elements on a top of the preheating station;  
a bending station, the bending station including a heating

Ni-Cd battery and processing scrap material containing nickel, cadmium, free water, molecular water, nonmetallic substances and other substances, said process comprising the steps of:  
depositing said scrap material in a furnace;  
adding an effective amount of an oxygen getter in said furnace to inhibit oxide formation;  
introducing and maintaining a gas selected from the group consisting of argon and nitrogen into the atmosphere of said furnace;  
heating said furnace for an effective period of time to evaporate said free water;  
increasing and maintaining the temperature of said furnace



to approximately 500°–800° C. for an effective period of time to volatilize said molecular water and said nonmetallic substances;  
raising the temperature of said furnace to greater than approximately 900° C. for an effective period of time to vaporize cadmium from said scrap material;  
directing said vaporized cadmium to a chamber connected to said furnace;  
condensing and solidifying said cadmium vapor disposed within said chamber by decreasing the temperature of said cadmium vapor within said chamber;  
recovering said solidified cadmium from said chamber; and  
recovering said nickel from inside said furnace.

5,437,706

# METHOD FOR OPERATING A BLAST FURNACE

Jonathan Edelson, Princeton, N.J., assignor to Borealis Technical Incorporated Limited, Eli, Israel

Filed Jun. 10, 1994, Ser. No. 258,506

Int. Cl.<sup>6</sup> C21B 5/00

U.S. Cl. 75—471

3 Claims

1. A method of reducing ore in furnace means, wherein a charge of ore and coke descend, said ore being melted and reduced, the method comprising the steps of: feeding ore and coke continually into the top of said furnace means; tapping metal and slag continually from the hearth of said furnace means; continuously injecting a reducing gas into the lower part of said furnace means, the improvement wherein being injecting oxygen at a level above that of the injection of said reducing gas whereby the thermal requirements for said melting and reduction not met by heat carried by said reducing gas are satisfied by exothermic reaction between said oxygen and said reducing gas.

5,437,707

# APPARATUS FOR TREATING IRON ORE

Mark Cross, 5, The Priors, Harriotts Lane, Ashted, Surrey KT21 2QF, England

Filed Apr. 28, 1994, Ser. No. 233,438

Int. Cl.<sup>6</sup> F27B 7/28

U.S. Cl. 75—474

4 Claims

1. Apparatus for treating iron ore, comprising an elongate and generally cylindrical inclined kiln mounted for rotation about its longitudinal axis, an upper end of the kiln, wall means defining an interior of the kiln, drive means coupled to the kiln to rotate the latter about its longitudinal axis, iron ore feed means positioned at the upper end of the kiln to feed iron ore into the kiln while the latter is rotating, port-defining means in the generally cylindrical wall of the kiln to enable gaseous

5,437,705

# DEVICE AND PROCESS FOR THE RECOVERY OF CADMIUM AND NICKEL

Ralph J. DeLisle; Harold E. Martin, both of Gainesville, and Amos Wilkerson, Alachua, all of Fla., assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Continuation of Ser. No. 5,705, Jan. 19, 1993, abandoned. This application Sep. 7, 1994, Ser. No. 303,126

Int. Cl.<sup>6</sup> C22B 7/00

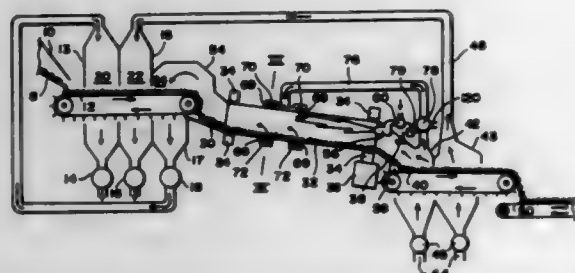
U.S. Cl. 75—403

25 Claims

1. A process for recovering cadmium and nickel metals from



material to be fed into the interior of the kiln at at least one position between the ends thereof, which port-defining means are of such a construction that they are open when they are underneath the iron ore in the kiln, and gaseous oxidising material feed means connected to the port-defining means to feed such oxidising material thereto, whereby oxidizing gaseous material is passed through the iron ore in the kiln when the apparatus is in use so as to raise the temperature of the iron ore,



by oxidation thereof, and cause the latter to be indurated, the apparatus further comprising temperature measuring means arranged to provide a measurement of an interior temperature of the kiln and control means connected to the gaseous oxidising material feed means to vary the rate at which gaseous oxidising material is fed to the port-defining means in dependence upon the said measurement so as to maintain the peak temperature of the iron ore in the kiln within a predetermined range.

5,437,708

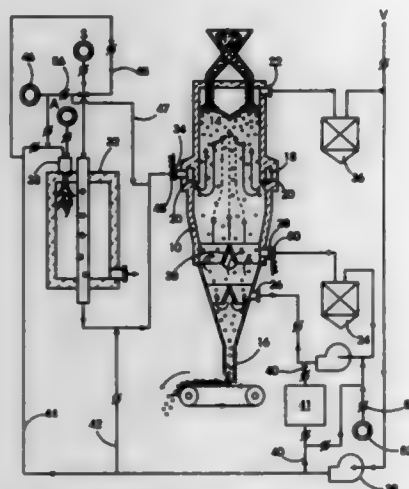
**IRON CARBIDE PRODUCTION IN SHAFT FURNACE**  
David C. Meisner, and Winston L. Tennes, both of Charlotte, N.C., assigns to Midrex International B.V. Rotterdam, Zurich Branch, Zurich, Switzerland

Filed May 4, 1994, Ser. No. 237,786

Int. Cl.<sup>6</sup> C21B 13/02; F27D 17/00

U.S. Cl. 75-490

25 Claims



1. A process for producing an iron carbide (Fe<sub>3</sub>C) product in a shaft furnace, comprising:

- establishing a gravitational flow of particulate metal oxide material by charging a generally vertical shaft furnace having an upper reducing zone and a lower cooling zone with particulate metal oxide material;
- introducing a reducing gas into the furnace intermediate the upper and lower zones at a temperature sufficient to promote a reducing reaction between the reducing gas and the metal oxide material;
- causing the reducing gas to move upwardly and counter-currently through the downward flow of metal oxide material, thereby reacting with and reducing a portion of

the metal oxide and forming a top gas at the upper portion of the furnace;

- removing the top gas from the upper portion of the furnace;
- maintaining the temperature of the metal oxide material in the reducing zone from about 1200° to about 1400° F. (about 649° to about 760° C.);
- containing the metal oxide material within the shaft furnace reducing zone for a residence time of from about 9 to about 15 hours;
- introducing a cooling gas near the cooling zone of the furnace; and
- removing the resulting metallized product from the bottom of the furnace.

5,437,709

**RECYCLING OF RARE EARTH METALS FROM RARE EARTH-TRANSITION METAL ALLOY SCRAP BY LIQUID METAL EXTRACTION**

Timothy W. Ellis, and Frederick A. Schmidt, both of Ames, Iowa, assigns to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jul. 26, 1994, Ser. No. 280,440

Int. Cl.<sup>6</sup> C01F 17/00

U.S. Cl. 75-581

12 Claims

1. A method of treating a rare earth metal-bearing material, comprising melting rare earth metal-bearing material comprising a rare earth metal and at least one other element that is not a rare earth metal, melting an extractant in which the rare earth metal is soluble in the molten state, and contacting the melted material and melted extractant at a temperature and for a time effective to selectively extract the rare earth metal from said melted material into said melted extractant.

5,437,710

**CHEMICAL PROCESSING SYSTEM FOR MAINTAINING CONCENTRATION OF SEMICONDUCTOR PROCESSING SOLUTION**

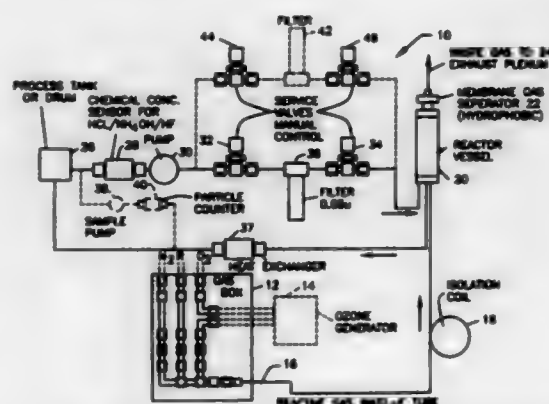
Robert W. Grant, Excelsior, and Richard E. Novak, Plymouth, both of Minn., assigns to Submicron Systems Inc., Allentown, Pa.

Continuation of Ser. No. 207,232, Mar. 7, 1994, abandoned, which is a continuation of Ser. No. 791,093, Nov. 12, 1991, abandoned. This application Dec. 14, 1994, Ser. No. 356,048

Int. Cl.<sup>6</sup> B01D 46/46

U.S. Cl. 95-12

3 Claims



1. A method of generating and maintaining the concentration of an ultra-pure chemical solution for semiconductor processing at a given point of use, said method comprising the steps of:

- sensing the concentration of solute in an ultra-pure chemical solution proximate said given point of use;
- providing said solute as a prescribed gas;
- filtering said prescribed gas to provide filtered gas;

controlling the flow of said filtered gas in response to sensing a change in concentration of said solute in said ultra-pure chemical solution from a preset value to provide controlled filtered gas;

mixing said controlled filtered gas with chemical solution taken from said

given point of use to form a maintained concentration ultra-pure chemical solution; and

transporting said maintained concentration ultra-pure chemical solution to said given point of use.

5,437,711

**METHOD OF PURIFYING CHLORINE-CONTAINING GASES**

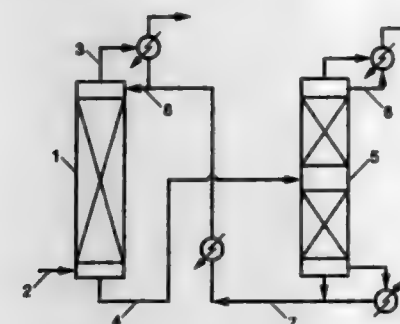
Ronald B. Kaplin, Lewiston; Chao-Peng Chen, and Tilak V. Bommaraju, both of Grand Island, all of N.Y., assigns to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Dec. 16, 1993, Ser. No. 167,294

Int. Cl.<sup>6</sup> B01D 53/14

U.S. Cl. 95-182

17 Claims



1. In a gas purification apparatus suitable for purifying a mixture of chlorine gas and nitrogen trichloride gas by contacting said mixture with carbon tetrachloride in order to remove said nitrogen trichloride gas from said mixture, a method of performing said removal in said same apparatus without using carbon tetrachloride comprising the steps of

- replacing said carbon tetrachloride in said apparatus with a chlorinated organic liquid selected from the group consisting of chloroform and 1,2-dichloroethane;
- mixing said chlorinated organic liquid with said mixture, whereby said chlorinated organic liquid absorbs nitrogen trichloride in said mixture; and
- separating said chlorinated organic liquid from said mixture.

5,437,712

**METHODS FOR INHIBITING DEPOSITION AND FOULING IN SCRUBBER SYSTEMS**

Stuart D. Klatskin, Aurora, and Robert F. Brazier, Wadsworth, both of Ohio, assigns to Betz Laboratories, Inc., Treviso, Pa.

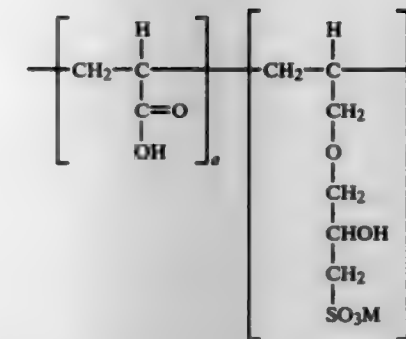
Filed Mar. 1, 1994, Ser. No. 204,575

Int. Cl.<sup>6</sup> B01D 47/06

U.S. Cl. 95-234

5 Claims

1. A method for inhibiting the deposition of zinc, iron, and mixed zinc-iron metals on the metal surfaces of scrubber systems in a steelmaking system wherein said zinc and iron metals are present in said scrubber system as a result of heating zinc-containing and iron-containing metals during the course of steelmaking wherein said scrubber system has a fan housing, fan, fan shroud, and mist eliminator located therein, comprising adding to said scrubber system a water soluble copolymer having repeat units (a) and (b) of the structure



wherein M is a water soluble cation, the molar ratio of the repeat units a:b of said polymer being between about 30:1 to 1:20, the number average molecular weight of said polymer being between 1,000 and 1,000,000 wherein said water soluble copolymer is added to said scrubber system by spraying water containing an effective amount of said copolymer into said fan housing to inhibit the deposition of zinc, iron, and mixed zinc-iron metals on the metal surfaces of said fan, fan shroud, and mist eliminator.

5,437,713

**REMOVAL DEVICE FOR ELECTROSTATIC PRECIPITATORS**

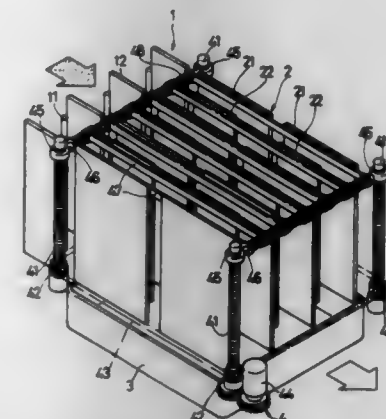
Chin-Chu Chang, No. 243, Sec. 2, Feng Shih Road, Feng Yuan City, Taichung Hsien, Taiwan

Filed Dec. 1, 1994, Ser. No. 952,667

Int. Cl.<sup>6</sup> B03C 3/74

U.S. Cl. 96-51

8 Claims



1. A removal device for electrostatic precipitators, said removal device comprising:

- an ion generator for supplying electric charge to particles in the air, said ion generator consisting of a plurality of electrodes charged with high voltage direct currents and parallel ground metal plates, in which an air current is introduced from the front of said ion generator into the interior of said ion generator;
- a precipitator for arresting particles in the air, in which the air current flows from said ion generator, then passes said precipitator, and finally flows out through the rear portion of said precipitator, said precipitator consisting of at least one pair of a first electrostatic plate and a second electrostatic plate of opposite polarities equally spaced apart and being parallel to each other, in which said first electrostatic plate is connected to one polarity and said second electrostatic plate is connected to another polarity; and
- a collector for collecting particles in the air, wherein at least a scraper is positioned between adjacent first and second electrostatic plates of said collector, said scraper

being parallel to said electrostatic plates with the two ends thereof linked to a vertical driving lever of said electrostatic plates, and said scraper being in contact with an electrostatic plate with a predetermined pressure, said driving lever linking a drive mechanism which drives said driving lever to perform linear displacement.

5,437,714

## SEMI-CONTINUOUS DEODORISER

Raymond Cook, and Donald G. Sewell, both of York, England, assignors to Ebotec Limited, York, England

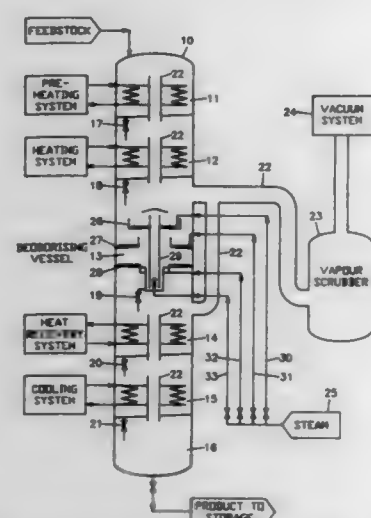
Filed Oct. 31, 1994, Ser. No. 331,731

Claims priority, application United Kingdom, Nov. 4, 1993, 9322788; Jul. 8, 1994, 9413794

Int. Cl.<sup>6</sup> B01D 19/00; C11B 11/00

U.S. Cl. 96—201

10 Claims



1. A semi-continuous deodoriser for edible oils and fats, comprising a series of discrete vessels maintained under a common vacuum, valves connecting the vessels to enable passage of liquid sequentially along the series, the series comprising at least a liquid heating section, a liquid cooling section, and a deodorising vessel; valves connecting the deodorising section to the heating and cooling sections thus to receive heated liquid to be deodorised and to discharge deodorised liquid to be cooled; and means to pass stripping steam through the liquid in the deodorising vessel; characterised in that the deodorising vessel contains a plurality of self draining shallow trays and includes means to circulate the liquid within the vessel between the trays; and in that means are provided for sparging steam through the liquid in the trays.

5,437,715

## RECORDING MATERIAL CONTAINING CARBONACEOUS POWDER WHOSE SURFACE IS MODIFIED WITH FLUORINE GAS

Hiroyuki Idogawa, Kyoto; Atsushi Wakata, Fajoka; Nobuatsu Watanabe, Nagakakyō, and Yong-Bo Chong, Kyoto, all of Japan, assignors to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1993, Ser. No. 101,177

Claims priority, application Japan, Aug. 31, 1992, 4-253449

Int. Cl.<sup>6</sup> C09D 11/16

U.S. Cl. 106—20 R

2 Claims

1. An ink for a writing instrument, said ink comprising fluorine-surface modified carbon black, a water soluble acrylic resin, water, ethylene glycol, and an antiseptic agent.

5,437,716

## RECORDING LIQUID

Hideo Sano; Tomio Yoneyama; Yukichi Murata, all of Kanagawa, and Masahiro Yamada, Tokyo, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed May 13, 1994, Ser. No. 242,627

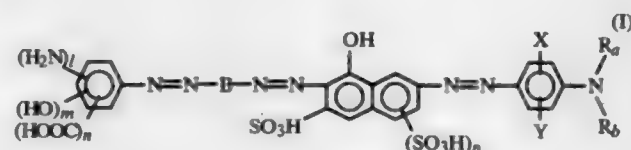
Claims priority, application Japan, May 13, 1993, 5-111575; May 20, 1993, 5-118493

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—22 K

13 Claims

1. A recording liquid comprising an aqueous medium and at least one dye selected from dyes, the free acid forms of which are represented by formulae (I) and (II):



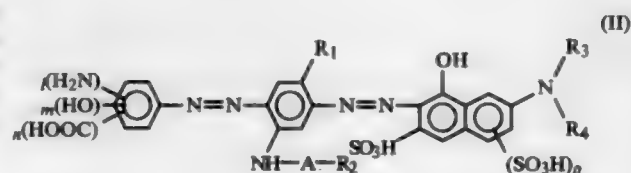
wherein

B represents a phenylene group or a naphthylene group, which each may have a substituent;

X and Y each represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 7 carbon atoms, or a substituted or unsubstituted alkoxy group having from 1 to 9 carbon atoms, provided that the total carbon number of the groups represented by X and Y is at least 3 when both X and Y are not a hydrogen atom, and is at least 2 when one of X and Y represents a hydrogen atom;

R<sub>a</sub> and R<sub>b</sub> each represents a hydrogen atom, an alkyl group having from 1 to 3 carbon atoms which has a carboxyl group as a substituent, or a hydroxyalkyl group having from 2 to 4 carbon atoms;

λ, m, and p each represents 0 or 1; and n represents 0, 1, or 2,



wherein

R<sub>1</sub> represents a substituted or unsubstituted alkoxy group having from 2 to 9 carbon atoms;

R<sub>2</sub> represents an alkyl group having from 1 to 12 carbon atoms or a substituted or unsubstituted aryl group having from 6 to 12 carbon atoms;

A represents —CO— or —SO<sub>2</sub>—;

R<sub>3</sub> represents a hydrogen atom, a phenyl group which may have a sulfo group or a carboxyl group as a substituent, or an alkyl group having from 1 to 3 carbon atoms which has a carboxyl group as a substituent;

R<sub>4</sub> represents a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms which has a carboxyl group as a substituent;

λ, m, and p each represents 0 or 1; and

n represents 1 or 2.

5,437,717

## ASPHALT COMPOSITIONS WITH IMPROVED CROSS-LINKING AGENT

Michael P. Doyle, Phoenix, Ariz., and Jimmy L. Stevens, Rio Linda, Calif., assignors to Vinzoyl Petroleum Co., Phoenix, Ariz.

Filed Jun. 13, 1994, Ser. No. 258,935

Int. Cl.<sup>6</sup> C09D 195/00, 7/12; C08L 93/00, 91/00

U.S. Cl. 106—220

13 Claims

1. An improved cross-linking agent for asphalt compositions, said cross-linking agent comprising:

tall oil;

a strong base;

n-methyl fatty acid taurate; and

fatty amines;

said cross-linking agent being substantially free of water.

11. An asphalt composition comprising:

asphalt;

crumb rubber from used automobile tires; and

an adhesion improving amount of a cross-linking agent comprising tall oil, a strong anhydrous base, n-methyl fatty acid taurate and fatty amines, said cross-linking agent being substantially free of water.

5,437,719

## POLYURETHANE-BASED AQUEOUS MULTICOLOR PAINT

James F. Lynch, Schaumburg, and John Predkelis, Glen Ellyn, both of Ill., assignors to Multicolor Specialties, Inc., Cicero, Ill.

Continuation-in-part of Ser. No. 43,849, Apr. 6, 1993, Pat. No. 5,318,619, which is a continuation-in-part of Ser. No. 851,525,

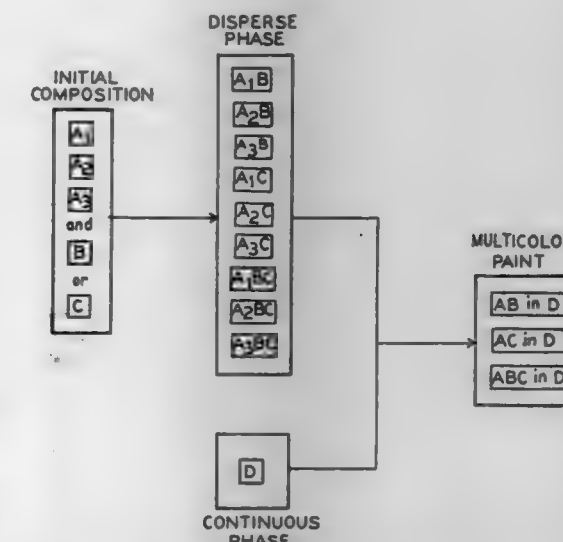
Mar. 16, 1992, Pat. No. 5,199,980, which is a continuation-in-part of Ser. No. 694,311, May 1, 1992, Pat. No. 5,114,485, which is a continuation-in-part of Ser. No. 586,762,

Sep. 21, 1990, Pat. No. 5,114,484. This application Jun. 7, 1994, Ser. No. 255,318

Int. Cl.<sup>6</sup> C09D 5/29

U.S. Cl. 106—311

6 Claims



1. A method for making an aqueous multicolor paint having a discontinuous aqueous phase dispersed in a continuous aqueous phase, said method comprising mixing at least one aqueous composition in another aqueous composition, each said one composition containing a water dispersed, film-forming, cross-linkable polymer system selected from the group consisting of a polyurethane polymer system, a carboxylated polymer system and mixtures thereof, dissolved cellulose material selected from the group consisting of hydroxy (lower alkyl) cellulose, alkali metal carboxylated (lower alkyl) cellulose, and mixtures thereof, and pigment, said another composition containing said water dispersed, film-forming crosslinkable polymer system and dispersed water swellable clay, said mixing being carried out with a mixing shear force sufficient to break up and disperse each said one aqueous composition into discrete gel bodies, thereby forming said discontinuous aqueous phase that is dispersed in said another aqueous composition as said continuous phase, and wherein the weight ratio of all said one compositions to said another composition is not greater than about 2:1 and wherein the weight ratio of all said one compositions to said another composition is in the range of about 1:1 to about 6:4, each said one composition has a starting viscosity in the range of about 25,000 to about 85,000 centipoises and said another composition has a starting viscosity in the range of about 3,000 to about 7,000 centipoises.



5,437,718

## NAPHTHENIC ACID ESTERS AS DISPENSING AGENTS FOR PIGMENT ADDITIVES AND PRODUCTS INCORPORATING SAME

James L. Carmine, Laguna Niguel, Calif., and Rose A. Ryntz, Clinton Township, Macomb County, Mich., assignors to Akzo Nobel N.V., SB Arnhem, Netherlands

Division of Ser. No. 14,213, Feb. 5, 1993, Pat. No. 5,383,965.

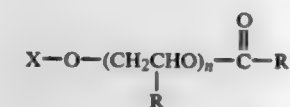
This application Sep. 14, 1994, Ser. No. 305,548

Int. Cl.<sup>6</sup> C09C 3/10

U.S. Cl. 106—287.24

9 Claims

1. An improved rubber composition which comprises rubber and a pigment dispersion comprising a normally solid pigment component and an ester of naphthenic acid, having the general formula:



where

R' = a naphthene group containing one or more alkylated cyclopentane and/or cyclohexane ring(s), and

where R = H or CH<sub>3</sub>,

where n = 1–6, and

X = H or



5,437,720

**SPHEROIDAL AGGREGATE OF PLATY SYNTHETIC HYDROTALCITE**

Sherman D. Cox, Allentown, and Kenneth J. Wise, Schnecks-ville, both of Pa., assignors to Minerals Technologies Inc., New York, N.Y.

Division of Ser. No. 964,338, Oct. 21, 1992, Pat. No. 5,364,828.

This application May 31, 1994, Ser. No. 251,412

Int. Cl.<sup>6</sup> C04B 14/26

U.S. Cl. 106—415

2 Claims



1. A sheen reducing paint additive comprising an effective amount to reduce the sheen of a paint of spheroidally aggregated synthetic platy hydrotalcite having an average spherical diameter of up to about 60 μm.

5,437,721

**METHOD OF PRODUCING CEMENT CLINKER**

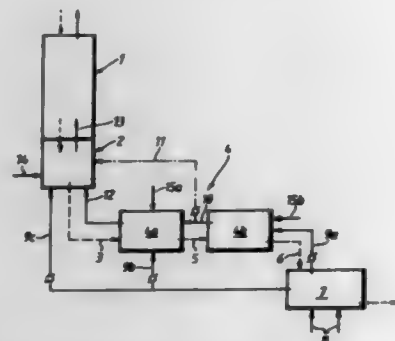
Detlev Kupper, Teigte, and Wolfgang Rother, Oelde, both of Germany, assignors to Krupp Polysius AG, Beckum, Germany  
Continuation of Ser. No. 71,079, Jun. 2, 1993, abandoned. This application Jun. 7, 1994, Ser. No. 255,126

Claims priority, application Germany, Jun. 16, 1992, 42 19 697.3

Int. Cl.<sup>6</sup> C04B 7/43

U.S. Cl. 106—739

12 Claims



1. A method of producing cement clinker from granular raw material having a sintering temperature characteristic of the raw material being treated, said method comprising the steps of:

- preheating the raw material in a preheating zone;
- at least partially calcining the preheated material in a calcining zone;
- heating the partially calcined material in a first stage of a clinker burning zone to a temperature approaching but lower than the sintering temperature while agitating said partially calcined material sufficient to produce only a partial agglomeration of the material;
- further heating the material in a second stage of the clinker burning zone to the sintering temperature to produce cement clinker; and
- cooling the cement clinker in a cooling zone.

5,437,722

**ATER-RESISTANT GYPSUM COMPOSITIONS AND EMULSION FOR MAKING SAME**

Lionel Borenstein, Laval, Canada, assignor to Bakor Inc., Quebec, Canada

Filed Mar. 1, 1994, Ser. No. 203,807

Int. Cl.<sup>6</sup> C04B 11/00

U.S. Cl. 106—778

29 Claims

- 1. An aqueous emulsion comprising water and:
  - i) a paraffin hydrocarbon having a melting point of 40°–80° C.,
  - ii) montan wax in an amount of about 1 to 200 parts, by weight, per 100 parts of said paraffin hydrocarbon, and
  - iii) polyvinyl alcohol in an amount of about 1 to 50 parts, by weight, per 100 parts of said paraffin hydrocarbon.

5,437,723

**COATING MACHINE FOR THE PROCESSING OF CHOCOLATE AND SIMILAR MASSES**

Helmut Sollich, Rabenkirchen, Germany, assignor to Sollich GmbH & Co. KG, Salzuflen, Germany

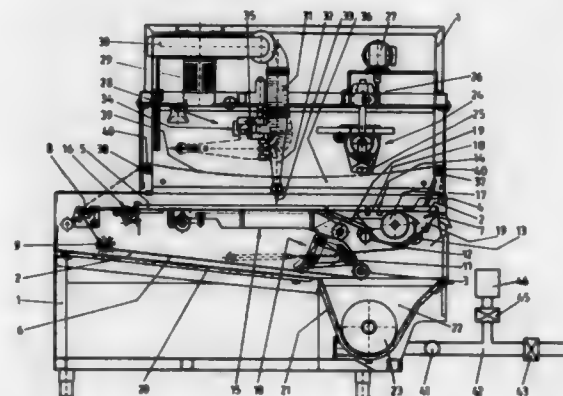
Filed Nov. 19, 1993, Ser. No. 155,451

Claims priority, application Germany, Dec. 23, 1992, 42 43 814.4

Int. Cl.<sup>6</sup> A23G 1/04

U.S. Cl. 118—21

16 Claims



1. A coating machine for the processing of chocolate and similar masses, comprising:

- a frame;
- a circularly driven grating belt, the grating belt having an upper run and a lower run;
- deflector means mounted on the frame for supporting the grating belt on the frame;
- a tensioning device supported on the frame and engaged with said grating belt, the tensioning device being moveable from a tensioning position into a relaxed position for creating slack in the grating belt;
- a shaking device supported on the frame below the upper run of the grating belt;
- a covering station supported on the frame above the upper run of the grating belt;
- support means disposed below said covering station for holding the upper run of the grating belt above the shaking device;
- a blower movably supported on the frame above the upper run of the grating belt between a first position for directing a stream of air toward, and a second position facing away from, the upper run of the grating belt to create a space above the upper run of the grating belt to allow for the lifting of the grating belt above the shaking device; whereby when the tensioning device is moved into its relaxed position, the blower is moved away from the grating belt, and the upper run of the grating belt is lifted away from the shaking device and supported on said support means above the shaking device so that the coating ma-

chine can be cleaned without interference from the grating belt and without having to remove the grating belt from the coating machine.

5,437,724

**MASK AND GRIT CONTAINER**

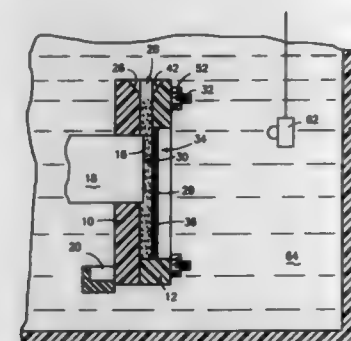
Richard J. Dansereau, Cromwell; Robert G. Adinolfi, Manchester, and Joseph J. Parkos, Jr., East Haddam, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 15, 1993, Ser. No. 137,656

Int. Cl.<sup>6</sup> B05C 13/02

U.S. Cl. 118—76

19 Claims



1. A tool for allowing an abrasive grit material to be incorporated into a coating being applied to a tip of at least one workpiece in an array of workpieces, said tool comprising:

- a first component and a second component;
- said first and second components being shaped and mounted adjacent to each other and defining a space containing an abrasive grit material;
- said first component having at least one first through slot for permitting a tip portion of said at least one workpiece to be coated to be inserted into said space, said at least one first through slot conforming to the tip of at least one workpiece to be coated;
- said second component having at least one second through slot for enabling a plating solution to flow into said space; and
- a screen affixed to an inner wall of said second component, said screen covering said at least one second through slot so that said abrasive grit material does not flow through said through slots.

5,437,725

**DEVICE FOR THE CONTINUOUS COATING OF A METALLIC MATERIAL IN MOTION WITH A POLYMER DEPOSITION HAVING A COMPOSITION GRADIENT**

Frédéric Schuster, Saint Germain En Laye, and Gérard Piet, Bezons, both of France, assignors to SOLLAC, Société anonyme, Puteaux, France

Filed Mar. 18, 1994, Ser. No. 214,548

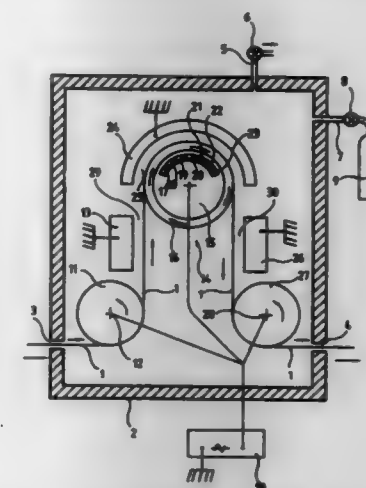
Claims priority, application France, Mar. 26, 1993, 93 03709

Int. Cl.<sup>6</sup> C23C 16/50, 16/54

U.S. Cl. 118—718

3 Claims

1. A device for the continuous coating, with a polymer deposition, of a metallic material in motion, of the type having a sealed chamber fitted with means for obtaining therein and maintaining therein a reduced pressure, means for progressively moving the material inside the chamber along a path; means for introducing a monomer of the polymer, in the gaseous state, into the chamber, means for creating conditions for forming, inside the chamber, a cold plasma over the path of the material in motion such that a polymer coating of a first composition is deposited on said metallic material, which also comprises means for superimposing a magnetic field on the



lic material to a second composition while said material moves through said fraction of the path.

5,437,726

**METHOD AND APPARATUS FOR TIPPING SUTURES**

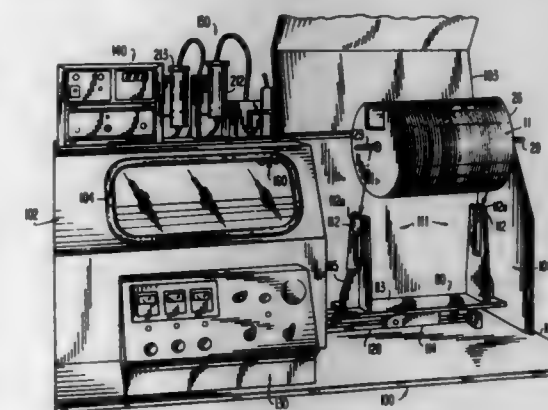
George R. Proto, West Haven; Francis D. Colligan, Waterbury, and Harold Bellmore, Jr., West Haven, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Division of Ser. No. 7,361, Jan. 21, 1993, Pat. No. 5,269,808, which is a continuation of Ser. No. 626,995, Dec. 13, 1990, abandoned. This application Dec. 13, 1993, Ser. No. 166,486

Int. Cl.<sup>6</sup> B05B 13/02

U.S. Cl. 118—325

17 Claims



1. A suture tipping apparatus comprising:

- a supply of tipping agent;
- atomizing means connected to the supply of tipping agent for atomizing said tipping agent to form a mist of tipping agent;
- a drum for holding a length of suture material and delimiting a portion of said suture material to be tipped; and
- transport means supporting the drum and synchronized with said atomizing means to contact the delimited portion of the suture material with said mist of tipping agent created by said atomizing means to tip said suture material with said tipping agent.

5,437,727

**APPARATUS FOR DRAWING PASTE PATTERN ON SUBSTRATE**

Tomio Yoneda; Shigeru Ishida, both of Shimoinayoshi, and Haruo Mishima, Ushika, all of Japan, assignors to Hitachi Techno Engineering Co., Ltd., Tokyo, Japan

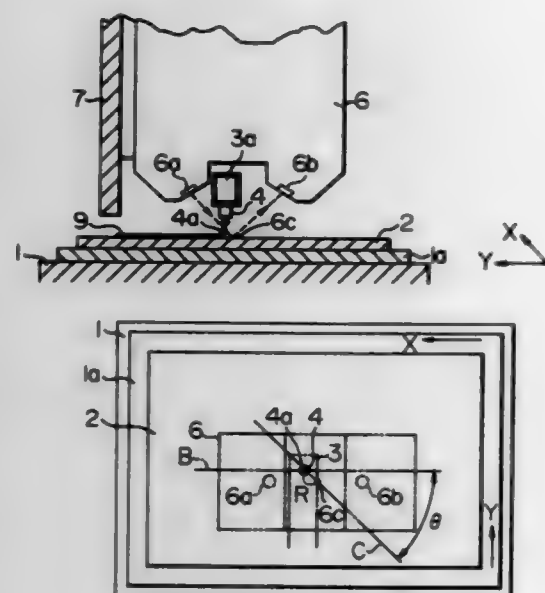
Filed Jul. 24, 1992, Ser. No. 917,934

Claims priority, application Japan, Jul. 24, 1991, 3-206154

Int. Cl.<sup>6</sup> B05C 11/00; B05B 15/10

U.S. Cl. 118—669

5 Claims



1. A paste pattern drawing apparatus including:
  - a table having a top portion which supports a substrate;
  - a paste container for containing paste;
  - a nozzle connected to said paste container and having a paste discharging opening which faces a top surface of the substrate supported by said table;
  - means for moving at least one of said table and said nozzle relative to the other so that relative movement between said table and said nozzle can be effected in at least two directions perpendicular to each other;
  - said paste being discharged from said nozzle while said at least one of said table and said nozzle is moved relative to the other so that a desired pattern of said paste is drawn on said substrate;
  - optical displacement measuring means for measuring a clearance between said substrate and said paste discharging opening of said nozzle at a measuring point on said substrate; and
  - clearance adjusting means for adjusting the clearance between said substrate and said paste discharging opening of said nozzle according to a result of the measurement provided by said optical displacement measuring means so that said clearance is maintained at a desired distance;
  - wherein said measuring point of said optical displacement measuring means is positioned on a first line on said substrate passing through a paste applying point on said substrate to which the paste discharged from said nozzle falls and said first line having a certain angle which is substantially 45° to a second line on said substrate passing through said paste applying point and being parallel to a direction of the relative movement of said substrate and said nozzle, and said measuring point being spaced by a desired distance from said paste applying point.

5,437,728

**APPARATUS AND METHOD FOR CHEMICAL VAPOR DEPOSITION OF DIAMOND**

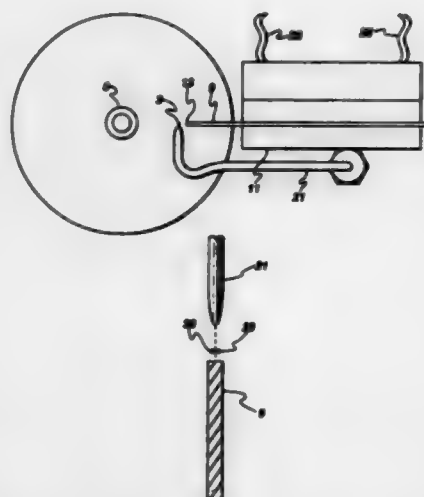
Thomas R. Anthony, Niskayuna; James F. Fleischer, Scotia, and Robert H. Ettinger, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 261,358, Jun. 13, 1994, which is a continuation-in-part of Ser. No. 194,958, Feb. 14, 1994, abandoned. This application Dec. 27, 1994, Ser. No. 364,568

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—724

11 Claims



1. Apparatus for chemical vapor deposition of diamond, comprising:
  - at least one filament resistant to temperatures up to about 2500° C.,
  - at least one substrate capable of receiving a diamond coating,
  - means for holding said substrate with an edge facing said filament at a distance therefrom up to about 1 mm., and for continuously moving said substrate relative to said filament,
  - means for heating said filament,
  - means for supplying a gas to contact said filament and substrate, and
  - an enclosure adapted to maintain said filament and substrate at subatmospheric pressure.

5,437,729

**CONTROLLED REMOVAL OF CERAMIC SURFACES WITH COMBINATION OF IONS IMPLANTATION AND ULTRASONIC ENERGY**

Lynn A. Bontner, Oak Ridge, Tenn.; Janet Rankin, Providence, R.I.; Paul Thevenard, Caluire, and Laurence J. Romana, Gaudeloupe Antilles, both of France, assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Apr. 8, 1993, Ser. No. 45,475

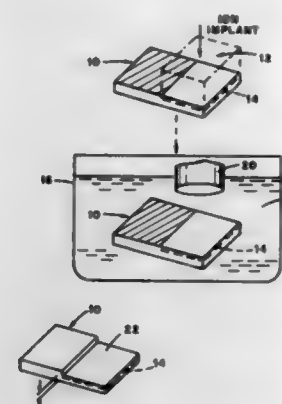
Int. Cl.<sup>6</sup> B08B 3/12

U.S. Cl. 134—1

16 Claims

1. A method for removing a surface layer of ceramic material of a thickness in the range of about 10 to 2000 nanometers from a selected surface region of a ceramic body, comprising the steps of implanting ions in the ceramic material at a selected location on the surface of the ceramic body at a fluence sufficient to damage lattice structure within the ceramic material in near-surface regions at said location for producing a bi-axial compressive strain and a metastable condition within the ion-damaged lattice structure, immersing at least the ion-damaged surface regions of the ceramic body in a liquid medium, and exciting the liquid medium with ultrasonic energy at a frequency sufficient to generate collapsible cavitation bubbles therein for contacting exposed surfaces of the ceramic material

containing the damaged near-surface regions with energy pulses produced by collapsing cavitation bubbles for removing ceramic material containing ion-damaged lattice structure from near-surface regions of the ceramic body, and contacting

**PROCESS FOR CLEANING GENERALLY CYLINDRICAL OBJECTS USING A CLEANING COMPOUND IMPREGNATED IN AN ENLONGATED LACE**

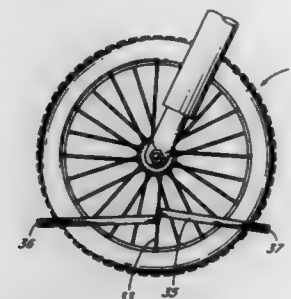
Robert L. Flores, 16125 Promontory Rd., Chino Hills, Calif. 91709

Continuation-in-part of Ser. No. 85,096, Jul. 2, 1993. This application Jul. 28, 1994, Ser. No. 281,603

Int. Cl.<sup>6</sup> B08B 7/04, 3/00; D04H 1/58; B32B 9/04

U.S. Cl. 134—6

1 Claim



1. A process for cleaning/disinfecting generally cylindrical objects comprising:
  - impregnating an elongated roll of absorbent fabric tape with a cleaning compound to form an elongated cleaning ribbon;
  - cutting a length of said elongated cleaning ribbon to form a length of cleaning lace;
  - forming at least one loop around a generally cylindrical object to be cleaned said loop being intermediate along said length of cleaning lace and leaving a first extending length and a second extending length; and
  - grasping the first and second extending lengths of said length of cleaning lace and pulling the cleaning ribbon back and forth to clean the generally cylindrical object.

5,437,731

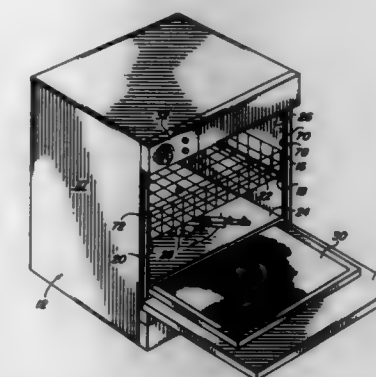
**METHOD OF WASHING PRODUCE**

Marty St. Martin, 613 E. Grand Ave., Fruita, Colo. 81521  
Division of Ser. No. 951,167, Sep. 25, 1992, Pat. No. 5,357,993.  
This application Aug. 12, 1994, Ser. No. 289,913

Int. Cl.<sup>6</sup> B08B 3/02

U.S. Cl. 134—10

12 Claims



1. A method for washing produce with a washing fluid within a compartment of a cabinet, said method comprising the steps of:
  - a) locating the produce to be washed within the compartment;
  - b) pumping the washing fluid from a trough at the bottom of the compartment to a conduit tree;
  - c) spraying the produce with droplets dispersed throughout expanding cones of spray from each of a plurality of nozzles in fluid communication with the conduit tree;
  - d) channeling the flow of washing fluid within the compartment into the trough;
  - e) filtering the washing fluid; and
  - f) recycling the washing fluid until the produce has been washed.

5,437,732

**DUST COLLECTOR/REMOVER IN KNITTING MACHINE AND ITS CONTROLLING METHOD**

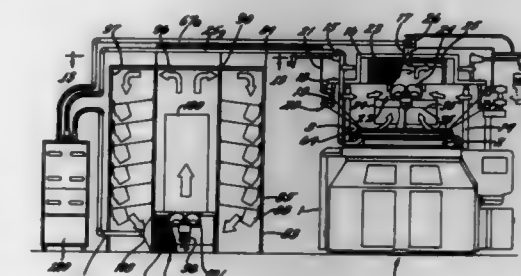
Yoshiaki Igarashi, and Kosaku Iida, both of Hyogo, Japan, assignors to Precision Fukuhara Works, Ltd., Kobe, Japan  
Division of Ser. No. 940,512, Sep. 4, 1992. This application Nov. 8, 1993, Ser. No. 148,327

Claims priority, application Japan, Sep. 5, 1991, 3-254391

Int. Cl.<sup>6</sup> D04B 35/32; B08B 5/04

U.S. Cl. 134—21

8 Claims



1. A method of collecting fiber waste from a knitting unit including a fiber waste remover, and a reel having a fiber waste collector, the unit further including a knitting machine having a knitting section, a top fiber waste collector above the knitting section, and a bottom fiber waste collector adjacent the knitting section, comprising:
  - selectively and sequentially conducting fiber waste from different ones of said fiber waste collectors to said fiber waste remover for time periods correlated to the amount



of fiber waste in respective ones of said fiber waste collectors.

5,437,733

# METHOD AND APPARATUS FOR TREATING A SUBSTRATE

Katsuya Okumura, Yokohama, Japan, assignor to Kabushiki Kaisha Tohisha, Kawasaki, Japan

Filed Oct. 17, 1991, Ser. No. 778,370

Claims priority, application Japan, Oct. 18, 1990, 2-277677  
Int. Cl.<sup>6</sup> B08B 3/04

U.S. Cl. 134—34

31 Claims

1. A method of treating a substrate having a treatment surface by using a treatment liquid holding means having a surface and defining a plurality of holes in the surface, the method comprising the steps of:

placing the surface of said holding means in parallel with the treatment surface;  
adjusting a distance between said treatment surface and the surface of said holding means to form a space therebetween;

filling said space with a treatment liquid and keeping said treatment liquid only on said treatment surface by utilizing a surface tension of said treatment liquid to prevent an overflow of said treatment liquid from said treatment surface; and

treating said substrate with said treatment liquid to give desired treatments to said treatment surface of said substrate.

14. An apparatus for treating a substrate having a treatment surface comprising:

means for holding said substrate;  
means for causing a treatment liquid to be maintained only on said treatment surface by utilizing a surface tension of said treatment liquid, the causing means including a surface adapted to face the treatment surface to form a space therebetween; and

means for supplying said treatment liquid to said space.

5,437,734

# SOLAR CELL

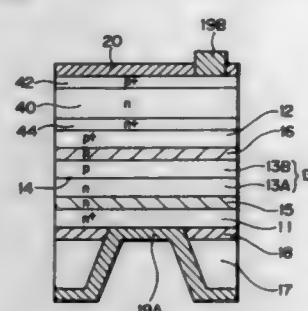
Takeshi Matsushita; Dharam P. Gosain; Jonathan Westwater; Setuo Ueno, all of Kanagawa, and Kunio Hane, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 8, 1994, Ser. No. 193,467

Claims priority, application Japan, Feb. 8, 1993, 5-041764  
Int. Cl.<sup>6</sup> H01L 31/06, 31/078

U.S. Cl. 136—249

11 Claims



8. A solar cell of tandem type having a bottom first solar cell and a top second solar cell being exposed to light incidence, in which the bottom first solar cell unit comprises:

- a first semiconductor layer of first conductivity type and having a first electrode thereon;
- a second semiconductor layer of the second conductivity type opposite to the first conductivity type which is on said first semiconductor layer;
- a third semiconductor layer having a pn junction therein and positioned between said first and second semiconductor layers, which has a band gap narrower than that of said first and second semiconductor layers;
- a first buffer layer between said first and third semiconductor layers;

ductor layers, which relieves the lattice mismatch between said first and third semiconductor layers, and

(e) a second buffer layer between said second and third semiconductor layers, which relieves the lattice mismatch between said second and third semiconductor layers;

and the top second solar cell unit comprises:

(f) a fourth semiconductor layer of the first conductivity type, which is arranged on said second semiconductor layer, and

(g) a fifth semiconductor layer of the second conductivity type, which is arranged on said fourth semiconductor layer.

5,437,735

# PHOTOVOLTAIC SHINGLE SYSTEM

Kais Younan, Troy; David Wolf, Clawson; Mark Lycette, Berkeley; Troy Glatfelter, Royal Oak; Kevin Hoffman, Sterling Heights, and Arindam Banerjee, Madison Heights, all of Mich., assignors to United Solar Systems Corporation, Troy, Mich.

Filed Dec. 30, 1993, Ser. No. 175,968  
Int. Cl.<sup>6</sup> E04D 13/18; H01L 31/042

U.S. Cl. 136—251

20 Claims



1. A photovoltaic roofing member comprising:  
a strip of roofing material having a length "L" and a width "W," said strip including an overlap portion having a length "L<sub>o</sub>" which is equal to L and a width "W<sub>o</sub>" which is less than W, said strip further including a plurality of tab portions depending from the overlap portion, said tab portions being defined by at least one notch cut part-way through the width of said strip, each tab having a length "L<sub>t</sub>" which is less than L and a width "W<sub>t</sub>" which is less than W, such that W<sub>t</sub> plus W<sub>o</sub> equals W;

a plurality of photovoltaic devices, each affixed to a corresponding one of said tabs and each including a positive electrode, a negative electrode, and a body of photovoltaic material disposed therebetween, each device operative to generate a flow of electrical current between said electrodes in response to the absorption of photons by said body of photovoltaic materials;

an interconnect system for establishing electrical communication between said plurality of photovoltaic devices; and  
a positive electrical terminal and a negative electrical terminal disposed on a bottom surface of said roofing member and in electrical communication with the plurality of photovoltaic devices.

5,437,736

# SEMICONDUCTOR FIBER SOLAR CELLS AND MODULES

Eric D. Cole, 14076 Winding Ridge La., Centreville, Va. 22020

Filed Feb. 15, 1994, Ser. No. 196,382

Int. Cl.<sup>6</sup> H01L 31/06, 31/042, 31/048, 31/05, 31/052  
U.S. Cl. 136—259

18 Claims

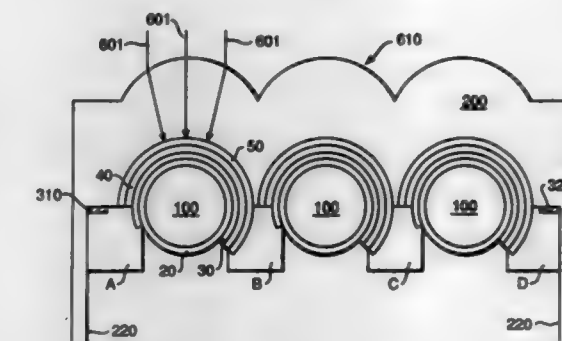
9. A semiconductor solar cell module comprising:  
an elongated substrate having a curved surface coated with at least a first and second semiconductive layer;  
a first conductive layer disposed between said first semiconductive layer and said substrate;  
a second conductive layer disposed on said second semiconductive layer;

said substrate, said first and second semiconductive layers,

and said first and second conductive layers forming a solar cell;

said semiconductor layers being selectively disposed about said substrate so as to form arcuate segments about said elongated substrate;

said semiconductive solar cell affixed to a superstrate;



a metallization layer applied to said semiconductive solar cell and said superstrate;  
said metallization layer being selectively removed to provide conductive paths; and  
electrical pads connected to said conductive paths.

13. The solar cell module as recited in claim 9, wherein said coated substrate and said superstrate are affixed to a frame.

5,437,737

REPAIR COATING FOR SUPERALLOY ARTICLES, SUCH AS GAS TURBINE ENGINE COMPONENTS  
Peter J. Draghi, Simsbury; Norman Pietruška, Durham, and Wayne F. Armstrong, Meriden, all of, assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 7, 1994, Ser. No. 192,242  
Int. Cl.<sup>6</sup> B23K 35/34

U.S. Cl. 148—23

11 Claims

1. A repair coating for superalloy articles comprising a liquid carrier and a filler mix comprising a blend of powders consisting of at least two particulate components having a composition approximating that of the article, wherein the second particulate component includes a quantity of a melting point depressant, substantially in excess of that in the article and sufficient to provide melting of a portion of the mix at a temperature below the melting temperature of the article, wherein the coating has a paint-like consistency.

5,437,738

# FLUXES FOR LEAD-FREE GALVANIZING

Yum Gerenrot, 3842 Dolphin Dr., Allison Park, Pa. 15101; David Leychik, 5820 Elwood St., Pittsburgh, Pa. 15232; Thomas L. Ranck, 1443 Mohican Trail, St. Charles, Mo. 63376; James L. Griffin, 11 Hosack Rd., Jackson Center, Pa. 16133, and Gary Stefanick, 1945 Richardson Dr., Hubbard, Ohio 44425

Filed Jun. 21, 1994, Ser. No. 264,133

Int. Cl.<sup>6</sup> B23K 35/34

U.S. Cl. 148—26

17 Claims

1. A preflux for galvanizing steel comprising about 8 to 30 wt. % zinc chloride, about 2 to 20 wt. % ammonium chloride, about 0.1 to 1.0 wt. % boric acid or salt thereof, and about 0.1 to 2.0 wt. % inhibitor.

5,437,739

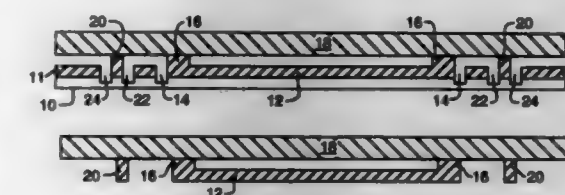
# ETCH CONTROL SEAL FOR DISSOLVED WAFER MICROMACHINING PROCESS

Kenneth M. Hays, Anaheim, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Apr. 19, 1994, Ser. No. 229,501  
Int. Cl.<sup>6</sup> H01L 21/302

U.S. Cl. 148—33.3

14 Claims



1. An etch control seal for a micromachining process, comprising:

- a first substrate dissolvable in a selective etch;
- a micromechanical structure having raised areas formed on said first substrate;
- a raised region of said first substrate forming a raised ring around said micromechanical structure, said raised ring having greater resistance to said selective etch than said first substrate; and
- a second substrate bonded to said raised ring and said raised areas of said micromechanical structure, said second substrate having greater resistance to said selective etch than said first substrate, said bonded ring forming an etch control seal for protecting said micromechanical structure from said selective etch during a process of dissolving said first substrate in said selective etch.

5,437,740

# CORROSION RESISTANT ALUMINUM AND ALUMINUM COATING

John W. Bibber, Batavia, Ill., assignor to Sanchem, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 50,841, Apr. 21, 1993, Pat. No. 5,358,623. This application Oct. 13, 1994, Ser. No. 322,238  
Int. Cl.<sup>6</sup> C23C 22/56

U.S. Cl. 148—273

2 Claims

1. A method of protecting non-anodized aluminum or aluminum alloy with a non-chromium coating comprising contacting the aluminum or aluminum alloy with an aqueous solution containing as the essential ingredients thereof an alkali metal permanganate and an aluminum nitrate, said aqueous coating solution contains at least 760 ppm of permanganate and about 0.10 to 10.0% of aluminum nitrate, maintaining the pH of the solution at about 2.5 to about 4.0, maintaining the temperature of the solution at about 140° to 170° F., immersing the aluminum or aluminum alloy in the solution for at least 20 seconds to form a protective conversion coating on the aluminum or aluminum alloy and removing any excess coating solution from the aluminum or aluminum alloy.





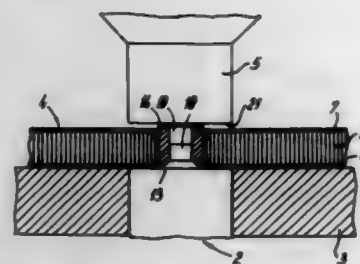
- (1) marking each component web upstream of entry into its respective web storage;
- (2) continuously measuring the lengths of each component web and the single face web passing points upstream and downstream of the respective storages;
- (3) continuously measuring the length of the double face web passing through the cutoff apparatus;
- (4) subtracting the measured length of the double face web passing through the cutoff apparatus from a total order length to provide a continuously decreasing remaining order length;
- (5) initially sensing each of the component web marks as each mark successively passes the upstream and downstream length measuring point for each respective storage;
- (6) measuring the web length entering each storage between upstream and downstream sensing of the respective mark to determine instantaneous lengths of each component web and the single face web in each of the respective storages;
- (7) continuously adjusting each instantaneous storage length value by adding and subtracting, respectively, the measured lengths of web passing the upstream and downstream points of the respective storage to provide real time storage values;
- (8) adjusting the real time storage value for the medium component web by applying the web compression factor to provide an adjusted real time storage value;
- (9) determining the dynamic real time length of each component web between its splicer and the cutoff apparatus by adding the real time storage values, adjusted real time storage value, and fixed distance values applicable to each respective component web; and
- (10) activating each of the component web splicers to make the splices when the remaining order length equals the dynamic real time length of the respective component webs, such that the splices in the double face web substantially coincide for cut out in the cutoff apparatus.

5,437,750

**METHOD FOR SECURING A THERMOPLASTIC INSERT**  
 Offringa A. Rinse, Hoozeveen, and John Teunissen, Drouwene-  
 veen, both of Netherlands, assignors to Fokker Special Pro-  
 ducts B.V., Hoozeveen, Netherlands  
 Filed Apr. 8, 1994, Ser. No. 224,728  
 Int. Cl.<sup>6</sup> B29C 65/08

U.S. Cl. 156—73.1

11 Claims



1. A method for securing a thermoplastic insert to skin hole walls of first and second skin sheets of a sandwich panel, comprising the steps of:
  - providing a sandwich panel comprising first and second fiber reinforced thermoplastic skin sheets and an intermediate core layer wherein the sandwich panel has a through hole such that the first skin sheet has a first skin hole wall which is perpendicular to the surface of the first sheet and the second skin sheet has a second hole wall which is perpendicular to the surface of the second skin sheet;
  - providing a thermoplastic insert having a first integrally formed sacrificial rim of thermoplastic material at one end and a second integrally formed sacrificial rim of thermoplastic material at another end;
  - placing said insert in said through hole in said sandwich panel such that said first rim protrudes beyond the upper

surface of said first skin sheet of said sandwich panel, a first gap is formed between said insert and said first skin hole wall and a second gap is formed between said insert and said second hole wall, said first and second sacrificial rims being dimensioned so as to provide sufficient thermo-plastic material to fill said first and second gaps respectively;

providing an ultrasonic welding apparatus comprising a horn and an anvil and positioning the insert between the horn and anvil; and

applying ultrasonic energy to the insert with said ultrasonic welding apparatus so that said first and second sacrificial rims of said insert fuse to said first and second skin hole walls respectively, the first gap between said insert and said first skin hole wall and the second gap between said insert and said second hole wall are filled with thermo-plastic material of said first and second rims respectively and the upper surface of the first skin sheet is flush with said one end of the insert.

5,437,751

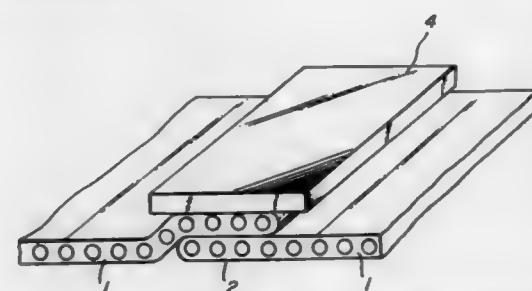
**METHOD OF PRODUCING PNEUMATIC RADIAL TIRES WITH A RUBBER SHEET OVER OVERLAPPED CARCASS EDGE PORTIONS**

Shinichi Hirano, Kawagoe, and Tsuneharu Akiyama, Akiyama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan  
 Continuation of Ser. No. 767,356, Sep. 30, 1991, abandoned, which is a continuation of Ser. No. 547,254, Jul. 3, 1990, abandoned. This application Jul. 23, 1992, Ser. No. 918,125  
 Claims priority, application Japan, Jul. 4, 1989, 1-171236; Jun. 5, 1990, 2-145498

Int. Cl.<sup>6</sup> B60C 9/02; B29D 30/06

U.S. Cl. 156—134

5 Claims



1. A method of producing a pneumatic radial tire having a carcass of at least one radial carcass ply containing rubberized organic fiber cords radially extending between a pair of bead cores through a tread portion, comprising the steps of: placing an unvulcanized rubber sheet having a width in the range of 5-80 mm, a thickness of not more than 1.5 mm and tensile modulus at 100% elongation after vulcanization of not more than 80 kg/cm<sup>2</sup> on an outer face of an overlap portion produced by first piling opposed cut edge portions of the carcass ply one upon the other and at least around said bead core, said unvulcanized rubber sheet completely covering said overlap portion, extending beyond a cut edge of said carcass ply, and containing no reinforcing cords, and then curing the assembled tire after building.

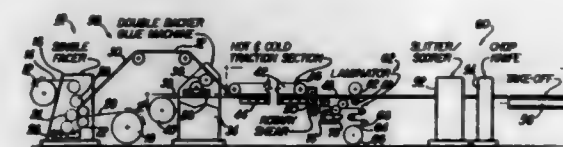
5,437,752

**METHOD OF APPLYING A FINISHING LAYER IN A CORRUGATING LINE**

Robert A. Lang, Atlanta, Ga., assignor to Lin Pac Inc., Atlanta, Ga.  
 Division of Ser. No. 903,978, Jun. 26, 1992, Pat. No. 5,324,383, which is a continuation-in-part of Ser. No. 524,352, May 16, 1990, Pat. No. 5,147,480. This application Apr. 4, 1994, Ser. No. 222,384  
 Int. Cl.<sup>6</sup> B32B 31/08

U.S. Cl. 156—210

33 Claims



21. A method for forming a laminated product on a corrugating line, comprising the steps of:
  - feeding a single face liner, a double face liner, and a fluted medium;
  - assembling the single face liner, the double face liner, and the fluted medium to form a corrugated material having the fluted medium positioned between the single face liner and the double face liner;
  - curing adhesive applied to form the corrugated material;
  - laminating a preprinted layer to one of the single face liner and the double face liner after the step of curing adhesive applied to form the corrugated material; and
  - cutting the corrugated material having the preprinted layer laminated thereto to form discrete sheets of laminated product.

5,437,753

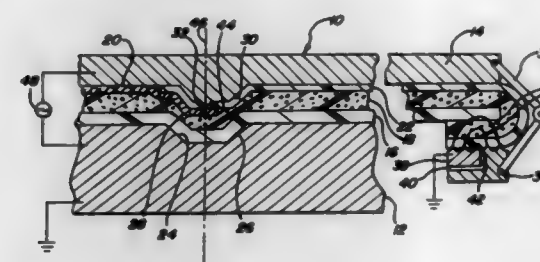
**METHOD FOR PRODUCING AN INTERIOR PANEL**  
 Kenneth J. Ugolini, Leonard, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1993, Ser. No. 173,034

Int. Cl.<sup>6</sup> B32B 31/20

U.S. Cl. 156—214

4 Claims



1. A method of producing an interior trim component comprising the steps of:
  - providing a grooved, dielectrically heatable panel;
  - placing a foam pad containing a dielectrically heatable thermoplastic binder atop said groove;
  - placing a fabric atop said pad;
  - placing a dielectrically heatable thermoplastic covering atop said fabric;
  - overlying a first electrode atop said covering, said electrode having a knife edge mating with said groove;
  - applying an electric field between said first electrode and a second electrode placed adjacent said panel sufficient to heat and soften said panel, said binder and said covering, said knife edge imparting a tear line on said covering;
  - urging said pad, said fabric and said covering towards said panel within said groove, wherein said binder bonds to said panel, said fabric and said covering; and

tearing said covering along said tear line.

5,437,754

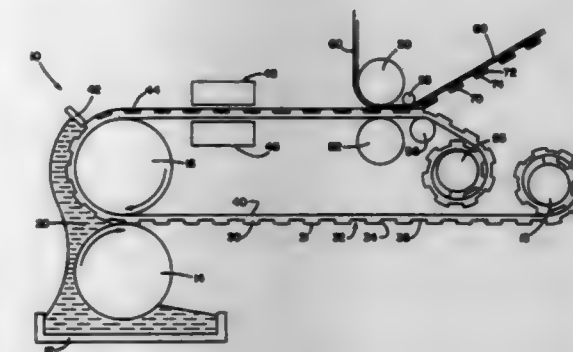
**ABRASIVE ARTICLE HAVING PRECISE LATERAL SPACING BETWEEN ABRASIVE COMPOSITE MEMBERS**

Clyde D. Calhoun, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
 Filed Jan. 13, 1992, Ser. No. 820,155

Int. Cl.<sup>6</sup> B29B 11/00

U.S. Cl. 156—231

25 Claims



1. A method of forming an abrasive article comprising the steps of:
  - A. providing an embossed carrier web having a front surface and a back surface, said front surface having a plurality of recesses formed therein, each of said recesses having a recessed bottom surface portion and sidewall portions;
  - B. filling said recesses with an abrasive slurry comprising a plurality of abrasive grains dispersed in a binder precursor;
  - C. providing a backing sheet having a front surface and a back surface;
  - D. laminating the front surface of said backing sheet to the front surface of said embossed carrier web so that at least a portion of the front surface of said backing sheet is in direct contact with the front surface of said embossed carrier web; and
  - E. hardening said binder precursor to form a plurality of abrasive composite members disposed on said front surface of said backing sheet.

5,437,755

**PROCESS FOR DECORATING THE TOP PORTION OF THE SKI**

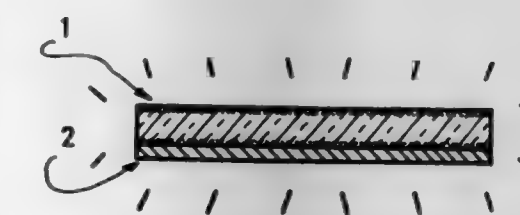
Pierre-Yves Lavorel, Fraugy, and Alain Grenetier, Annecy, both of France, assignors to Salomon S.A., Metz-Tessy, France  
 Filed Jan. 10, 1994, Ser. No. 179,229

Claims priority, application France, Jan. 12, 1993, 93 00315

Int. Cl.<sup>6</sup> B44C 1/16

U.S. Cl. 156—240

19 Claims



1. Process for decorating the top portion of a ski, said process comprising the steps of:

assembling and affixing an external, thick layer of a transparent plastic material, onto an opaque internal layer, the external layer having a first connecting surface and said internal layer having a second connecting surface, said first connecting surface and said second connecting surface being connected by said step of assembling and affixing, wherein, prior to the assembling and affixing step, the process comprises the steps of transferring a first decoration onto an external surface of the external layer, and transferring a second internal decoration, different from the first, onto said second connecting surface connecting the internal layer with the external layer.

5,437,756

# METHOD OF MAKING A COMPOSITE SPHERE FOR A MOTION BASE SIMULATOR WITH A LOW CENTER OF GRAVITY

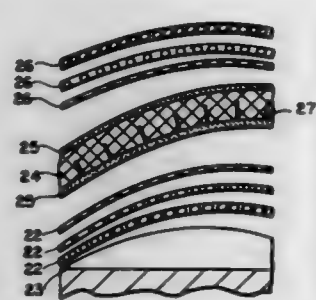
Joseph M. Carlos, Southbury; Thomas A. Carstensen, Shelton; William J. Hall, Cheshire, and Larry J. Osiecki, Oxford, all of Conn., assignors to United Technologies Corp., Hartford, Conn.

Continuation of Ser. No. 914,258, Jul. 15, 1992, abandoned, which is a division of Ser. No. 553,871, Jul. 16, 1990, Pat. No. 5,182,150. This application Jun. 9, 1994, Ser. No. 257,459

Int. Cl.<sup>6</sup> G09B 9/12; B29B 11/04

U.S. Cl. 156—245

2 Claims



1. A method for fabricating a crack resistant simulator dome used in simulating high G maneuvers in a motion base simulator, the dome being mounted on a base which is movable to exert high G forces on the dome comprising:

- providing a mold having a mold surface corresponding to an inner surface of the dome;
- placing an inner fiber reinforced polymer impregnated layer on the mold surface;
- providing a foam core material having predetermined different densities;
- placing the core material of predetermined different densities in designated locations on the first fiber layer;
- placing an outer fiber reinforced polymer impregnated layer on the core material;
- consolidating and curing the layers to form a unitary structure, the structure having different densities in designated different portions thereof to adjust the center of gravity of the dome, and
- mounting the dome on the base which moves the dome to exert high G forces on the dome.

5,437,757

# CLAMP RING FOR DOMED PEDESTAL IN WAFER PROCESSING CHAMBER

Michael Rice, Pleasanton, and Jon Mohn, Saratoga, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jan. 21, 1994, Ser. No. 184,125

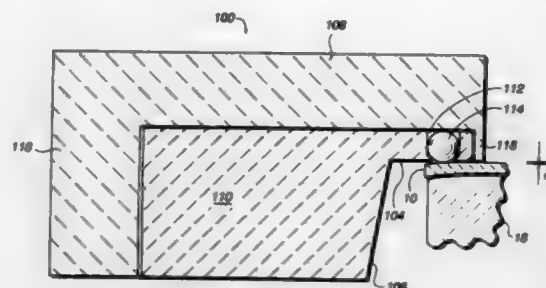
Int. Cl.<sup>6</sup> C23F 1/02

U.S. Cl. 156—345

21 Claims

1. A clamp for use in a reactor for processing a substrate, the reactor including a pedestal for supporting the substrate, the

clamp comprising a rigid body including a seat formed therein, the seat having at least one convex seat surface for engaging



and holding a peripheral portion of the substrate against the pedestal.

5,437,758

# GREEN SHEET MANUFACTURING METHODS AND APPARATUS

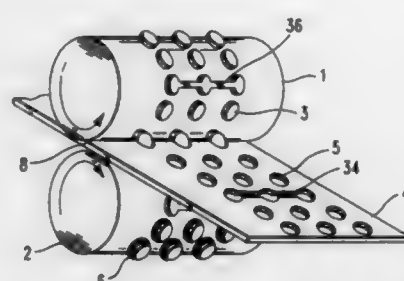
Thomas J. Walsh, Jr., Poughkeepsie, N.Y., assignor to Joseph B. Taphorn, Poughkeepsie, N.Y., a part interest

Filed May 9, 1990, Ser. No. 521,020

Int. Cl.<sup>6</sup> B32B 31/18

U.S. Cl. 156—513

9 Claims



1. In an apparatus for manufacturing sheets with through-holes for use as substrates of an electronic assembly, a roller having a pattern of high and low areas on its surface, an object presenting a firm surface making line contact with the roller pattern high areas, means for providing a malleable material to the roller, and means for rotating the roller so as to dispense a sheet having through-holes from the material past its surface line contact with the object, wherein the object is a second roller, wherein a plurality of high areas are formed on each roller, and the rollers are synchronized so that corresponding high areas mate with each other in the sheet to form holes through it.

5,437,759

# APPARATUS AND METHOD FOR APPLYING LABELS ONTO SMALL CYLINDRICAL ARTICLES USING WIPER SPEED DIFFERENTIAL

Ian Westbury, 2251 Solitude Ln., Turlock, Calif. 95380

Division of Ser. No. 906,573, Jun. 30, 1992, Pat. No. 5,350,482.

This application Jun. 14, 1994, Ser. No. 259,640

Int. Cl.<sup>6</sup> B65C 9/00

U.S. Cl. 156—566

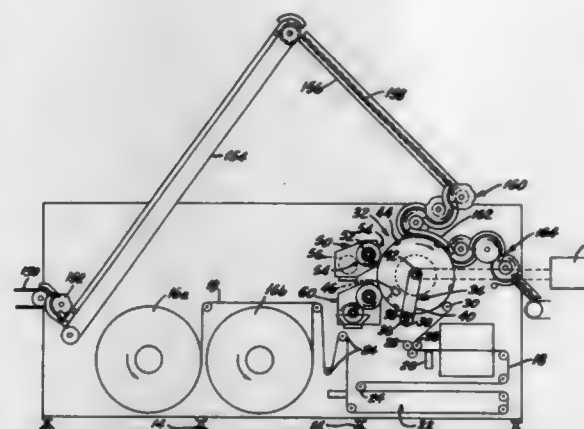
32 Claims

1. An apparatus for applying a label to small cylindrical articles such as dry cell batteries while forming a high quality seam comprising

- a label transport drum having a substantially smooth surface and a plurality of substantially evenly spaced label retaining areas on the surface of the drum on which cut labels are retained as the drum rotates,
- means for rotating said drum,
- means for supplying labels to successive label retaining areas of the surface of the drum,
- means for applying an adhesive onto an area adjacent the

leading edge of said label while said label is moving with said drum,

- a wiper member having at least one outwardly extending and narrowly tapered flexible tip, said tip ending in one substantially pointed configuration and having a tip width at any point substantially less than the tip length,
- means for rotating said wiper member at a speed and timing such that one wiper tip engages a label retaining area on the drum at a surface speed slower than the surface speed of the label transport drum,
- means for supplying solvent to said flexible tip as said wiper member is rotated,



said wiper member being positioned adjacent said label transport drum so that said flexible and pointed tip is deflected against the area adjacent the trailing edge of the label wherein solvent captured on the tip is controllably wiped onto the area adjacent the trailing edge of the label, and

means for conveying a cylindrical article into tangential spinning engagement with said drum and into rotative engagement with the adhesive positioned on the area adjacent the leading edge of the label whereby said label is transferred by wrapping onto said article after said label is moved into engagement with said rotating article to form a high quality solvent-seal based seam at the overlap of leading and trailing edge positions.

5,437,760

# PRESS BELT APPLICATOR FOR A CONTINUOUS BELT PRESS

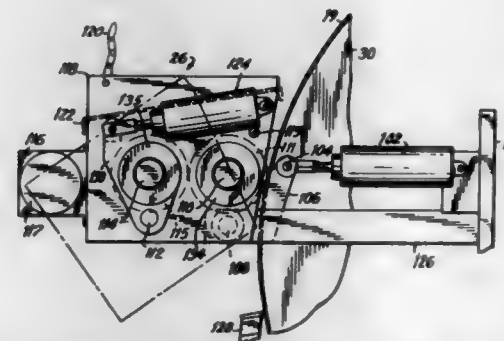
Frank J. Benkowski, New Philadelphia; Morris Cordova, Newark, both of Ohio; E. Scott DelliGatti, Clifton Park, N.Y., and Timothy A. Holder, Coshocton, Ohio, assignors to General Electric Company, Coshocton, Ohio

Filed Sep. 13, 1993, Ser. No. 120,889

Int. Cl.<sup>6</sup> B65G 45/10

U.S. Cl. 156—580

7 Claims



1. A continuous press belt system for the manufacture of metal laminates comprising:

- first and second press belts, said first and second press belts

being supported for the formation of a press gap between said press belts,

first and a second platen, each platen being operably associated with a respective press belt for applying pressure to material within said press gap;

first and second applicator system, each applicator system being removably mounted to said continuous belt system for applying a coating of fluid to a respective belt;

each applicator system comprising an applicator roller, a fluid outlet means for providing fluid to said applicator roller such that said fluid is applied by said applicator roller onto said press belt, a chill roller removably in contact with said applicator roller for controlling the temperature of the fluid applied to said applicator roller, a first actuator means for positioning said applicator roller into and out of contact with a respective belt, and a second actuator means for positioning said chill roller into and out of contact with a respective applicator roller.

5,437,761

# LITHIUM NIOBATE CRYSTAL WAFER, PROCESS FOR THE PREPARATION OF THE SAME, AND METHOD FOR THE EVALUATION THEREOF

Akira Koide, Tatebayashi, Japan, assignor to Nihon Kessho Kogaku Co., Ltd., Tatebayashi, Japan

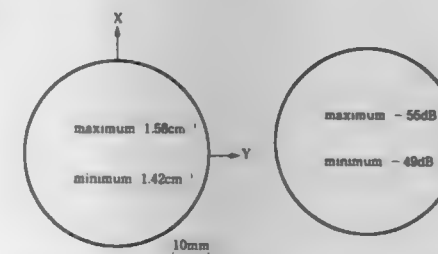
Filed Mar. 4, 1994, Ser. No. 206,097

Claims priority, application Japan, Mar. 9, 1993, 5-072754

Int. Cl.<sup>6</sup> B44C 1/22

U.S. Cl. 216—85

3 Claims



3. A method for the evaluation of a lithium niobate crystal wafer, which comprises determining the difference between the maximum and minimum absorption coefficients of the wafer at a wavelength of 2.87  $\mu$ m.

5,437,762

# METHOD AND APPARATUS FOR SEMICONDUCTOR MEMORY

Akihiko Ochiai; Makoto Hashimoto; Takeshi Matsushita; Machio Yamagishi; Hiroshi Sato, and Muneharu Shimano, all of Kanagawa, Japan, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 960,822, Oct. 14, 1992, abandoned.

This application Jul. 13, 1994, Ser. No. 274,587

Claims priority, application Japan, Oct. 16, 1991, 3-296241; Oct. 31, 1991, 3-313701; Oct. 31, 1991, 3-313764

Int. Cl.<sup>6</sup> H01L 21/306

U.S. Cl. 216—20

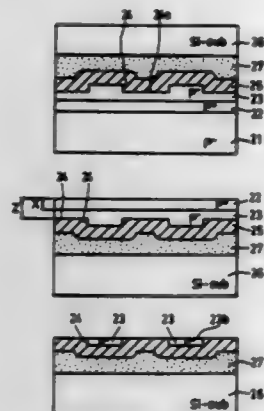
9 Claims

1. A method of manufacturing a SOI substrate forming a thin film of a silicon layer on an insulator substrate by bonding a substrate, wherein the method comprises successively:

- forming an etching stopping layer on the surface of a silicon substrate,
- forming an epitaxially grown polycrystalline silicon layer having a rectangular step on said etching stopping layer,
- bonding said silicon substrate formed with said silicon layer with another substrate as the insulator substrate,
- grinding said silicon substrate from the rear face to such an

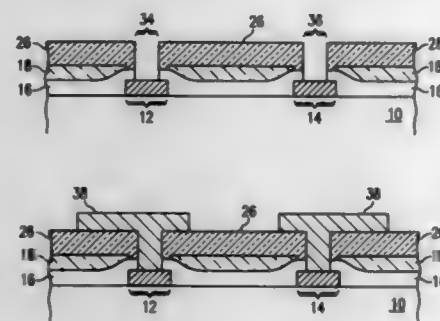


extent as not to expose said etching stopping layer, and etching it using a solution of ethylene diamine and pyro-



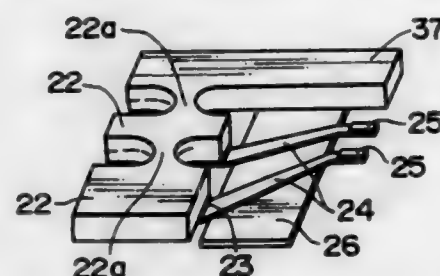
catechol till said etching stopping layer is exposed and removing said etching stopping layer.

**5,437,763**  
**METHOD FOR FORMATION OF CONTACT VIAS IN INTEGRATED CIRCUITS**  
Kuei-Wu Huang, Irving, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.  
Division of Ser. No. 843,507, Feb. 28, 1992, Pat. No. 5,384,483.  
This application Oct. 6, 1994, Ser. No. 319,234  
Int. Cl.<sup>6</sup> B44C 1/22; C03C 15/00; C23F 1/02  
U.S. Cl. 216—18 21 Claims



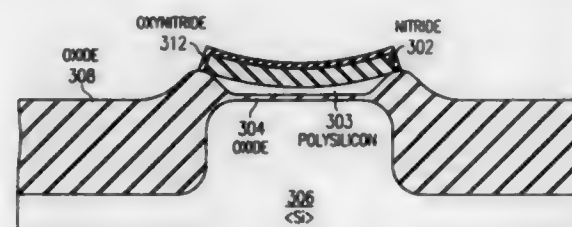
1. A method for forming contact vias in an integrated circuit, comprising the steps of:  
forming a first insulating layer containing planarizing material on the upper surface thereof over an underlying region in the integrated circuit;  
partially etching into the first insulating layer at the locations of the contact vias to be formed, wherein the first insulating layer is etched deep enough to remove the planarizing material;  
forming a second insulating layer over the integrated circuit;  
and  
forming the contact vias through the first and second insulating layers to expose a portion of the underlying region.

**5,437,764**  
**LEAD FRAME AND MANUFACTURING METHOD THEREFOR**  
Kenji Ohsawa, Makoto Ito, and Mutsumi Nagano, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan  
Filed May 24, 1994, Ser. No. 248,096  
Claims priority, application Japan, May 25, 1993, 5-145625  
Int. Cl.<sup>6</sup> B44C 1/22; C23F 1/02  
U.S. Cl. 216—14 7 Claims



5. A manufacturing method for a lead frame, comprising the steps of:  
working a metal base in an outer lead forming region thereof to form an outer lead in said outer lead forming region;  
forming an etching stop layer on a first surface of said metal base in an inner lead forming region thereof, from metal different from that of said outer lead;  
forming a plating resist layer having a negative pattern with respect to an inner lead pattern, on said first surface of said metal base so as to cover said etching stop layer;  
plating metal on said metal base with said plating resist layer used as a mask to form an inner lead on said etching stop layer, said inner lead having an outer end portion contact with a surface of said outer lead;  
etching off a second surface of said metal base in said inner lead forming region; and  
etching off an unnecessary part of said etching stop layer.

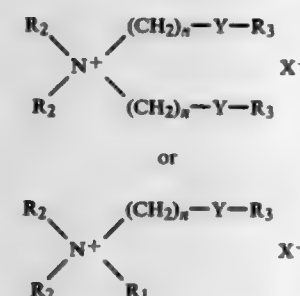
**5,437,765**  
**SEMICONDUCTOR PROCESSING**  
Lee M. Loewenstein, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Filed Apr. 29, 1994, Ser. No. 236,788  
Int. Cl.<sup>6</sup> H01L 21/00  
U.S. Cl. 216—51 13 Claims



1. A method of stripping an oxidation mask, comprising the steps of:  
(a) providing a locally oxidized silicon layer with an oxidation mask including silicon oxynitrides on silicon nitride;  
(b) exposing said layer and mask to a gas mixture including a fluorine source, whereby said oxynitrides are removed; and then  
(c) exposing said layer and mask to a gas mixture including fluorine and chlorine sources plus a control gas selected from the group consisting of an oxygen source, a nitrogen source, and a mixture thereof, whereby said silicon nitride is removed.

**5,437,766**  
**MULTI-PLY FACIAL TISSUE PAPER PRODUCT COMPRISING BIODEGRADABLE CHEMICAL SOFTENING COMPOSITIONS AND BINDER MATERIALS**  
Dean Van Phan, West Chester; Paul D. Trokhan, Hamilton, both of Ohio; Stephen R. Kelly, Independence, Ky.; Ward W. Ostendorf, West Chester, and Bart S. Hersko, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio  
Filed Oct. 22, 1993, Ser. No. 141,320  
The portion of the term of this patent subsequent to Nov. 23, 2010, has been disclaimed.  
Int. Cl.<sup>6</sup> D21H 27/38  
U.S. Cl. 162—127 31 Claims

1. A multi-ply facial tissue paper product comprising:  
a) paper making fibers;  
b) from about 0.01% to about 3.0% of a biodegradable quaternary ammonium compound having the formula



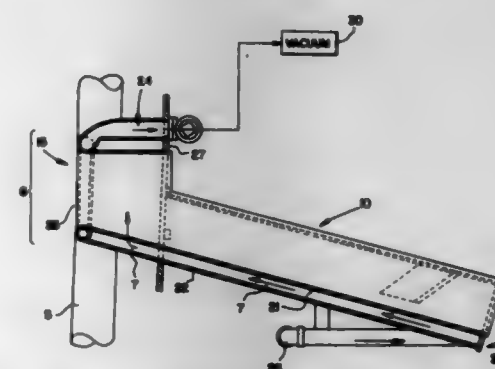
wherein each  $R_2$  substituent is a C1-C6 alkyl or hydroxyalkyl group, benzyl group or mixtures thereof; each  $R_1$  substituent is a C12-C22 hydrocarbyl group, or substituted hydrocarbyl group or mixtures thereof; each  $R_3$  substituent is a C11-C21 hydrocarbyl group, or substituted hydrocarbyl or mixtures thereof; Y is -O-C(O)- or -C(O)-O- or -NH-C(O)- or -C(O)-NH- or mixtures thereof; n is 1 to 4 and  $X^-$  is a suitable anion;  
c) from about 0.01% to about 3.0% of a water soluble polyhydroxy compound selected from the group consisting of glycerol, polyglycerols having a weight average molecular weight of from about 150 to about 800, polyoxyethylene glycols and polyoxypropylene glycols having a weight average molecular weight from about 200 to 1000, and mixtures thereof;  
d) from about 0.01% to about 3.0% of a wet strength binder, either permanent and/or temporary; and  
e) from about 0.01% to about 3.0% of a dry strength binder; wherein said facial tissue paper product comprises two plies in juxtaposed relation, wherein each of said plies comprises at least two superposed layers, an inner layer and an outer layer contiguous with said inner layer, said plies being oriented in said facial tissue so that said outer layer of each ply forms one exposed surface of said multi-ply facial tissue and each of said inner layers of said plies are disposed toward the interior of said facial tissue paper product, and wherein the majority of the biodegradable quaternary ammonium compound and the polyhydroxy compound is contained in at least one of said outer layers of said plies.

**5,437,767**  
**WET-LAYING PROCESS FOR MAKING LIQUID SEALING GASKET SHEET MATERIALS**  
Nowaf Halout, Alexandra M. Kavoulakis, both of Lancaster, and Ellen R. Romano, Elizabethtown, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.  
Filed Jul. 22, 1992, Ser. No. 916,725  
Int. Cl.<sup>6</sup> D21F 11/00  
U.S. Cl. 162—145 14 Claims

1. A process for making a liquid sealing gasket sheet material

which seals against polar liquids, said process consisting essentially of:  
mixing fiber and filler with water to form a suspension containing from about 0.5 to about 3% solids;  
adding a flocculant to the suspension and allowing the solids to flocculate;  
adding a binder to the suspension, said binder being added to the suspension either with the flocculant or after the flocculant;  
wet-laying to form a sheet; and  
drying the sheet;  
wherein the filler includes a gel forming mineral filler, the wet-laid sheet comprises the gel forming mineral filler at an amount of at least about 3% by total dry weight, the fiber at an amount of from about 5 to about 20% by total dry weight, the binder at an amount from about 0.5 to about 18% by total dry weight and the filler at an amount of at least about 62% by total dry weight.

**5,437,768**  
**NON-BAFFLED LOW PRESSURE DROP VACUUM COOLED INSERTED SMELT SPOUT**  
J. William Smith, Massillon; Jerry D. Blue, Clinton; Stan Crofut, Massillon; Ed Gayhart, North Canton, and Joan Barnes, Akron, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.  
Filed Oct. 28, 1993, Ser. No. 144,921  
Int. Cl.<sup>6</sup> B22D 35/06; B67D 5/62; D21C 11/12  
U.S. Cl. 162—239 5 Claims



1. A spout for channeling smelt from a boiler, the boiler having a wall, the wall having an opening, the spout being insertable into the opening of the wall, the spout comprising:  
a jacket having an inner wall and outer wall, the outer wall being spaced a distance away from the inner wall, the jacket having one end insertable into the opening of the wall of the boiler, the jacket defining a trough for carrying smelt from the boiler;  
an inlet communicating with the jacket for delivering a water flow to the jacket between the inner wall and the outer wall;  
an O-shaped tube communicating with the jacket at the one end of the jacket for receiving the water flow from between the inner wall and the outer wall of the jacket, said O-shaped tube having means for separating the inlet and outlet of said O-shaped tube;  
an outlet communicating with the O-shaped tube near the one end of the jacket for channeling the water flow from the O-shaped tube, the outlet having a vent hole therein to permit escape of non-condensable gases from the jacket, said outlet being above and along a section of the periphery of the O-shaped tube and structure so that the water circulates from the inlet, around the spout, and out through the outlet; and  
vacuum means for facilitating the water flow throughout the spout.

5,437,769

**DEWATERING INSTRUMENT FOR A PAPER MACHINE TWIN-WIRE FORMER**

Takashi Bando; Kazuhide Sakamoto; Hiromu Masuda, all of Mihara, and Hiroshi Iwata, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

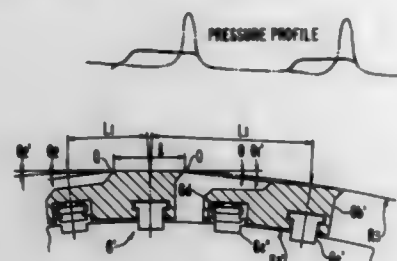
Filed Oct. 28, 1993, Ser. No. 141,934

Claims priority, application Japan, Oct. 29, 1992, 4-312672

Int. Cl.<sup>6</sup> D21F 1/54

U.S. Cl. 162—301

9 Claims



1. In a twin-wire former of a paper making machine having two coating wire loops, a dewatering instrument comprising: a main body; a plurality of rigid dewatering blades having respective lands constituting upper surfaces of the blades, said blades being supported by said main body adjacent one of the wire loops, said lands of said blades contacting said one of the wire loops at the inside of said one of the wire loops, and said lands lying in and being spaced from one another along an arcuate path as viewed in the traveling direction in which stock travels through the twin-wire former to thereby establish angles at which said one of the wires wraps around the lands such that the blades impart a pulsating pressure to stock traveling past the dewatering instrument in the twin-wire former; the twin-wire former defining an open space adjacent the inside of the other of said wire loops at locations directly opposite locations where said lands contact said one of said wire loops; a respective set of first and second support members mounted to said main body and supporting each of said blades, the first and second support members of each said set being spaced from one another in said traveling direction, each said first support member being fixed and pivotally supporting the respective dewatering blade, each said second support member being disposed directly beneath the land of the respective dewatering blade, and each said second support member being movable relative to said main body so as to pivot the respective dewatering blade supported thereby and the land of the blade contacting said one of the wires about the first support member pivotally supporting the respective blade, whereby angles at which said one of the wires are wrapped about the lands of the dewatering blades are adjustable, respectively, to vary the pulsating pressure imparted to stock traveling past the dewatering instrument in the twin-wire former.

5,437,770

**SEPARATION OF ETHANOL FROM ISOPROPANOL BY AZEOTROPIC DISTILLATION**

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Sep. 13, 1994, Ser. No. 305,342

Int. Cl.<sup>6</sup> B01D 3/36; C07C 29/84

U.S. Cl. 203—57

1 Claim

1. A method for recovering ethanol from a mixture of ethanol and isopropanol which comprises distilling a mixture of ethanol and isopropanol in the presence of an azeotrope forming agent, recovering the ethanol and the azeotrope forming agent as overhead product and obtaining the isopropanol as bottoms product, wherein said azeotrope forming agent consists of one material selected from the group consisting of methyl formate, t-butyl methyl ether, isopropyl ether, 2,2-dimethoxypropane, ethyl formate, t-amyl methyl ether, tetrahydrofuran, acetone, cyclopentane, hexene-1, cyclohexanone,

1-heptene, 1-octene, 1,3-dioxolane, acetal, dimethoxymethane, and nitromethane.

5,437,771

**ELECTROLYTIC CELL AND PROCESSES FOR PRODUCING ALKALI HYDROXIDE AND HYDROGEN PEROXIDE**

Takayuki Shimamune; Yasuo Nakajima, both of Tokyo; Shuji Nakamatsu, Kanagawa; Yoshinori Nishiki, Kanagawa, and Shuhei Wakita, Kanagawa, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

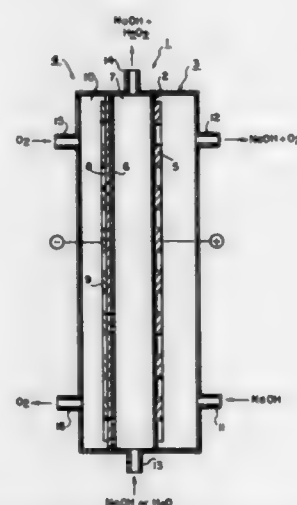
Filed Feb. 15, 1994, Ser. No. 196,442

Claims priority, application Japan, Feb. 26, 1993, 5-062684; Feb. 26, 1993, 5-062685

Int. Cl.<sup>6</sup> C25B 1/20, 1/30, 9/00

U.S. Cl. 204—84

5 Claims



3. An electrolytic process for production of hydrogen peroxide by the use of an electrolytic cell having an anode compartment accommodating an anode and a cathode compartment accommodating a gas cathode wherein, said two compartments are separated from each other by a cation exchange membrane, and cathode compartment is divided into a solution compartment in contact with the anode compartment and a gas compartment accommodating the gas cathode by an anion exchange membrane in direct contact with the gas cathode, said process comprising the steps of: supplying said gas compartment with an oxygen-containing gas; and supplying said anode compartment with an aqueous solution of alkali hydroxide, as a result producing hydrogen peroxide in said solution compartment and oxygen in said anode compartment.

5,437,772

**PORTABLE LEAD DETECTOR**

Emory S. De Castro, Williamsville, and John D. Genders, Marilla, both of N.Y., assignors to The Electrosynthesis Co., Inc., Lancaster, N.Y.

Filed Nov. 1, 1993, Ser. No. 144,342

Int. Cl.<sup>6</sup> G01N 27/26

U.S. Cl. 204—153.1

31 Claims

1. A method of trace substance analysis, comprising the steps of: introducing a solution having a low concentration of at least one metallic or non-metallic, electro-active substance into a chamber containing a transducer having a collector electrode array interdigitated with a detector electrode array; applying a first reducing potential to said collector electrode array for a first period of time whereby ions of said at least

one metallic or non-metallic, electro-active substance are reduced from said solution and concentrated on said collector electrode array;

applying a first oxidizing potential to said collector electrode array for a second period of time and simultaneously applying a detecting potential to said detector electrode array for said second period of time whereby said at least one metallic or non-metallic, electro-active substance concentrated on said collector array is stripped as ions from said collector electrode array back into said solution; and

measuring a current across said detector electrode array during said second period of time to determine the amount of said at least one metallic or non-metallic, electro-active substance within said solution.

5,437,773

**METHOD FOR MONITORING ENVIRONMENTAL AND CORROSION**

Robert S. Glass, Livermore; Willis L. Clarke, Jr., San Ramon, and Dino R. Carlo, Livermore, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

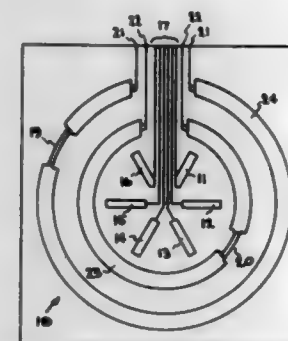
Division of Ser. No. 61,724, May 17, 1993, Pat. No. 5,306,414.

This application Apr. 8, 1994, Ser. No. 224,691

Int. Cl.<sup>6</sup> G01N 27/26

U.S. Cl. 204—153.11

8 Claims



1. A method for monitoring the effects of environment on a material located within that environment, comprising the steps of:

forming a sensor array having a plurality of individual electrochemical sensors therein such that certain of the individual sensors are sensitive to elements of the environment and certain of the individual sensors are constructed of a material whose corrosion properties are to be evaluated; positioning the sensor array so as to be in contact with the material to be evaluated; and providing read-out means for at least receiving signals from each of the plurality of individual electrochemical sensors.

5,437,774

**HIGH MOLECULAR WEIGHT ELECTRODIALYSIS**

Mads Laustsen, Lyngby, Denmark, assignor to Zymogenetics, Inc., Seattle, Wash.

Filed Dec. 30, 1993, Ser. No. 176,037

Int. Cl.<sup>6</sup> B01D 61/42

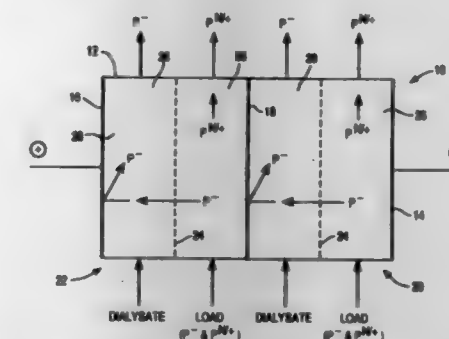
U.S. Cl. 204—182.3

59 Claims

1. A method for separating a charged first molecular species from a second molecular species in an aqueous media, said method comprising:

flowing the aqueous media between a retention membrane having a low molecular weight cutoff and a separation membrane having a high molecular weight cutoff, wherein both the first molecular species and the second molecular species have molecular weights of over 5 kD, and wherein the high molecular weight cutoff is at least three times the low molecular weight cutoff and the separation membrane will pass at least one of the first and second molecular species and the low molecular weight

cutoff of the retention membrane will pass neither of the molecular species; flowing dialysate over a surface of the separation membrane opposite to the surface in contact with the aqueous media flow; and



controlling electrical potential and differential pressure across the separation and retention membranes in order to selectively pass one of the molecular species through the separation membrane into the dialysate and contain the other of the molecular species between the separation and retention membranes in the aqueous media.

5,437,775

**METHOD FOR PREPARING HIGH-PURITY PROPYLENE CARBONATE AND FOR SIMULTANEOUSLY MAKING PASSIVATED ELECTRODES**

Wolfgang Dittich, Munich; Herbert Hill, Erding, and Elke Kinzel, Zorneding, all of Germany, assignors to Huls Aktiengesellschaft, Marl, Germany

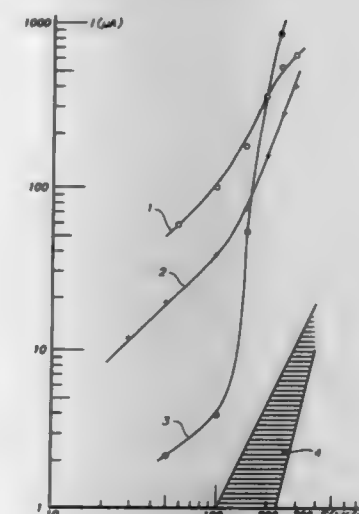
Filed Jan. 12, 1994, Ser. No. 30,114

Claims priority, application Germany, Sep. 10, 1990, 40 28 708.4

Int. Cl.<sup>6</sup> B01D 17/06

U.S. Cl. 204—186

30 Claims



1. A method for preparing high-purity propylene carbonate, said method comprising the steps of:

(a) exposing in a cell prepurified propylene carbonate liquid to an electric field of at least 1 kV/cm between first and second bare metal electrodes for a time to obtain a high-purity propylene carbonate; and (b) simultaneously passivating said first and second electrodes.



5,437,776

## PROCESS FOR REDUCING THE PHOSPHORUS CONTENT OF WASTE WATER

Johann Schwabegger, Friesdorf 24, Wartberg/Aist, Austria A-4224, and Rudolf Lametzberger, Sandeilen 13, Pregarten, Austria A-4230

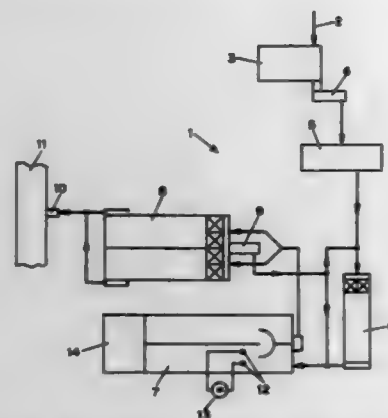
PCT No. PCT/AT93/00110, § 371 Date Feb. 25, 1994, § 102(e) Date Feb. 25, 1994, PCT Pub. No. WO94/00388, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 30, 1993, Ser. No. 204,139

Claims priority, application Austria, Jun. 30, 1992, 1328/92 Int. Cl.<sup>6</sup> C02F 1/461

U.S. Cl. 204—149

8 Claims



1. A process for reducing the phosphate content in waste water, which is conducted in a purification cycle through individual treatment tanks, selected from the group consisting of preliminary sedimentation tanks, activation tanks, and final sedimentation tanks comprising the steps of:

providing microorganisms which decompose phosphates in one of said treatment tanks; and simultaneously subjecting the waste water to electrolysis in said one treatment tank to precipitate phosphates.

5,437,777

## APPARATUS FOR FORMING A METAL WIRING PATTERN OF SEMICONDUCTOR DEVICES

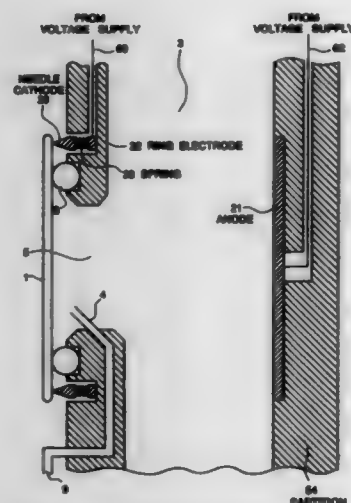
Shuji Kishi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1992, Ser. No. 997,181

Claims priority, application Japan, Dec. 26, 1991, 3-358885 Int. Cl.<sup>6</sup> C25D 17/00

U.S. Cl. 204—224 R

4 Claims



1. A plating apparatus for forming a wiring pattern on a

surface of a semiconductor wafer by causing a plating liquid into contact with the surface of the semiconductor wafer, the plating apparatus comprising a storage tank storing and heating a treatment liquid, a treatment tank provided adjacent to said storage tank and having an opening formed in a wall at the side opposite to the side adjacent to said storage tank, said treatment tank being supplied with said treatment liquid from said storage tank, said opening being configured to bring the surface of the semiconductor wafer into contact with said treatment liquid within said treatment tank, and a holding mechanism for holding said semiconductor wafer vertically and pushing said surface of said semiconductor wafer to said opening.

5,437,778

## SLOTTED CYLINDRICAL HOLLOW CATHODE/MAGNETRON SPUTTERING DEVICE

Virgil L. Hedgecoth, Pomona, Calif., assignor to Telic Technologies Corporation, Santa Monica, Calif.

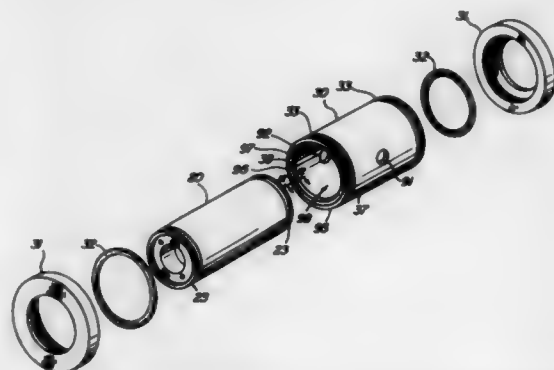
Continuation of Ser. No. 809,705, Dec. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 550,719, Jul. 10, 1990, Pat. No. 5,073,245. This application Nov. 15, 1993, Ser. No. 152,916

The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—298.21

6 Claims



1. A hollow cylindrical cathode target for use with an anode in sputtering a material onto a substrate, comprising:

an elongated electrically conductive cylindrical member having an elongated exterior surface and an elongated cylindrical bore extending along a longitudinal axis of the elongated cylindrical member from a first end thereof to a second end thereof, said bore defining a cylindrical interior surface, at least the cylindrical interior surface being comprised of the material to be sputtered, the cylindrical interior surface of said elongated cylindrical member consumable over time as a result of sputtering the material onto the substrate;

first and second electrically conductive annular flanges having an external diameter sized to fit into and conductively contact the elongated cylindrical member within the bore of said elongated cylindrical member, each of said annular flanges removably located in the bore at a respectively numbered end of said elongated cylindrical member; and

means for detachably securing said annular flanges within said bore without separate fasteners and without exposing any connective seam between the elongated cylindrical member and the annular flanges on the elongated exterior surface of the cylindrical member to minimize the possibility of a vacuum leak, said securing means comprised of internal threads located in the bore at the first and second ends of said elongated cylindrical member and corresponding external threads located on the exterior of the first and second annular flanges, whereby the assembly

and replacement of said hollow cylindrical cathode target is simplified, whereby said flanges may be reused with a new replacement elongated cylindrical member, after consumption of a first elongated cylindrical member, and whereby potential vacuum leaks due to exposure of any connective seam are eliminated.

5,437,779

## METHOD OF MAKING A MAGNETIC RECORD MEDIUM

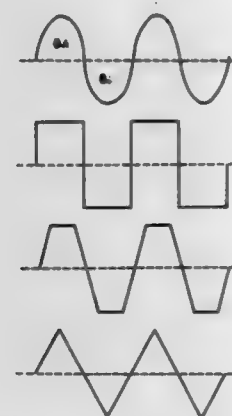
Tomoo Shige, Yasuaki Makabe, and Masataka Yokoyama, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Dec. 9, 1993, Ser. No. 163,551

Claims priority, application Japan, Dec. 11, 1992, 4-331665 Int. Cl.<sup>6</sup> C25D 5/34

U.S. Cl. 205—106

17 Claims



1. A method of making a magnetic record medium, comprising the steps of:

- texturing a surface of a non-magnetic substrate to form a textured substrate;
- electrolyzing said surface of said textured substrate in an electrolyte of an acid solution, by applying an electric potential on said non-magnetic substrate, to remove protrusions and burrs from said surface of said textured substrate to form an electrolyzed substrate; and
- forming an undercoating layer and a magnetic layer on a surface of said electrolyzed substrate.

5,437,780

## PROCESS FOR MAKING SOLVATED MESOPHASE PITCH

W. Mark Southard; H. Ernest Romine; Edward J. Nanni, and Mark W. Carel, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Oct. 12, 1993, Ser. No. 135,204

The portion of the term of this patent subsequent to Nov. 9, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> C01C 3/02

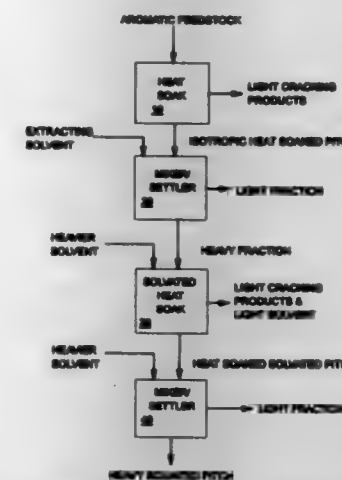
U.S. Cl. 209—45

35 Claims

1. A process yielding heavy solvated mesophase pitches comprising:

- combining a heavy aromatic pitch fraction and a solvating solvent;
- heat soaking said heavy aromatic pitch fraction in the presence of said solvating solvent under conditions for promoting the formation of larger heavy aromatic molecules, wherein such conditions include pressure sufficient to maintain said solvating solvent in the liquid state, while retaining sufficient solvent in the pitch fraction in order to generate a solvated mesophase pitch; and

(c) recovering said solvated mesophase pitch comprising said larger heavy aromatic molecules formed in heat soak-



ing and a sufficient portion of a solvating solvent to solvate said solvated mesophase pitch.

5,437,781

## HYDROCARBON CONVERSION PROCESSES USING CRYSTALLINE SILICOALUMINO PHOSPHATES: SAPO-36 AND SAPO-56

Stephen T. Wilson, Libertyville, Ill., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 67,883, May 27, 1993, Pat. No. 5,370,851. This application Aug. 15, 1994, Ser. No. 291,050

Int. Cl.<sup>6</sup> C10G 11/04

U.S. Cl. 208—46

6 Claims

1. A hydrocarbon conversion process comprising contacting a hydrocarbon feed under hydrocarbon conversion conditions with a catalyst to give a hydroconverted product, the catalyst comprising a crystalline molecular sieve having a three-dimensional microporous framework of SiO<sub>2</sub>, AlO<sub>2</sub>, and PO<sub>2</sub> tetrahedral units, having an intracrystalline pore system and an empirical formula expressed in molar ratios:



where R represents at least one organic templating agent present in the intracrystalline pore system; m is the molar amount of R per mole of (Si<sub>x</sub>Al<sub>y</sub>P<sub>z</sub>)O<sub>2</sub> and has a value from zero to about 0.3; x is the mole fraction of silicon and varies from about 0.01 to about 0.98, y is the mole fraction of aluminum and varies from about 0.01 to about 0.60, z is the mole fraction of phosphorus and varies from about 0.01 to about 0.52 and x + y + z = 1, the molecular sieve characterized in that it has an x-ray diffraction pattern that contains at least the d-spacings set forth in Tables A or B:

TABLE A

2θ	D(Å)	Relative Intensity
7.88	11.22	vs
13.55	6.54	w
15.84	5.59	w
16.41	5.40	m
19.07	4.65	m
20.81	4.27	m
21.98	4.04	m
22.40	3.97	m
23.91	3.72	w
24.26	3.67	w
27.53	3.24	w
27.81	3.21	w
28.8	3.10	w
30.2	2.96	w

TABLE A-continued

#	D(Å)	Relative Intensity
34.8	2.58	W-III

TABLE B

(SAPO-56)

#	D(Å)	Relative Intensity
7.27	12.16	III
8.49	10.41	VS
11.41	7.76	I
12.73	6.95	II
14.75	6.01	W
15.11	5.86	W
15.42	5.75	III
17.21	5.15	II
17.59	5.04	II
20.09	4.42	S
21.53	4.13	S
21.86	4.07	III
23.34	3.81	III
25.81	3.45	III
27.67	3.22	III-IV
28.36	3.15	W
29.83	3.00	III
30.26	2.95	III
30.64	2.92	W
31.27	2.88	III
31.49	2.84	W
32.10	2.79	W
33.34	2.69	III
34.43	2.60	W
42.64	2.12	W
43.34	2.09	W
45.91	1.98	W
46.79	1.94	W
47.63	1.91	W
49.77	1.83	W
50.56	1.81	W
50.68	1.80	W
53.20	1.72	W
53.35	1.72	W

5,437,782

## INTEGRATED FLUID

COKING/PARAFFINDEHYDROGENATION PROCESS  
Michael C. Kerby, Roby Bearden, Jr., and Stephen M. Davis, all of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

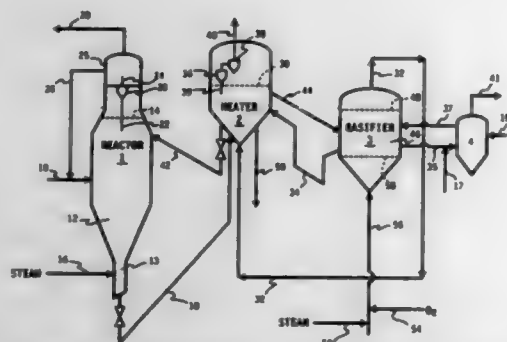
Filed Oct. 27, 1993, Ser. No. 144,969

The portion of the term of this patent subsequent to Jul. 25, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> C10G 57/00; C07C 5/00

U.S. Cl. 208-53

7 Claims



1. An integrated process for converting a heavy hydrocarbonaceous chargestock to lower boiling products and for converting light paraffins to olefins, said process being performed

in a fluid coking process unit comprised of a fluid coking reactor, a heater, and a gasifier, said fluid coking reactor containing a coking zone, a scrubbing zone located above the coking zone for collecting vapor phase products, and a stripping zone for stripping hydrocarbons from solid particles passing downwardly through the coking zone, which process comprises:

- introducing the heavy hydrocarbonaceous chargestock having a Conradson carbon content of at least about 5 wt. %, into the coking zone containing a fluidized bed of solid particles and maintained at temperatures from about 450° and 650° C. and pressures from about 0 to 150 psig, wherein there is produced a vapor phase product, including normally liquid hydrocarbons, and where coke is deposited on the solid particles;
- passing the vapor phase product to said scrubbing zone;
- passing the solid particles with coke deposited thereon downwardly through the coking zone, past the stripping zone and passing said solid particles to said heating zone which contains a fluidized bed of solid particles and operated at a temperature about 40° to 200° C. greater than that of the coking zone;
- recycling at least a portion of the solids from the heating zone to said coking zone; and
- passing a portion of heated solids from the heater to the gasifier, said gasifier being operated at a temperature from about 870° to 1100° C.;
- recycling a portion of hot solids from the gasifier to the heater;
- passing another portion of hot solids from the gasifier to a satellite reactor; and
- introducing a stream comprised of one or more C<sub>2</sub> to C<sub>10</sub> paraffins either directly into said stream of solids passing from said gasifier to said satellite reactor or directly into said satellite reactor, thereby resulting in conversion of at least a portion of said paraffins to the corresponding olefins.

5,437,783

PROCESS FOR AROMATICS REDUCTION AND ENHANCED ISOPARAFFIN YIELD IN REFORMATE  
Versie T. Cuthbert, Port Arthur, and Ooripadical C. Abraham, Nederland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 10, 1994, Ser. No. 250,220

Int. Cl.<sup>6</sup> C10G 35/09

U.S. Cl. 208-139

9 Claims

1. In a reforming process for the production of a gasoline component from naphtha feedstock comprising:

- contacting the naphtha feedstock containing above 20 mol% aromatics in a reforming zone at reforming conditions with a reforming catalyst comprising one or more metals from Group VIII and IVA of the Periodic Table, optionally on a support, to produce a reformat and a hydrogen-rich gas, the improvement which provides reduced aromatics by isomerization to isoparaffins, improved isoparaffin yield, and reduced loss of octane which comprises,
- contacting said naphtha with said catalyst further characterized by a total pore volume of about 0.300 to 0.600 cc/g, a median pore size of about 60-80 Å, less than 1% in pores of diameter greater than 500 Å, and greater than 85% in pores of diameter less than 100 Å, and producing said gasoline component.

5,437,784

## INJECTOR FOR A FLOTATION DEVICE

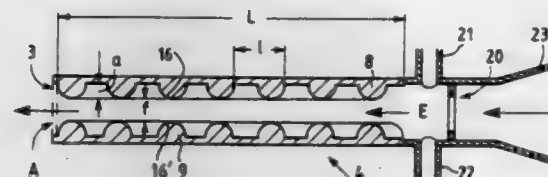
Albrecht Meinecke, Michael Trefz, both of Heidenheim, and Helmut Heinzmann, Böhmekirch, all of Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany  
Filed May 3, 1994, Ser. No. 237,381

Claims priority, application Germany, May 3, 1993, 43 14 507.8

Int. Cl.<sup>6</sup> B03D 1/24; B01F 3/04

U.S. Cl. 209-170

9 Claims



1. In a flotation apparatus comprising a flotation device for separating constituents by flotation and comprising an injector having a flow channel with an inlet end and an outlet end, means for introducing a liquid into said flow channel, and means for introducing a gas into said flow channel, both said liquid introducing means and said gas introducing means disposed upstream of said flow channel with respect to a direction of fluid flow through the channel, said flow channel having a variable cross sectional area with respect to the direction of fluid flow through the injector, said injector connected to means for introducing a mixture of gas and liquid from said injector into the flotation device, the improvement comprising repeated narrowings and widenings of the flow channel in the direction of fluid flow and wherein the flow channel is defined by first and second opposing injector plates, said flow channel being substantially narrow, each said plate having elongate projections defining a plurality of ridges, with adjacent ridges oriented with respect to one another ranging from being parallel to deviating at most 8° with respect to one another, the elongate projections of the first plate crossing in superposed relationship the elongate projections of the second plate.

5,437,785

## APPARATUS FOR DISSOLVED GAS FLOTATION IN ANAEROBIC WASTEWATER TREATMENT

Mel Roshanravan, Coppell, Tex., assignor to Darling International, Irving, Tex.

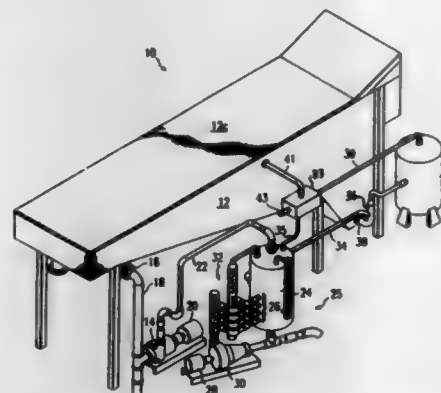
Division of Ser. No. 953,853, Sep. 30, 1992, Pat. No. 5,310,485.

This application Nov. 22, 1993, Ser. No. 155,649

Int. Cl.<sup>6</sup> C02F 3/28, 1/24, 11/04; B01D 17/035

U.S. Cl. 210-95

9 Claims



1. Apparatus for aerating wastewater in an anaerobic dissolved air-flotation system comprising:  
an enclosed flotation-container means for receiving waste-

water and for receiving and retaining aerated water to allow flotation of particles to the surface of the wastewater held therein and for producing gases to be entrained with the water;

a gas entrainment tank pressurized to a predetermined pressure for receiving water to be aerated from said flotation-container means;

a digester for breaking down solid-waste matter and producing gases to be entrained with the water in said gas entrainment tank and means to deliver wastewater from said digester to said flotation-container means;

means for pressuring said gases from said flotation-container means and from the digester to a predetermined pressure

and for transferring said pressurized gases to said gas entrainment tank, said means for pressuring and transferring being connected to the digester and said flotation container means for receiving the gases therefrom without removing any gaseous components from said gas delivered from said digester and flotation-container means;

aeration means connected to receive water and gases from said gas entrainment tank, said aeration means comprising a plurality of jets for entraining the gases in the water as the water is forced through the jets and back into the gas entrainment tank;

means for connecting pressurized gases from said gas entrainment tank to said aeration means; means for connecting water from said gas entrainment tank to said aeration means where the water and pressurized gases are combined to aerate the water;

means for returning the aerated water back to said gas entrainment tank;

means for returning the aerated water from the gas entrainment tank to the enclosed flotation-container means.

5,437,786

STORMWATER TREATMENT SYSTEM/APPARATUS  
Scott W. Horsley, and Winfried Platz, both of Sandwich, Mass., assignors to Stormtreat Systems, Inc., Barnstable, Mass.

Filed Feb. 14, 1994, Ser. No. 195,447

Int. Cl.<sup>6</sup> C02F 3/32

U.S. Cl. 210-170

11 Claims



3. A storm water treatment apparatus comprising,  
a lightweight watertight integrated sedimentation tank module, said sedimentation tank module having a central sedimentation tank within it, formed integrally with an annular perimeter basin, also within said sedimentation tank module,  
said central sedimentation tank having a removable watertight cover,  
said annular perimeter basin having an open top and a wetland formed of sand and gravel deposited within it, said open top including wetland plants, having roots extending downwardly into said sand and gravel, said central sedimentation tank including an inlet port from outside said basin for carrying stormwater into said covered central sedimentation tank and having an infiltration section in the wall between it and the annular perimeter basin, said infiltration section being located generally diametrically opposite to said inlet port, said sedimentation tank comprising filter means between said inlet port and said infil-



tration section being transmissive of water, but generally not transmissive of particulate materials and said infiltration section being located to pass water into said perimeter basin in the subsurface area of said wetland plants roots, and;

an outlet port located near the bottom of said annular perimeter basin, said outlet port including valve means which can be preset to control the throughput of water entering said sedimentation tank and exiting said annular perimeter basin at said outlet port.

5,437,787

## ADSORPTION/REACTION EQUIPMENT

Hiroshi Ishida; Kiyoshi Izumi, Osaka, Japan, and Shuzo Matsumura, London, United Kingdom, assignors to Kubota Corporation, Osaka, Japan, a part interest

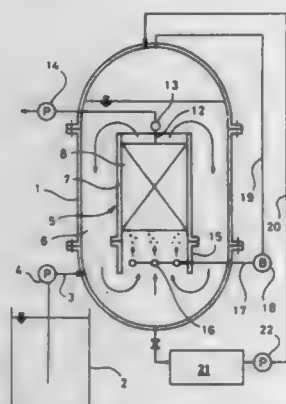
Filed Dec. 9, 1993, Ser. No. 164,395

Claims priority, application Japan, Dec. 24, 1992, 4-342964

Int. Cl.<sup>6</sup> B01D 15/02, 61/58

U.S. Cl. 210—189

2 Claims



1. An adsorption/reaction equipment comprising:
  - a reaction tank (1) which receives inflow of raw liquid subject to a purification process through a supply tube (3), an adsorbent component pooled in said reaction tank and comprising fine particles of predetermined diameter in slurry condition;
  - a filtration device (5) which is disposed inside of said reaction tank (1) and is submerged in said slurry of adsorbent pooled therein;
  - a plurality of filtering membrane elements (8) each incorporating a filtering membrane (10) having a through-hole diameter wherein said elements (8) are disposed in parallel with each other in the vertical direction inside of a casing (7) of said filtration device (5) at predetermined intervals between surfaces of adjoining filtering membranes (10);
  - a suction pump (14) which is connected to said filtering membrane elements (8) by a suction tube (13) for sucking processed liquid;
  - a gas-dispersing device (16) disposed below said filtering membrane elements (8) inside of said casing (7);
  - a blower (18) connected to said gas-dispersing device (16) by a blowing duct (17), an adsorbent-regenerating equipment (21) and an adsorbent-supply pump (22) respectively being interposed in an adsorbent circulating duct (20) that forms a circulatory system with said reaction tank (1).

5,437,788

## BACKWASHING FILTER ASSEMBLY

Stephen A. Geibel, and Ashok K. Bhanot, both of Cortland, N.Y., assignors to Pall Corporation, East Hills, N.Y.

Filed Jan. 10, 1994, Ser. No. 179,121

Int. Cl.<sup>6</sup> B01D 29/66

U.S. Cl. 210—333.01

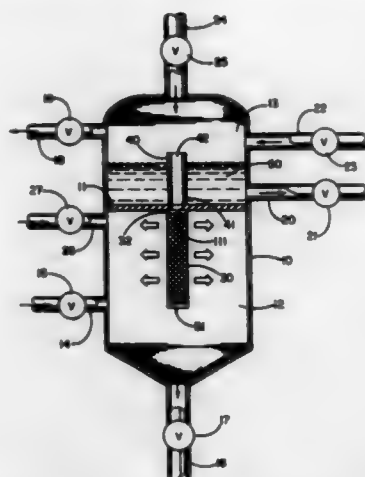
25 Claims

1. A filter assembly comprising:
  - a housing divided into a first chamber and a second chamber,

the second chamber being arranged to contain a backwash liquid;

a filter element disposed in the first chamber and having an interior;

a conduit disposed in the second chamber and having an interior which communicates with the interior of the filter element and an opening which communicates with the second chamber;



a weep hole arranged to drain backwash liquid from the second chamber into the filter element or the conduit, the weep hole being below the opening in the conduit; and

a gas feed pipe arranged to introduce pressurized gas into the second chamber to force the backwash liquid through the conduit and into the filter element.

5,437,789

## WASHING MACHINE LINT STRAINER

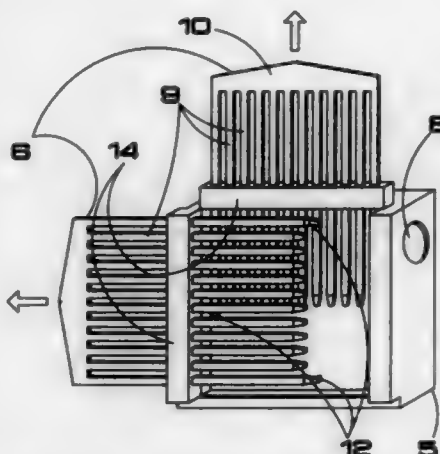
Darriek Karl Sabo, and Susan Jane Sabo, both of 3174 Sunnywood, Ann Arbor, Mich. 48103

Filed Aug. 20, 1993, Ser. No. 110,183

Int. Cl.<sup>6</sup> B01D 29/03

U.S. Cl. 210—357

1 Claim



1. A self-cleaning box-shaped lint strainer for a washing machine discharge comprising a box element, a first finger element, and a second finger element;
  - said box element having sides arranged in a rectilinear shape, at least two perpendicular said sides including a first and second set of holes extending along its length;
  - said first finger element comprising a cross member support having free floating fingers extending parallel to one another;
  - said second finger element comprising a cross member support having free floating fingers extending parallel to one another;

port having free floating fingers extending parallel to one another;

said first and second set of holes receiving the floating finger of said first and second finger elements, respectively, to form a porous straining surface;

wherein said first and second finger elements may be withdrawn to clear the straining surface of any accumulated debris.

5,437,790

## FILTRATION TECHNIQUE

John R. Fyson, London; Martyn S. Glover, Watford, and David M. Henson, Harrow, all of Great Britain, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 984,577, Aug. 4, 1993, abandoned. This application Nov. 16, 1994, Ser. No. 341,452

Claims priority, application United Kingdom, Sep. 7, 1990, 9019607

Int. Cl.<sup>6</sup> C02F 1/72; B01D 37/02

U.S. Cl. 210—710

4 Claims

1. A method for increasing the filtration rate of a filtered precipitate from a photographic effluent comprising:
  - treating a photographic effluent with hydrogen peroxide and an alkaline earth metal salt to form a precipitate;
  - adding to said precipitate an inert powder comprising a diatomaceous earth; and
  - filtering the precipitate.

5,437,791

## METHOD FOR PURIFYING PROCESS WATER FROM PULP MANUFACTURE

Gunnar Göransson; Birgitta Sundblad, Göteborg; Johan Landfors, Sundsvall, and Hans A. Baltsén, Varberg, all of Sweden, assignors to Eka Nobel AB, Bohus, Sweden

Filed Feb. 2, 1994, Ser. No. 190,367

Claims priority, application Sweden, Nov. 15, 1993, 9303762

Int. Cl.<sup>6</sup> C02F 1/56; B01D 1/00

U.S. Cl. 210—712

12 Claims

1. A method for purifying process water from pulp manufacture, comprising the steps of (a) purifying raw process water in a separator device by a process selected from the group consisting of mechanical and a combination of mechanical and chemical methods, (b) evaporating the process water purified in step (a), and (c) recycling at least part of the concentrate resulting from the evaporation in step (b) to an inlet to the separator device, said raw process water and purified process water forming a mixed stream at said inlet.

5,437,792

## PROCESS OF RECOVERING SILVER FROM PHOTOGRAPHIC SOLUTIONS

Albert R. Szembrot, Penfield, and Charles S. Christ, Jr., Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 27, 1994, Ser. No. 281,362

Int. Cl.<sup>6</sup> C02F 1/62

U.S. Cl. 210—727

10 Claims

1. A process for removing silver from a silver containing photoprocessing solution, comprising the steps of:
  - a) mixing a mercapto-s-triazine, or a water soluble salt thereof, with the solution thereby causing formation of a mixture of i) precipitates and fines of silver mercapto-s-triazine and ii) the solution;
  - b) mixing a copolymer flocculant with the mixture thereby causing flocculation and agglomeration of the fines of silver mercapto-s-triazine; wherein the copolymer i) comprises the monomers acryloyloxyethyl trimethylamine chloride and acrylamide and ii) has a reduced viscosity of 21 to 30 dL/g.

5,437,793

## COAGULANT FOR OIL GLYCERIDE/ISOBUTYL METHACRYLATE COMPOSITION AND METHOD OF USE

Hal Alper, Brooklyn, N.Y., assignor to Mansfield & Alper, Inc., Gainesville, Ga.

Filed Jun. 8, 1993, Ser. No. 74,114

Int. Cl.<sup>6</sup> B01J 13/00; C02F 1/54, 1/56

U.S. Cl. 210—728

6 Claims

1. A composition comprising the product of a synthesis process between 72–77% of a glyceride and 23–28% of a polymer; and
- 45–55% solvent, wherein said polymer is poly(isobutyl methacrylate).
4. A method of using a composition to coagulate oil that has been spilled on water comprising the steps of:
  - (a) applying a composition manufactured from linseed oil, poly(isobutyl methacrylate), and 2, 2, 4-trimethyl-1, 3-pentanediol monoisobutyrate to oil that has been spilled on water such that the percentage of said composition to said spilled oil ranges from 5–15%; and
  - (b) allowing said composition and spilled oil to admix such that said composition coagulates said spilled oil.
5. The method of claim 4 wherein said coagulated oil is mechanically removed from the water.

5,437,794

## HYDROCYCLONE WITH TURBULENCE CREATING MEANS

Roine Anderson, Järfälla, Sweden, assignor to Cellico Hed-mora AB, Stockholm, Sweden

PCT No. PCT/SE92/00814, § 371 Date Jan. 1, 1994, § 102(e) Date Jan. 1, 1994, PCT Pub. No. WO93/10908, PCT Pub. Date Jan. 10, 1993

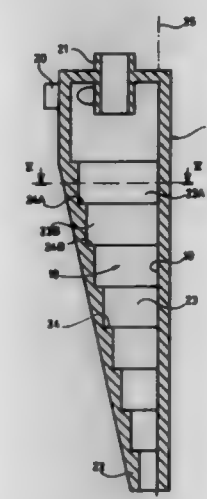
PCT Filed Nov. 26, 1992, Ser. No. 244,699

Claims priority, application Sweden, Dec. 2, 1991, 9103569

Int. Cl.<sup>6</sup> B01D 21/20

U.S. Cl. 210—512.1

8 Claims



1. A hydrocyclone for separating a liquid mixture into a heavy fraction and a light fraction, comprising a housing forming an elongated separation chamber with a circumferential wall and two opposed ends, an inlet member for supplying a liquid mixture tangentially into the separation chamber at one end of the separation chamber, a first outlet member for discharging separated heavy fraction from the separation chamber at the other end of the separation chamber, a second outlet member for discharging separated light fraction from the separation chamber, means for supplying the liquid mixture to the separation chamber via the inlet member, so that during operation a liquid stream is generated along a helical flow path having a central axis in the separation chamber, said helical flow path having a central axis in the separation chamber.

path extending from the inlet member to said first outlet member for heavy fraction, and at least one turbulence creating member, which extends in the separation chamber along the circumferential wall and crosses said helical path,

wherein immediately upstream of the turbulence creating member in said flow path in the separation chamber the circumferential wall has a smooth surface extending along a first zone of the circumferential wall which is situated at a substantially constant distance from said central axis for at least a fifth of the circumference of the separation chamber,

wherein the turbulence creating member is formed by an offset on the circumferential wall which offset extends from said first zone of the circumferential wall to a second zone of the circumferential wall situated at a greater distance from the central axis of the helical flow path than the first zone, the second zone extending forward from the offset in the flow direction of said helical flow path, the offset being formed and dimensioned so that during operation said liquid stream substantially loses its contact with the circumferential wall, as the liquid stream passes the offset, whereby turbulence is created in a layer of the liquid stream situated closest to the circumferential wall, without the liquid stream forming any substantial flow component directed toward said central axis.

5,437,795

# CHROMATOGRAPHIC SEPARATION OF ERBIUM ISOTOPES

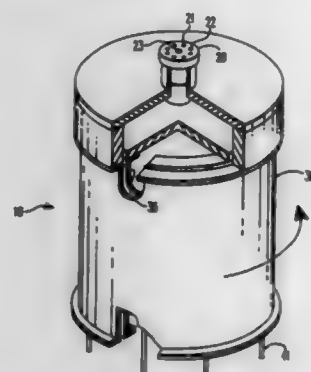
Thomas S. Snyder, Oakmont; Steven H. Peterson; Umesh P. Nayak, both of Murrysville, and Richard J. Beleski, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 23, 1994, Ser. No. 264,810

Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—635

13 Claims



1. A continuous chromatographic process for the simultaneous separation of each isotope of erbium in a sample containing a mixture of erbium isotopes to produce substantially pure fractions of each separated isotope, wherein said process includes the steps of:

- loading a chromatographic separation column having an effective length sufficient to resolve each said erbium isotope into a distinct product fraction having a purity greater than about 50% with a cation exchange resin having an affinity for erbium cations; said resin having a solid to liquid separation factor in excess of about 1.02 in acid solutions of less than about 7-8 Normal;
- preparing an aqueous feed solution of ionic erbium from said sample having a pH of between about 0 and 5 and a solubility limit of about 40 g/l;
- preparing an eluant capable of displacing erbium ions from said exchange resin, wherein said eluant is an aqueous solution of a strong mineral acid having a normality greater than about 1N;
- feeding said aqueous erbium feed solution to the top of

said loaded chromatographic separation column so that said feed solution begins to travel down said column;

- feeding said mineral acid eluant to the top of said column to cause each of the erbium isotopes in said feed solution to pass downwardly through said column at a different speed; and
- collecting a separate erbium isotope containing product fraction having an isotope purity greater than 50% at the bottom of said column for at least one of the isotopes present in said sample.

5,437,796

# PLATE MODULE AND ITS USE FOR SEPARATING FLUID MIXTURES

Hartmut E. A. Bruschke, Kurpfalzstrasse 64, 6907 Nussloch; Raif Abouchar, Feldmannstrasse 7, 6600 Saarbrücken; Hartmut Ganz, Bexbacherstrasse 38, 6680 Neunkirchen, all of Germany; Joel Huret, 55, rue des Melezes, 57070 Metz-Valières, France, and Frank Marggraff, Ehrlichstrasse 9, 6650 Bad Homburg, Germany

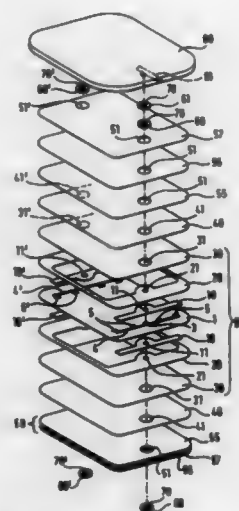
Filed Jul. 22, 1993, Ser. No. 94,966

Claims priority, application Germany, Jul. 29, 1992, 42 25 060.9

Int. Cl.<sup>6</sup> B01D 61/36

U.S. Cl. 210—640

7 Claims



1. An apparatus for the separation of fluid mixtures into a retentate and a permeate, comprising:

- a feed plate having two opposite major planar surfaces and two opposite sides each having at least one opening, each said opening of said feed plate being connected to at least one distribution duct with outlets formed in a said major planar surface;
- a cover plate respectively covering a said distribution duct on each of said major planar surfaces of said feed plate, said cover plates each comprising at least one opening which coincides with said openings of said feed plate, said cover plates not covering said outlets;
- a gasket being positioned on each of said major planar surfaces of said feed plate, the outer dimensions of said gaskets coinciding with the outer dimensions of said feed plate, and the inner dimensions of said gaskets coinciding with the inner dimensions of said cover plates at those sides where said gaskets are covering said cover plates, each said gasket including openings coinciding with said openings of said feed plate and said cover plates;
- a membrane having a feed surface and a permeate surface, the feed surface of each said membrane facing a major planar surface of said feed plate, said gasket being interposed between said feed surface and the major planar surface of the feed plate to form a feed compartment between said feed surface and said major planar surface,

each said membrane having openings concentric to said openings of said feed plate, said openings of said cover plates, and said openings of said gaskets, and said openings of said membranes having diameters larger than said openings of said feed plate, said cover plates, and said gaskets; a permeate compartment each comprising a first perforated plate, a second perforated plate, and a spacer interposed between said perforated plates, each said first and second perforated plates and said interposed spacer having openings coinciding with said openings of said membranes; a ring in each of the coinciding openings of said perforated plates and said spacer and said openings of said membranes, the outer diameters of said rings equalling the diameters of said openings of said membranes, said perforated plates and said spacers, and the inner diameters of said rings equalling diameters of the coinciding openings of said feed plate, said openings of said cover plates, and said openings of said gaskets, wherein said rings are contacting said gaskets;

each said ring having a thickness equalling the sum of the thicknesses of said permeate compartment formed by said perforated plates and said interposed spacer, plus two times the thickness of one said membrane;

at least one supply duct and at least one removal duct each being formed by an inner lumen of said rings, said rings leading through said permeate compartments and being sealed against said permeate compartments, said supply and removal ducts being connected via said distribution ducts and said outlets with the interior of said feed compartment;

said gasket sealing said feed surfaces of said membranes as well as said supply and removal ducts against said permeate compartments; and,

a drainage fabric adjacent said permeate side of each said membrane, said drainage fabrics having outer shape dimensions equalling those of said membrane, and openings equalling and coinciding with openings of said membranes, each said drainage fabric being interposed between said permeate surface of one said membrane and one said perforated plate of said permeate compartment; whereby said permeate exits said permeate compartments through open peripheral edges of said spacers.

5,437,797

# MERCURY REMOVAL FROM WASTE WATER

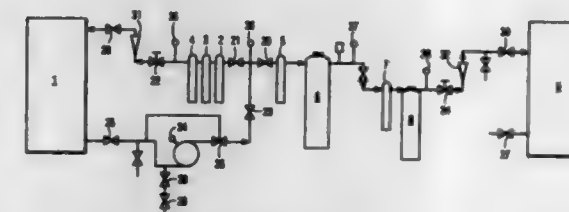
Edward G. Helmig, Harleysville, Pa., assignor to American Home Products Corporation, Madison, N.J.

Filed Jun. 14, 1994, Ser. No. 259,764

Int. Cl.<sup>6</sup> C02F 9/00

U.S. Cl. 210—669

7 Claims



1. A process for removal of mercury from an aqueous effluent stream containing organic and inorganic mercury contaminants produced in a biological vaccine production facility, which consists essentially in:

- removing solids from said effluent stream in excess of about five millimicrons in size by filtration through one or more molecular sieve filters providing pore sizes from about 100 millimicrons to about 1 millimicron;
- adjusting the pH of the effluent stream to about 6 or below if it is above pH6;
- decolorizing the effluent stream with activated carbon;
- removing both organic and inorganic mercury compounds with a macroporous, cross-linked polystyrene

chelating resin having polyisothiuronium functional groups.

5,437,798

# PURIFICATION OF SALT-CHARGES WASTE WATER BY WET OXIDATION UNDER SUPER-CRITICAL CONDITIONS

Hans L. LaRoche; Markus Weber, both of Zürich, and Best Zehnder, Dübendorf, all of Switzerland, assignors to Sulzer Chemtech AG, Winterthur, Switzerland

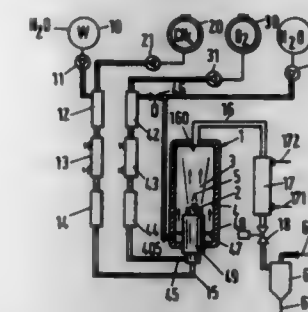
Filed Feb. 22, 1994, Ser. No. 199,864

Claims priority, application European Pat. Off., Feb. 2, 1993, 93810129

Int. Cl.<sup>6</sup> C02F 1/72

U.S. Cl. 210—761

19 Claims



1. A process of purifying waste water including organic matter by wet oxidation under supercritical conditions comprising the steps of preheating the water, mixing the water with a fuel to form a water-fuel combined mixture, directing the mixture and an oxygenous fluid to a supercritical zone formed in a central region of a tubular reactor, surrounding the supercritical zone with a by-pass flow formed of cooling water to thereby form a subcritical zone surrounding the supercritical zone, reacting the combined mixture and oxygenous fluid in the supercritical zone so that a flame is formed, entraining reaction products formed in the reactor in the cooling water, and removing the cooling water and reaction products therein from the reactor.

5,437,799

# METHOD AND INTERFACE VALVE FOR SEPARATING A FLUID

Gerhard Kissler, Posener Strasse 90, 93057 Regensburg, Germany

PCT No. PCT/EP92/00108, § 371 Date Nov. 29, 1993, § 102(e) Date Nov. 29, 1993, PCT Pub. No. WO92/14953, PCT Pub. Date Sep. 3, 1992

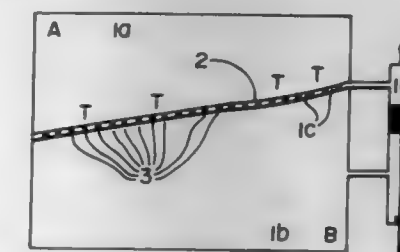
PCT Filed Jan. 20, 1992, Ser. No. 107,666

Claims priority, application Germany, Feb. 15, 1991, 41 04 741.9

Int. Cl.<sup>6</sup> B01D 17/00

U.S. Cl. 210—767

6 Claims



1. A method for the separation of fluids comprising the steps of: inserting a separating fluid (1c) into an existing body of fluid



to form a separating layer (T) between a first quantity (1a) of said body of fluid and a second quantity (1b) of said body of fluid so that said separating layer (T) causes separation of said first and second quantities by interface tension therebetween;

said separating fluid (1c) being inserted by transferring said separating fluid (1c) with a pumping mechanism to a support (2) which is positioned at a location where said separating layer (T) is formed, said support including at least one channel hole (3) between said first and second quantities of said body of fluid;

said separating fluid (1c) being transferred to said support (2) so that said separating fluid at least partially enters and seals or narrows said at least one channel hole (3), thereby preventing said first and second quantities of said body of fluid from penetrating said at least one channel hole.

5,437,800

# METHOD OF PROCESSING A SIDESTREAM WITH A HYDROCYCLONE

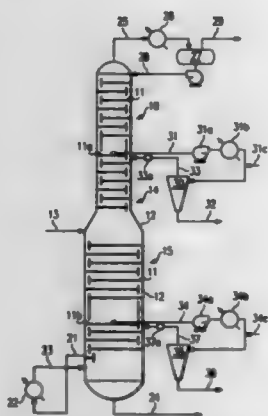
Derek T. White-Stevens, Fairview, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 25, 1993, Ser. No. 140,931

Int. Cl.<sup>6</sup> B01D 11/60, 21/26

U.S. Cl. 210—787

10 Claims



1. A method of processing a multi-component stream from a separation tower which is comprised of a vertical column having a plurality of vertically-stacked, horizontal trays therein which form coexisting zones therebetween wherein said stream includes an unwanted component, said method comprising:

withdrawing said multi-component sidestream including said unwanted component from one of said coexisting zones at a first vertical point along said separation tower; passing said multi-component sidestream including component through a hydrocyclone to substantially separate said unwanted component from said multi-component sidestream; and

passing the components remaining in said multi-component sidestream without further separation back into a different one of said coexisting zones of said separation tower at a second vertical point along said separation tower.

5,437,801

# AQUEOUS EMULSIONS CONTAINING FATTY ACID ESTERS OF N-METHYL-N,N,N-TRIHYDROXYETHYL AMMONIUM METHYL SULFATE

Harald Lüders, Darmstadt-Eberstadt; Kurt Kosswig, Marl, and Hauke Steinhardt, Herne, all of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Continuation of Ser. No. 814,475, Dec. 30, 1991, abandoned.

This application Nov. 2, 1993, Ser. No. 144,501

Claims priority, application Germany, Jan. 17, 1991, 41 01 251.8

Int. Cl.<sup>6</sup> C11D 1/46; D06M 13/228

U.S. Cl. 252—8.8

6 Claims

1. In a concentrated aqueous emulsion which has a viscosity ranging from 100 to 15 mpa.s at 25° C. and which is stable in storage, consisting of:

- (1) water,
- (2) from 0.1 to 2% calcium chloride, relative to the water content of the emulsion,
- (3) from 15% by weight up to 25% by weight of a fatty acid ester of N-methyl-N,N,N-trihydroxyethyl ammonium methyl sulfate, wherein the esterifying fatty acid component of the fatty acid ester of N-methyl-N,N,N-trihydroxyethyl ammonium methyl sulfate is selected from the group consisting of hydrogenated tallow fatty acid, partially hydrogenated tallow fatty acid, stearic acid and mixtures thereof, wherein said fatty acid ester of N-methyl-N,N,N-trihydroxyethyl ammonium methyl sulfate is esterified to an extent ranging from 1.1 to 1.7 fatty acid groups per molecule of said N-methyl-N,N,N-trihydroxyethyl ammonium methyl sulfate and wherein the fatty acid ester is prepared by reacting fatty acid, optionally with fatty acid alkyl ester, and triethanolamine, and then reacting the product obtained with dimethylsulfate, and
- (4) at least one member selected from the group consisting of perfumes, synthetic and natural dyes and pigments wherein the composition does not coalesce.

5,437,802

# LUBRICATING COMPOSITION FOR HOT-ROLLING STEEL

Ryuro Kurahashi; Takahiko Kouga, both of Muroran; Masataka Shirata, Kanagawa; Masayoshi Sakakibara, Fujisawa, and Hiroshi Kamiyashiki, Chigasaki, all of Japan, assignors to Nippon Steel Corporation and Kyodo Yushi Co., Ltd., both of Tokyo, Japan

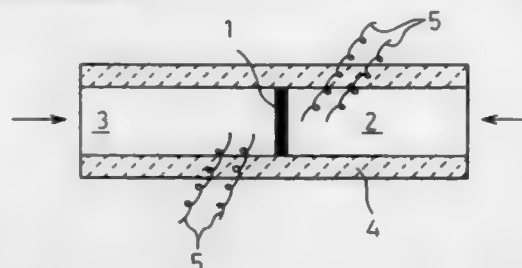
Continuation of Ser. No. 915,403, Jul. 20, 1992, abandoned, which is a continuation of Ser. No. 465,092, filed as PCT/USJP89/00591, Jun. 13, 1989, published as WO89/12669, Dec. 28, 1989, abandoned. This application Jun. 28, 1994, Ser. No. 266,784

Claims priority, application Japan, Jun. 14, 1988, 63-144588; May 26, 1989, 1-134323

Int. Cl.<sup>6</sup> C01M 141/06

U.S. Cl. 252—18

3 Claims



1. A lubricating composition for hot-rolling steel, which consists essentially of a base oil or base grease; a combination of heat-insulating agents (A) and (B), in which the heat-insulating agent (A) is an inorganic compound which is melted by an absorption of heat at a temperature lower than 1200° C., and the heat-insulating agent (B) is an inorganic powder which is not melted or decomposed at a temperature lower than 1200° C.

C. and has a heat conductivity lower than 0.01 cal/cm.s. °C. at room temperature and a friction coefficient smaller than 0.7; an extreme pressure additive; and a solid lubricant,

wherein said combination of heat-insulating agents (A) and (B) is selected from the group consisting of a combination of a condensed phosphoric acid salt as (A) and silicon nitride as (B); a combination of a condensed phosphoric acid salt as (A) and amorphous carbon as (B); a combination of a condensed phosphoric acid salt as (A) and silicon dioxide as (B); and a combination of sodium chloride as (A) and silicon nitride as (B).

said extreme pressure additive is selected from the group consisting of zinc dialkyldithiophosphate, tricresyl phosphate and sulfurized lard,

said solid lubricant is selected from the group consisting of graphite, molybdenum disulfide, mica and a melamine/cyanuric acid adduct, and

said heat-insulating agents (A) and (B) are contained in the composition in a weight ratio of from 49/1 to 1/49 and in a total amount of 5 to 50% by weight of the composition.

5,437,803

# PROCESS FOR THE PRODUCTION OF A LUBRICATING OIL ADDITIVE CONCENTRATE

Charles Cane, Hull; John Crawford, Surrey, and Patrick S. O'Connor, Hull, all of England, assignors to BP Chemicals (Additives) Limited, London, England

Continuation of Ser. No. 713,532, Jun. 5, 1991, abandoned, which is a continuation of Ser. No. 363,550, Jun. 8, 1989, abandoned. This application Jul. 22, 1993, Ser. No. 96,061

Claims priority, application United Kingdom, Jun. 14, 1988, 14010

The portion of the term of this patent subsequent to Nov. 10, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> C10M 159/12

U.S. Cl. 252—33.2

4 Claims

1. A process for the production of a lubricating oil additive concentrate which process comprises reacting at elevated temperature in the absence of CO<sub>2</sub>

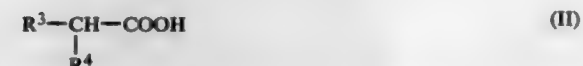
component (A) at least one compound or sulphurised derivative thereof, said compound being (i) a hydrocarbyl-substituted phenol, (ii) a hydrocarbyl-substituted sulphonic acid, (iii) a hydrocarbyl-substituted salicylic acid, or (iv) a hydrocarbyl-substituted naphthenic acid, component (B) a calcium base added either in a single addition or in a plurality of additions during the reaction, component (C) at least one compound which is (i) water, (ii) a polyhydric alcohol having 2 to 4 carbon atoms, (iii) a di-(C<sub>3</sub> or C<sub>4</sub>) glycol, (iv) a tri-(C<sub>2</sub>—C<sub>4</sub>) glycol, (v) a mono- or poly-alkylene glycol ether of the formula (I)



wherein R is a C<sub>1</sub> to C<sub>6</sub> alkyl group, R<sup>1</sup> is an alkylene group, R<sup>2</sup> is hydrogen or a C<sub>1</sub> to C<sub>6</sub> alkyl group and x is an integer from 1 to 6, (vi) a C<sub>1</sub> to C<sub>20</sub> monohydric alcohol, (vii) a C<sub>1</sub> to C<sub>20</sub> ketone, (viii) a C<sub>1</sub> to C<sub>10</sub> carboxylic acid ester, or (ix) a C<sub>1</sub> to C<sub>20</sub> ether,

component (D) a lubricating oil,

component (E) at least one compound which is (i) a carboxylic acid or an acid anhydride, or ester thereof, said acid having the formula (II)



wherein R<sup>3</sup> is a C<sub>10</sub> to C<sub>24</sub> alkyl or alkenyl group and R<sup>4</sup> is hydrogen, a C<sub>1</sub> to C<sub>4</sub> alkyl group or a CH<sub>2</sub>COOH group, or (ii) a di- or poly-carboxylic acid containing from 36 to 100 carbon atoms or an acid anhydride, acid chloride or ester thereof, and

component (G) which is at least one compound which is an ammonium alkanoate or a mono-, di-, tri- or tetra-alkyl ammonium formate or alkanoate, said component (E) is

present in an amount up to 60% by weight of the total weight of component (A) and component (E), said total weight of component (A) and component (E) being that required to satisfy an equivalent ratio of component (B) to component (A) plus component (E) of not greater than about one.

5,437,804

# SOLID POLYMER ELECTROLYTE

Takakazu Yamamoto, Yokohama, Japan, assignor to Yuasa Corporation, Takatsuki, Japan

Continuation-in-part of Ser. No. 837,103, Feb. 18, 1992,

abandoned, which is a continuation of Ser. No. 410,855, Sep. 22, 1989, abandoned. This application May 25, 1993, Ser. No. 66,935

Int. Cl.<sup>6</sup> H01M 4/88

U.S. Cl. 252—62.2

5 Claims

1. A solid polymer electrolyte which consists of a lithium salt in polyvinyl alcohol and an adduct of said lithium salt and a non-aqueous polar solvent, said lithium salt being present in an amount such that the number of moles thereof is 0.10 to 0.60 the number of moles of hydroxyl groups in said polyvinyl alcohol, said polyvinyl alcohol having a proportion of saponification from 80% to 100% and a molecular weight of 8,000 to 50,000, and said polyvinyl alcohol constituting 38 to 80% by weight of said solid polymer electrolyte.

2. A solid polymer electrolyte which consists of a lithium salt in polyvinyl alcohol, an adduct of said lithium salt and a non-aqueous polar solvent, and a polyether, said lithium salt being present in an amount such that the number of moles thereof is 0.10 to 0.60 the number of moles of hydroxyl groups in said polyvinyl alcohol, said polyvinyl alcohol having a proportion of saponification from 80% to 100% and a molecular weight of 8,000 to 50,000, and said polyvinyl alcohol constituting 38 to 80% by weight of said solid polymer electrolyte.

5,437,805

# PARTICLES CONTAINING IRON CARBIDE

Takuya Arase, Settsu; Yoshiyuki Shibuya, and Shigeo Daimon, both of Osaka, all of Japan, assignors to 501 Daiken Industries Ltd., Osaka, Japan

Continuation of Ser. No. 864,729, Apr. 7, 1992, abandoned, which is a division of Ser. No. 758,370, Sep. 10, 1991, abandoned,

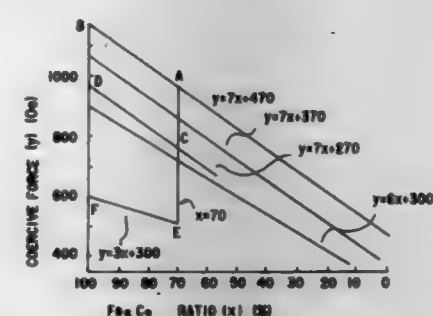
which is a continuation of Ser. No. 596,619, Oct. 12, 1990, abandoned, which is a continuation of Ser. No. 342,512, Apr. 24, 1989, abandoned, which is a division of Ser. No. 944,163, Dec. 22, 1986, Pat. No. 4,900,464. This application Oct. 12, 1993, Ser. No. 134,873

Claims priority, application Japan, Dec. 24, 1985, 60-290989; Jul. 4, 1986, 61-158369; Sep. 8, 1986, 61-211200

Int. Cl.<sup>6</sup> C01B 31/30

U.S. Cl. 252—62.51

5 Claims



1. Acicular particles having a coercive force of about 600 to about 700 Oe and a saturation magnetism of about 85 to about 95 emu/g, which particles contain iron carbide of the formula Fe<sub>3</sub>C<sub>2</sub>, which particles are obtained by heating an aqueous dispersion of ferric hydroxide under alkaline conditions with



an effective amount of a water-soluble compound capable of coordinating to iron, which is necessary to control the direction and speed of growth of acicular particles of  $\alpha$ -ferric oxide, to obtain an acicular  $\alpha$ -ferric oxide product, said heating being to a temperature high enough so that substantially no branched particles are obtained; and contacting said acicular  $\alpha$ -ferric oxide product with a carbon-containing reducing-and-carburizing agent, or with a mixture of said carbon containing reducing and carburizing agent and a carbon-free reducing agent under conditions sufficient to convert  $\alpha$ -ferric oxide product to iron carbide.

5,437,806

## ELECTORHEOLOGICAL FLUIDS CONTAINING POLYANILINES

Charles P. Bryant, Euclid; Kasturi Lal, Willoughby, and Joseph W. Piolet, Euclid, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 774,398, Oct. 10, 1991, abandoned. This application Dec. 14, 1993, Ser. No. 167,592. The portion of the term of this patent subsequent to Jul. 25, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> C10M 171/00, 169/04

U.S. Cl. 252-77

55 Claims

1. A non-aqueous electrotheological fluid which comprises a hydrophobia; liquid phase and at least about 15 percent, by weight of the composition of a dispersed particulate phase of a polyaniline prepared by polymerizing aniline, using about 1 to about 2 moles of an oxidizing agent per mole of aniline to effect polymerization thereof, wherein the oxidant is added to the aniline, and from about 0.1 to about 1.2 moles of an acid per mole of aniline to form an acid salt of polyaniline, and thereafter treating the acid salt with a base in an amount and for a period of time sufficient to remove at least a portion of the acidic protons therefrom.

5,437,807

## REDUCED RESIDUE HARD SURFACE CLEANER

Aram Garabedian, Jr., Fremont; Scott C. Mills, Livermore, and William P. Sibert, Stockton, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 832,275, Feb. 7, 1992, Pat. No. 5,252,245. This application Oct. 8, 1993, Ser. No. 134,349. The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> C11D 1/50, 3/26

U.S. Cl. 252-153

12 Claims



1. An aqueous, hard surface cleaner with significantly improved residue removal and substantially reduced filming/streaking, said cleaner consisting essentially of:

- an effective amount of a solvent selected from  $C_{1-6}$  alcohol,  $C_{3-24}$  alkylene glycol ether, and mixtures thereof;
- an effective amount of a surfactant selected from amphoteric and anionic surfactants, and mixtures thereof, wherein the effective amount for the amphoteric surfactant is about 0.005-2% and for the anionic surfactant is

- about 0.001-1%, and, optionally, a further nonionic surfactant in an effective amount of about 0.75%;
- about 0.01-2% of a buffering system which comprises a nitrogenous buffer which is either ammonium or alkaline earth carbamate; and
- the remainder as substantially all water.

5,437,808

## NONFLAMMABLE MILD ODOR SOLVENT CLEANER

Henry J. Weltman, and Tony L. Phillips, both of Fort Worth, Tex., assignors to Lockheed Corporation, Fort Worth, Tex.

Continuation-in-part of Ser. No. 927,921, Aug. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 743,258, Aug. 9, 1991, Pat. No. 5,188,754, which is a continuation-in-part of Ser. No. 686,180, Apr. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 614,228, Nov. 15, 1990, abandoned. This application Jul. 15, 1993, Ser. No. 92,209. Int. Cl.<sup>6</sup> C23G 5/032; G11D 7/50; C09D 9/00

U.S. Cl. 252-170

5 Claims

1. An organic cleaning formulation, comprising: ethyl lactate, isoparaffins of isoundecane (C11) and isododecane (C12), and a stabilizing agent comprising propylene glycol propyl ether for causing said ethyl lactate and said isoparaffins to be miscible; said ethyl lactate is present in a concentration range of about 50-70% by volume; said isoparaffins are present in a concentration range of about 15-25% by volume; and said propylene glycol propyl ether is present in a concentration range of about 10-25% by volume.

5,437,809

## SHAMPOO COMPOSITIONS WITH DIMETHICONE COPOLYOLS

Dwaipayan Chaudhuri, deceased, late of Windsor, Great Britain by Sheila Chaudhuri, legal representative, assignor to The Gillette Company, Boston, Mass.

PCT No. PCT/US91/09245, § 371 Date Sep. 9, 1993, § 102(e) Date Sep. 9, 1993, PCT Pub. No. WO92/10990, PCT Pub. Date Jul. 9, 1992

PCT Filed Dec. 11, 1991, Ser. No. 74,821

Claims priority, application United Kingdom, Dec. 18, 1990, 9027363

Int. Cl.<sup>6</sup> C11D 1/02, 1/82, 1/83, 1/94

U.S. Cl. 252-174.15

7 Claims

1. A conditioning shampoo composition which comprises in percent by weight in water 10 to 20% of one or more anionic surfactants, 1 to 5% of one or more amphoteric surfactants, 0.5 to 2.0% of one or more quaternary ammonium surfactants, 0.5 to 4.0% of one or more non-ionic emulsifiers having an HLB of from 8 to 12, and 0.1 to 4.0% of one or more dimethicone copolyols having from 60 to 140  $SiO_2$  units and an ethylene oxide/propylene oxide (EO/PO) ratio of from 20/80 to 80/20.

5,437,810

## AQUEOUS LIQUID DETERGENT COMPOSITIONS CONTAINING OXIDIZED POLYSACCHARIDES

Eric Ewbank, Brussels; Geneviève Jonlet, Hermalle, and Hoi-Chau Cao, Liege, all of Belgium, assignors to Colgate-Palmolive Co., New York, N.Y.

Filed Apr. 26, 1994, Ser. No. 233,661

Int. Cl.<sup>6</sup> C11D 1/12, 1/755, 17/00

U.S. Cl. 252-174.17

22 Claims

1. A heavy duty liquid detergent composition having a viscosity in the range of from about 1,000 to 20,000 cps comprising a homogeneous mixture of:

- at least one water soluble anionic sulfate or sulfonate organic detergent;
- at least one detergent builder;
- from about 1 to about 5% by weight of an oxidized polysaccharide viscosity modifier having an acid index value of from about 1 to 20, expressed as the number of grams of

carboxylic functionality per 100 grams of oxidized polysaccharide;

- from 0 to about 1.5% by weight of an alkali metal salt of an acrylic polymer having a mass molecular weight in the range of from about 500 to 10,000; and
- from about 25 to about 70% by weight of water; said composition further characterized by the fact that it exhibits a lower viscosity than an otherwise identical composition which does not contain said oxidized polysaccharide viscosity modifier.

5,437,811

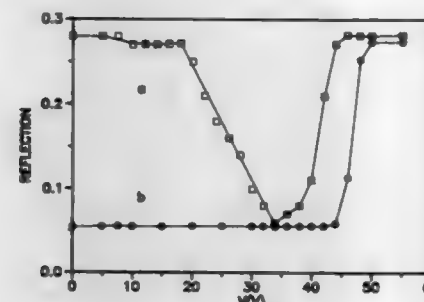
## LIQUID CRYSTALLINE LIGHT MODULATING DEVICE AND MATERIAL

J. William Doane; Deng-ke Yang, both of Kent, and Liang-Chy Chien, Stow, all of Ohio, assignors to Kent State University, Kent, Ohio

Continuation of Ser. No. 694,840, May 2, 1991, abandoned, and a continuation of Ser. No. 885,154, May 18, 1992, Pat. No. 5,384,067. This application Oct. 30, 1992, Ser. No. 969,093. Int. Cl.<sup>6</sup> C09K 19/52; G02F 1/137

U.S. Cl. 252-299.01

21 Claims



1. A light modulating cell comprising liquid crystalline light modulating material of liquid crystal and polymer, the liquid crystal being a chiral nematic liquid crystal having positive dielectric anisotropy and including chiral material in an amount effective to form focal conic and twisted planar textures having a pitch length effective to reflect light outside the visible spectrum, the polymer being distributed in phase separated domains in the cell in an amount that stabilizes the focal conic and twisted planar textures in the absence of a field and permits the liquid crystal to change textures upon the application of a field, and wherein said phase separated domains are formed in the presence of a field such that a proportion of the liquid crystal in the vicinity of the domains is characterized by preferential homeotropic alignment in the absence of a field, and the surrounding regions of liquid crystal are characterized by a light scattering focal conic texture in the absence of a field and an optically clear homeotropic alignment in a field-ON condition.

8. A light modulating cell comprising liquid crystalline light modulating material of liquid crystal and polymer, the liquid crystal being a chiral nematic liquid crystal having positive dielectric anisotropy and including chiral material in an amount effective to form focal conic and twisted planar textures having a pitch length effective to reflect light outside the visible spectrum and cell wall structure treated to align the liquid crystal, the polymer being distributed in phase separated domains in the cell in an amount that stabilizes the focal conic and twisted planar textures in the absence of a field and permits the liquid crystal to change textures upon the application of a field, and wherein the liquid crystal is characterized by an optically clear twisted planar texture in the absence of a field and by a light scattering focal conic texture in a field-ON condition.

5,437,812

## LIQUID CRYSTAL COMPOUNDS HAVING PERFLUOROETHER TERMINAL PORTIONS

Eugene P. Janulis, Mahtomedi; Gilbert C. Johnson, Anoka; Patricia M. Savu; Terence D. Spawa, both of Maplewood, and Marc D. Radcliffe, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 875,223, Apr. 28, 1992, Pat. No. 5,262,082. This application Apr. 16, 1993, Ser. No. 45,283. The portion of the term of this patent subsequent to Nov. 16, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> C09K 19/52, 19/34; C07D 239/02; C07C 43/247; G07F 1/12

U.S. Cl. 252-299.01

7 Claims

1. Fluorine-containing achiral liquid crystal compounds comprising a fluorocarbon terminal portion having at least one catenary ether oxygen located between two fluorocarbons and a hydrocarbon terminal portion, the terminal portions being connected by a central core, the compounds having smectic mesophases or having latent smectic mesophases.

5,437,813

## LIQUID CRYSTAL DISPLAY DEVICE

Mitsuru Akashi, Kagoshima; Haruhiko Itoh, Tokorozawa, and Mikio Murakami, Sakai, all of Japan, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 21, 1993, Ser. No. 171,101

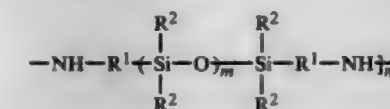
Claims priority, application Japan, Dec. 28, 1992, 4-348551

Int. Cl.<sup>6</sup> C09K 19/56; G02F 1/137

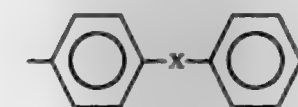
U.S. Cl. 252-197.4

21 Claims

1. A liquid crystal display comprising a liquid crystal layer, which is enclosed, in the sequence starting from the liquid crystal layer, at least on one side by an alignment layer and on both sides by transparent electrodes and substrates, wherein at least one aramide-silicone-multiblock copolymer having the repeating unit represented by the following formula is used as an alignment layer on at least one of the two opposing surfaces of said substrates:



wherein m represents an integer of more than 1 and less than 100; n and x represent an integer of more than 1; A represents para-phenylene group, meta-phenylene group, diphenylene group, naphthylene group, or

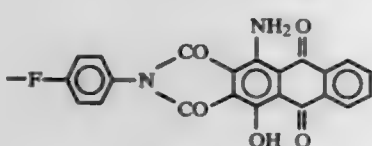
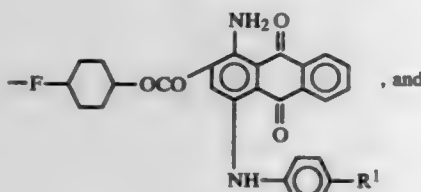
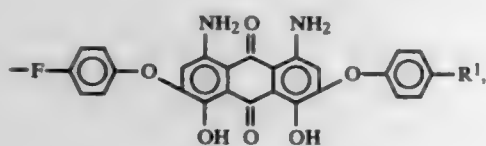
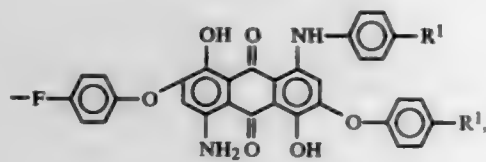
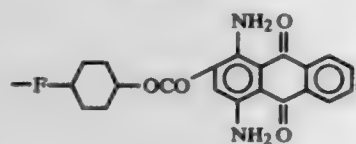
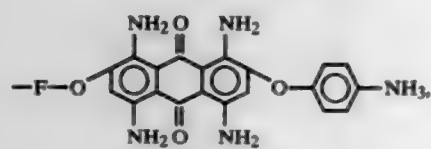
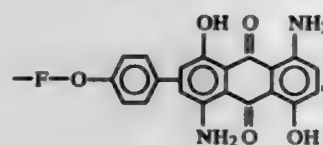
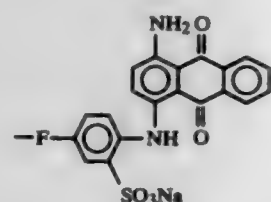
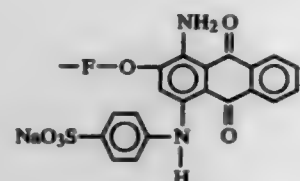
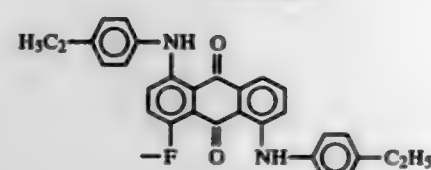


(X represents  $-\text{O}-$ ,  $-\text{SO}_2-$ ,  $-\text{CO}-$ ,  $-\text{S}-$ ,  $-\text{C}(\text{CH}_3)_2-$ ,  $-\text{C}(\text{CF}_3)_2-$ ,  $-\text{SO}-$  or  $-\text{CH}_2-$ ); B represents a bivalent hydrocarbon radical;  $\text{R}^1$  represents a bivalent hydrocarbon radical having 1 to 5 carbon atoms;  $\text{R}^2$  represents a monovalent straight-chain or branched-chain aliphatic hydrocarbon radical having 1 to 5 carbon atoms, an alicyclic hydrocarbon radical or an aromatic hydrocarbon radical; and the content of polysiloxane is 0.2 to 80%.





-continued



wherein F is a linear or branched alkylene group having 1 to 12

carbon atoms and may optionally contain —O—, —COO— or —OCO— in the chain, and R<sup>1</sup> is an alkyl group having 1 to 8 carbon atoms,

letters a, b, and c are numbers in the range: 1 ≤ a < 2, 0 < b + c ≤ 1, 0.45 ≤ b + c ≤ 0.95, and 1 < a + b + c ≤ 3.

#### 5,437,818 HYDRATES OF THE DISODIUM SALT OR DIPOTASSIUM SALT OF 4,4'-BIS(2-SULFOSTYRYL)BIPHENYL

Thomas Ehli, Freiburg, Germany; André Geoffroy, Habsheim, France; Erwin Marti, Basel, Switzerland; Josef Zelger, Riehen, Switzerland; Karlheinz Franke, Basel, Switzerland, and Andreas Burkhard, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 23, 1993, Ser. No. 81,597

Claims priority, application Switzerland, Jun. 30, 1992, 2042/92

Int. Cl.<sup>6</sup> C09K 11/06; C07C 309/01

U.S. Cl. 252—301.21

38 Claims

1. A hydrate of the disodium salt or dipotassium salt of 4,4'-bis(2-sulfostryl)biphenyl whose crystal form is characterized by an X-ray diffraction diagram which is essentially as in Table 1, 2, 3, 5 or 6 or a mixture of hydrates of the disodium salt of 4,4'-bis(2-sulfostryl)biphenyl whose crystal forms are essentially characterized by additive superpositions of the lines according to Tables 2 and 3, as shown in Table 4.

#### 5,437,819 FLUID CONTACTING APPARATUS AND METHODS OF MAKING THE SAME

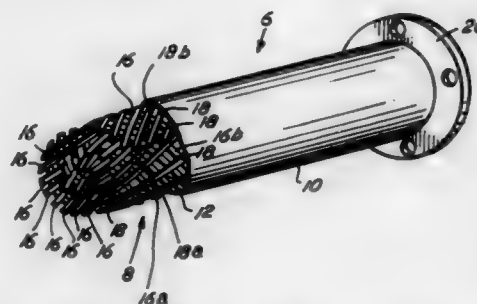
Leslie C. Hardison, Barrington, Ill., assignor to ARI Technologies, Inc., Barrington, Ill.

Filed Jan. 26, 1994, Ser. No. 187,639

Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261—94

5 Claims



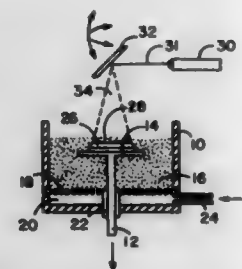
1. An apparatus for use in multi-phase contacting of fluids comprising:

a retaining vessel; and

a substantially cylindrical contactor disposed in the retaining vessel, said contactor formed by coiling a single substantially rectangular sheet of flexible and resilient net-like material into a substantially cylindrical shape, said sheet when in a substantially flat configuration comprising first and second sets of solid unitary plastic parallel ribs, the first set of ribs transverse and intersecting in a diamond pattern with the second set of ribs and the first and second sets of ribs being disposed on opposite sides of a median plane of the sheet, both first and second sets of ribs being fixedly attached where they intersect each other and oriented obliquely with respect to sides of the sheet.

#### 5,437,820 PROCESS FOR MANUFACTURING A THREE-DIMENSIONAL SHAPED PRODUCT Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081 Continuation-in-part of Ser. No. 834,386, Feb. 12, 1992, Pat. No. 5,269,982. This application Dec. 13, 1993, Ser. No. 166,511 Int. Cl.<sup>6</sup> B29C 35/08, 35/10 U.S. Cl. 264—25

19 Claims



1. A process for producing a three-dimensional shaped product comprising the steps of:

- providing a container having a top, a bottom and sides;
- providing a fluidized particle bed in said container made of a plurality of fusible particles, each particle in contact with its immediately adjacent particles in said particle bed, said particle bed having an upper layer of particles;
- providing a base plate having a top that is vertically movable within said particle bed, said base plate positioned immediately below said upper layer of particles;
- providing a heat beam;
- directing said heat beam in a desired pattern onto said upper layer of particles above said base plate;
- melting and fusing together those particles heated by said heat beam;
- allowing said fused particles to solidify into a shape formed in said desired pattern;
- lowering said base plate to a position under said upper layer of said particle bed;
- covering said formed shape by further of said particles moving over said fused particles;
- directing said heat beam in a desired pattern onto said particles covering said previously fused formed shape, said heat beam fusing certain of said particles together with one another and with said fused particles of said formed shape;
- allowing said newly fused shape to solidify on top of said previously fused particles;
- repeating said steps of lowering said base plate and causing further particles to cover said previously fused particles, directing said heat beam in a desired pattern, and allowing said fused particles to solidify as many times as necessary to complete the formation of said three-dimensional shaped product; and
- removing said three-dimensional shaped product from said particle bed.

#### 5,437,821 PROCESS FOR MAKING CARBON-CARBON COMPOSITES BY USING ACETYLENE TERMINATED CONJUGATED SCHIFF'S BASE MONOMERS

Thomas Diberardino, and Vincent J. Castelli, both of Severna Park, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C. Division of Ser. No. 953,353, Sep. 30, 1992, abandoned. This application Sep. 30, 1993, Ser. No. 129,502

Int. Cl.<sup>6</sup> C04B 35/524; B29C 43/52

U.S. Cl. 264—29.1

2 Claims

1. A process for manufacturing a carbon-carbon composite rocket nozzle in a single casting, comprising

- A. placing a woven mat of graphite fibers within a mold which is in the shape of the rocket nozzle;
- B. adding to the mold an acetylene-terminated, aromatic, conjugated Schiff's base monomer of the formula HC=C-

Ar-R-Ar-C≡CH wherein R is selected from the group consisting of —N=CH-Ar'-CH=N—, —N=CH—, and —CH=N-Ar'-N=CH—, wherein Ar and Ar' are independently selected from the group consisting of phenylene, biphenylene, naphthalene, anthracene, phenanthrene, pyrene, alkyl, or aryl substituted phenylene, alkyl or aryl substituted naphthylene, and heterocyclic analogues of the above, and wherein linkages across the phenyl groups are selected from the group consisting of meta-meta-meta, meta-para-meta, and para-meta-para linkages;

C. slowly raising the temperature of the mold to the melting point of the selected monomer and maintaining the temperature for sufficient time for all of the monomer to be melted;

D. slowly raising the temperature of the mold to a temperature slightly below the exothermic transition temperature and maintaining the temperature for a sufficient time for polymerization of the monomer to be completed, thereby forming a green casting in the shape of the rocket nozzle; and

E. slowly raising the temperature of the green casting to a carbonizing temperature in at least one step and maintaining the carbonizing temperature for a sufficient time for complete carbonization of the casting to form the carbon-carbon composite rocket nozzle.

#### 5,437,822 METHOD FOR PRODUCING A SKIN-FORMED POLYURETHANE FOAM MOLDED PRODUCT

Hiroshi Wada, Hisakazu Harada, and Shoji Hayashida, all of Kawasaki, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jan. 26, 1993, Ser. No. 9,096

Claims priority, application Japan, Jan. 29, 1992, 4-038802

Int. Cl.<sup>6</sup> B29C 44/06

U.S. Cl. 264—45.5

18 Claims

1. A method for producing an integral skin-formed polyurethane foam molded product, which comprises reacting a high molecular weight active hydrogen compound containing at least 80% by weight of a polyoxyalkylene polyol having from 2 to 8 hydroxyl groups and a hydroxyl value of from 3 to 60 (mgKOH/g) and consisting essentially of from 20 to 100% by weight of the following component (a) and from 0 to 80% by weight of the following component (b), a chain extender and a polyisocyanate compound in a closed molding tool in the presence of a catalyst and a blowing agent consisting essentially of water, a heat decomposable blowing agent capable of generating a gas upon heat decomposition, an inert gas, or mixtures thereof:

(a) a polyoxyalkylene polyol having from 2 to 8 hydroxyl groups and a hydroxyl value X (mgKOH/g) of 3 ≤ X ≤ 60, provided that when 3 ≤ X ≤ 32.5, the total unsaturated degree Y (meq/g) is Y ≤ 0.04, and when 32.5 ≤ X ≤ 60, X and Y satisfy the relation of the following formula (I):

$$Y \leq 0.9/(X-10) \quad (I)$$

or a polymer-dispersed polyol having such a polyoxyalkylene polyol as matrix,

(b) a polyoxyalkylene polyol other than the above component (a), or a polymer-dispersed polyol having such a polyoxyalkylene polyol as matrix, wherein the skin layer obtained has a thickness of at least 0.5 mm and, wherein the integral-skin polyurethane foam molded product is produced by reaction injection molding using two components, a first component comprising the high molecular weight active hydrogen compound and the chain extender, and a second component containing the polyisocyanate compound.



5,437,823

# METHOD FOR MOLDING A PLASTIC ARTICLE OF VARIOUS DENSITY

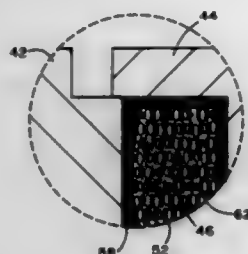
Siebolt Hettings, 2123 NW 111th St., Des Moines, Iowa 50325, and Harold J. Buchl, 4714 EP True Pkwy., #205, West Des Moines, Iowa 50265

Filed Jun. 23, 1993, Ser. No. 82,266

Int. Cl.<sup>6</sup> B29C 44/06, 44/10

U.S. Cl. 264—45.5

8 Claims



1. A method of plastic injection molding a plastic article comprising:

- providing a first mold section;
- providing a second mold section which, when moved into sealed engagement with said first mold section, forms a mold cavity for molding a plastic article;
- mixing a blowing agent with a plastic injection material to form an injection mixture;
- clamping said first mold section and said second mold section together to form said mold cavity of an initial volume;
- maintaining said mold cavity at said initial volume as said injection mixture is injected into said mold cavity until said initial volume of said mold cavity is substantially filled with said injection mixture;
- allowing said injection mixture to cool and form a skin against interior sides of said mold cavity;
- moving said first mold section and said second mold section apart whereby said initial volume of said mold cavities increased to an intermediate volume;
- allowing said injection mixture to expand;
- moving said first mold section and said second mold section together whereby said intermediate volume of said mold cavity is decreased to a compression volume;
- allowing said injection material to cool; and
- removing the finished plastic article from said mold cavity.

5,437,824

# METHOD OF FORMING A MOLDED SILICONE FOAM IMPLANT HAVING OPEN-CELLED INTERSTICES

Daniel A. Carlisle, Santa Barbara; Richard S. Waybright, Lompoc, and Blanca Guillen, Goleta, all of Calif., assignors to Moghan Medical Corp., Santa Barbara, Calif.

Filed Dec. 23, 1993, Ser. No. 172,851

Int. Cl.<sup>6</sup> B29C 44/02

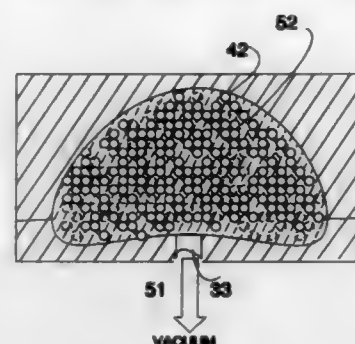
U.S. Cl. 264—50

1 Claim

1. A method for making a foam insert for use with a saline filled breast implant comprising the steps of:

- creating gaseous bubbles within a fluid silicone;
- preheating a mold to 200° to 300° F.;
- injecting said fluid silicone containing said bubbles into a cavity within the preheated mold;
- reducing the external pressure exerted on said fluid silicone within said cavity of said mold below atmospheric pressure;
- curing said fluid silicone by holding the mold at elevated temperature and reduced pressure for 30 to 60 minutes to form a foam insert; and
- removing said foam insert from said cavity in said mold,

wherein the reduced pressure operates to force a portion of said bubbles from said fluid silicone while said fluid



silicone is curing to form said foam insert having open-celled interstices.

5,437,825

# POLYMER PRECURSOR FOR SILICON CARBIDE/ALUMINUM NITRIDE CERAMICS

James A. Jensen, Hockessin, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 4,045, Jan. 15, 1993, which is a division of Ser. No. 836,676, Feb. 13, 1992, Pat. No. 5,229,468. This application Apr. 11, 1994, Ser. No. 226,133

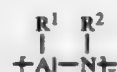
Int. Cl.<sup>6</sup> C04B 35/64

U.S. Cl. 264—56

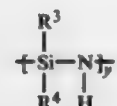
5 Claims

1. In a reaction injection molding process for preparing a sintered ceramic article comprising:

- injecting into a heated mold a mixture comprising at least one powder selected from the group consisting of a ceramic powder and a metal powder, and a curable ceramic precursor binder phase that is a liquid, said powder being present in an amount sufficient to cure the binder phase of said mixture and produce a molded article,
  - heating the molded article to a temperature sufficient to convert the cured binder phase to a ceramic, and
  - sintering the article in the presence of a non-oxidizing atmosphere,
- the improvement comprising using as the curable, liquid ceramic precursor binder phase at least one polymer that contains at least one metallic element within said at least one polymer and forms at least two compositionally distinct ceramics upon pyrolysis under said non-oxidizing atmosphere, wherein said curable ceramic precursor phase comprises at least one block copolymer comprising a multiplicity of blocks of units having the formula



alternating with a multiplicity of blocks of units having the formula



wherein  $x > 1$  and  $y > 1$ ,  $R^1$  and  $R^2$  are the same or different and are selected from the group consisting of hydrogen, substituted or unsubstituted 1-12 carbon alkyl, 3-12 carbon cycloalkyl, 2-12 carbon alkenyl, 3-12 carbon cycloalkenyl, and aryl groups;  $R^3$  and  $R^4$  are the same or different and are selected from the group consisting of hydrogen, substituted or unsubstituted 1-6 carbon alkyl, 3-6 carbon cycloalkyl, 3-6 carbon cycloalkenyl, 2-6 car-

bon alkenyl, 2-6 carbon alkynyl, and aryl groups, provided that  $R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  are not all hydrogen.

5,437,826

# EXTRUSION METHOD

Luciano Martinello, Rovigo, and Giancarlo Colombo, Milan, both of Italy, assignors to ICMA San Giorgio SPA, Italy

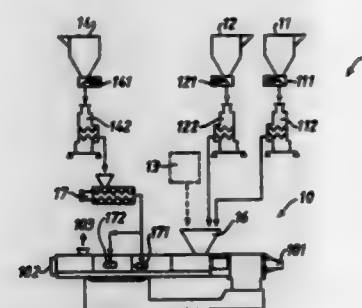
Filed Feb. 2, 1994, Ser. No. 190,462

Claims priority, application Italy, Feb. 5, 1993, MI93A0188

Int. Cl.<sup>6</sup> B29B 7/84; B29C 47/76

U.S. Cl. 264—102

19 Claims



1. A method of extruding a substantially uniform polymer composition which, per each 100 parts of its weight, consists essentially of (A) about 20 to about 95 parts by weight of un compounded particulate polyvinylchloride, (B) about 1 to about 12 parts of weight of a stabilizing additive composition and at least one of two additional constituents, one of which is (C) a mineral filler in an amount of up to about 70 parts by weight and the other of which is (D) a normally liquid plasticizer for said polyvinylchloride in an amount of up to 60 parts by weight; said method comprising the steps of:

- providing an extruding device having
  - an elongated cavity extending from a drive end to an extrusion die end of said device including
  - a pair of essentially isomorphous elongated rotors matchingly fitting into said cavity and being arranged adjacent each other for mutually interpenetrating motion; each of said rotors having a length-diameter ratio in the range of from 24D to 36D and being formed of at least six conservative rotor segments having at least three conveying segment portions as well as at least three kneading segment portions arranged in a longitudinal sequence of alternating conveying and kneading segment portions;
- operating said rotors for essentially synchronous rotation in a common direction at a speed of at least about 10 rotations per minute while maintaining within said cavity a temperature sufficient to plasticize said polyvinylchloride;
- feeding un compounded particulate polyvinylchloride (A) and said additive composition (B) as separate components without substantial premixing of said constituents (A,B) into said cavity at a first inlet provided near said drive end and adjacent a first conveying segment portion of said rotors;
- introducing at least one of said constituents (C) and (D) through at least one second inlet provided downstream of said first inlet and adjacent a rotor section downstream of said first conveying section and downstream of at least one kneading segment section thereby forming a mixture; and thereafter
- degassing said mixture and extruding it through said extrusion die end.

19. A process for continuous production of panels comprising extruding a substantially uniform polymer composition which, per each 100 parts of its weight, consists essentially of (A) about 20 to about 95 parts by weight of un compounded particulate polyvinylchloride, (B) about 1 to about 12 parts by weight of a stabilizing additive composition and at least one of two additional constituents, one of which is (C) a mineral filler

in an amount of up to about 70 parts by weight and the other of which is (D) a normally liquid plasticizer for said polyvinylchloride in an amount of up to 60 parts by weight; said method comprising the steps of:

- providing an extruding device having
  - an elongated cavity extending from a drive end to an extrusion die end of said device including
  - a pair of essentially isomorphous elongated rotors matchingly fitting into said cavity and being arranged adjacent each other for mutually interpenetrating motion; each of said rotors having a length-diameter ratio in the range of from 24D to 36D and being formed of at least six consecutive rotor segments having at least three conveying segment portions as well as at least three kneading segment portions arranged in a longitudinal sequence of alternating conveying and kneading segment portions;
- operating said rotors for essentially synchronous rotation in a common direction at a speed of at least about 10 rotations per minute while maintaining within said cavity a temperature sufficient to plasticize said polyvinylchloride;
- feeding un compounded particulate polyvinylchloride (A) and said additive composition (B) as separate components without substantial premixing of said constituents (A,B) into said cavity at a first inlet provided near said drive end and adjacent a first conveying segment portion of said rotors;
- introducing at least one of said constituents (C) and (D) through at least one second inlet provided downstream of said first inlet and adjacent a rotor section downstream of said first conveying section and downstream of at least one kneading segment section, thereby forming a mixture; thereafter
- degassing said mixture and extruding it through said extrusion die end; and
- forming panels of said extruded mixture.

5,437,827

# MAKING A HEAT RECOVERABLE ARTICLE

Karl-Heinz Marx, Garbsen, Germany, assignor to Kabelmetal Electro, Hanover, Germany

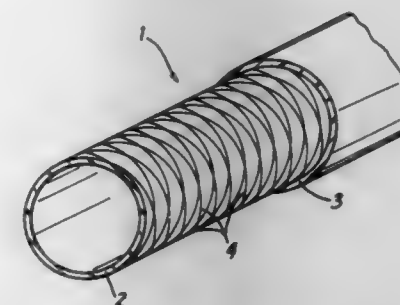
Filed Sep. 10, 1990, Ser. No. 580,837

Claims priority, application Germany, Sep. 8, 1989, 39 29 859.0

Int. Cl.<sup>6</sup> B29C 61/08

U.S. Cl. 264—103

13 Claims



1. Method of making a shrink article, comprising the steps: extruding a robe from a polymeric material; wrapping on said robe a first layer of at least one strand in a helical pattern, the strand having a synthetic polymeric material core and a wrapping wrapped around the core by spinning or braiding of an essentially nonstretchable material such as metal, glass, mineral, cotton, polyester, polyamide; extruding a second polymeric tubular material on top of the first layer and the tube made as per the proceeding steps;

cross linking the material of at least one of the extruded tubes;  
heating or maintaining a temperature above the crystalline melting point of the cross linked tube or tubes;  
expanding the tubular assembly as a whole in the heated state; and cooling the material in the expanded state.

5,437,828

# METHOD FOR MANUFACTURING A SPOOL OF A PHOTOGRAPHIC FILM CASSETTE

Makoto Shimizu; Mitsuru Suzuki; Susumu Sato; Koichi Takahashi, and Toshiro Esaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

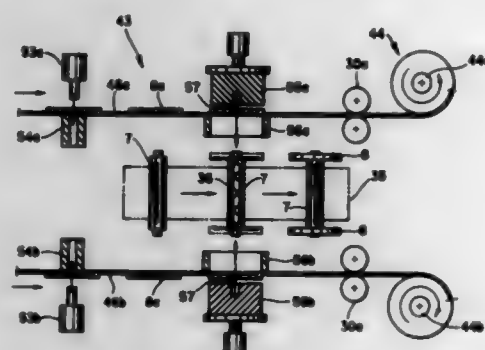
Filed Jun. 24, 1993, Ser. No. 80,515

Claims priority, application Japan, Jun. 24, 1992, 4-166420

Int. Cl.<sup>6</sup> B29C 65/56, 51/10; B26F 1/02

U.S. Cl. 261-152

9 Claims



1. A method of manufacturing a spool of a photographic film cassette wherein said spool is rotatable within a cassette housing and constructed of a spool core for winding a photographic filmstrip thereon and a pair of identical flanges mounted on opposite ends of said spool core, said method comprising the steps of:

forming a plurality of shapes on a sheet of thermoplastic resin, each of said shapes constituting a fundamental construction of said flange, said shapes include an annular circumferential lip, said lip extending axially inwardly to contact with an outer periphery of a roll of said photographic filmstrip coiled about said spool core when said flanges are mounted on the opposite ends of said spool core;

placing said spool core in a first position;

placing one of said shapes formed on said thermoplastic resin sheet in a second position wherein said one of said shapes is coaxial with said spool core placed in said first position; punching holes of said flanges out of said thermoplastic resin sheet in the center of each of said shapes, portions of said spool core extending through said holes when said flanges are mounted on said spool core.

blanking said one of said shapes out of said thermoplastic resin sheet into an individual one of said flanges from said second position in a direction which is toward said spool core which is in said first position; and moving said individual one of said flanges in the blanking direction in succession to said blanking step, to mount said individual one of said flanges onto said spool core.

5,437,829

# METHOD OF FORMING A THREE-DIMENSIONAL DECORATIVE ITEM

Pamela J. Rist, 1200 Ironwood, Normal, Ill. 61761

Filed Feb. 10, 1994, Ser. No. 194,696

Int. Cl.<sup>6</sup> A23L 1/00; B29C 41/03

U.S. Cl. 264-153

12 Claims

1. The method of forming a three-dimensional, self-supporting decorative member comprising the steps of:

forming a blank of flat sheet material having a plastic stage and which can thereafter be hardened, said blank having

an exterior surface and an interior surface and forming a two-dimensional image of the decorative member to be formed;

placing said formed blank in one three-dimensional mold having an interior surface and a plurality of spaced substantially horizontal portions and arranging said blank to seat in said mold and on said horizontal portions with said exterior surface of said blank being substantially aligned with the interior surface of said mold and only said exterior surface of the blanks is in contact with said mold; and said interior blank surface forms a recess in said blank; hardening said blank as it rests in only said one mold; and removing said mold following hardening whereby a three-dimensional, self-supporting, free-standing decorative object having an exterior surface which substantially conforms to the interior surface of said mold, is formed.

5,437,830

# PROCESS OF MAKING A ROD FOR USE IN REINFORCING AN UNDERGROUND ROCK FORMATION

Frank Calandra, Jr., Pittsburgh; John C. Stankus, Canonsburg, and John G. Oldsen, Butler, all of Pa., assignors to Jenmar Corporation, Pittsburgh, Pa.

Division of Ser. No. 4,076, Jan. 13, 1993, Pat. No. 5,314,268.

This application Jan. 3, 1994, Ser. No. 176,724

Int. Cl.<sup>6</sup> B29C 43/14

U.S. Cl. 264-296

3 Claims

1. A method for fabricating a rod for use in reinforcing an underground rock formation comprising the steps of, molding polymeric material to form a reinforcing rod including an elongated shaft having a body portion of substantially uniform cross sectional area along the length thereof,

forming one end portion of the shaft for insertion in a bore hole of an underground rock formation and a second end portion for extending out of the bore hole,

forming integrally of polymeric material on the shaft second end portion a washer element having a semi-spherical surface facing the shaft second end portion, and

forming integrally of polymeric material with the washer element a retainer for receiving torque to transmit rotation to the reinforcing rod when positioned in the bore hole of the underground rock formation.

5,437,831

# PROCESS OF MODIFYING A CABLE END

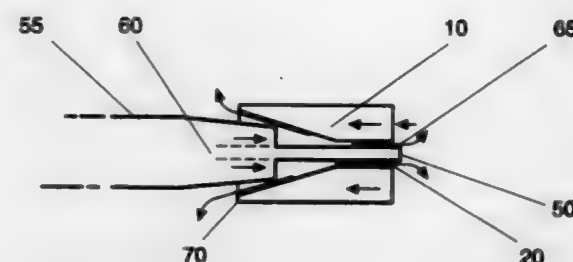
Lars D. Roose, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 4, 1993, Ser. No. 102,184

Int. Cl.<sup>6</sup> B29C 33/10, 67/00

U.S. Cl. 264-322

11 Claims



1. A method for modifying an electrical cable end comprising the steps of:

heating the end of a cable, comprising a conducting core surrounded by a dielectric insulating medium capable of being softened by the application of heat and having an

end, sufficiently to render said dielectric insulating medium malleable,

pressing said heated cable via an inlet into a mold comprising an inlet, a terminus bearing a central orifice, and a receptacle positioned between said inlet and said terminus, pressing such that a portion of said conducting core passes through said central orifice and said malleable dielectric medium is shaped into a desired configuration conforming to the shape of said receptacle,

cooling said cable, and

removing said cable from said mold.

5,437,833

# METHOD OF MODIFYING CERAMIC COMPOSITE BODIES BY A POST-TREATMENT PROCESS AND ARTICLES PRODUCED THEREBY

Terry D. Claar, Newark; Gerhard H. Schiroky, Hockessin, and William B. Johnson, Newark, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 973,449, Nov. 9, 1992, Pat. No. 5,298,051, which is a division of Ser. No. 700,349, May 7, 1991, Pat. No. 5,162,098, which is a continuation of Ser. No. 296,239, Jan. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 137,382, Dec. 23, 1987, Pat. No. 4,915,736. This application Mar. 25, 1994, Ser. No. 218,386

Int. Cl.<sup>6</sup> B22F 7/02; C04B 35/56, 35/58, 35/60

U.S. Cl. 419-2

23 Claims



1. A method of producing at least one self-supporting body, comprising:

(1) producing at least one first composite body by

(a) selecting at least one parent metal comprising at least one metal selected from the group consisting of zirconium, titanium and hafnium;

(b) providing at least one mass comprising boron carbide;

(c) heating said at least one parent metal in a substantially inert atmosphere to a temperature above its melting point to permit infiltration of molten parent metal into said at least one mass and to permit reaction of molten parent metal with said boron carbide to form at least one boron-containing compound; and

(d) continuing said infiltration reaction for a time sufficient to produce said at least one first composite body comprising at least one three-dimensionally interconnected ceramic phase extending to the boundaries of said at least one first composite body, said ceramic phase comprising at least one carbide selected from the group consisting of a carbide of zirconium, a carbide of titanium, and a carbide of hafnium; at least one boride of a metal corresponding to said carbide, said boride having a platelet-like structure; and at least one metal phase comprising about 4.5-40 percent by volume of said at least one first composite body; and

(2) subjecting said at least one first composite body to a post-treatment process, said post-treatment process (a) at least partially reducing the amount of the at least one metal phase in at least one zone or surface of said at least one first composite body to about 0-2 percent by volume of said at least one zone or surface, and (b) maintaining a higher metal content in a core of said at least one first composite body relative to said metal content of said at least one zone or surface, thereby forming said at least one self-supporting body.

5,437,834

# POROUS LIVING BODY REPAIRING MEMBER, AND A METHOD OF IMPARTING ELASTICITY TO IT

Hideaki Okimatsu, and Yasunori Tamura, both of Gamou, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Oct. 7, 1993, Ser. No. 133,655

Claims priority, application Japan, Oct. 8, 1992, 4-270371

Int. Cl.<sup>6</sup> B22F 3/16

U.S. Cl. 419-24

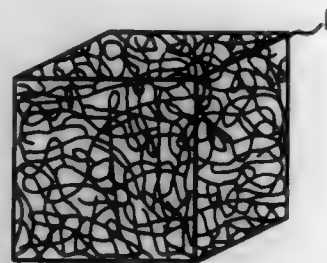
1 Claim

1. A method for imparting elasticity to a porous living body repairing member, comprising:

compression-molding a metal fiber material into a fiber mesh body having a compressive elasticity and a desired shape,



sintering the resulting fiber mesh body in vacuo, imparting a compressive stress of between 4.00 and 40.0 MPa to the fiber mesh body using a compressive load, and adjusting the compressive elasticity of the fiber mesh body to an amount not greater than 2000 MPa,



whereby the fiber mesh body exhibits a permanent deformation rate of not more than 0.1% under a stress below a compressive yield stress substantially equal to the compressive stress.

5,437,835

# CORROSION RESISTANT TI ALLOY CONTAINING CU, SI, AND A PLATINUM GROUP METAL

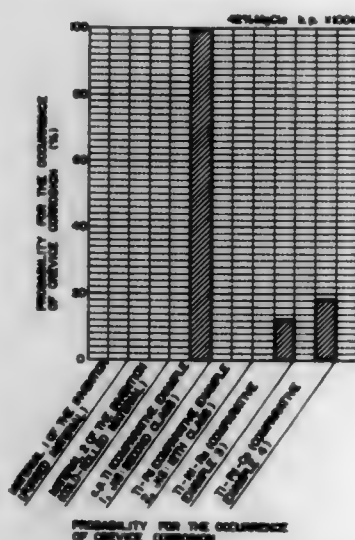
Yasunaki Sugizaki; Keiji Ueda; Hiroshi Satoh; Hidetoshi Nishimoto; Tatsuya Yasunaga; and Takashi Yashiki, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Division of Ser. No. 911,077, Jul. 9, 1992, Pat. No. 5,316,722. This application Jan. 26, 1994, Ser. No. 186,547

Int. Cl.<sup>6</sup> C22C 14/00

U.S. Cl. 420-421

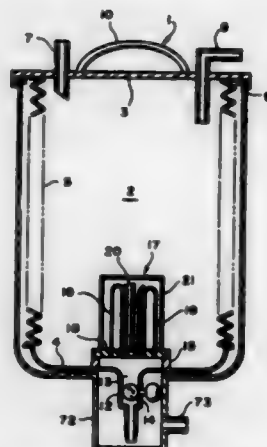
1 Claim



1. A corrosion resistant Ti based alloy comprising: one or more of elements selected from:

Cu: 0.005-1.5 wt % and Si 0.005-1.5 wt %, and further comprising one or more of elements selected from: Ni: 0.005-2.0 wt %, Pd: 0.005-2.0 wt %, Ru: 0.005-2.0 wt %, Pt: 0.005-2.0 wt %, Os: 0.005-2.0 wt %, Ir: 0.005-2.0 wt %, Rh: 0.005-2.0 wt %, and the balance of Ti and inevitable impurities.

5,437,836  
METHOD OF AND CONTAINER FOR TREATING WASTE LIQUID CONTAINING BODY FLUID  
Keiichi Yamada, Sakai, Japan, assignor to Daiken Iki Co., Ltd., Japan  
PCT No. PCT/JP93/00437, § 371 Date Dec. 17, 1993, § 102(e) Date Dec. 17, 1993, PCT Pub. No. WO93/20855, PCT Pub. Date Oct. 28, 1993  
PCT Filed Apr. 2, 1993, Ser. No. 167,821  
Claims priority, application Japan, Apr. 17, 1992, 4-098151  
Int. Cl.<sup>6</sup> B01D 63/02; C02F 9/00; A61M 1/00  
U.S. Cl. 422-1 19 Claims



1. A method of treating a waste liquid containing a body fluid comprising the steps of: sucking and collecting a waste liquid containing a body fluid in a storage container made of synthetic resin; removing a water content in said waste liquid from said storage container through a microporous filter disposed between an interior since of the container and an inlet end of a discharge tube of the container to separate infectious microbes from the water content as it is removed; and discarding said storage container, with the infectious microbes from said waste liquid still within the container, together with said filter; wherein said filter comprises a secondary filter capable of separating infectious microbes and a primary filter for preventing the blocking of said secondary filter, said primary filter being disposed in surrounding relationship to said secondary filter.

5,437,837

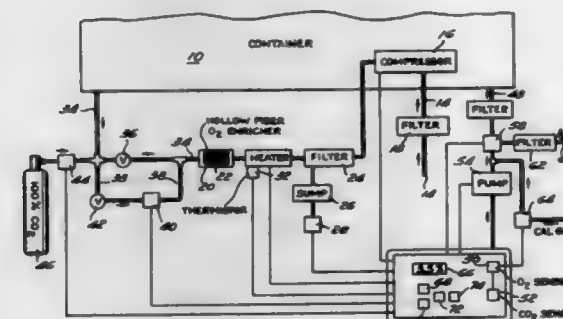
# CONTROLLED ATMOSPHERE STORAGE CONTAINER

Robert J. Olson, Santa Rosa; Max D. Liston, Irvine, and Todd I. Harrison, Santa Ana, all of Calif., assignors to Prolong Systems, Inc., Wilsonville, Oreg.  
Continuation of Ser. No. 968,829, Oct. 29, 1992, Pat. No. 5,332,547, which is a continuation of Ser. No. 686,174, Apr. 16, 1991, abandoned. This application Feb. 8, 1994, Ser. No. 193,799  
The portion of the term of this patent subsequent to Jul. 26, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G05B 15/00; A61L 9/00; B01J 19/00; A01K 43/00  
U.S. Cl. 422-3 19 Claims

1. A controlled atmosphere system, comprising: a sealed transport container; a first inlet line having a first end in fluid communication with ambient air from outside said container and a second end disposed within said container; a compressor having an intake port fluidly coupled to the second end of said first inlet line and an exhaust port; an exhaust line having first and second ends, said first end fluidly coupled to said exhaust port; a gas separation means having an entrance port fluidly cou-

pled to the second end of said exhaust line and having an exit port; a first outlet line having a first end fluidly coupled to said exit port and a second end fluidly coupled to said container for placing said exit port into fluid communication with gas inside said container; a second outlet line having a first end fluidly coupled to said container for receiving gas samples from within said container and a second end disposed outside of said container; a gas analyzing means fluidly coupled to the second end of said second outlet line for determining the oxygen level of gas within said container; and a programmable control means electrically interfaced to said compressor, said gas separation means and said gas analyz-



ing means, said control means being programmed to increase the oxygen level of gas inside said container in response to an electrical signal generated by said gas analyzing means indicating that the oxygen level of the gas within the container as determined from the gas samples is below a predetermined oxygen range, and decrease the oxygen level of the gas inside said container in response to an electrical signal generated by the gas analyzing means indicating that the oxygen level within said container as determined from the gas samples is above the predetermined oxygen range; said compressor being operable to introduce gas into the container in quantities sufficient to internally pressurize the container.

5,437,838

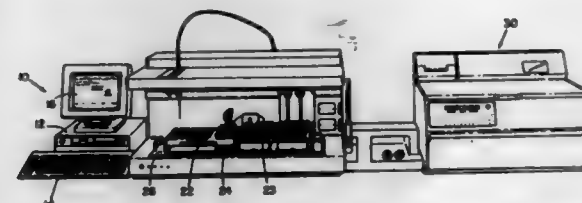
# CLINICAL LABORATORY WORK-FLOW SYSTEM

Victoria E. DeMoranville, Assonet, and James E. Ellis, Mansfield, both of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.  
Continuation of Ser. No. 477,265, Jan. 30, 1990, Pat. No. 5,355,304. This application Jun. 16, 1994, Ser. No. 261,085  
The portion of the term of this patent subsequent to Oct. 11, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G06F 15/00; G01N 35/00

U.S. Cl. 422-67

15 Claims

MICROFICHE APPENDIX INCLUDED  
(400 Microfiche, 6 Pages)

1. A clinical laboratory work-flow system which semi-automates validated immunoassay protocols, said system having components including: a) a controller for directing the operation of said system, said controller comprising: 1) a memory unit having a plurality of computer programs stored therein, each of said programs providing format

instructions for performance of a specific immunoassay protocol; 2) means for selecting a protocol; 3) means for entering the number of test samples to be analyzed by said protocol; 4) means for displaying the format instructions for said protocol, and; b) a robotic test sample transfer device comprising: 1) a planar work-flow surface having a defined coordinate area for receiving and aligning test rack(s) and reaction medium(s); and 2) means for transferring a volume of test sample for each test sample to be analyzed, and a volume of one or more reagent(s) from a reagent source(s) for immunoassay protocols, to a reaction medium for initiating a test reaction, the transfer(s) being in response to format instructions from said controller, and wherein said transfer(s) are free of sample carryover and free of end run effect.

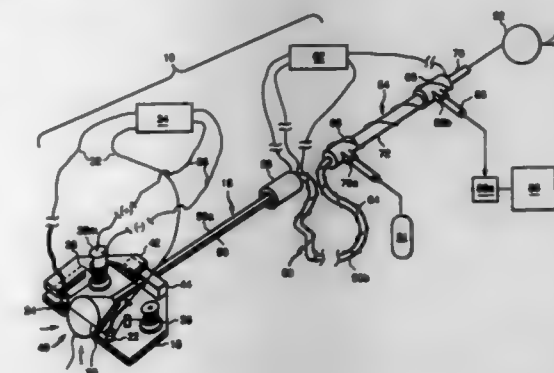
5,437,839

# WIRE APPARATUS FOR PYROLYSIS

Woodfin V. Ligon, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
Filed Apr. 4, 1994, Ser. No. 222,043  
Int. Cl.<sup>6</sup> G01N 31/12

U.S. Cl. 422-78

10 Claims



1. A pyrolysis instrument for obtaining a pyrolysate from a specimen comprising a probe including: a base; a wire supported on said base and positionable against said specimen; means supported on said base for indexing into position another portion of said wire to effect a subsequent pyrolysis; means for heating said wire to pyrolyze by cutting said specimen to release said pyrolysate therefrom; and means for collecting said pyrolysate produced from pyrolysis of said specimen by said heated wire.

5,437,840

# APPARATUS FOR INTRACAVITY SENSING OF MACROSCOPIC PROPERTIES OF CHEMICALS

David A. King, Palo Alto, Calif., and Jens-Peter Seher, Stuttgart, Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.  
Filed Apr. 15, 1994, Ser. No. 227,932  
Int. Cl.<sup>6</sup> G01N 21/41

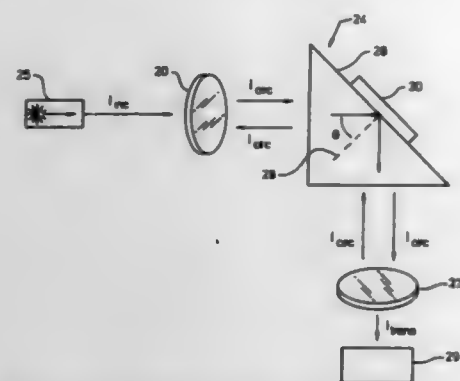
U.S. Cl. 422-82.06

14 Claims

1. A device for detecting a target substance in a sample comprising: A. a light source; B. an optical resonator that has a resonance cavity for light generated by the light source;

C. a total internal reflection (TIR) member that is located within the resonance cavity and has a TIR surface; in which:

D. the light passes into the TIR member and is reflected substantially without loss by the TIR surface, with an angle of incidence greater than a critical angle;



E. the sample is positioned to extend within an evanescent field region at the TIR surface; and

F. the device further includes detection means for substantially non-absorptively detecting a predetermined macroscopic optical characteristic of the sample corresponding to the amount of the target substance that is in the sample in the evanescent field region.

#### 5,437,841 CUVETTE

Alfons Balmer, Steinhausen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

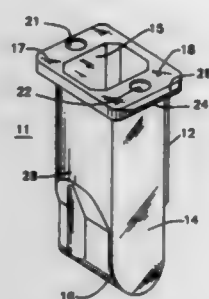
Continuation of Ser. No. 880,149, May 7, 1992, abandoned. This application Jan. 21, 1994, Ser. No. 184,521

Claims priority, application Switzerland, May 7, 1991, 1368/91

Int. Cl.<sup>6</sup> B01L 3/00

U.S. Cl. 422-102

16 Claims



1. A cell for performing optical measurements in an automatic analyzer having a gripping means for transporting the cell, which comprises:

- a tubular body having (i) two opposite ends, (ii) two plane-parallel walls positioned parallel to each other and to the longitudinal axis of the cell, said walls extending between said two opposite ends, and (iii) a bottom wall having the shape of a half-cylinder of a preselected diameter, projecting away from the tubular body, the first opposite end being open and the second opposite end being closed by the bottom wall;
- each of the plane-parallel walls at the open end of the tubular body having a tongue which extends outwardly from the open end in a direction perpendicular to the plane-parallel wall and ending at an outer edge;
- each tongue having an upper surface and a recess;
- each tongue and its recess being positioned symmetrically relative to the other tongue and its recess with respect to the longitudinal axis of the cell; and

(e) said cell having a one piece molded construction of transparent plastic material, and being constructed and arranged such that the dimensions of each tongue and its corresponding recess are preselected to permit cooperation with a gripping means to releasably engage therewith.

#### 5,437,842

#### FOAM CONTROL SYSTEM

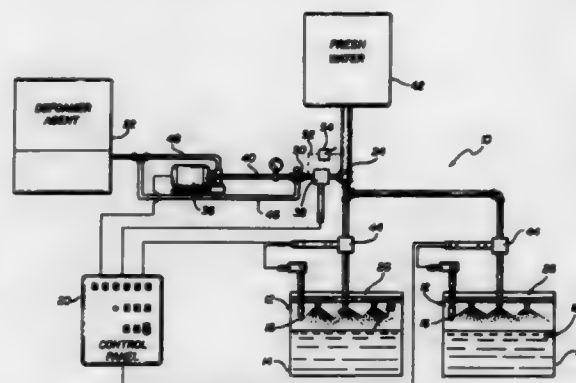
Richard B. Jensen, and H. Jeff Kronenberg, both of Caldwell, Id., assignors to J. R. Simplot Company, Caldwell, Id.

Filed Mar. 28, 1991, Ser. No. 677,644

Int. Cl.<sup>6</sup> B05B 12/00; G05D 9/00

U.S. Cl. 422-106

9 Claims



1. A foam control system for detecting and dissipating foam generated at the surface of a process liquid, said system comprising:

a foam detector probe mounted in close proximity with and a short distance above the surface of a process liquid, said probe including means for detecting foam at the surface of the process liquid and for generating a signal in response thereto;

a control unit; and

defoamer agent supply means for supplying a defoamer agent to the process liquid to dissipate the detected foam, said control unit including means responsive to said signal generated by said probe to operate said supply means to supply a predetermined incremental dose of the defoamer agent to the process liquid, said dose being independent of the quantity of foam on the surface of the process liquid.

#### 5,437,843 OZONIZER

Yu-hung Kuan, 3rd Fl., 247, Ta Hsing Road, Taoyuan, Taiwan

Filed Jul. 8, 1993, Ser. No. 87,527

Int. Cl.<sup>6</sup> C01B 13/11

U.S. Cl. 422-186.07

2 Claims

1. An ozonizer having a base and a housing enclosing a high voltage unit, an air compressor and an ozone converter, wherein the ozone converter comprises:

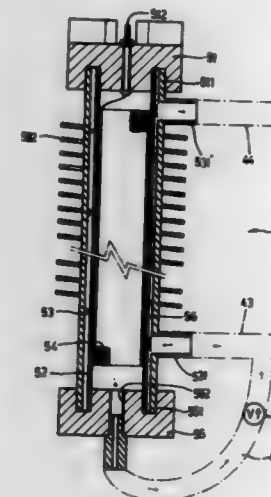
- an electrode member having an electrode pin extending from a center thereof and having a circular groove formed in a side thereof with an inner wall and an outer wall;
- a hollow inner pipe of electrically insulating material having a first inner end inserted into said circular groove of said electrode member against the inner wall thereof and a second inner end;
- a hollow outer pipe of electrically conductive material having a first outer end inserted into said circular groove of said electrode member against the outer wall, thereby making the outer pipe and the inner pipe spaced apart to form a circular air passage therebetween, said outer pipe further comprising a second outer end, an air inlet and an

air outlet laterally extending therefrom, and spiral radiating fins wound round a surface thereof;

d) an electrode screen located in said inner pipe having an end thereof electrically connected to said electrode pin of said electrode member;

e) a coupler having an exhaust hole at a center thereof and a stop groove with inner and outer walls, the coupler connected to the second inner end and the second outer end such that said inner end and said outer end are respectively inserted against the inner and outer walls thereof;

f) air pipe means connecting an outlet of the air compressor to the air inlet of the outer pipe;



g) a vacuum source connected to the exhaust hole of said coupler;

wherein a high voltage electric discharge by said electrode screen will cause a static electric arc to reach said outer pipe through said inner pipe when air flows in said circular air passage from said air inlet of said outer pipe, thus producing ozone in said air passage which is exhausted through said outlet, during which a vacuum is created within the inner pipe during supply of air to the circular air passage.

#### 5,437,844

#### CORONA TREATER ELECTRODE COOLING SYSTEM

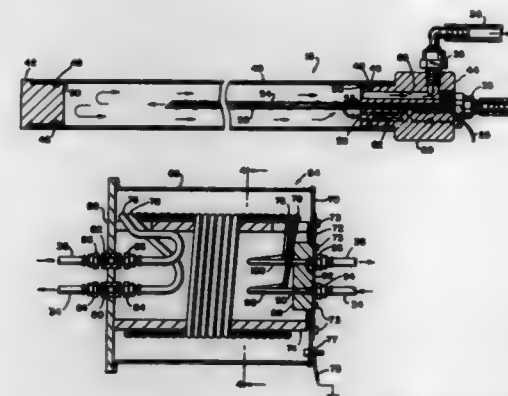
William H. Bonner, Cedarburg, Wis., assignor to Pillar Technologies, Inc., Hartland, Wis.

Filed Oct. 25, 1993, Ser. No. 142,616

Int. Cl.<sup>6</sup> C01B 13/11; B01J 19/08

U.S. Cl. 422-186

12 Claims



1. A cooling system for the high voltage electrode of a corona treater of the type utilizing an elongated high voltage

wire disposed within a dielectric tube, said cooling system comprising:

a first port disposed in one end of said dielectric tube for introducing a cooling fluid into the dielectric tube, a second port disposed in said one end of said dielectric tube for withdrawing said cooling fluid from the dielectric tube,

a nonconductive tube disposed within said dielectric tube and having one end connected to one of said ports and having the other end open in the other end of said dielectric tube so that cooling fluid flows through said tube to the other end of said dielectric tube, and said high voltage wire being supported by said nonconductive tube,

a high voltage isolator means disposed between said dielectric tube and said reservoir for removing residual electric charge from said cooling fluid passing through said isolator means.

#### 5,437,845

#### APPARATUS FOR ACTIVATING CARBON-CONTAINING MATERIAL

Osvaldo Brioni, Solza, and Dario Buizza, Ospitaletto, both of Italy, assignors to O.E.T. Calusco S.r.l., Milan, Italy

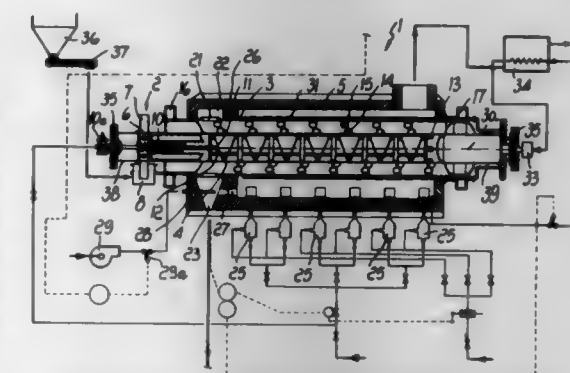
Filed Jun. 20, 1994, Ser. No. 262,706

Claims priority, application Italy, Jun. 22, 1993, MI9-3A001346

Int. Cl.<sup>6</sup> F28D 11/02

U.S. Cl. 422-198

17 Claims



1. Apparatus for activating carbon-containing material by an activation reaction, comprising:

a heating muffle

a drum-shaped reactor partially accommodated inside the muffle and defining a reactor axis, the reactor being arranged so that the reactor axis is substantially horizontal means for feeding the carbon-containing material to be activated in the reactor

means for moving the material around and along the reactor axis

heating means arranged inside the muffle, between the muffle and the reactor

means for injecting a stream of superheated steam inside the reactor

means for discharging activated carbon-containing material outside the reactor

means for preheating the carbon-containing material prior to its introduction in the reactor, the preheating means comprising a preheating drum arranged coaxially with and inside the reactor, the preheating drum being provided with at least one loading port, the at least one loading port being arranged proximate to a first axial end of the preheating drum that protrudes from a first axial end of the reactor, the preheating drum being further provided with at least one discharge port, the at least one discharge port being formed proximate to a second axial end of the reactor opposite to first end of the reactor.



5,437,846

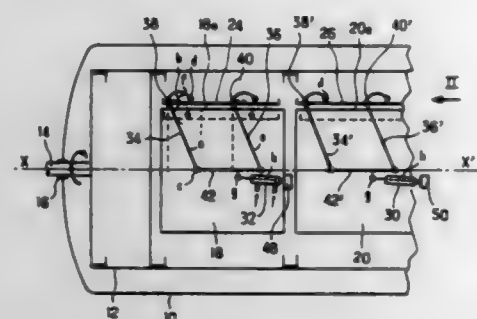
## SYSTEM FOR SUPPORTING OBJECTS INSIDE A ROTATING DRUM

Jean-Patrick Roumagnac, Le Coteau; Francisco Naveros, Roanne, and Jacques Timmermans, Perreux le Coteau, all of France, assignors to Barriquand Steriflow, Roanne, France  
Filed Feb. 22, 1994, Ser. No. 196,193

Claims priority, application France, Aug. 30, 1991, 91 10802  
Int. Cl.<sup>6</sup> A61L 2/00

U.S. Cl. 422-297

13 Claims



1. A system for supporting at least one stack of objects inside a rotating drum, the system comprising:  
at least one presser plate for application against a top part of a stack of objects inside a rotating drum having a rotation axis, the drum including a floor to receive the stack; and means for displacing said plate so as to apply said plate against the stack, said displacement means comprising:  
at least one member forming a lever disposed on at least one side of the stack, and pivotally mounted about a pin secured to the drum, parallel to the floor and perpendicular to the axis of rotation of the drum; and  
means for controlling pivoting of said lever about the pin, said control means also being disposed on one side of the stack, a first end of said lever being driven by said control means and a second end of said lever being secured to the stack, a displacement of said first end of said lever in a first direction causing said second end of said lever to approach said plate, whereby said plate is applied against the top end of the stack.

5,437,847

## METHOD OF SEPARATING AND RECOVERING RUTHENIUM FROM HIGH-LEVEL RADIOACTIVE LIQUID WASTE

Masayuki Yoneya, Suginami; Kazuhiro Kawamura; Shin-ichiro Torata, both of Ibaraki, and Takeshi Takahashi, Katsuta, all of Japan, assignors to Doryokuro Kakuneryo Kaihatsu Jigyodan, Tokyo, Japan

Continuation of Ser. No. 165,498, Dec. 13, 1993, abandoned.

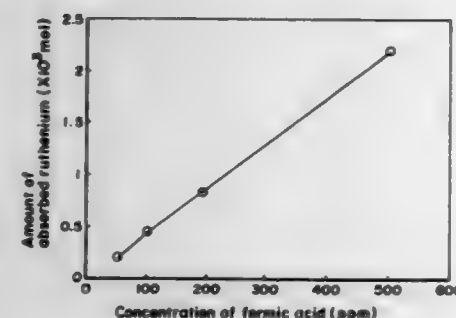
This application Dec. 7, 1994, Ser. No. 350,643

Claims priority, application Japan, Dec. 15, 1992, 4-334277

Int. Cl.<sup>6</sup> C01F 13/00, 15/00

U.S. Cl. 423-2

6 Claims



1. A method of separating and recovering ruthenium from high-level radioactive liquid waste comprising electrolyzing at

a constant potential a high-level radioactive liquid waste from which palladium has substantially been removed in advance, thereby vaporizing ruthenium from the liquid waste, bringing the vaporized ruthenium into contact with an aqueous solution of formic acid to precipitate ruthenium oxide, and separating tile precipitate from the aqueous solution of formic acid to recover ruthenium.

5,437,848

## RECOVERY OF METAL VALUES FROM PROCESS RESIDUES

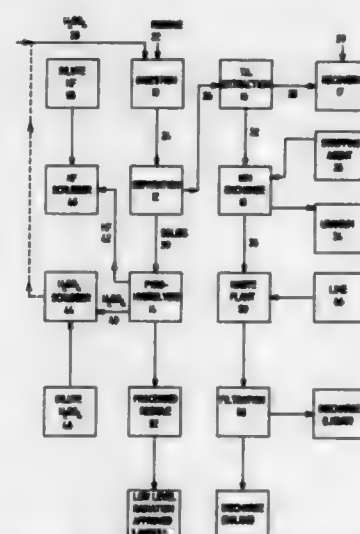
Robert A. Hard, Oley, Pa., assignor to Cabot Corporation, Boston, Mass.

Filed Jul. 10, 1992, Ser. No. 911,435

Int. Cl.<sup>6</sup> C01G 56/00, 57/00

U.S. Cl. 423-7

24 Claims



1. A process for recovering metal values from a source material containing at least tantalum and metallic fluorides comprising:

- digesting the source material in sulfuric acid to form a slurry;
- separating the slurry to form at least a first liquid aqueous phase containing tantalum and a solid phase;
- contacting the first liquid aqueous phase with a water immiscible organic liquid extractant suitable for extracting tantalum to form a first organic liquid phase containing tantalum values and a second liquid aqueous phase; and
- recovering the tantalum values from the first organic aqueous phase.

5,437,849

## METHOD OF PROCESSING VANADIUM-CONTAINING RESIDUES

Wolfgang Fennemann, Karben, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany  
Filed May 20, 1993, Ser. No. 64,969

Claims priority, application Germany, May 21, 1992, 42 16 798.1

Int. Cl.<sup>6</sup> C01G 31/00; C22B 34/00, 30/00; C01D 5/00

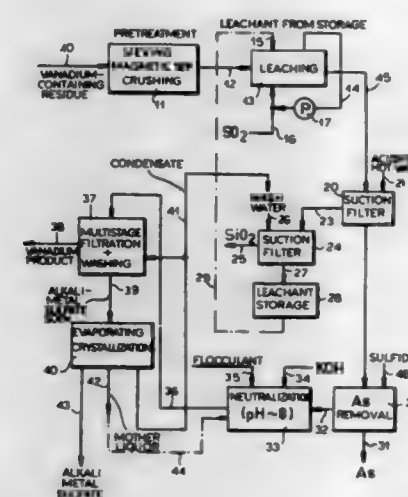
U.S. Cl. 423-66

5 Claims

1. A method of processing a residue consisting essentially of pentavalent vanadium compound, said residue derived from a supported catalyst for the conversion of SO<sub>2</sub> to SO<sub>3</sub>, which comprises the steps of:

- in a closed cycle introducing SO<sub>2</sub> in an oxygen-free gas into an aqueous slurry containing a pentavalent vanadium-containing residue to leach vanadium from the residue into a sulfate solution;

- adding about 1 mole of sulfuric acid to said sulfate solution per mole of V<sub>2</sub>O<sub>5</sub> during the leach in step (a);
- precipitating tetravalent vanadium compound and forming an alkali metal sulfate by adding an alkali metal hydroxide to said sulfate solution to bring a pH of said sulfate solution to 7 to 9, to form a second slurry which contains precipitated tetravalent vanadium compound and the alkali metal sulfate;
- filtering the second slurry to separate the precipitated tetravalent vanadium compound from the alkali metal



sulfate in solution, and recovering the precipitated tetravalent vanadium compound;

- subjecting the alkali metal sulfate in solution to evaporative crystallization to obtain the alkali metal sulfate as a moist solid in crystalline form and a mother liquor, and recovering the alkali metal sulfate;
- combining the mother liquor with the second slurry formed in step (c); and
- recovering SO<sub>2</sub>-containing gas evolved during the leach in step (a), and recycling said SO<sub>2</sub>-containing gas to said slurry in step (a).

5,437,850

## METHOD FOR CALCINING MOIST GYPSUM

Paul Kroehl, Ravensburg, and Heiko Lindner, Bochum, both of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Germany

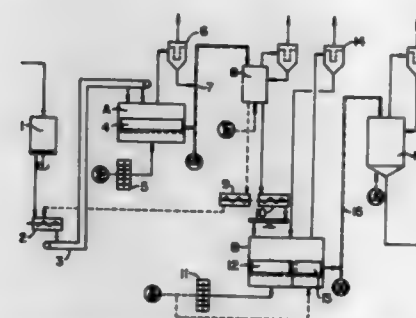
Continuation of Ser. No. 952,899, filed as PCT/EP92/00607, Mar. 19, 1992, published as WO92/16468, Oct. 1, 1992, abandoned. This application Jun. 2, 1994, Ser. No. 252,639

Claims priority, application Germany, Mar. 25, 1991, 41 09 743.2

Int. Cl.<sup>6</sup> C04B 11/02

U.S. Cl. 423-171

9 Claims



1. A method for thermally treating moist hydrates comprising the steps of:  
feeding moist hydrates into a first fluidized bed apparatus

having a static heat exchanger including heat exchange surfaces disposed in the apparatus;  
vaporizing the surface water of the hydrates in the first fluidized bed apparatus to form surface-dried hydrate by a complete homogenous fluidization of the hydrates with hot gas and by heating the heat exchange surfaces and contacting the fluidized hydrates with the heat exchange surfaces, the majority of the heat introduced into the apparatus via the hot gas and heat exchange surfaces being from the heat exchange surfaces;  
conveying surface-dried hydrate from the first fluidized bed apparatus to a second, separate fluidized bed apparatus having a static heat exchanger including heat exchange surfaces disposed in the apparatus; and  
withdrawing the water of crystallization from the surface-dried hydrate in the second fluidized bed apparatus by a complete homogenous fluidization of the surface-dried hydrate with hot gas and by heating the heat exchange surfaces in the second apparatus and contacting the fluidized surface-dried hydrate with the heat exchange surfaces in the second apparatus, the majority of the heat introduced into the second fluidized bed apparatus via the hot gas and heat exchange surfaces being from the heat exchange surfaces.

9. A method for thermally treating moist gypsum comprising the steps of:

feeding moist gypsum into a first fluidized bed apparatus having heat exchanger surfaces;  
vaporizing the surface water of the gypsum in the first fluidized bed apparatus at a product temperature less than or equal to about 90° C. to form surface-dried gypsum by a complete homogenous fluidization of the gypsum with hot gas and by heating the heat exchanger surfaces and contacting the fluidized gypsum with the heat exchanger surfaces without using any mechanical aids;  
conveying the surface-dried gypsum from the first fluidized bed apparatus to a second, separate fluidized bed apparatus having heat exchanger surfaces; and  
withdrawing the water of crystallization from the surface-dried gypsum in the second fluidized bed apparatus by a complete homogenous fluidization of the surface-dried gypsum with hot gas and by heating the heat exchange surfaces in the second apparatus and contacting the fluidized surface-dried gypsum with the heat exchange surfaces in the second apparatus without using any mechanical aids.

5,437,851

## COMBINED HEAT EXCHANGER AND AMMONIA INJECTION PROCESS

James M. MacInnis, Copley, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 76,994, Jan. 15, 1993. This application May 27, 1994, Ser. No. 250,187

Int. Cl.<sup>6</sup> C01B 21/02; B01J 8/00

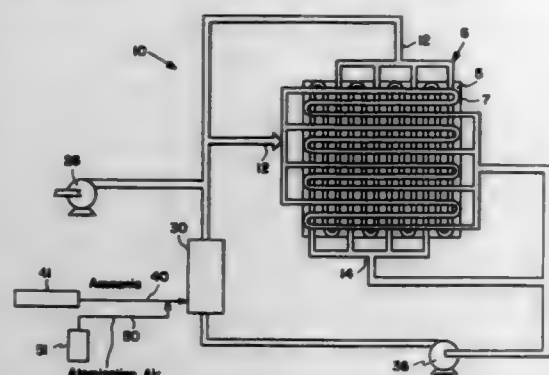
U.S. Cl. 423-239.1

6 Claims

1. A method for injecting a vaporized ammonia-and-air mixture into a flue gas for reducing NO<sub>x</sub> in the flue gas, the method comprising the steps of:

providing a flue gas duct with at least one tube pass, said at least one tube pass having an inlet, at least one injection port, and a return;  
providing a NO<sub>x</sub>-containing flue gas in a path defined by said duct;  
providing an aqueous ammonia and air mixture, vaporizing at least some of said aqueous mixture to form a vaporized ammonia-and-air mixture;  
introducing said vaporized ammonia-and-air mixture through the inlet of said at least one tube pass and allowing the NO<sub>x</sub>-containing flue gas to heat said vaporized ammonia-and-air mixture;  
injecting at the same time some of the vaporized ammonia-

and-air mixture into the flue gas through said at least one injection port; circulating a remaining portion of the heated vaporized



ammonia-and-air mixture through said return to mix the vaporized ammonia-and-air mixture with said aqueous mixture; and vaporizing more of said aqueous mixture.

5,437,852

#### WATER-SOLUBLE PRE-CERAMIC POLYMERS AND METHODS OF THEIR PRODUCTION

Sung S. Pak, Evinston, and Archie N. Tolley, Appomattox, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 13, 1993, Ser. No. 61,134

Int. Cl.<sup>6</sup> C01F 17/00, 7/02

U.S. Cl. 423-263

9 Claims



1. A method for making a water soluble pre-ceramic polymer, comprising the steps of:

- heating a hydrated metal salt in a furnace to a temperature above the melting point of the hydrated metal salt, said hydrated metal salt being a member selected from the group consisting of a hydrated metal nitrate salt, and a hydrated metal chloride salt;
- providing a flow of air above the melted hydrated metal salt to drive a polymerization reaction forward;
- forming a water soluble pre-ceramic polymer;
- maintaining the heat at a temperature not exceeding 100° C. above a melting point of the pre-ceramic polymer and flow of air until a weight loss ranging from about 18% to 73% weight percent of the pre-ceramic polymer is obtained; and
- adding water to the pre-ceramic polymer to make a pre-ceramic polymer solution with a polymer to water weight ratio of at least 1 to 1.5.

5,437,853

#### DISPOSAL OF HYDRAZINE PROPELLANTS

Russell W. Johnson, Elmhurst, Ill.; Brent S. DeFeo, Sparta, N.J.; Francis S. Lupton, Evanston, and Mark B. Koch, Mt. Prospect, both of Ill., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed Oct. 21, 1993, Ser. No. 140,589

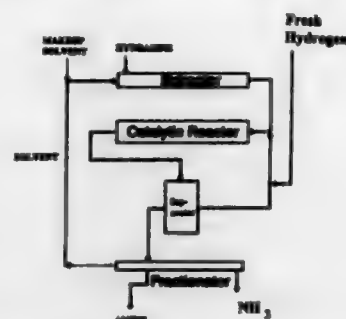
Int. Cl.<sup>6</sup> C01C 1/00; C07C 211/00

U.S. Cl. 423-352

19 Claims

1. A method of converting hydrazines to ammonia or ammonia and the corresponding amines comprising:

- (a) dissolving said hydrazine in a suitable liquid carrier;
- (b) passing said dissolved hydrazine of (a) over a supported metal from Group VIII at a temperature of 0° to 250° C. in the presence of about 0.1-10 mols of added hydrogen
- (c) recovering the ammonia or ammonia and corresponding amine from the product of (b) and optionally returning the liquid carrier to step (a).



for each mol of hydrazine so as to produce by hydrogenolysis ammonia or ammonia and the corresponding amine;

5,437,854

#### PROCESS FOR PURIFYING ZIRCONIUM TETRACHLORIDE

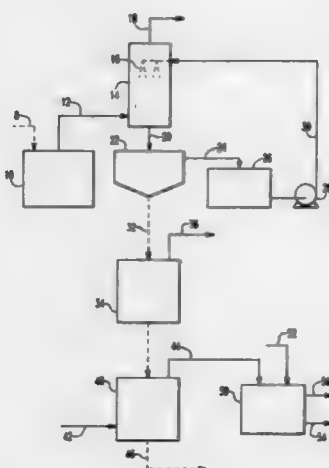
Roy G. Walker, and Carlos L. Aguilar, both of Ogden, Utah, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 27, 1994, Ser. No. 265,910

Int. Cl.<sup>6</sup> C01G 25/04, 27/04

U.S. Cl. 423-492

12 Claims



1. A process for separating hafnium tetrachloride contaminants from zirconium tetrachloride, comprising the steps of: reacting a mixture of zirconium tetrachloride and hafnium tetrachloride with liquid metallic tin to reduce the zirconium tetrachloride to zirconium trichloride while oxidizing the tin to stannous dichloride; and separating from the reaction step a hafnium tetrachloride-containing vapor from liquid metallic tin, the liquid containing zirconium trichloride and stannous dichloride.

5,437,855

#### SYNTHETIC POROUS CRYSTALLINE MCM-58, ITS SYNTHESIS AND USE

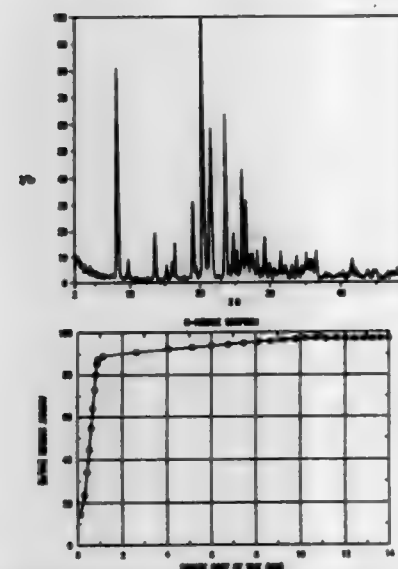
Ernest W. Valyocik, Yardley, Pa., assignor to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 137,705, Oct. 18, 1993, abandoned. This application Mar. 4, 1994, Ser. No. 205,437

Int. Cl.<sup>6</sup> C01B 39/04, 39/48

U.S. Cl. 423-706

25 Claims



17. A method for synthesizing crystalline material exhibiting a characteristic X-ray diffraction pattern including d-spacing maxima values shown in Table I which comprises (i) preparing a mixture capable of forming said material, said mixture comprising sources of alkali or alkaline earth metal (M), an oxide of trivalent element (X), an oxide of tetravalent element (Y), water, and directing agent (R) comprising benzylquinidinium cations, and having a composition, in terms of mole ratios, within the following ranges:

YO <sub>2</sub> /X <sub>2</sub> O <sub>3</sub>	15 to 1000
H <sub>2</sub> O/YO <sub>2</sub>	5 to 200
OH <sup>-</sup> /YO <sub>2</sub>	0 to 3
M/YO <sub>2</sub>	0 to 3
R/YO <sub>2</sub>	0.02 to 1.0

(ii) maintaining said mixture under sufficient conditions including a temperature of from about 80° C. to about 250° C. until crystals of said material are formed; and (iii) recovering said crystalline material from step (ii).

5,437,856

#### ORAL COMPOSITIONS

Michael F. Lukacovic, West Chester, and Satyanarayana Majeti, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 998,709, Dec. 30, 1992, Pat. No. 5,320,830. This application Mar. 3, 1994, Ser. No. 205,676

Int. Cl.<sup>6</sup> A61K 7/16, 7/18, 7/28

U.S. Cl. 424-50

15 Claims

1. An oral composition providing improved oral cleansing properties, comprising:

- a) a safe and effective amount of a surfactant;
- b) a safe and effective amount of an enzyme;
- c) a safe and effective amount of a chelating agent having a calcium binding coefficient of from about 10<sup>2</sup> to about 10<sup>5</sup> wherein the the luring agent is selected from the group consisting of citric acid, alkali metal citrate, polymeric

polycarboxylates, soluble pyrophosphates and mixtures thereof;

- d) a safe and effective amount of a fluoride ion source; and
  - e) a suitable oral carrier;
- wherein the pH of the composition is from about 4.0 to about below 6.0, the composition is free of materials which complex with fluoride ions and wherein said composition is free of the combination of citric acid and the alkyl metal citrate.

5,437,857

#### METHODS AND COMPOSITIONS FOR MINERALIZING AND FLUORIDATING CALCIFIED TISSUES

Ming S. Tung, Gaithersburg, Md., assignor to American Dental Association Health Foundation, Gaithersburg, Md.

Division of Ser. No. 723,839, Jul. 1, 1991, Pat. No. 5,268,167, which is a division of Ser. No. 356,201, May 24, 1989, Pat. No. 5,037,639. This application Aug. 9, 1993, Ser. No. 104,350

The portion of the term of this patent subsequent to Dec. 7, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 7/16, 7/18, 9/12

U.S. Cl. 424-52

6 Claims

- 1. A dental restorative comprising in combination: a substantially non-aqueous, non-toxic carrier capable of suspension of amorphous calcium compounds or a material that will form amorphous calcium compounds therein; and a material comprising or that will form amorphous calcium phosphate, amorphous calcium phosphate fluoride or amorphous calcium carbonate phosphate suspended within said carrier; whereby when the combination is contacted with the teeth, a calcium phosphate compound is deposited and apatite is formed on and in the teeth.

5,437,858

#### ORAL HYGIENE AGENT CONTAINING HYDROGEN PEROXIDE STABILIZED BY COLLOIDAL SILVER

Heinz Hungerbach, Merchweiler, Werner Struzina, Hellingenhaus, and Albrecht Hoburg, Ratingen, all of Germany, assignors to Ulrike Hungerbach, Merchweiler, Germany

PCT No. PCT/EP92/01558, § 371 Date Mar. 11, 1994, § 102(e) Date Mar. 11, 1994, PCT Pub. No. WO93/00884, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 9, 1992, Ser. No. 182,050

Claims priority, application Germany, Jul. 13, 1991, 41 23 297.5

Int. Cl.<sup>6</sup> A61K 7/20, 33/40, 33/38, 9/68

U.S. Cl. 424-53

10 Claims

- 1. In a hydrogen-peroxide-containing oral hygiene composition, the improvement wherein the hydrogen peroxide is silver-colloid-stabilized hydrogen peroxide present at a concentration of 0.1 to 10% by weight.

5,437,859

#### PROCESS FOR THE PREPARATION OF A SOLID DISPERSION OF AT LEAST ONE POLYHYDRIC ALCOHOL IN A FATTY BODY AND THE RESULTING DISPERSION FOR COSMETIC AND PHARMACEUTICAL USE

Jean-Claude Ser, Chevilly-Larue, and Dolores Miguel, Aubervilliers, both of France, assignors to L'Oreal, Paris, France

Filed Jul. 24, 1992, Ser. No. 917,897

Claims priority, application France, Jul. 26, 1991, 9109514

Int. Cl.<sup>6</sup> A61K 7/42, 7/44, 7/48

U.S. Cl. 424-59

15 Claims

- 1. A stable and anhydrous solid cosmetic dispersion which provides emollient properties on application to the skin comprising from 20 to 95 weight percent of a fatty body and 4 to 50 weight percent of particles of a polyhydric alcohol having from 2 to 8 carbon atoms and 2 to 6 hydroxyl groups, wherein the average size of said polyhydric alcohol particles dispersed therein is lower than or equal to 1 μm and said fatty body



comprises from 10 to 50 weight percent of at least one wax having a melting point greater than 55° C.

5,437,860

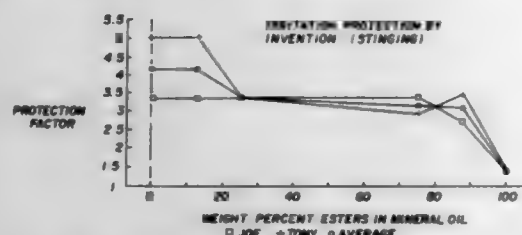
# SKIN AND SCALP BARRIER FOR USE WITH HAIR TREATMENT PRODUCTS

David P. Jarvis, Midway; Mario J. de la Guardia, and Joseph Jones, Jr., both of Savannah, all of Ga., assignors to Aminco, Inc., Wilmington, Del.

Filed Jun. 22, 1993, Ser. No. 79,809  
Int. Cl.<sup>6</sup> A45D 7/04; A61K 7/09, 7/40

U.S. Cl. 424—70.2

2 Claims



1. A method of protecting skin and scalp from the irritating side effects of hair relaxers without interfering with the hair straightening action of hair relaxers, said method comprising applying to a user's scalp, prior to the application of the hair relaxer, a protection-effective amount of a composition comprising:

- about 10–85 weight percent paraffin; and
- about 15–90 weight percent of at least one ester, wherein the ester is of the formula:



wherein n is 0, 1, or 2;

wherein R<sub>1</sub> is selected from the group consisting of C<sub>1</sub>–C<sub>30</sub> alkyl, C<sub>1</sub>–C<sub>30</sub> alkene, phenyl, benzyl, polyhydroxy C<sub>1</sub>–C<sub>30</sub> alkanols, C<sub>1</sub>–C<sub>30</sub> amino acid, C<sub>1</sub>–C<sub>30</sub> alkyl-amine, and C<sub>1</sub>–C<sub>30</sub> oxy-alcohol;

wherein x is selected from the group consisting of a single bond, C<sub>1</sub>–C<sub>30</sub> alkyl, C<sub>1</sub>–C<sub>30</sub> alkene, C<sub>1</sub>–C<sub>30</sub> alkyl-oxy C<sub>1</sub>–C<sub>30</sub> alkyl, C<sub>1</sub>–C<sub>30</sub> alkyl-carboxy C<sub>1</sub>–C<sub>30</sub> alkyl, phenyl, and phenyl C<sub>1</sub>–C<sub>30</sub> alkyl; and

wherein R<sub>2</sub> is defined the same as R<sub>1</sub>, and R<sub>1</sub> and R<sub>2</sub> may be the same or may be different.

5,437,861

# REMOVAL OF SELECTED FACTORS FROM WHOLE BLOOD OR ITS COMPONENTS; AND PREVENTION AND TREATMENT OF SEPTIC SHOCK SYNDROME

Thomas B. Okarma, Palo Alto; John Blankenship, Santa Clara; Abraham T. Lin, Palo Alto, and Mohammad A. Elkalay, Cupertino, all of Calif., assignors to Applied Immune Sciences, Inc., Santa Clara, Calif.

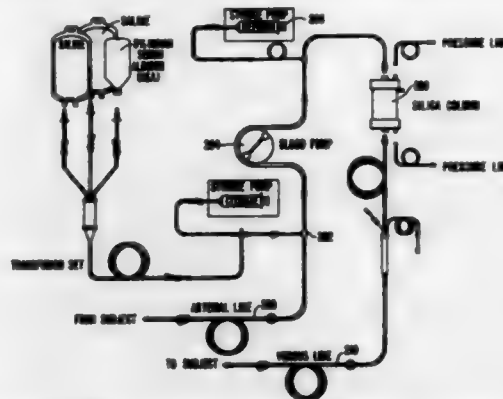
Filed Mar. 16, 1993, Ser. No. 32,357

Int. Cl.<sup>6</sup> A61M 1/14; A61K 31/74; A01N 59/00; B01D 15/00  
U.S. Cl. 424—78.08

14 Claims

1. A composition of matter comprising amorphous, particulate, non-spherical silica and a silica pretreating agent wherein the silica pretreating agent is substantially devoid of covalent attachment to the silica, wherein the silica has a specific sur-

face area between 150 m<sup>2</sup>/g and 600 m<sup>2</sup>/g, and contains between 0.5 cc/g and 2.5 cc/g of porosity, and wherein the silica



pretreating agent is heparin or albumin; and wherein the composition is capable of removing selected factors from blood.

5,437,862

Patent Not Issued For This Number

5,437,863

# METHOD OF ENHANCING THE GROWTH OF GUT EPITHELIAL CELLS BY ADMINISTRATION OF A CYTOKINE SUCH AS INTERLEUKIN II

David A. Williams, Indianapolis, Ind., and Steven C. Clark, Winchester, Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 941,372, Sep. 2, 1992. This application Sep. 1, 1993, Ser. No. 115,680  
Int. Cl.<sup>6</sup> A61K 38/18, 38/19, 38/20

U.S. Cl. 424—85.1

27 Claims

1. A method for enhancing growth of a gut epithelial cell population comprising the step of administering a pharmaceutically effective amount of a cytokine selected from the group consisting of interleukin-11, interleukin-6, leukemia inhibitory factor, oncostatin M, and ciliary neurotrophic factor.

5,437,864

# METHOD OF INHIBITING BLOOD COAGULATION IN EXTRACORPOREAL CIRCULATION BY INHIBITING HUMAN TISSUE FACTOR

Thomas S. Edgington, La Jolla, Calif.; Robert W. Colman, Moylan, Pa.; Janos Kappelmayer, Debrecen, Hungary; L. Henry Edmunds, Jr., Bryn Mawr, and Alvise Bernabei, Philadelphia, both of Pa., assignors to The Scripps Research Institute, La Jolla, Calif.; Trustees of the University of Pennsylvania and Temple University - Of the Commonwealth Systems of Higher Education, both of Philadelphia, Pa.

Continuation-in-part of Ser. No. 165,939, Mar. 9, 1988, Pat. No. 5,223,427, which is a continuation-in-part of Ser. No. 67,103, Jun. 25, 1987, Pat. No. 5,110,730, which is a continuation-in-part of Ser. No. 33,047, Mar. 31, 1987, abandoned. This application Nov. 16, 1992, Ser. No. 977,281  
Int. Cl.<sup>6</sup> A61K 39/395; G07K 15/28

U.S. Cl. 424—145.1

9 Claims

1. A method of inhibiting coagulation in an extracorporeal circulation procedure used on a subject extracorporeally, comprising (1) removing blood from a subject and (2) administering to the blood a therapeutically effective amount of a monoclonal antibody which inhibits binding of tissue factor to factor VII/VIIIa so that the activity of tissue factor is neutralized in the vasculature.

5,437,865

# ISOLATED SIALYLATED GLYCOPROTEIN ENDOSIALIN, WHICH IS EXPRESSED BY TUMOR ASSOCIATED VASCULAR ENDOTHELIUM

Pilar Garcia-Chen; Wolfgang J. Rettig, and Lloyd J. Old, all of New York, N.Y., assignors to Memorial Sloan-Kettering Cancer Center, N.Y.

Division of Ser. No. 976,405, Nov. 13, 1992, Pat. No. 5,342,757.  
This application Mar. 30, 1994, Ser. No. 221,033

Int. Cl.<sup>6</sup> A61K 39/00; C07K 14/00, 14/435

U.S. Cl. 424—184.1

4 Claims

1. Isolated, sialylated glycoprotein expressed by vascular endothelium associated with a tumor and not normal vascular endothelium, wherein said sialylated glycoprotein is specifically bound by monoclonal antibody produced by hybridoma cell line ATCC 11190, has a molecular weight of about 165 kilodaltons as determined by SDS-PAGE, the protein portion of said glycoprotein have a molecular weight of about 95 kilodaltons as determined by SDS-PAGE, are oligosaccharides being linked thereto by O-linked glycosylation.

3. Immunogenic composition comprising the isolated, sialylated glycoprotein of claim 1, and an adjuvant.

5,437,866

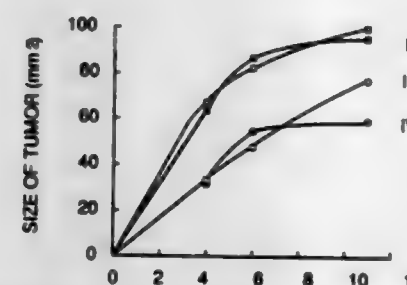
# HERBAL TREATMENT OF MALIGNANCY

Alexander S. Sun, 123 York St., 15K, New Haven, Conn. 06511  
PCT No. PCT/US90/06376, § 371 Date Jun. 12, 1992, § 102(e)  
Date Jun. 12, 1992, PCT Pub. No. WO91/06306, PCT Pub. Date May 16, 1991

Continuation-in-part of Ser. No. 431,599, Nov. 3, 1989, abandoned. This PCT application Nov. 5, 1990, Ser. No. 855,025  
Int. Cl.<sup>6</sup> A61K 35/78

U.S. Cl. 424—195.1

10 Claims



1. A method to ameliorate at least one effect of malignancy in humans which method comprises

administering to a subject in need of such treatment an anti-malignancy effective amount of a boiling water extract of *Letinus edodes* and an anti-malignancy effective amount of extract of mung bean, said extracts being administered periodically for a time sufficient to achieve amelioration.

5,437,867

# SOLUBILIZING, THICKENING AND EMULSIFYING COSMETIC COMPOSITION AND PROCESS FOR PREPARATION OF SAME

Thomas J. Vichroski, Oakdale; Regina A. Costa, Port Jefferson Station, and James A. Hayward, Port Jefferson, all of N.Y., assignors to Collaborative Laboratories, East Setauket, N.Y.  
Filed Mar. 19, 1993, Ser. No. 33,819

Int. Cl.<sup>6</sup> A61K 9/10

U.S. Cl. 424—401

9 Claims

1. A cosmetic composition comprising:  
(a) about 15.0% to about 98.9% by weight of ether alcohols having the formula C<sub>n</sub>H<sub>(2n+2)</sub>O<sub>(n/2)</sub>, where n is an integer which ranges from 4 to 12;  
(b) 0.01% to about 10% by weight of a homopolymer of acrylic acid cross-linked with an allyl ether of pentaerythritol;  
(c) 0% to about 60.0% by weight of a fragrance oil; and

(d) the balance up to 100% by weight of water; with all weight percents based upon the total composition weight.

5,437,868

# PEROXYACID ANTIMICROBIAL COMPOSITION

Thomas R. Oakes, Lake Elmo, and Thomas G. Boufford, Eagan, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.  
Continuation-in-part of Ser. No. 734,580, Jul. 23, 1991, Pat. No. 5,200,189. This application Apr. 12, 1993, Ser. No. 47,264  
Int. Cl.<sup>6</sup> A01N 37/02

U.S. Cl. 424—405

15 Claims

1. An aqueous peroxyacid antimicrobial composition consisting essentially of:

- at least about 10 parts per million (ppm) of peroxyglutaric acid; and
- at least about 1 ppm of a peroxyacid selected from the group consisting of a C<sub>6</sub>–C<sub>18</sub> aliphatic peroxyacid, and mixtures thereof;

wherein the aqueous composition has a pH in the range of about 2 to 8.

5,437,869

# PEST CONTROL SYSTEM

Donald W. Kelley, 6205 Glenmoor Ave., Garland, Tex. 75043  
Continuation-in-part of Ser. No. 782,512, Oct. 24, 1991, abandoned. This application Oct. 29, 1992, Ser. No. 968,997

Int. Cl.<sup>6</sup> A01N 25/32

U.S. Cl. 424—406

12 Claims

1. A method for reducing the irritation to warm blooded animals of a pest control active ingredient of a solid or liquid pest control active ingredient formulation which consists essentially of incorporating triphenyl phosphate into said formulation in an amount effective to reduce the irritation of said active ingredient to warm blooded animals, the amount of triphenyl phosphate being at least equal to the amount of active ingredient, said active consisting of pyrethrins and synthetic pyrethroids.

5,437,870

# INGESTIBLE MOLLUSC POISONS

George S. Puritch, Seannichton; David S. Almond; Robert M. Matson, both of Victoria, and Wanda M. Mason, Seannichton, all of Canada, assignors to W. Neudorff GmbH KG, Emmertal, Germany

Filed Aug. 25, 1994, Ser. No. 295,606

Int. Cl.<sup>6</sup> A02N 25/34

U.S. Cl. 424—408

10 Claims

1. A terrestrial mollusc stomach poison composition, comprising

a simple iron compound selected from the group consisting of iron proteins, iron carbohydrates, and iron salts, which, alone, have little or no toxicity to the molluscs;  
a second component selected from the group consisting of edetic acid, hydroxyethyl derivative of edetic acid, or salts thereof; and

an inert carrier material edible to molluscs, wherein the molar ratio of the iron in the simple iron compound to the second component is in the range of 1:0.2 to 1:2.0.

5,437,871

Patent Not Issued For This Number

5,437,872

**PHARMACEUTICAL COMPOSITIONS AND A DEVICE FOR ADMINISTERING THE SAME**

William H. Lee, Essex, England, assignor to Bioglan Laboratories Ltd., England

PCT No. PCT/GB90/01321, § 371 Date Feb. 12, 1992, § 102(e) Date Feb. 12, 1992, PCT Pub. No. WO91/02518, PCT Pub. Date Mar. 7, 1991

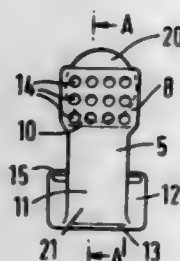
PCT Filed Aug. 24, 1990, Ser. No. 834,556

Claims priority, application United Kingdom, Aug. 25, 1989, 8919446; Aug. 25, 1989, 8919447

Int. Cl.<sup>6</sup> A61K 9/26

U.S. Cl. 424-464

31 Claims



1. A pharmaceutical tablet or lozenge, comprising at least two non-absorbable antibiotic agents, in combination with a tablet matrix for providing controlled and sustained release of said agents, wherein the tablet or lozenge is arranged for providing controlled and sustained release of a prophylactic dose of said antibiotic agents, into the mouth and gastrointestinal tract, from a buccal or sub-lingual location for selectively decontaminating a human or animal digestive tract.

5,437,873

**SUPERIOR TASTING PHARMACEUTICAL COMPOSITION HAVING POROUS PARTICLES AND THE PROCESS OF PREPARING SUCH PHARMACEUTICAL COMPOSITION**

Deepak S. Phadke, and Melissa P. Neddermeyer, both of Indianapolis, Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 884,299, May 12, 1992, Pat. No. 5,302,396, which is a continuation of Ser. No. 606,284, Oct. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 586,351, Sep. 21, 1990, abandoned. This application Jan. 19, 1994, Ser. No. 184,613

Int. Cl.<sup>6</sup> A61K 9/16, 9/20

U.S. Cl. 424-465

15 Claims

1. A method of preparing a pharmaceutical composition of porous particles comprising:

- (a) mixing stoichiometric amounts of a base selected from the group consisting of sodium bicarbonate, potassium bicarbonate, sodium carbonate and potassium carbonate and an acid selected from the group consisting of citric acid, tartaric acid, malic acid and maleic acid in a press to produce a compact;
- (b) milling the compact to form an evenly distributed effervescent mixture of the acid and the base;
- (c) adding the effervescent mixture to a preparation of a pharmacologically active agent selected from the group consisting of an antacid and a calcium supplement to form an active mixture;
- (d) granulating the active mixture in admixture with an appropriate amount of a granulating agent sufficient to form a wet granulation containing water;
- (e) drying said wet granulation with applied heat whereby the applied heat and the water in the wet granulation cause substantially all of both the acid and the base to react thus releasing gas from the wet granulation to form porous particles;
- (f) milling said porous particles to form a fine powder, which can be compressed to form a tablet, used in a reconstituted

able powder dosage form or filled in a capsule as a quick dissolving powder.

5,437,874

**PHARMACEUTICAL COMPOSITION FOR THE PREPARATION OF A STABLE POWDER CONTAINING AN ASSOCIATION OF ACETYSALICYLIC ACID AND METOCLOPRAMIDE AS THE ACTIVE INGREDIENTS**

Nicole Bru, Paris; Jean-Francois S. Cordoliani, Layrac; Pierre-André Poly, Athis Mons, and Jehan-Yves P. Drouin, Verrieres le Buisson, all of France, assignors to Laboratoires UPSA, Agen, France

Filed Jan. 4, 1994, Ser. No. 177,316

Claims priority, application France, Nov. 26, 1993, 93 14170 Int. Cl.<sup>6</sup> A61K 9/14, 9/48, 31/60, 31/165

U.S. Cl. 424-466

20 Claims

1. A pharmaceutical composition for the preparation of a powder comprising, as active ingredient, an effective amount of a water-soluble salt or complex of acetylsalicylic acid in association with metoclopramide or a pharmaceutically acceptable salt thereof, and at least one pharmaceutically acceptable hydrophilic polymer in an amount sufficient to stabilize the metoclopramide.

5,437,875

**WAX-FREE LOW MOISTURE CHEWING GUM**

Steven P. Synosky, Greenbrook, N.J.; Gordon N. McGrew, Evanston, and Phillip G. Schnell, Downers Grove, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

PCT No. PCT/US93/01900, § 371 Date Aug. 24, 1994, § 102(e) Date Aug. 24, 1994, PCT Pub. No. WO93/17573, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 2, 1993, Ser. No. 295,661

Int. Cl.<sup>6</sup> A23G 3/30

U.S. Cl. 426-3

45 Claims

1. A substantially wax-free low moisture chewing gum containing from about 0.10 weight percent to about 2.0 weight percent water and comprising from about 10 to 90 weight percent of a wax-free gum base comprising:

- about 20 to about 60 weight percent of at least one synthetic elastomer;
- 0 to about 30 weight percent of at least one natural elastomer;
- about 5 to about 55 weight percent of at least one elastomer plasticizer;
- about 4 to about 40 weight percent filler; and
- about 5 to about 40 weight percent of at least one fat, oil or softener; said chewing gum further comprising from about 0.001 to about 70 weight percent sweetener, and from about 0.01 to 10.0 weight percent flavoring agent.

5,437,876

**WAX-FREE CHEWING GUMS WITH CONTROLLED SWEETENER RELEASE**

Steven P. Synosky, Greenbrook, N.J., and Michael J. Greenberg, Northbrook, Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

PCT No. PCT/US93/01940, § 371 Date Aug. 30, 1994, § 102(e) Date Aug. 30, 1994, PCT Pub. No. WO93/17577, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 2, 1993, Ser. No. 295,745

Int. Cl.<sup>6</sup> A23G 3/30

U.S. Cl. 426-3

48 Claims

1. A substantially wax-free chewing gum having controlled sweetener release comprising a wax-free chewing gum base comprising:

Ingredient	Wt. Percent of Gum Base
Synthetic Elastomer	about 20-60 weight percent,
Natural Elastomer	about 0-30 weight percent,

-continued

Ingredient	Wt. Percent of Gum Base
Elastomer Plasticizer	about 5-55 weight percent,
Filler	about 4-40 weight percent,
Fats, Oils, Softeners	about 5-40 weight percent;

said wax-free chewing gum further comprising at least one flavoring agent, at least one water-soluble bulking agent, and at least one controlled release sweetener ingredient.

5,437,877

**WAX-FREE CHEWING GUM WITH INITIAL SOFT BITE**

Steven P. Synosky, Greenbrook, N.J.; Michael A. Reed, Merrillville, Ind., and Kenneth W. Laughlin, Richardson, Tex., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

PCT No. PCT/US93/01941, § 371 Date Aug. 30, 1994, § 102(e) Date Aug. 30, 1994, PCT Pub. No. WO93/17578, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 2, 1993, Ser. No. 302,699

Int. Cl.<sup>6</sup> A23G 3/30

U.S. Cl. 426-3

44 Claims

1. A substantially wax-free chewing gum having an initial soft bite comprising a gum base comprising:

- about 20 to about 60 weight percent of a blend of at least two synthetic elastomers;
- 0 to about 30 weight percent of at least one natural elastomer;
- about 5 to about 55 weight percent of at least one elastomer plasticizer;
- about 4 to about 40 weight percent filler; and
- about 5 to about 40 weight percent of at least one softener, said chewing gum also having a Taber Stiffness at least 5 percent less than the Taber Stiffness of a comparable wax containing gum.

5,437,878

**CHEWING GUM EXHIBITING REDUCED ADHERENCE TO DENTAL WORK**

Dorothy A. Panhorst, Morris Plains, and John M. Cahill, Newfoundland, both of N.J., assignors to Nabisco, Inc., Parsippany, N.J.

Filed Nov. 10, 1993, Ser. No. 150,657

Int. Cl.<sup>6</sup> A23G 3/30

U.S. Cl. 426-4

8 Claims

1. A chewing gum exhibited reduced tack to dental surfaces, comprising a gum base, an optional sweetener component and an optional flavor component, wherein the gum base consists of:

- (a) about 8 to about 18 wt. % of low molecular weight polyisobutylene and about 1 to about 4 wt. % of high molecular weight polyisobutylene;
- (b) about 16 to about 30 wt. % of polyvinyl acetate;
- (c) about 16 to about 30 wt. % of inorganic filler;
- (d) about 1 to about 6 wt. % of polyethylene having a molecular weight of about 2,000;
- (e) about 18 to about 30 wt. % of a fat component selected from the group consisting of hydrogenated and partially hydrogenated vegetable oils and mixtures thereof;
- (f) about 1 to about 6 wt. % of emulsifier; and
- (g) about 2 to about 10 wt. % of microcrystalline wax wherein said chewing gum does not contain a resin or rosin component or derivative.

5,437,879

**LAYERED CHEWING GUM CONFECTION**

Kishop Kabae, and Walter J. Hager, both of Scarborough, Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 4, 1993, Ser. No. 132,063

Int. Cl.<sup>6</sup> A23G 3/30

U.S. Cl. 426-5

37 Claims

1. A multi-layered chewing gum confection comprising:  
a) at least two separate layers of a soft chewing gum composition comprising chewing gum base, flavoring agents, sweetening agents, emulsifiers, bulking agents and fillers and;  
b) at least one layer of a hydrophilic confectionery gel-creme sandwiched therebetween.

5,437,880

**HEALTH DRINK COMPOSITION**

Akihisa Takaichi, Naruto; Toshiko Okamoto, Tokushima; Ichiro Otsuka, Naruto, and Ryoichi Hatai, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co. Ltd., Tokyo, Japan

PCT No. PCT/JP93/00342, § 371 Date Nov. 17, 1993, § 102(e) Date Nov. 17, 1993, PCT Pub. No. WO93/19642, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 24, 1993, Ser. No. 150,043

Claims priority, application Japan, Mar. 27, 1992, 4-071267 Int. Cl.<sup>6</sup> A23L 1/302, 1/308

U.S. Cl. 426-73

9 Claims

1. A health drink composition comprising 1-30 g/100 ml of a hardly digestible saccharide, an oil, an emulsifier, vitamin E, malodextrin, and 0.5-30 mg/100 ml of a carotenoid as active ingredients.

5,437,881

**PACKAGE FOR FOOD PRODUCTS**

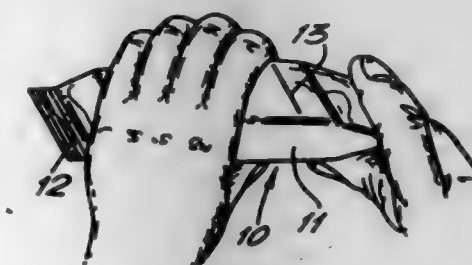
Bernard Jeannin, Dijon, France, assignor to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 971,251, Nov. 3, 1992, abandoned, which is a continuation of Ser. No. 542,840, Jun. 22, 1990, abandoned. This application Jul. 30, 1993, Ser. No. 100,604 Claims priority, application European Pat. Off., Jul. 1, 1989, 89112028

Int. Cl.<sup>6</sup> B65D 85/00

U.S. Cl. 426-122

8 Claims



1. A packaged food product comprising a rigid food product bar which has a width, a height and a length extending between end edges of the bar; a package comprising a hand-tearable product packaging material enclosing the bar having a notch positioned therein, wherein the notch is a single linear slit positioned adjacent and parallel to an end edge of the enclosed bar and wherein the notch has a length less than the width of the enclosed bar; and a material covering the notch on an interior surface of the packaging material which liquefies when heated to a temperature compatible with the packaging material and which is adhesive enough to remain on the notch but which is weak enough to break when the package is bent by leveraging the product contained in the package against the packaging material interior adjacent the covered notch.



5,437,882

**CONTROLLER FOR A FEED GRAIN CONDITIONER**

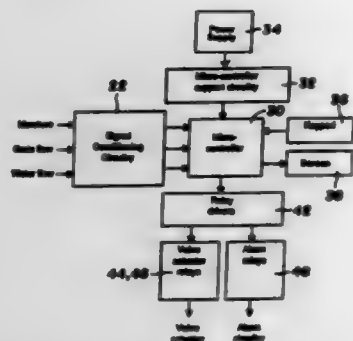
Bryan D. Greer, Anoka, Minn., and David M. Mills, Crossnore, N.C., assignors to BioChem, Inc., Cambridge, Minn.

Filed Jul. 18, 1994, Ser. No. 276,351

Int. Cl.<sup>6</sup> A23L 1/00; A23N 17/00; G01N 33/00

U.S. Cl. 426—231

10 Claims



6. A method for controlling the moisture content in feed grain as it passes through a transfer auger, comprising the steps of

- sensing the moisture content and mass flow of untreated grain;
- sensing the flow of moisture delivered to the grain;
- generating first input signals corresponding to the sensed moisture content, grain mass flow, and moisture flow;
- providing a second input signal corresponding to the type of grain passing through the auger;
- calculating a new moisture flow to be delivered to the grain to adjust the moisture content of the grain to a predetermined level in accordance with the first and second input signals;
- generating at least one pair of complementary control signals in accordance with the calculated flow;
- operating a moisture flow control valve in accordance with said pair of complementary control signals to increase and decrease the flow of moisture delivered to the grain, thereby to adjust its moisture content; and
- integrating the input signals over time to produce a plurality of output signals corresponding to the average and total grain and moisture flows and to the average moisture content of the untreated grain.

5,437,883

**METHOD OF PROCESSING PIG INTESTINES AND STOMACHS**

Juelling He, 60 Baruch Dr., Apt. 12D, New York, N.Y. 10002

Filed Jul. 25, 1994, Ser. No. 279,399

Int. Cl.<sup>6</sup> A23L 1/312

U.S. Cl. 426—254

10 Claims

1. A method for processing frozen pig stomach and intestines comprising the steps of:

- thawing frozen pig stomach meat and intestine meat;
- slow cooking the meat in preheated water;
- stopping the cooking of the meat;
- soaking the meat in a granular sodium hydroxide solution for 30 to 40 minutes;
- draining the sodium hydroxide solution from the meat;
- rinsing the meat in cold running water for 5 minutes;
- soaking the meat in an oxygen bleach solution;
- draining the oxygen bleach solution from the meat;
- rinsing the meat in cold water for 2 hours; and then refrigerating the meat for 2 hours at 40 degrees F.

5,437,884

**METHOD OF PROCESSING DUCK FEET**

Juelling He, 60 Baruch Dr., Apt. 12D, New York, N.Y. 10002

Filed Jul. 22, 1994, Ser. No. 284,882

Int. Cl.<sup>6</sup> A23L 1/312

U.S. Cl. 426—253

5 Claims

1. A method for processing duck feet comprising the steps of:

- freezing fresh duck feet at an approximate temperature of minus 20 degrees F. for at least one day;
- thawing the fresh duck feet;
- slow cooking the duck feet in preheated water for 12½ to 15 minutes;
- stopping the cooking of the duck feet;
- running cold water over the duck feet for 20 minutes;
- cooling the duck feet at 40 degrees F. for two hours;
- removing the minor toe and the nails and tips of the major toes;
- removing the bones and joints from the major toes;
- running cold water over the duck feet for five minutes;
- soaking the duck feet in a solution of oxygen bleach and 100 degree F. water for 90–120 minutes;
- running cold water over the duck feet for two hours; and then
- chilling the duck feet at 40 degrees F. for two hours.

5,437,885

**METHOD OF MAKING A NON-POROUS VEGETABLE PROTEIN FIBER PRODUCT**

Edmund W. Lussas, Bryan; Gabriel J. Guzman, College Station, and Steven C. Doty, Caldwell, all of Tex., assignors to Texas A&amp;M University, College Station, Tex.

Continuation of Ser. No. 852,835, Mar. 16, 1992, abandoned, which is a continuation of Ser. No. 670,007, Mar. 15, 1991, abandoned. This application Dec. 21, 1993, Ser. No. 171,753

Int. Cl.<sup>6</sup> A23B 9/00; A23P 1/00

U.S. Cl. 426—302

12 Claims

1. A method of preparing nutritious agglomerated fibers resembling meat, comprising:

- admixing ingredients consisting essentially of i) a dehulled, defatted, oilseed protein meal in a form selected from a group consisting of flour, concentrate and isolate; ii) a source of water selected from the group consisting of meat, meat trimmings, meat by-products, poultry, seafood, and water; and iii) an edible ingredient selected from the group consisting of emulsifiers, sweeteners, flavorings, salt, colorings, soy fiber, fat, and combinations thereof, the edible ingredient being in an amount which does not interfere with the extruding step c) and is not detrimental to the fibers' taste and appearance, to obtain an admixture having a protein content of about 25–80 wt % and a water content of about 50–20 wt %;
- heating the admixture at a temperature of about 200° to 350° F.;
- extruding the heated admixture from a first area maintained at a pressure of about 500–1500 psig to a second area of lower pressure to obtain extruded protein fibrils disposed in generally parallel relationship;
- coating the once extruded fibrils with a liquid edible oil or fat under pressure above atmospheric pressure; and
- extruding the coated fibrils from an area maintained at a pressure of about 50 to 1500 psig to an area of lower pressure to force the oiled fibrils to cluster into non-porous oil coated fibers having a glistening appearance similar to meat fibers.

5,437,886

**CUTTING PROCESS**

Anthony G. Atkins, Newbury; Leonard D. Hughes, Rushden; George Jeronimidis, Reading; Paul Jolley, Otterhampton; Peter Puralow, Bristol, and Peter Wilding, Raunds, all of Great Britain, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Continuation of Ser. No. 676,169, Mar. 28, 1991, abandoned.

This application Jan. 25, 1993, Ser. No. 8,891

Claims priority, application United Kingdom, Mar. 28, 1990, 900688H0

Int. Cl.<sup>6</sup> A23L 1/025

U.S. Cl. 426—518

14 Claims

1. A process for cutting a hard-frozen anisotropic foodstuff comprising cutting said foodstuff with a rotating conical cutting device comprising at least one cutting blade adjusted to form an angle with the axis of said foodstuff wherein said cutting blade faces inward to said conical cutting device, such that discontinuous, ribbon-like offcuts of said foodstuff are formed, and strong and brittle parts of said foodstuff are weakened by fracturing without extensive damage to weak and less brittle parts of said foodstuff.

5,437,887

**METHOD OF PREPARING ALUMINUM MEMORY DISKS**

Eugene F. Yarkosky, Milford; Deborah Friday, Rocky Hill, and Patricia A. Cacciatore, Prospect, all of Conn., assignors to Enthone-Omi, Inc., West Haven, Conn.

Filed Dec. 22, 1993, Ser. No. 172,418

Int. Cl.<sup>6</sup> H01F 10/02

U.S. Cl. 427—131

15 Claims

1. A method for depositing an electroless nickel-phosphorus paramagnetic metal coating on a zincated aluminum substrate wherein retention of the original paramagnetic property of the metal coating on the substrate after exposure to elevated temperatures is enhanced comprising plating the zincated aluminum substrate using an electroless nickel-phosphorus paramagnetic metal plating bath comprising (1) a source of nickel ions, (2) a hypophosphite reducing agent, (3) an acid or hydroxide pH adjuster to provide the required pH and (4) a complexing agent for metal ions sufficient to prevent their precipitation in solution and containing an effective amount of an additive material selected from the group consisting of antimony ions and cadmium ions.

5,437,888

**METHOD FOR CONTINUOUSLY MANUFACTURING A WATERPROOF ZIP CLOSURE**

Hartmut Ortlieb, Rehder Str. 5, D-90431 Nurnberg, Germany

PCT No. PCT/DE92/00688, § 371 Date Mar. 3, 1994, § 102(e) Date Mar. 3, 1994, PCT Pub. No. WO93/04605, PCT Pub. Date Mar. 18, 1993

PCT Filed Aug. 17, 1992, Ser. No. 204,171

Claims priority, application Germany, Sep. 3, 1991, 41 29 191.3

Int. Cl.<sup>6</sup> B05D 3/12; A44B 19/32

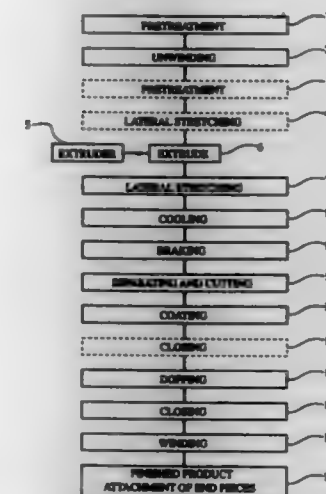
U.S. Cl. 427—172

6 Claims

1. A method for the continuous manufacture of a waterproof zip closure comprising:

- providing a zip closure having pairs of opposed plastic spiral teeth, with zip closure tapes;
- pretreating said zip closure in a closed state with a first thermoplastic material;
- applying a lateral force to said zip closure while solidifying said first thermoplastic material;
- the step of applying a lateral force including applying a sufficient lateral force to urge corresponding teeth of said zip closure together, without separating both rows of teeth;

cooling said zip closure, while said first thermoplastic material solidifies; separating said zip closure while applying a longitudinal force to said zip closure;



cutting said zip closure longitudinally; and, closing said zip closure.

5,437,889

**FLUIDIZED BED WITH SPRAY NOZZLE SHIELDING**

David M. Jones, Ramsey, N.J., assignor to Glatt Air Technologies, Inc., Ramsey, N.J.

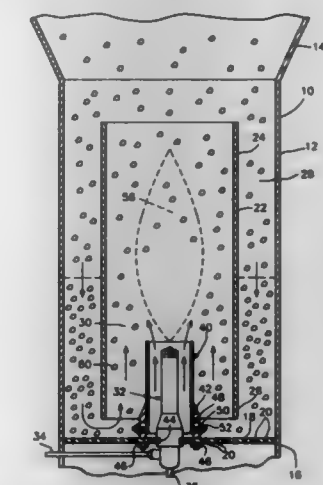
Division of Ser. No. 783,124, Oct. 28, 1991, Pat. No. 5,236,503.

This application Aug. 9, 1993, Ser. No. 103,129

Int. Cl.<sup>6</sup> B05D 1/24

U.S. Cl. 427—185

9 Claims



1. A method for coating product in a fluidized bed having a product container section opening upwardly into an expansion chamber and downwardly into a lower plenum chamber through a generally horizontally disposed air distribution plate/screen having openings formed therethrough for upward air flow from said lower plenum chamber into said product container section, said product container section including a substantially cylindrical partition spaced above said air distribution plate/screen for dividing said product container section into an inner upbed area and an outer downbed area, and an upwardly discharging spray nozzle mounted substantially centrally within said cylindrical partition, said method including the steps of positioning a cylindrical inner partition adjacent said distribution plate/screen and extending upwardly therefrom, surrounding said nozzle, and projecting upwardly

to a level at least equal in height to said nozzle, and passing air upwardly through said air distribution plate/screen and through said cylindrical inner partition about said nozzle to shield the initial spray pattern developed by said nozzle against the entrance of particles moving upwardly through said upped.

5,437,890

## COATINGS FOR RECEPTACLES

Mark H. Gramke, Valparaiso, Ind., assignor to Edw. C. Levy Co., Detroit, Mich.

Filed Apr. 18, 1994, Ser. No. 229,376

Int. Cl.<sup>6</sup> B05D 7/22

U.S. Cl. 427—236

7 Claims

1. A composition for coating receptacles used for containing molten metal comprising a mixture of slag fines, lime and water to form a slurry, wherein the ratio of each constituent on a weight basis include from between about 0.8 to about 1.2 kg of slag fines; from between about 0.8 to about 1.2 kg of lime and from between about 2.6 to about 3.9 kg of water, based on a total weight of between 4.2 kg to about 6.3 kg for the composition.

3. A process of coating receptacles used for containing molten metals, said process comprising the steps of:

- mixing a slurry comprising slag fines, lime and water, wherein the ratio of each constituent on a weight basis include from between about 0.8 to about 1.2 kg of slag fines; from between about 0.8 to about 1.2 kg of lime and from between about 2.6 to about 3.9 kg of water, based on a total weight of between 4.2 kg to about 6.3 kg for the slurry;
- heating a receptacle for receiving molten metal to a temperature of between about 400° to about 800° C.; and
- applying the slurry of step (a) to the heated receptacle walls.

5,437,891

## CHEMICAL VAPOR DEPOSITION OF POLYCRYSTALLINE DIAMOND WITH &lt;100&gt; ORIENTATION AND &lt;100&gt; GROWTH FACETS

Thomas R. Anthony, Niskayuna; James F. Fleischer, Scotia, both of N.Y., and David E. Slutz, Columbus, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 23, 1994, Ser. No. 264,268

Int. Cl.<sup>6</sup> C23C 16/26

U.S. Cl. 427—249

7 Claims

1. A method for depositing diamond on a substrate by chemical vapor deposition which comprises activating a gas mixture and contacting said substrate therewith at a pressure below 760 torr, said gas mixture comprising by weight about 45.5–99% hydrogen, about 0.5–2.0% of a gaseous hydrocarbon, about 0.05–2.0% oxygen and about 0.2–0.5% of at least one inert gas, at least about 95% of said inert gas being nitrogen; thereby producing polycrystalline diamond with <100> orientation and (100) growth facets.

5,437,892

## METHOD FOR MANUFACTURING A FINE-PARTICLES TWO-DIMENSIONAL AGGREGATE FROM A LIQUID DISPERSION OF FINE PARTICLES

Kuniaki Nagayama, Tokyo; Nikolai D. Denkov, Sofia; Tzetzio D. Douchkin, and Hideyuki Yoshimura, both of Tsukuba, all of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

Filed Aug. 31, 1993, Ser. No. 113,664

Claims priority, application Japan, Aug. 31, 1992, 4-231838; Nov. 11, 1992, 4-300869

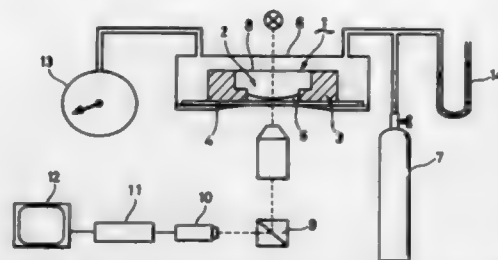
Int. Cl.<sup>6</sup> B05D 3/00, 1/32

U.S. Cl. 427—372.2

9 Claims

1. A method for manufacturing a fine-particle two-dimensional assembly, which comprises the steps of arranging a wall cell forming a closed surface region on the surface of a solid

substrate, injecting a liquid containing fine particles into the closed surface region in said wall cell, and then removing the



liquid, thereby forming two-dimensional assembly of the fine particles on the surface of the solid substrate.

5,437,893

## METHOD FOR SUPPRESSION OF ELECTRIFICATION

Fumio Mural, Tokyo; Yasunori Suzuki, Hachioji; Hideki Tomozawa, Tokyo; Ryuma Takashi, Tokyo; Yoshihiro Saida, Tokyo, and Yoshiaki Ikenoue, Tokyo, all of Japan, assignors to Hitachi, Ltd and Showa Denko K. K., both of Tokyo, Japan

Continuation of Ser. No. 707,819, May 30, 1991, Pat. No. 5,256,454. This application Apr. 26, 1993, Ser. No. 51,841

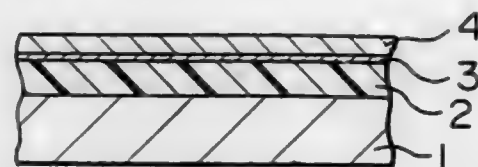
Claims priority, application Japan, May 30, 1990, 2-138467

The portion of the term of this patent subsequent to Oct. 26, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> B05D 3/06

U.S. Cl. 427—498

10 Claims



1. A method for suppression of electrification which comprises a step of forming on a substrate a water-soluble electrification-suppressing film having an electron conductivity and comprising an electron conducting polymer having a  $\pi$ -electron conjugated system, and a step of irradiating a charged particle beam onto the substrate; said charged particle beam being an electron or ion beam.

5,437,894

## METHOD OF MANUFACTURING A WATER- AND OIL-REPELLING FILM HAVING SURFACE IRREGULARITIES

Kazufumi Ogawa, and Mamoru Soga, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 824,287, Jan. 23, 1992, Pat. No. 5,324,566. This application Jan. 25, 1994, Ser. No. 186,117

Claims priority, application Japan, Jan. 23, 1991, 3-024023; Jan. 23, 1991, 3-024024; Feb. 5, 1991, 3-036773; Feb. 5, 1991, 3-036775; Feb. 6, 1991, 3-038133; Jun. 4, 1991, 3-132737

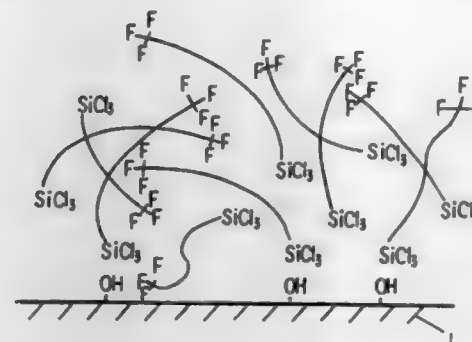
Int. Cl.<sup>6</sup> B06D 3/06

U.S. Cl. 427—535

14 Claims

1. A method of manufacturing a water- and oil-repelling adsorbed film comprising: making a substrate surface irregular wherein the irregularities have a diameter of 0.01–50  $\mu$ m; and contacting said irregular surface with a non-aqueous solu-

tion containing an active surface material comprising molecules having a fluorocarbon group and a chlorosilane



group or having a fluorocarbon group and an alkoxysilane group.

5,437,895

## PLASMA CVD PROCESS FOR FORMING AMORPHOUS SILICON THIN FILM

Akira Kodama; Yoshimi Watabe, and Masashi Ueda, all of Tokyo, Japan, assignors to Anelva Corporation, Fuchu, Japan

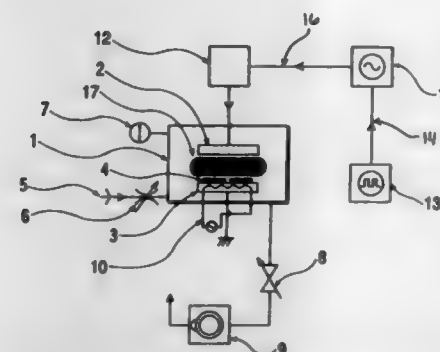
Filed Jul. 19, 1994, Ser. No. 276,906

Claims priority, application Japan, Sep. 21, 1993, 5-234705

Int. Cl.<sup>6</sup> B05D 3/06

U.S. Cl. 427—578

10 Claims



1. A process for forming a silicon containing thin film on an insulating substrate by a plasma enhanced chemical vapor deposition process, comprising the steps of:

- intermittently generating a high frequency discharge between a high frequency applying electrode and a ground electrode, wherein a duration of each discharge is shorter than a time period necessary for a DC bias voltage, which is generated on the high frequency-applying electrode side, to attain a maximum constant value; and
- providing a starting material gas in the vicinity of the high frequency discharge.

5,437,896

## METHOD OF PREPARING A COMPOSITE MATERIAL OF SILICA NETWORK AND CHAINS OF A POLYHYDROXY COMPOUND AND A LIQUID CRYSTAL DISPLAY DEVICE INCORPORATING SUCH COMPOSITE MATERIAL

Johan G. Kloosterboer, and Fredericus J. Touwslager, both of Eindhoven, Netherlands, assignors to U.S. Philips corporation, New York, N.Y.

Filed Jul. 6, 1994, Ser. No. 271,294

Claims priority, application European Pat. Off., Jul. 6, 1993, 93201973

Int. Cl.<sup>6</sup> G02F 1/1333

U.S. Cl. 428—1

8 Claims

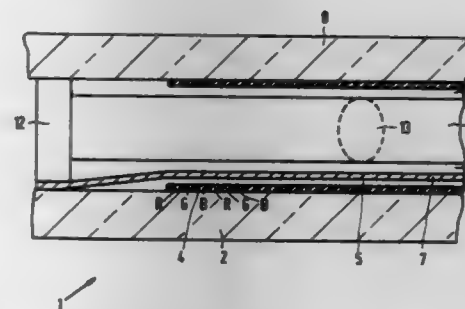
1. A method of preparing a composite material comprising a silica network and, interwoven therewith, chains of a polyhy-

droxy compound, the method comprising converting a mixture comprising an alkenyl-orthosilicate monomer and a photoinitiator into said silica network by hydrolysis and polycondensation, and into said polyhydroxy compound by radical polymerization, characterized in that the alkenyl-orthosilicate monomer has the formula:



where p is 0 or 1, and

R<sup>1</sup> represents a methylene group and R<sup>2</sup> represents a vinyl group, or



R<sup>1</sup> represents a C<sub>1</sub>–C<sub>10</sub> alkylene group and R<sup>2</sup> represents a vinyloxy group, allyloxy group, acryloxy group or methacryloxy group, and

R<sup>3</sup> represents a C<sub>1</sub>–C<sub>12</sub> alkyl group, aryl group or (meth)acryloxy(C<sub>1</sub>–C<sub>10</sub>) alkylene group, and in that first the radical polymerization is carried out by exposure to UV radiation, thereby forming a siloxy-polymer network, after which said siloxy-polymer network is subjected to hydrolysis and polycondensation to convert it into the silica network and the chains of the polyhydroxy compound interwoven with said silica network.

5,437,897

## ANTI-COUNTERFEIT LATENT IMAGE FORMATION OBJECT FOR BILLS, CREDIT CARDS, ETC. AND METHOD FOR MAKING THE SAME

Toshinori Tanaka, Tokyo; Satoru Nishiyama, Odawara, and Masaharu Koyama, Tokyo, all of Japan, assignors to Director-General, Printing Bureau, Ministry of Finance, Japan, Tokyo, Japan

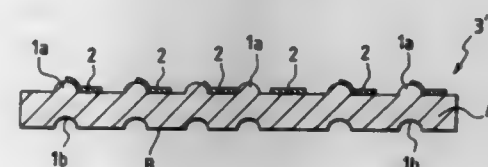
Filed May 18, 1993, Ser. No. 62,796

Claims priority, application Japan, Jun. 4, 1992, 4-168252

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—29

12 Claims



1. A latent image formation object for printed matter comprising:

- a main body;
- projections or recesses formed on said main body in such a manner as to exhibit various kinds of patterns, in which said various kinds of patterns comprise straight image lines forming a pattern, a relief pattern or a combination of said pattern and said relief pattern; and
- a plurality of straight lines printed on at least one surface of said main body at predetermined spaces, said straight lines being printed in colors different from that of said main body itself, wherein the relative positional relationship between said projections or recesses is non-uniform.



5,437,898

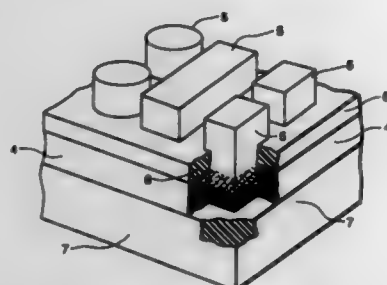
**CERAMIC VENEER COMPOSITE STRUCTURE**

John S. Forry, Lancaster; Thomas C. Simonton, Willow Street; William C. Welch, and Jerome D. Wisnosky, both of Lancaster, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Division of Ser. No. 878,554, May 5, 1992. This application Oct. 24, 1994, Ser. No. 327,698  
Int. Cl.<sup>6</sup> B32B 7/00

U.S. Cl. 428—34.4

4 Claims



1. A composite layer comprising a fibrous mat and a ceramic composition, the ceramic composition forming a plurality of discrete elements which penetrate into the fibrous mat, a portion of the fibrous mat being embedded in a portion of each of the discrete elements and a portion of the fibrous mat between adjacent discrete elements being free of the ceramic composition.

5,437,899

**STRUCTURAL ELEMENT FORMED OF A FIBER REINFORCED THERMOPLASTIC MATERIAL AND METHOD OF MANUFACTURE**

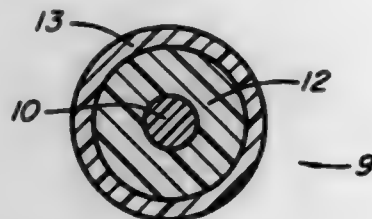
Peter A. Quigley, Cataumet, Mass., assignor to Composite Development Corporation, West Wareham, Mass.

Filed Jul. 14, 1992, Ser. No. 913,594

Int. Cl.<sup>6</sup> B65D 1/00

U.S. Cl. 428—35.7

12 Claims



1. A structural member comprising a sheath formed of polymeric material having a first melting temperature and characterized by deformability upon the application of heat at a temperature just below said first melting temperature, and a core material positioned within said sheath, said core material being formed of a composite including first reinforcing fibers and polymeric material and characterized by a second melting temperature substantially below said first melting temperature, the characteristics of said sheath material and of said core material being such that upon application of sufficient heat to said member, at a temperature between said first and second temperatures, said core material becomes fluid, while said sheath material becomes deformable, but not fluid.

5,437,900

**SURFACE MODIFIED POROUS EXPANDED POLYTETRAFLUOROETHYLENE AND PROCESS FOR MAKING**

Stanislaw L. Kuzowski, Flagstaff, Ariz., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation of Ser. No. 718,324, Jun. 14, 1991, abandoned.

This application Dec. 1, 1993, Ser. No. 161,184

Int. Cl.<sup>6</sup> A01K 91/00; A61F 2/01, 2/04, 2/06, 2/52; A61L 27/00; B01D 39/16; B32B 33/00

U.S. Cl. 428—36.1

22 Claims

1. Porous expanded polytetrafluoroethylene having a microstructure comprised of nodes interconnected by fibrils, said porous expanded polytetrafluoroethylene comprising a three dimensional material having at least one surface wherein at least a substantial portion of the at least one surface is comprised of freestanding node portions with open valleys disposed between the freestanding node portions.

5,437,901

**PARKING CARD FOR THE CHARGE-RELATED ACTUATION OF A PARKING BARRIER**

Johann Farmont, Talstrasse 1, 40217 Dusseldorf, Germany

Continuation-in-part of Ser. No. 84,545, Jun. 29, 1993,

abandoned. This application Jan. 3, 1994, Ser. No. 176,956

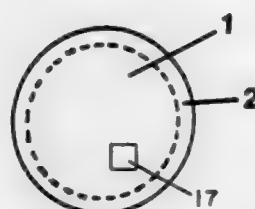
Claims priority, application Germany, Oct. 21, 1993, 9316028

U

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—64.2

6 Claims



1. A parking card for the charge-related actuation of a parking barrier comprising: a round plastic piece having a front side and a rear side; an integrated electronic component formed within said plastic piece for the storing of parking information; a peripheral border region of said plastic piece with a radially outwardly tapering thickness.

5,437,902

**FIRE-RESISTANT GLASS AND PROCESS FOR PRODUCTION THEREOF**

Hiroshi Itoh, Kamakura; Takashi Abe, Yokohama; Hitoshi Yamashita, Kawasaki; Toshihiro Yoshimura, Kamakura; Takeshi Hisanaga, Matsusaka; Takao Takebayashi, Ise; Kunio Nakata, Matsusaka, and Chikara Hashimoto, Ohmiya, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo and Central Glass Company, Limited, Ube, both of Japan

Filed Sep. 30, 1993, Ser. No. 128,709

Claims priority, application Japan, Sep. 30, 1992, 4-261888

Int. Cl.<sup>6</sup> B32B 17/10; C09K 21/00; E06B 5/16

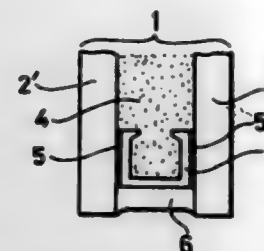
U.S. Cl. 428—68

6 Claims

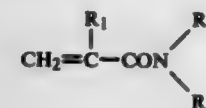
1. A fire-resistant glass comprising: (a) at least two plate-shaped vitreous materials arranged parallel and apart, the sides of the plate-shaped vitreous materials facing each other being treated with a silane coupling agent, (b) a spacer provided between the plate-shaped vitreous materials at their peripheries via an adhesive, (c) a sealing agent adhered to the outer surface of the spacer, and (d) an aqueous gel filled into the space formed by the plate-

shaped vitreous materials and the spacer, the aqueous gel comprising 2 to 35 percent by weight a polymer of a

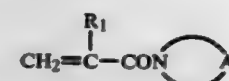
a plurality of star-shaped cells; and a plurality of hexagonal-shaped cells, each of said hexagonal-shaped cells being in contact with surfaces partially forming at least one point of a star-shaped cell.



(meth)acrylamide derivative represented by the following general formula (I) or (II)



(R<sub>1</sub> is a hydrogen atom or a methyl group; R<sub>2</sub> is a hydrogen atom, a methyl group or an ethyl group; and R<sub>3</sub> is an ethyl group or a propyl group)



[R<sub>1</sub> is a hydrogen atom or a methyl group, and A is —(CH<sub>2</sub>)<sub>n</sub>—(4 ≤ n ≤ 6) or —(CH<sub>2</sub>)<sub>2</sub>—O—(CH<sub>2</sub>)<sub>2</sub>—], 4 to 40 percent by weight of a particulate metal oxide which is insoluble in water and has a particle diameter of 0.5 micron or less, and remainder is an aqueous medium and an antifreezing agent wherein the portion of the antifreezing agent in the total of the aqueous medium and the antifreezing agent in the aqueous gel is 5 to 60 percent by weight.

5,437,903

**STAR CELL TYPE CORE CONFIGURATION FOR STRUCTURAL SANDWICH MATERIALS**

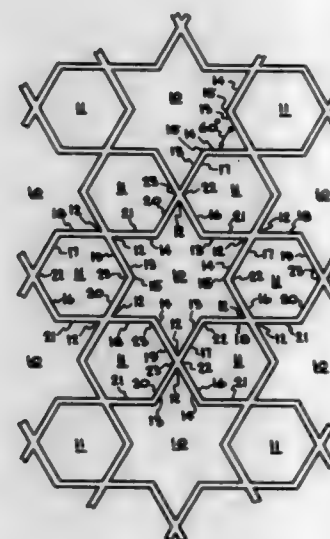
Richard M. Christensen, Danville, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Jun. 23, 1994, Ser. No. 264,261

Int. Cl.<sup>6</sup> B32B 3/12

U.S. Cl. 428—73

19 Claims



1. A microstructure comprising:

5,437,904

**LOW FLUID PRESSURE DUAL-SIDED FIBER ENTANGLEMENT METHOD, APPARATUS AND RESULTING PRODUCT**

Roger Boulanger, Ste-Julie; Daniel Ploerde, McMasterville; Andre Brousseau, Lavaltrie, and Flavio Metta, Longueuil, all of Canada, assignors to Johnson & Johnson Inc., Montreal, Canada

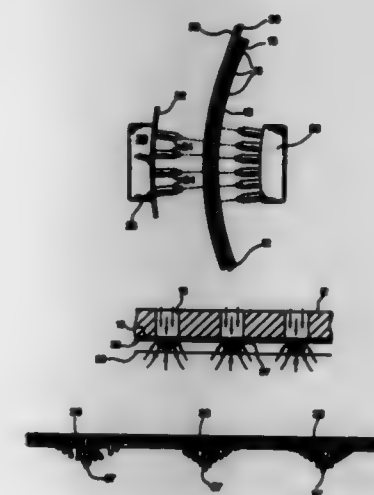
Division of Ser. No. 558,679, Jul. 26, 1990, Pat. No. 5,238,644.

This application Apr. 6, 1993, Ser. No. 43,423

Int. Cl.<sup>6</sup> D04H 1/70

U.S. Cl. 428—91

7 Claims



1. A nonwoven three-dimensional fabric comprising a unitary reticular network of fibers in mechanical engagement one with another, defining a predetermined pattern of blind holes, each hole extending transversely to the plane of the fabric and containing a protuberant fiber packing at a closed end thereof, one side of said fabric containing a pattern of recesses corresponding to openings of said blind holes, the other side of said fabric having a knobby surface containing apexes of the protuberant fiber packings.

5,437,905

**BALLISTIC LAMINATE STRUCTURE IN SHEET FORM**

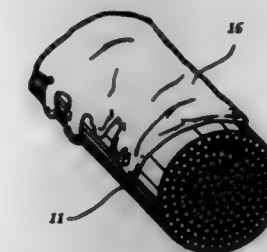
Andrew D. Park, 2851 E. Brigstock Rd., Midlothian, Va. 23113

Filed May 17, 1994, Ser. No. 243,976

Int. Cl.<sup>6</sup> B32B 5/12

U.S. Cl. 428—105

6 Claims



1. A ballistic laminate structure in sheet form, comprising: (a) a first array of high performance, unidirectionally-oriented fiber bundles; (b) a second array of high performance, unidirectionally-oriented fiber bundles cross-plyed at an angle with respect to the first array.

said first array of fiber bundles, and laminated to said first array of fiber bundles in the absence of adhesives or bonding agents, said first and second arrays of high performance unidirectionally-oriented fiber bundles comprising fibers chosen from the group consisting of aramid fiber ultra high molecular weight polyethylene, high molecular weight polyethylene, high modulus vinylon, and liquid crystal polymer-based fiber; and

(c) first and second thermoplastic films bonded to outer surfaces of said laminated first and second arrays of unidirectional fiber bundles without penetration of said films into said fiber bundles or through the laminate from one side to the other, whereby a sufficient amount of film resides between the laminated first and second arrays of unidirectional fiber bundles to adhere the first and second arrays of fiber bundles together to form the ballistic laminate structure.

5,437,906

## SANITARY TOILET SEAT COVERS

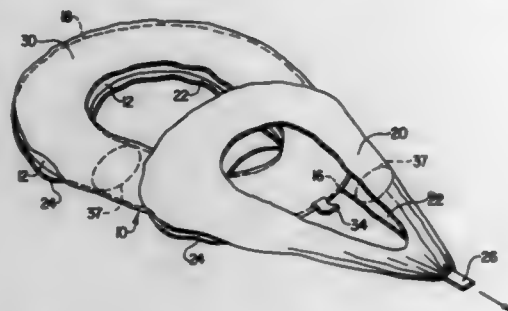
Stuart E. Snuggs, 10009 Lakemere, Dallas, Tex. 75238

Filed Nov. 8, 1993, Ser. No. 148,318

Int. Cl.<sup>6</sup> A47K 13/00

U.S. Cl. 428—131

20 Claims



1. A toilet seat cover adapted to substantially enclose a toilet seat in such a way that allows a user to quickly and easily expose a sanitary surface, said toilet seat having a top surface and a bottom surface, comprising:

a base slip cover, having a protective surface, configured to provide a generally oval cross section adapted to fit over a toilet seat;

a plurality of secondary slip covers removably supported on the base slip cover in a configuration providing a plurality of protective surfaces ranging from an innermost protective surface provided by the secondary slip cover next adjacent to the base slip cover to an outermost protective surface provided by the outermost of the secondary slip covers; and

means for removably supporting the secondary slip covers on the base slip cover in a manner permitting each of the secondary slip covers to be progressively removed to expose the next succeeding protective surface wherein said secondary slip covers are not connected to one another in anyway, and wherein the protective surface of said base slip cover and the plurality of protective surfaces provided by said secondary slip covers are adapted to substantially cover both said top surface and said bottom surface of said toilet seat.

5,437,907

## REMOVABLE REFLECTIVE TAPE OR SHEETING

Fred G. Peil, St. Louis, and Herbert J. Kramer, Ballwin, both of Mo., assignors to Flex-O-Lite, Inc., Clayton, Mo.

Continuation of Ser. No. 459,563, Jan. 2, 1990, abandoned. This application Nov. 25, 1992, Ser. No. 982,232

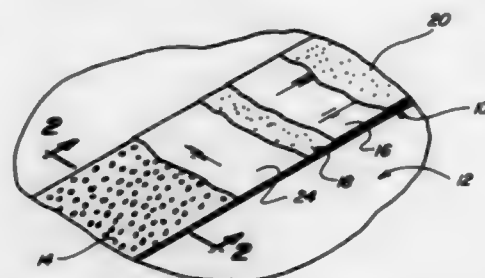
Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—143

6 Claims

1. A marking tape having adhesion to supporting surfaces comprising a multi-layer composite structure including an

upper layer in the form of a film having a reflective face, a supporting layer in the form of a plastic film having properties such that its breaking resistance is effective to overcome adhesion to those surfaces on being pulled off of the surfaces, the supporting layer including a high-density polyethylene film having a film thickness of between about 0.5 to 5 mils, a tensile strength of about 3,000 psi or more, a tearing strength of about



600 g/mil or more, and an elongation of about 200% or more, the upper layer being bonded to the supporting layer by an intermediate layer of adhesive so that the entire marking tape is rendered highly resistant to fracture and breakage and the tape may be substantially cleanly removed from those supporting surfaces, the underside of the supporting layer carrying a layer of adhesive for bonding the tape to said surfaces.

5,437,908

## BATHROOM TISSUE AND PROCESS FOR PRODUCING THE SAME

Takeshi Demura; Tetsuo Uchiyama, both of Tokyo; Sadayuki Aoki, and Minoru Ihara, both of Ehime, all of Japan, assignors to Jujo Kimberly K.K., Tokyo and Toyo Paper Mfg. Co., Ltd., Kawano, both of Japan

Continuation of Ser. No. 937,703, Sep. 1, 1992, abandoned. This application May 12, 1994, Ser. No. 241,673

Claims priority, application Japan, Sep. 2, 1991, 3-221537

Int. Cl.<sup>6</sup> B32B 3/10; D21F 11/00

U.S. Cl. 428—154

9 Claims

1. A bathroom tissue for use with toilets equipped with a washing facility obtained by a process comprising the steps of:

(a) preparing web A from a paper stock slurry, the web A comprising wood pulp and rayon pulp mixed in a weight ratio of from about 40:60 to about 80:20;

(b) preparing web B from a paper stock slurry, said web B comprising about 100% wood pulp; and

(c) superposing said web B and two webs A to sandwich web B between said two webs A, wherein said two webs A and said web B are not permanently attached to one another and said bathroom tissue is dispersible in water.

5,437,909

## MULTILAYER NONWOVEN THERMAL INSULATING BATTIS

Carol E. Herzberg, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 20, 1994, Ser. No. 247,133

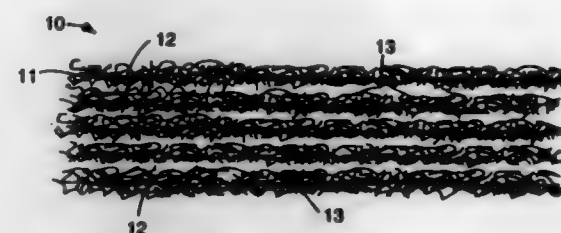
Int. Cl.<sup>6</sup> B32B 5/06

U.S. Cl. 428—192

6 Claims

1. A nonwoven thermal insulating batt comprising multiple layers of webs, each web comprising 5 to 100 weight percent bonding staple fibers and 0 to 95 weight percent staple fill fibers, said bonding staple fibers being thermally activatable at a temperature below the melt temperature of the staple fill fibers and the bonding fibers bonded to other bonding fibers and fill fibers at the points of contact within each layer to

enhance the structural stability of the layers of the batt, said layered batt being further bonded at the perimeter of the layers polyester copolymer, said base film comprising a monolayer film or coextruded multilayer film, which is biaxially stretched



on the periphery of the batt and the interior portions of the layers not being bonded to adjacent layers.

5,437,910

## MULTI-PLY FILTER LAMINATE/COMPOSITE FOR MANUFACTURING VACUUM CLEANER FILTER BAGS

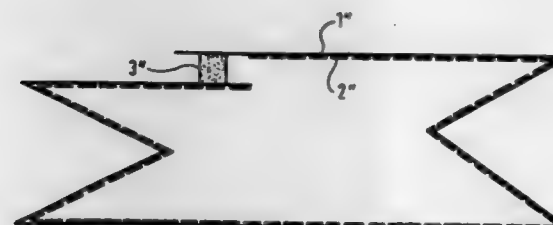
Ernst Raabe, Raubling-Nickelheim, and Albrecht Klimmek, Bruckmühl, both of Germany, assignors to Steinbeis Gessner GmbH, Bruckmühl, Germany

Filed Jul. 21, 1993, Ser. No. 95,751

Int. Cl.<sup>6</sup> B01D 39/18; B32B 23/02

U.S. Cl. 428—194

13 Claims



1. A multi-ply filter laminate composite for manufacturing vacuum cleaner filter bags, said laminate composite comprising at least one ply of a filter paper and at least one ply of a fibrous filter web bonded to said filter paper, said at least one ply of fibrous filter web extending over the surface of said filter paper excepting a width along an edge of the ply of filter paper so as to form at least one edge strip blank on said at least one ply of filter paper.

5,437,911

## COATED FILM FOR PACKAGING SLICED FOODSTUFFS

Heinz-Werner Rohrer, Kiedrich; Lothar Sieben, Nieder; Rolf Mueller, and Wolfgang Funk, both of Wiesbaden, all of Germany, assignors to Wolff Walrode AG, Walrode, Germany

Filed Jan. 28, 1993, Ser. No. 10,184

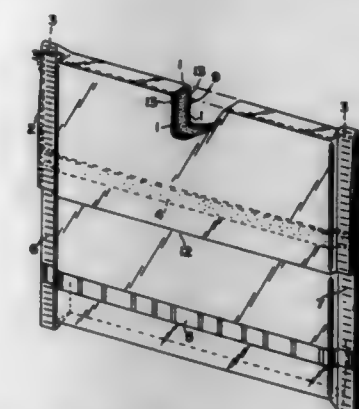
Claims priority, application Germany, Jan. 31, 1992, 42 02 727.6

Int. Cl.<sup>6</sup> B32B 3/00

U.S. Cl. 428—195

31 Claims

1. A coated film useful for packaging sliced foodstuffs, which film is wound about said foodstuff in the form of a tube lying flat and completely enclosing said foodstuff, whereby two edge zones along the longitudinal axis of the film overlap and are joined to one another by means of a peelable heat-sealable coating applied to at least a portion of a base film, said heat-sealable coating comprising an olefin copolymer and



and heat-fixed, wherein applied to at least a portion of said base film is a mixture of water-repellant components.

5,437,912

## COATED THIN FILM FOR IMAGING

Hsin-Hsin Chou, Woodbury, Mo., and Rebecca M. Williams, Ithaca, N.Y., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

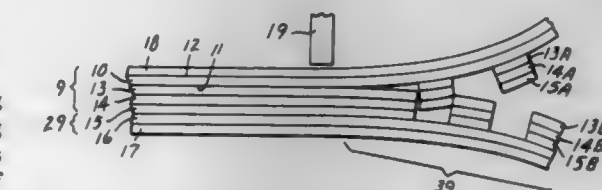
Continuation of Ser. No. 776,602, Oct. 11, 1991, abandoned.

This application Dec. 3, 1993, Ser. No. 161,974

Int. Cl.<sup>6</sup> B32B 3/00

U.S. Cl. 428—195

38 Claims



1. A composite article comprising:  
(a) a support member having a thermoplastic front surface;  
(b) a controlled release material coated directly onto at least a portion of said thermoplastic front surface; and  
(c) a vapor coated inorganic pigment coated directly onto at least a portion of said controlled release material.

5,437,913

## ELECTROPHOTOGRAPHIC TRANSFER FILM

Kazuo Asaka; Katsumi Harada, both of Ebina; Takashi Kobayashi, and Yoshio Tani, both of Fujinomiya, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1994, Ser. No. 228,936

Claims priority, application Japan, Apr. 16, 1993, 5-113723; Jul. 8, 1993, 5-193159

Int. Cl.<sup>6</sup> B32B 3/00

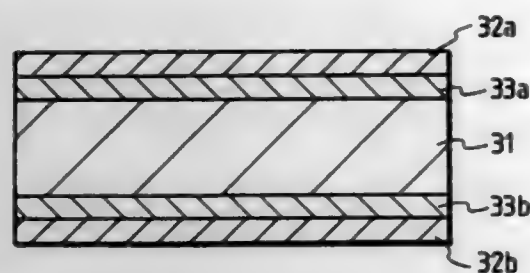
U.S. Cl. 428—195

17 Claims

1. An electrophotographic transfer film comprising a transparent substrate having formed on at least one side thereof an image-receiving layer containing a binder resin and at least one resistivity control agent selected from (a) conductive metal



oxide fine particles having an average particle size of not greater than 0.1  $\mu\text{m}$  and (b) an nonionic surface active agent,



said image-receiving layer having a surface resistivity of from  $1 \times 10^9$  to  $1 \times 10^{13} \Omega$  at 25° C. and 65% RH.

5,437,914

### COPPER-CLAD LAMINATE AND PRINTED WIRING BOARD

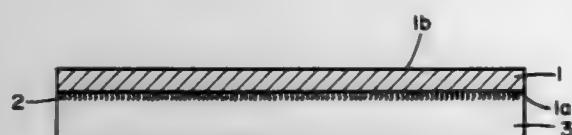
Muneeo Saida, Tokyo; Yutaka Hirasawa, Okegawa, and Katsuhiko Yoshimura, Oomiya, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Nihombashi-Muromachi, Japan  
Filed Oct. 26, 1993, Ser. No. 143,849

Claims priority, application Japan, Mar. 19, 1993, 5-085765

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428-209

6 Claims



1. A copper clad laminate which consists essentially of an electrolytic copper foil (1) and a substrate (3), said substrate (3) having two sides, said electrolytic copper foil (1) having a glossy surface side (1a) and a matte surface side (1b), a granular copper layer (2) being electrodeposited on said glossy surface side (1a), said glossy surface side (1a) being bonded through said granular copper layer (2) to at least one side of said substrate (3).

5,437,915

### SEMICONDUCTOR LEADFRAME AND ITS PRODUCTION METHOD AND PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICE

Asao Nishimura, Ushiku; Akihiro Yaguchi; Mitsuaki Haneda, both of Ibaraki; Ichiro Anjoh, Koganei; Junichi Arita, Musashino; Akihiko Iways, Kokubunji, and Masahiro Ichitani, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

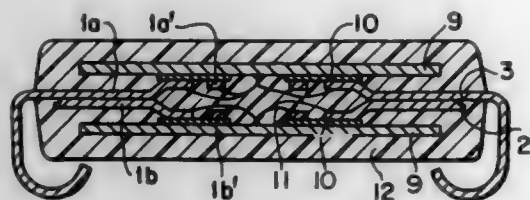
Continuation of Ser. No. 5,036, Jan. 15, 1993, abandoned. This application Jun. 16, 1994, Ser. No. 261,230

Claims priority, application Japan, Jan. 17, 1992, 4-006522

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428-209

4 Claims



1. A plastic molded semiconductor device comprising: a mass of a plastic material; a pair of semiconductor chips disposed in said mass of plastic

material and in spaced relationship with each other so that circuit-formed surfaces of said semiconductor chips are directed towards each other;

at least one set of leads comprising first and second leads; each of said first and second leads having an inner section disposed in said mass of plastic material between said semiconductor chips and an outer section integral with and extending from said inner section also disposed in said mass of plastic material and extending from an area of an associated semiconductor chip toward an outer surface of said mass of plastic material;

a length of metal wire disposed in said mass of plastic material for electrically connecting each of said first and second leads to an associated semiconductor chip;

the outer section of said first lead extending in overlapping and face-to-face contacting relationship with the outer section of said second lead and having an outer end extremity welded to the outer section of said second lead; and

the outer section of said second lead having an outer extension extending outwardly from said mass of plastic material.

5,437,916

### FLEXIBLE PRINTED CIRCUITS

Albert W. Morgan, Wilbraham; James P. Brozek, Chicopee, both of Mass.; James D. Capistran, Suffield, Conn., and Michael T. O'Connor, Jr., Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

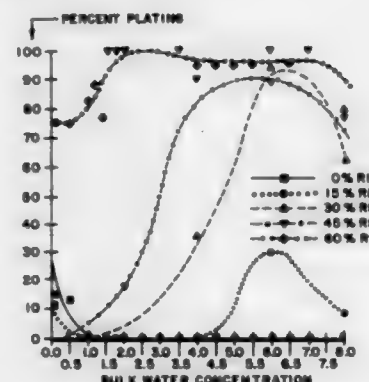
Division of Ser. No. 812,245, Dec. 19, 1991, Pat. No. 5,328,750, which is a division of Ser. No. 468,509, Jan. 22, 1990, Pat. No. 5,075,037, which is a division of Ser. No. 320,914, Mar. 7, 1989, Pat. No. 4,910,072, which is a continuation of Ser. No. 928,499, Nov. 7, 1986, abandoned. This application Jul. 8, 1994, Ser. No. 272,895

The portion of the term of this patent subsequent to Jul. 12, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428-209

5 Claims



1. A patterned, cobalt electrical circuit on a flexible film substrate wherein said cobalt is deposited onto a pattern of printed, activated ink comprising a vinyl polymer or an unsaturated polymer and a palladium compound.

5,437,917

### IMAGE-RECEIVING PAPER

Tomio Ohe; Shigeru Katayama, and Kenichiro Itoh, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Apr. 1, 1994, Ser. No. 221,573

Claims priority, application Japan, Apr. 1, 1993, 5-100214

Int. Cl.<sup>6</sup> B32B 3/00

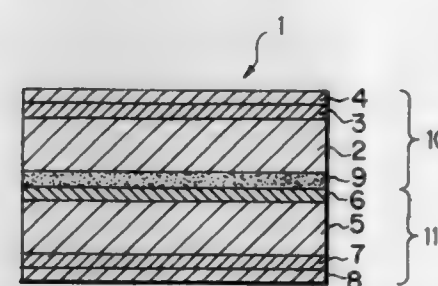
U.S. Cl. 428-211

4 Claims

1. An image-receiving paper comprising a label paper and a

separate paper which is releasably adhered to the label paper, wherein said label paper comprises:

a synthetic resin film having a heat resistant temperature of at least 100° C. and having formed on the front surface thereof a matted layer and having formed on the back surface thereof an adhesive layer, wherein said matted layer has a surface resistivity of from  $1 \times 10^6$  to  $1 \times 10^{13} \Omega/\text{cm}^2$  and comprises a toner adhering layer, and wherein said separate paper comprises: a synthetic resin film having a heat resistant temperature of at least 100° C., and having formed on the front surface thereof a releasing layer and having formed on the back surface thereof a matted layer and an antistatic agent layer, and the coefficients of thermal shrinkage  $\epsilon$  of said label paper in the



lengthwise direction and the width direction are all or less in the following test method:

Sample Form: 20 mm  $\times$  100 mm

Load: None

Pre-treatment: 25° C. vacuum drying

( $10^{-3}$  Torr or less), 24 hours

Heat Treatment Temperature: 150° C.  $\pm$  3° C.

Treatment Time: 30 minutes

Coefficient of Thermal Shrinkage  $\epsilon$ :

$$\epsilon = [(L_1 - L_2)/L_1] \times 100$$

wherein  $L_1$ : Initial length

$L_2$ : Length when allowed to stand at room temperature for 30 minutes after the heat treatment.

5,437,918

### DEGRADABLE NON-WOVEN FABRIC AND PREPARATION PROCESS THEREOF

Keiko Taniguchi, Gifu; Masahiro Washino, Aichi; Shinobu Moriya, Aichi; Hosi Shinoda, Aichi; Masami Ohtaguro, Aichi; Akihiro Funae, Aichi, and Shigeru Imuro, Aichi, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan  
Filed Nov. 4, 1993, Ser. No. 145,621

Claims priority, application Japan, Nov. 11, 1992, 4-301192; Jun. 4, 1993, 5-134425

Int. Cl.<sup>6</sup> B32B 1/02, 1/08, 1/10, 27/02

U.S. Cl. 428-224

22 Claims

1. A degradable non-woven fabric obtained from a web of a mixture of filaments composed of a lactic acid-based polymer (A) and filaments composed of a thermoplastic lactic acid-based polymer (B), wherein the polymer (A) comprises one or more lactic acid-based polymers selected from the group consisting of poly(DL-lactic acid) having more than 80 mol % of L-lactic acid units, poly(DL-lactic acid) having more than 80 mol % of D-lactic acid units, L-lactic acid/hydroxycarboxylic acid copolymer having 70 mol % or more of L-lactic acid units, and D-lactic acid/hydroxycarboxylic acid copolymer having 70 mol % or more of D-lactic acid units, and

the thermoplastic lactic acid-based polymer (B) comprises one or more lactic acid-based polymers selected from the group consisting of poly(DL-lactic acid) having from 1:4 to 4:1 in the mol ratio of L-lactic acid units to D-lactic acid units, a DL-lactic acid/hydroxycarboxylic acid copolymer, L-lactic acid/hydroxycarboxylic acid copolymer having 30 mol % or more of hydroxycarboxylic acid units, and D-lactic acid/hydroxycarboxylic acid copoly-

mer having 30 mol % or more of hydroxycarboxylic acid units.

5,437,919

### LINING PART FOR MOTOR VEHICLES AND A METHOD FOR THE MANUFACTURE THEREOF

Sven Wellich, Leuggries; Gunther Feist, Rosenheim, and Rainer Gardill, Reichersbeuern, all of Germany, assignors to Empe-Werke Ernst Pelz GmbH & Co., KG, Geretried, Germany  
Filed Feb. 28, 1994, Ser. No. 202,431

Claims priority, application Germany, Jun. 25, 1993, 43 21 225.5

Int. Cl.<sup>6</sup> B32B 7/00; B29C 47/00; B60J 7/00

U.S. Cl. 428-245

15 Claims



1. A lining part for motor vehicles, comprising:

a core layer;

first and second outside layers of natural fiber fleece covering said core layer on opposite sides thereof, first and second adhesive layers respectively connecting said outside layers to the core layer, said first and second adhesive layers containing foamed epoxy resin; and said first and second outside layers containing loosely woven material.

5,437,920

### SOFT ASBESTOS-FREE SEALING MATERIAL

Gerhard Bauer, Neuenmarkt, and Fritz E. Wolfshöfer, Bad Berneck, both of Germany, assignors to Frenzelit-Werke GmbH & Co. KG, Bad Berneck, Germany  
Filed Jan. 6, 1994, Ser. No. 178,126

Claims priority, application Germany, Dec. 15, 1993, 43 42 811.8

Int. Cl.<sup>6</sup> B32B 15/04

U.S. Cl. 428-283

13 Claims

1. A non-woven gasket composition for forming substantially planar sealing materials, said gasket composition comprising:

a non-woven web of inter-engaged fibers including nonfibrillated organic staple fibers having an elongation at break of less than about 5% at temperatures up to about 200° C., from about 2 to about 4% by weight, based on the weight of the gasket composition, of fibrillated polyamide fibers, at least about 60% by weight, based on the weight of the gasket composition, of finely-divided graphite powder, the graphite powder having a particle size distribution such that 98% of the graphite powder has a particle size less than about 70 micrometers, and an elastomeric resin binder, said composition being substantially free of inorganic fibrous materials and having sufficient sheet forming properties such that the composition form a web by calendering at elevated temperature and pressure conditions, the non-woven web having a temperature stability such that there is less than a 10% change in thickness of the web under a compression of 50 Newtons per square millimeter as the temperature is increased from 20° C. to 200° C.

5,437,921

**ELECTRONIC COMPONENTS MOUNTING BASE MATERIAL**

Yasuo Kogo, Takefumi Ito, Mitsuhiro Okumura, Kiyoshi Yoshizaki, Takeji Fujihara, and Hirofumi Yamashita, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

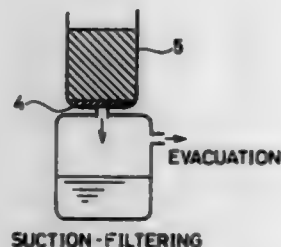
Filed Oct. 9, 1991, Ser. No. 773,818

Claims priority, application Japan, Oct. 9, 1990, 2-272666

Int. Cl.<sup>6</sup> B32B 5/06

U.S. Cl. 428—288

9 Claims



1. A base material having a surface for mounting an electronic component, comprising:
  - a matrix consisting essentially of at least either aluminum or an aluminum alloy, and
  - a non-woven mat of carbon fibers arranged in said matrix with a volume fraction from 0.15 to 0.55,
  - said carbon fibers having an aspect ratio in the range of 10-500, and
  - said carbon fibers being arranged in a plurality of planes wherein each plane is substantially parallel to said surface, such that a longitudinal direction of said carbon fibers is oriented at random in each said plane and said carbon fibers are layered in said planes such that longitudinal axes thereof are substantially parallel to said surface with substantially no carbon fibers oriented substantially perpendicular to said surface.

5,437,922

**FIBROUS, NON-WOVEN POLYMERIC INSULATION**

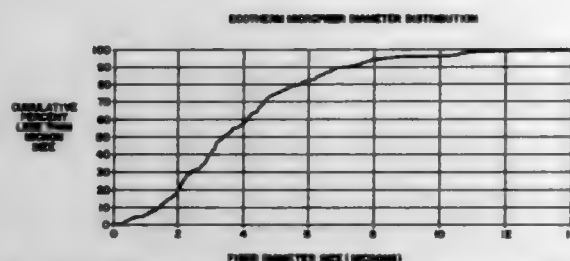
Fred L. Jackson, Littleton; Kevin P. McHugh, Denver, and John S. Robertson, Littleton, all of Colo., assignors to Schuller International, Inc., Denver, Colo.

Filed May 4, 1994, Ser. No. 237,814

Int. Cl.<sup>6</sup> D04H 1/58, 3/16, 1/52

U.S. Cl. 428—288

43 Claims



1. A non-woven fibrous blanket of thermal insulating material comprising:
  - finite length insulation microfibers having a composition comprising between 25% and 95% by weight virgin synthetic polymeric resin and between 5% and 75% by weight recycled polyethylene terephthalate; said insulation microfibers having a softening point; said insulation microfibers comprising between 35% and 80% by weight of the fibrous thermal insulating material;
  - finite length, synthetic polymeric resin staple fibers; said staple fibers having a softening point; said staple fibers comprising between 15% and 60% by weight of the fibrous thermal insulating material;
  - finite length synthetic polymeric resin bonding fibers com-

prising between 5% and 25% by weight of the fibrous thermal insulating material; said bonding fibers having thermoplastic surfaces with a lower temperature softening point than the softening points of said insulation microfibers and said staple fibers; and said insulation microfibers, said staple fibers, and said bonding fibers being randomly oriented and randomly intermingled in a blanket; and said bonding fibers bonding said insulation microfibers, said staple fibers and said bonding fibers together to form said blanket.

5,437,923

**HALOGEN-FREE FLAME-RETARDANT BITUMEN ROOFING COMPOSITION**

Huam M. Kalkanoglu, Swarthmore, Pa., assignor to GS Roofing Products Company, Inc., Irving, Tex.

Filed Jan. 9, 1993, Ser. No. 74,302

Int. Cl.<sup>6</sup> B32B 11/02

U.S. Cl. 428—291

6 Claims

1. A roofing composition consisting essentially of a single layer of a material coated or impregnated with a halogen-free flame-retardant bitumen composition, said bitumen composition comprising:
  - at least about 45 weight percent of bitumen;
  - about 2 to about 25 weight percent of a thermoplastic polymer;
  - about 5 to about 30 weight percent of a member selected from the group consisting of alumina trihydrate, magnesium hydroxide, and mixtures of these;
  - about 2 to about 20 weight percent of zinc borate; and
  - about 2 to about 20 weight percent of calcium carbonate, wherein said weight percents are of a total weight of said halogen-free flame-retardant bitumen composition, said roofing composition having sufficient mechanical properties for a UL approved class A rating.

5,437,924

**COMPOSTABLE, BIODEGRADABLE FOAM CORE BOARD**

William C. Decker, III, Cary, N.C., and William A. Wittouch, Jr., Warwick, N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Jul. 8, 1993, Ser. No. 90,221

Int. Cl.<sup>6</sup> B32B 3/26, 5/14

U.S. Cl. 428—318.4

5 Claims



1. A compostable, biodegradable foam core board comprising:
  - a foam core sheet made of a mixture of:
    - (a) a foamable, biodegradable material which is a polymer composition containing destructurized starch and includes a blend of starch, polyethylene, polyvinyl alcohol, polyvinyl acetate, and glycerol as a plasticizer,
    - (b) a diluent polymer selected from the group consisting of aryl polymers, olefinic polymers, derivatives, and copolymers thereof, and
    - (c) a blowing agent selected from the group consisting of a low molecular weight alcohol, an endothermic blowing agent, air, water, a hydrocarbon or halogenated hydrocarbon, and
  - a facing sheet adhered to at least one side of said foam core sheet, said facing sheet being made of a material selected from the group consisting of paper, paperboard, wood, metal and a polymer sheet or film,
  - wherein said combination of foamable, biodegradable mate-

rial, diluent polymer, and blowing agent are selected such that a foam core sheet of sufficient structural rigidity for a foam core board is formed, and wherein said foam core sheet has selected structural properties including a foam core weight of about 25 to 80 lbs/msf, a foam density of about 1.5 to 15 lbs/ft<sup>3</sup>, and a foam cell size of about 0.20 to 1.24 mm.

5. A compostable, biodegradable foam core board comprising:

a foam core sheet made of a mixture of:

- (a) a foamable, biodegradable material which is a polylactic acid polymer, copolymer or derivative thereof,
- (b) a diluent polymer selected from the group consisting of aryl polymers, olefinic polymers, derivatives, and copolymers thereof, and
- (c) a blowing Agent selected from the group consisting of a low molecular weight alcohol, an endothermic blowing agent, air, water, a hydrocarbon or halogenated hydrocarbon, and

a facing sheet adhered to at least one side of said foam core sheet, said facing sheet being made of a material selected from the group consisting of paper, paperboard, wood, metal and a polymer sheet or film,

wherein said combination of foamable, biodegradable material, diluent polymer, and blowing agent are selected such that a foam core sheet of sufficient structural rigidity for a foam core board is formed, and wherein said foam core sheet has selected structural properties including a foam core weight of about 25 to 80 lbs/msf, a foam density of about 1.5 to 15 lbs/ft<sup>3</sup>, and a foam cell size of about 0.20 to 1.24 mm.

5,437,925

**COATED SUBSTRATE FOR USE AS A TONER RECORDING MEDIUM AND METHOD OF MAKING SAME**

Norman Macaulay, Tonawanda; Nancy G. Mitchell, Grand Island, and Mary R. Dean, Williamsville, all of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation-in-part of Ser. No. 684,202, Apr. 12, 1991, abandoned. This application Feb. 1, 1993, Ser. No. 11,715

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—331

16 Claims

1. A toner recording medium comprising:

a substrate having coated thereon a toner receptive composition consisting essentially about 50 to up to 90 parts of a particulate silica and about 10 to 50 parts of a polyvinyl alcohol, by dry weight, in a coating weight of less than 2.0 g/m<sup>2</sup> per side of the substrate; wherein the substrate has a Stockigt sizing degree before coating greater than 25 seconds.

5,437,926

**MOLDED ARTICLES HAVING HARD COAT LAYER**

Nobukazu Takahashi, Yokohama; Teiji Kohara, Kawasaki, and Tadao Natsuume, Yokosuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 615,837, Nov. 19, 1990, abandoned.

This application Jul. 20, 1992, Ser. No. 915,389

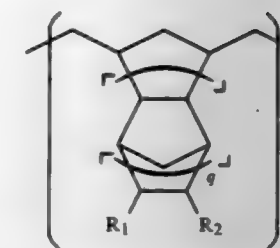
Claims priority, application Japan, Nov. 20, 1989, 1-301233

Int. Cl.<sup>6</sup> B32B 27/30

U.S. Cl. 428—337

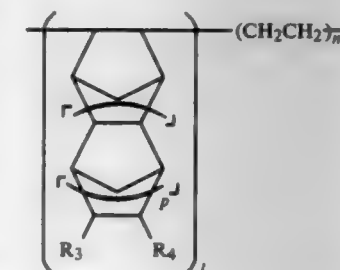
10 Claims

1. A thermoplastic saturated norbornene polymer molded or formed article comprising a polymer having at least one structural unit selected from the group consisting of general formula [I] and general formula [II];



General formula [I]

wherein R<sub>1</sub> and R<sub>2</sub> are independently hydrogen, a hydrocarbon moiety, or a polar group, or R<sub>1</sub> and R<sub>2</sub> together form a ring, n is a positive integer, and q is zero or a positive integer;



General formula [II]

wherein R<sub>3</sub> and R<sub>4</sub> are independently hydrogen, a hydrocarbon moiety or a polar group, or R<sub>3</sub> and R<sub>4</sub> together form a ring, l and m are positive integers, and p is zero or a positive integer, and

a 3 to 300 μm thick, hard coat layer having a surface hardness, measured by a hardness test according to JIS K-5400, of at least 3H and having a bond strength, when measured by a crosscut adhesion test, where not less than 90% of 100 squares formed during the test are not peeled off,

said article prepared by forming a coating on a surface of the polymer with a UV curable hard coating agent containing (a) reactive monomer and/or reactive oligomer, (b) a photopolymerization initiator, and (c) a solvent consisting of an aromatic hydrocarbon, an alicyclic hydrocarbon, or mixtures thereof, drying the resultant coating, and irradiating the dried coating with UV rays.

5,437,927

**PITCH CARBON FIBER SPINNING PROCESS**

Roger A. Ross, Chattanooga, and Uel D. Jennings, Signal Mountain, both of Tenn., assignors to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 987,900, Dec. 8, 1992, abandoned, which is a division of Ser. No. 606,675, Oct. 31, 1990, Pat. No. 5,202,072, which is a continuation of Ser. No. 567,817, Aug. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 311,511, Feb. 16, 1989, abandoned. This application May 18, 1994, Ser. No. 245,345

Int. Cl.<sup>6</sup> D02G 3/00

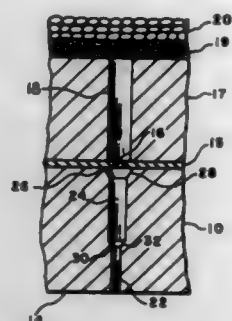
U.S. Cl. 428—367

9 Claims

1. A carbon fiber having a cross section, wherein said cross



section has a cross sectional aspect ratio of 1.1 or less, and wherein the diameters of said cross section range from 30 to



100 micrometers, a random microstructure and a tensile strength of at least 335 Kpsi.

5,437,928

## GLASS FIBER SIZE AND MAT

Thomas V. Thimons, Allison Park; Robert G. Swisher, and Yongsheng Hou, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 29, 1993, Ser. No. 146,267

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—391

19 Claims

1. A mat of glass fibers for use in reinforcing thermoplastic polymers, comprising glass fibers having a dried residue of an aqueous treating composition that is peroxide-free comprising in weight percent of the solids:

- from about 2 to about 22 percent by weight of polymeric amine;
- from about 2 to about 10 percent by weight of amine-reactable organosilane, wherein the polymeric amine and the amine-reactable organosilane are present in these amounts in the composition to form a reaction product in an amount of about 4 to about 32 percent by weight;
- from about 5 to about 20 percent by weight of water-dispersible film-forming polymer; and
- from about 50 to about 90 percent by weight of emulsified polyolefin.

5,437,929

## GERMANIUM PHTHALOCYANINE FILMS

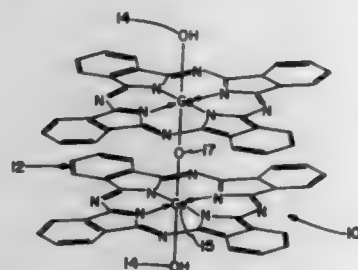
Malcom E. Kenney, Cleveland Heights, and Terri R. Clark, Morristown, both of Ohio, assignors to Edison Polymer Innovation Corp., Brecksville, Ohio

Filed Jan. 19, 1994, Ser. No. 183,527

Int. Cl.<sup>6</sup> B32B 33/00

U.S. Cl. 428—411.1

9 Claims



1. A process for preparing a substrate coated with a film comprising:

- preparing a solvent solution of an amphiphilic, multiring compound containing at least two adjacent, parallel phthalocyanine rings having identical coordinating atoms selected from the group consisting of germanium and tin located at the center of the rings, said rings being interconnected along an axis perpendicular to their surfaces and passing through the centers thereof, by means of single oxygen atoms located along said axis, said oxygen atoms

connecting the coordinating atoms in adjacent rings and in which the outermost ring at one end of said axis has a hydrophilic ligand selected from the group consisting of chloroacetoxy, dichloroacetoxy, trichloroacetoxy, fluoroacetoxy, difluoroacetoxy, trifluoroacetoxy, bromoacetoxy, dibromoacetoxy, tribromoacetoxy, iodoacetoxy, diiodoacetoxy, and triiodoacetoxy, attached to the coordinating atom thereof, while the outermost ring at the other end of said axis has a hydrophobic ligand attached to the coordinating atom thereof;

depositing said solution on an aqueous subphase, said subphase having a pH of from about 2 to 6, thereby hydrolyzing said hydrophilic ligands to hydroxyl ligands; evaporating said solvent from said solution to provide a monolayer of said compound on said subphase; compressing said monolayer to form a substantially continuous film, and passing a substrate having a hydrophilic surface substantially vertically through said film, thereby hydrolyzing said hydrophobic ligand to a hydroxyl ligand and producing said coated substrate.

5,437,930

## CABLE FOR HIGH OPERATING TEMPERATURES

Eduardo G. Redondo, Monza; Luca Castellani, and Antonio Zaopo, both of Milan, all of Italy, assignors to Pirelli Cavi S.p.A., Milan, Italy

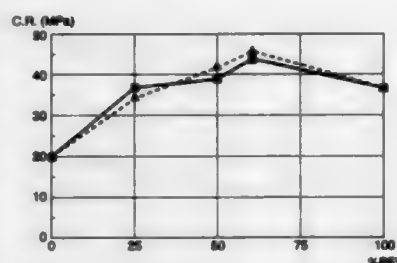
Filed Apr. 16, 1993, Ser. No. 48,768

Claims priority, application Italy, May 8, 1992, MI92A1113

Int. Cl.<sup>6</sup> B32B 27/06

U.S. Cl. 428—419

5 Claims



1. A cable comprising an electric or optical conductor and a coating layer of polymeric material extruded on said conductor wherein said coating layer comprises a mixture of a polyphenylsulfide and a silicone ether imide block copolymer in which the polyphenylsulfide has a viscosity greater than or equal to 110 Pa per second at 310° C. and is present in an amount between 15 and 90 parts by weight per 100 parts by weight of the polyphenylsulfide-silicone ether imide block copolymer mixture.

5,437,931

## OPTICALLY VARIABLE MULTILAYER FILM AND OPTICALLY VARIABLE PIGMENT OBTAINED THEREFROM

Rung-Ywan Tsai, Kaohsiung; Chaur-Tsang Wei; Chih-Hua Lee, both of Taipei; Fang-Chuan Ho, Hsinchu, and Gi-Horng Chuang, Niantou, all of Taiwan, assignors to Industrial Technology Research Institute, Chunguang, Taiwan

Filed Oct. 20, 1993, Ser. No. 139,524

Int. Cl.<sup>6</sup> B32B 9/04

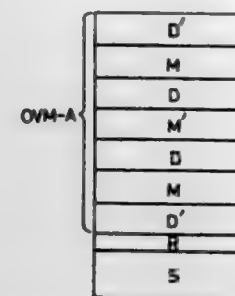
U.S. Cl. 428—446

5 Claims

1. An optically variable multilayer film, comprising:

- (1) a metallic reflective layer M';
- (2) two sub-unit multilayer stacks symmetrically mounted onto opposite surfaces of the metallic reflective layer M'; each of the stacks having a structure of D'MD, wherein D' and D are a protective layer and a color-presenting layer, respectively, and both are composed of low refrac-

tive index, high hardness, chemically stable silicon dioxide; said protective layer D' further has an optical thickness which is  $\frac{1}{4}$  of the wavelength of the desired reflected light; and M is a semi-transparent metallic layer;



said optically variable multilayer film being deposited on a flexible substrate S with a release layer R made of a neutral detergent, soluble in water or a solvent, deposited between said optically variable multilayer film and said flexible substrate S so as to form a structure of S-R-D'-M-D-M'-D-M-D'.

5,437,932

## HIGH SPEED AQUEOUS SOLVENT DEVELOPABLE PHOTOPOLYMER COMPOSITIONS

M. Zaki Ali; Mahfuza B. Ali, both of Woodbury, and Dean M. Moren, North St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn. Division of Ser. No. 52,117, Apr. 23, 1993, abandoned, which is a division of Ser. No. 658,983, Feb. 21, 1991, Pat. No. 5,235,015.

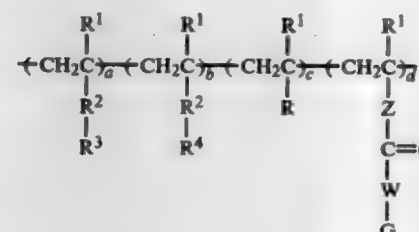
This application May 13, 1994, Ser. No. 242,367

Int. Cl.<sup>6</sup> C08F 20/64; B32B 15/08

U.S. Cl. 428—461

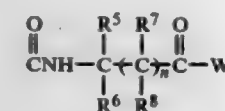
4 Claims

1. A composite structure comprising a composition coated on a grained, anodized, and hydrophilized aluminum, wherein the composition comprises an effective amount of a thermal or photoinitiator and a polymer having the formula;



wherein

R<sup>1</sup> is independently hydrogen or methyl;  
R<sup>2</sup> is given by

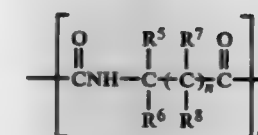


wherein

n is 0 or 1;

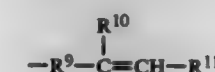
R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> are independently an alkyl group having 1 to 12 carbon atoms or a cycloalkyl group having 5 to 12 carbon atoms or at least one of the pairs R<sup>5</sup> and R<sup>6</sup>, and R<sup>7</sup> and R<sup>8</sup>, taken together with the carbon to which it is joined forms a 5- or 6-membered carbocyclic ring, or any of R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> may be H when n is 1;  
W is -NH-, -NR<sup>20</sup>-, -S-, or -O-; wherein R<sup>20</sup> is alkyl of 1 to 12 carbon atoms; and

Z represents



wherein R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, and n are as previously described; R<sup>3</sup> is a polymerizable, ethylenically unsaturated group selected from

(a)



in which

R<sup>9</sup> is an alkylene group having 1 to 12 carbon atoms, an arylene group having 6 to 10 carbon atoms, an oxyalkylene group or a poly(oxyalkylene) in which said alkylene group has 2 to 4 carbon atoms, the number of oxygen atoms is a positive integer less than or equal to four; R<sup>10</sup> is hydrogen, cyano, a carboxyl group, or a -C(=O)NH<sub>2</sub> group; and R<sup>11</sup> is hydrogen, an alkyl group having 1 to 12 carbon atoms, or a phenyl group or naphthyl group; or

(b) -R<sup>9</sup>-W-T- in which R<sup>9</sup> is as defined as in (a), W is as previously defined, and T is an ethylenically unsaturated group selected from the group consisting of acryloyl, methacryloyl, cinnamoyl, maleoyl, fumaroyl, itaconoyl, and crotonoyl, and is preferably acryloyl or methacryloyl; a, b, c, and d are independently integers, wherein a and b are at least 1, and the sum of a+b+c+d is sufficient to provide a polymer having a number average molecular weight in the range of 2,000 to 1,000,000;

G is given by -R<sup>9</sup>-N+R<sup>12</sup>R<sup>13</sup>R<sup>14</sup>X<sup>-</sup>, wherein R<sup>9</sup> is as previously defined, and R<sup>12</sup>-R<sup>14</sup> are independently an alkyl group having 1 to 12 carbon atoms or a cycloalkyl group having 5 to 12 carbon atoms, an aryl or aralkyl group having 6 to 12 carbon atoms or any two or all three of R<sup>12</sup>-R<sup>14</sup> taken together with the nitrogen to which they are joined can form a 5- to 8-membered heterocyclic ring, and X<sup>-</sup> represents any non-interfering anion including anions located elsewhere on the polymeric backbone or side chains;

R represents an aryl group having from 6 to 30 carbon atoms, cyano, -CO<sub>2</sub>H, carboxyalkoxy group having from 2 to 40 carbon atoms, or a mono- or dialkylamido group having from 2 to 40 carbon atoms;

R<sup>4</sup> represents, a solubilizing cation, or -E-A wherein E represents an organic divalent connecting group having up to a total of about 18 C, N, S, and nonperoxidic O atoms, and A is an acid selected from carboxylic acids, sulfonic acids, phosphonic acids, and salts thereof.

5,437,933

## COATED CERAMIC ARTICLE

Duncan R. Coupland, High Wycombe, and Helena E. Hunt, Witney, both of United Kingdom, assignors to Johnson Matthey Public Limited Company, London, England

Filed Feb. 2, 1993, Ser. No. 12,422

Claims priority, application United Kingdom, Feb. 18, 1992, 9203394

Int. Cl.<sup>6</sup> B32B 15/04

U.S. Cl. 428—469

12 Claims

1. A ceramic article for use at high temperatures and in corrosive environments, comprising a refractory ceramic substrate on which is flamed sprayed a coating of at least one precious metal or alloys thereof, said coating having a thickness of from 50 to 350 μm and being non-porous.

5,437,934

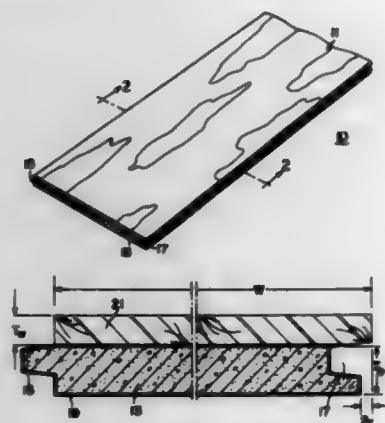
**COATED CEMENT BOARD TILES**

Alvin E. Witt, West Chester; Joseph E. Tomasko, and Matthew F. Humphreys, both of Bellefonte, all of Pa., assignors to Permagrain Products, Inc., Media, Pa.

Filed Oct. 21, 1993, Ser. No. 140,255

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—537.1



1. A floor tile, comprising:

- a cement base portion cut to a desired size for a floor tile, said base portion being coated with a waterproof coating to substantially maintain the moisture content of said cement at a constant level;
- a veneer layer on top of said base portion, said veneer layer having a combination of wood and vinyl to provide a thin layer having the appearance of wood and a vinyl surface facing up from said layer.

5,437,935

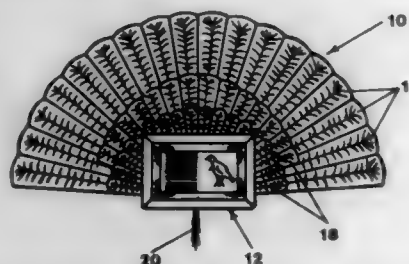
**GAME BIRD FEATHER MOUNT**

Vernon W. Fredeen, Brooklyn Center, Minn., assignor to Summer Time Products, Inc., Brooklyn Center, Minn.

Filed Mar. 28, 1994, Ser. No. 218,438

Int. Cl.<sup>6</sup> B44C 5/04, 5/06

U.S. Cl. 428—542.4



1. Apparatus for mounting and displaying feathers from a game bird, which comprises:

- a picture frame having front and back sides;
- a mounting block secured to the back side of said picture frame;
- said mounting block including a multiplicity of radially extending circumferentially spaced-apart predetermined holes arranged in generally parallel rows for receiving the feathers therein; and
- means secured to said mounting block for hanging the apparatus on a wall.

5,437,936

**HONEYCOMB CORE STRUCTURE AND METHOD AND APPARATUS RELATING THERETO**

Jeffrey D. Johnson, 5320 W. Main, Parsons, Kans. 67357

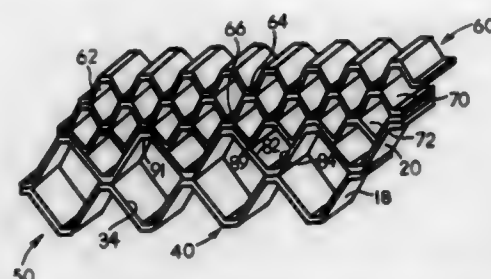
Continuation-in-part of Ser. No. 699,981, May 13, 1991,

abandoned. This application Sep. 14, 1992, Ser. No. 945,234

Int. Cl.<sup>6</sup> B21D 39/00; B23K 31/02

19 Claims U.S. Cl. 428—593

12 Claims



1. In an expandable honeycomb core metallic foil sheet assemblage, the combination of: a plurality of foil sheets disposed in a stack with the entire areas of their confronting surfaces in contact, said sheets having top and bottom surfaces; and a plurality of weldments between said sheets, said weldments being uniformly disposed at spaced intervals to cause said sheets, when said stack is subjected to tensional forces at the top and bottom, to expand without tensional stretching of said sheets to impart a uniform honeycomb configuration to said stack.

5,437,937

**SURFACE TREATMENT OF METALS**

Richard A. Cayless, 22 Wentworth Crescent, Maidenhead, Berkshire, SL6 4RW, England, assignor to Richard A. Cayless, Berkshire, England

Continuation of Ser. No. 678,341, Apr. 24, 1991, abandoned.

This application May 12, 1993, Ser. No. 60,882

Claims priority, application United Kingdom, Nov. 1, 1988, 8825482

Int. Cl.<sup>6</sup> B32B 15/08; B05D 5/10

U.S. Cl. 428—626

17 Claims

16. A structure comprising two metal objects having treated surfaces which have

- (1) been treated by being contacted with an aqueous treatment medium which is:
  - a) a solution of a salt of a metal selected from the group consisting of yttrium and metals of the lanthanum series having atomic numbers from 57 to 71 inclusive, or
  - b) an aqueous suspension of alumina particles to the surface of which particles chromate anions are chemically bound, and
- (2) subsequently been contacted with a solution of an organo silane, and
- (3) bonded together by a layer of a polymeric organic adhesive.

5,437,938

**BATTERY PACK**

Hidero Mitsui, Kanagawa, and Yoshihiro Ide, Tokyo, both of Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 22,562, Feb. 25, 1993, abandoned. This application Aug. 12, 1994, Ser. No. 290,077

Claims priority, application Japan, Mar. 6, 1992, 4-050004

Int. Cl.<sup>6</sup> H01M 2/10

U.S. Cl. 429—1

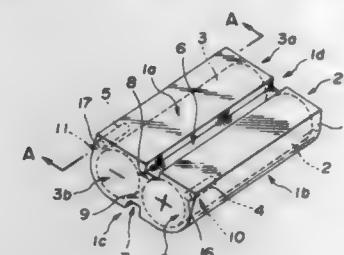
33 Claims

1. A battery pack for providing electrical energy to an external device comprising:

- a battery casing for containing at least one rechargeable secondary battery, said battery casing having a front side portion, a rear side portion, and a flat portion connected to

a curved portion whereby a first void and a second void are formed respectively within said battery casing within spaces defined by said front side portion, said rear side portion, said flat portion, said curved portion, and sides of said at least one rechargeable battery;

a first terminal coupled to the anode of said at least one rechargeable battery, said first terminal being located in



said first void, said first terminal having a central axis which is disposed parallel to the longitudinal direction of said at least one rechargeable battery; and

a second terminal coupled to the cathode of said at least one rechargeable battery, said second terminal being located in said second void, said second terminal having a central axis which is disposed parallel to the longitudinal direction of said at least one rechargeable battery.

5,437,939

**SEALED LEAD-ACID BATTERY TRAY ASSEMBLIES AND MOTIVE POWER VEHICLES USING SUCH BATTERY TRAY ASSEMBLIES**

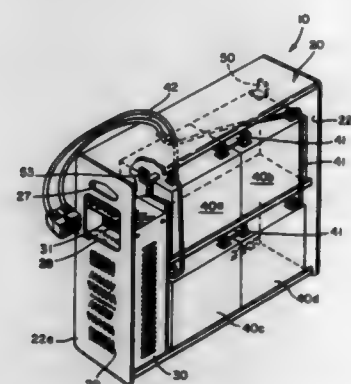
Gordon C. Beckley, West Chicago, Ill., assignor to GNB Industrial Battery Company, Lombard, Ill.

Filed Jan. 6, 1994, Ser. No. 178,021

Int. Cl.<sup>6</sup> H01M 2/10; B60R 16/04

U.S. Cl. 429—99

20 Claims



1. A sealed lead-acid battery tray assembly for motive powered vehicles which comprises:

- a battery tray including a tray base to support one or more sealed lead-acid batteries, three upstanding tray walls connected to the tray base, the upstanding tray walls consisting of two side walls and a front wall, a tray top connected to the upstanding tray walls, and one or more divider walls, the tray base, side walls, front wall, tray top, and divider walls defining one or more compartments to receive batteries and a compartment to receive a battery charger, the battery tray having a generally open back providing access for loading batteries into the battery compartments and loading a charger into the charger compartment, the battery and charger compartments being otherwise substantially enclosed by the battery tray;
- a battery charger mounted in the charger compartment; and
- two or more sealed lead-acid batteries supported in the

battery compartments and electrically connected together to provide positive and negative termination.

5,437,940

**HIGH POWER ENERGY COMPRESSION DEVICE**

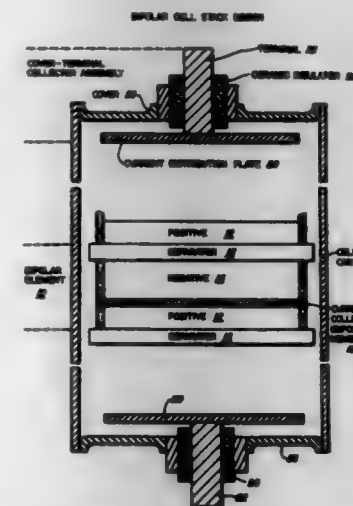
Michael D. Hilston, Painesville, Ohio, and Neil C. Otto, Chicago, Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 14, 1986, Ser. No. 918,479

Int. Cl.<sup>6</sup> G03G 13/06

U.S. Cl. 429—103

43 Claims



1. An energy compression device comprising at least one bipolar element, said bipolar element comprising:

- (a) a negative electrode comprising a lithium alloy;
- (b) a positive electrode comprising an active material consisting essentially of CoS<sub>2</sub>;
- (c) an inert electrolyte-containing separator consisting essentially of compacted particles of an inert electrically insulating material disposed between and in contact with said positive and negative electrodes;
- (d) an electrolyte comprising at least one lithium cation salt dispersed through said separator and in contact with said positive and negative electrodes; and,
- (e) means for collecting current discharged from said bipolar element.

5,437,941

**THIN FILM ELECTRICAL ENERGY STORAGE DEVICE**

John K. Arledge, Lauderhill; James L. Davis, Coral Springs, and Thomas J. Swirbel, Davie, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

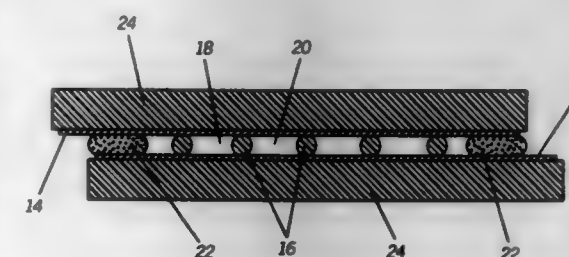
Continuation-in-part of Ser. No. 125,717, Sep. 24, 1993,

abandoned. This application Jan. 17, 1995, Ser. No. 373,903

Int. Cl.<sup>6</sup> H01M 2/14, 2/18

U.S. Cl. 429—129

11 Claims



1. An electrical energy storage device, comprising: first and second substrates, each having a planar face; first and second electrodes consisting of a thin film of metal



or metal oxide deposited on said respective substrate planar faces, the thin film being less than 10,000 Angstroms thick;  
spacers, comprising particles of electrically non-conductive material disposed between the first and second electrodes; the first and second electrodes arranged so that the spacers form a uniform gap of less than 20 microns between the electrodes, and the spacers cover less than 10% of the area of either electrode;  
an electrolyte disposed in the gap between the electrodes; and  
sealing means disposed between the first and second electrodes to seal the gap.

5,437,942

## LITHIUM SECONDARY BATTERY

Kazuo Murata, Yosetsu Yoshihisa, Kazunari Takeda, and Syuichi Izachi, all of Takatsuki, Japan, assignors to Yuasa Corporation, Osaka, Japan

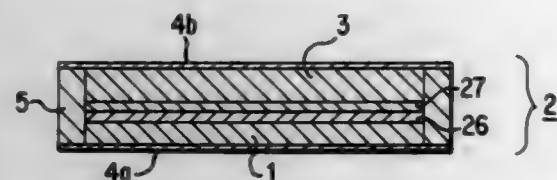
PCT No. PCT/JP92/01043, § 371 Date Apr. 20, 1993, § 102(e) Date Apr. 20, 1993, PCT Pub. No. WO93/04509, PCT Pub. Date Apr. 3, 1993

PCT Filed Aug. 18, 1992, Ser. No. 39,431

Claims priority, application Japan, Aug. 21, 1991, 3-235364 Int. Cl.<sup>6</sup> H01M 6/18

U.S. Cl. 429—192

3 Claims



1. A lithium secondary battery comprising:  
a positive electrode,  
an electrolyte layer having a solid polymer electrolyte, and  
a negative electrode using metallic lithium alloy as an active material,  
wherein the electrolyte layer comprises a first layer and a second layer, said first layer having a first electrolyte in contact with the negative electrode, said second layer having a second electrolyte, said first electrolyte being less reactive with a negative active material than said second electrolyte,  
wherein the second layer includes a solvent, and the first layer includes a small amount of solvent as compared to the second layer.

5,437,943

## POSITIVE ELECTRODE AND SECONDARY BATTERY USING THE SAME

Toshihige Fujii, Yokohama; Okitoshi Kimura, Tokyo; Toshiyuki Ohsawa, Kawasaki; Toshiyuki Kabata, Machida, and Nobuo Katagiri, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 7, 1993, Ser. No. 117,286

Claims priority, application Japan, Sep. 4, 1992, 4-263078; Nov. 18, 1992, 4-332508; Feb. 4, 1993, 5-040491; Apr. 28, 1993, 5-103015; May 6, 1993, 5-129997

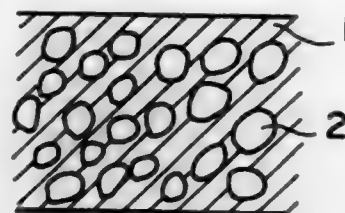
Int. Cl.<sup>6</sup> H01M 4/60, 10/40

U.S. Cl. 429—192

23 Claims

1. A positive electrode comprising a film-shaped composite active material, which comprises a conducting polymer serving as a first active material, and an electrochemical active material serving as a second active material which is uniformly dispersed in the shape of particles in said conducting polymer, with the parts-by-weight ratio of said second active material to

said first active material being 3 to 9 parts of said second active material to 7 to 1 part of said first active material, when the



total of said first active material and said second active material is 10 parts.

5,437,944

## ORGANIC ELECTROLYTIC SOLUTION CELL

Fusaji Kita, and Akira Kawakami, both of Osaka, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

PCT No. PCT/JP91/00787, § 371 Date Feb. 10, 1992, § 102(e) Date Feb. 10, 1992, PCT Pub. No. WO91/20104, PCT Pub. Date Dec. 26, 1991

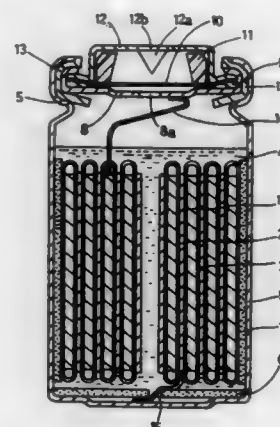
PCT Filed Jun. 12, 1991, Ser. No. 829,061

Claims priority, application Japan, Jun. 12, 1990, 2-153082; Aug. 17, 1990, 2-217963

Int. Cl.<sup>6</sup> H01M 10/40

U.S. Cl. 429—195

12 Claims



1. An organic electrolytic solution cell which comprises a positive electrode, a negative electrode comprising an alkali metal or a compound of an alkali metal, and an electrolytic solution comprising an organic solvent and an electrolyte, said electrolyte comprising a compound of the formula:



wherein M is an alkali metal or an alkaline earth metal, n is an integer of at least 4, and x is 1 when M is the alkali metal and x is 2 when M is the alkaline earth metal.

5,437,945

## SECONDARY BATTERY HAVING NON-AQUEOUS ELECTROLYTE

Atsuo Oamaru, Kanagawa, and Shigeru Fujita, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 8, 1993, Ser. No. 131,957

Claims priority, application Japan, Mar. 19, 1993, 5-060754

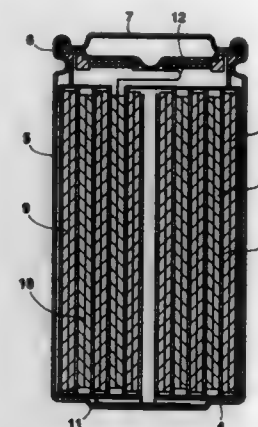
Int. Cl.<sup>6</sup> H01M 10/40

U.S. Cl. 429—197

8 Claims

1. A secondary battery containing a non-aqueous electrolyte therein, said secondary battery comprising a negative electrode formed of a carbonaceous material capable of doping and de-doping lithium, a positive electrode formed of  $Li_xMO_2$ ,

where M denotes at least, one of cobalt, nickel and manganese, and the non-aqueous electrolyte having an electrolyte dissolved in a non-aqueous solvent, characterized in that



said non-aqueous solvent is a mixed solvent of propylene carbonate and methyl ethyl carbonate.

5,437,946

## MULTIPLE RETICLE STITCHING FOR SCANNING EXPOSURE SYSTEM

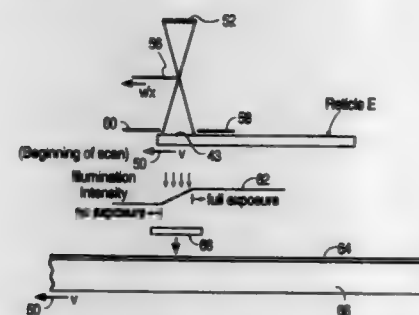
John H. McCoy, San Carlos, Calif., assignor to Nikon Precision Inc., Belmont, Calif.

Filed Mar. 3, 1994, Ser. No. 205,865

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

23 Claims



1. A method for stitching reticle patterns together on a target substrate, said method comprising the steps of:

providing a first reticle on an X-Y movable stage in a scanning projection exposure system, said first reticle having a first pattern formed thereon, said first pattern having four sides, said four sides including a first side adjacent to a second side, a third side adjacent to said second side and opposing said first side, and a fourth side adjacent to said third side and opposing said second side,

said first side having a border portion containing a first border pattern, said second side having a border portion containing a second border pattern, said third side having a border portion containing a third border pattern, and said fourth side having a border portion containing a fourth border pattern;

positioning said X-Y movable stage such that said first pattern is imaged onto a first surface area of a target substrate; scanning a source of radiation across said first reticle in a scan direction substantially parallel to said second side such that a first exposed pattern is formed in said first surface area of said substrate,

said first exposed pattern containing a first exposed border pattern corresponding to said first border pattern, a second exposed border pattern corresponding to said second border pattern, a third exposed border pattern corresponding to said third border pattern, and a fourth ex-

posed border pattern corresponding to said fourth border pattern;

partially blocking said radiation impinging on said substrate as said source of radiation scans over said first border pattern, an intensity of said radiation impinging on said substrate as said source of radiation is scanned over said first border pattern having a graded intensity profile;

positioning said X-Y movable stage such that said first pattern on said first reticle is imaged onto a second surface area of said substrate, and an image corresponding to said third border pattern overlaps said first exposed border pattern on said first surface area of said substrate;

scanning said source of radiation across said first reticle in a scanning direction substantially parallel to said second side such that said first exposed pattern is formed in said second surface area of said substrate, said first exposed pattern formed in said second surface area containing a third exposed border pattern overlapping said first exposed border pattern previously formed in said first surface area; and

partially blocking said radiation impinging on said substrate as said source of radiation scans over said third border pattern, an intensity of said radiation impinging on said substrate as said source of radiation is scanned over said third border pattern having a graded intensity profile such that an overlapping exposure of said first exposed border pattern in said first surface area and said third exposed border pattern in said second surface area approximately equals an exposure of a central portion of said first exposed pattern in said first surface area and said first exposed pattern in said second surface area.

5,437,947

## PHASE SHIFTING MASK AND METHOD OF MANUFACTURING THE SAME

Hun Hur, and Jun S. Lee, both of Seoul, Rep. of Korea, assignors to Goldstar Electron Co., Ltd.

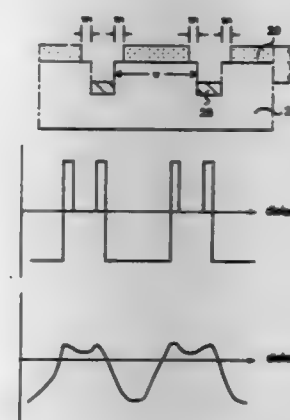
Filed Mar. 31, 1994, Ser. No. 221,386

Claims priority, application Rep. of Korea, Mar. 4, 1994, 4218/1994

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

28 Claims



1. A phase shifting mask comprising:  
a transparent substrate having at least one or more trenches spaced apart from each other by a predetermined distance; an opaque layer filling some portion of the trench; and a phase shifting layer formed on the substrate area between the trenches.

5,437,948

**PROCESS FOR ADJUSTING A PHOTOLITHOGRAPHIC EXPOSURE MACHINE AND ASSOCIATED DEVICE**

Blandine Minghetti, Vaulnaveys le Haut; Annie Tisser, Saint Ismier; Alain Proia, Grenoble, and Eric Schwartz, Seyssins, all of France, assignors to France Telecom, Paris, France  
Filed Jul. 12, 1993, Ser. No. 90,669

Claims priority, application France, Jul. 10, 1992, 92 08610  
Int. Cl.<sup>6</sup> G03F 7/20

U.S. Cl. 430—30

9 Claims

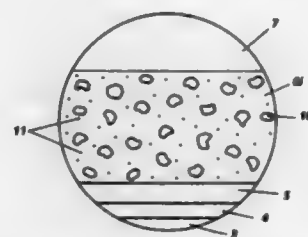
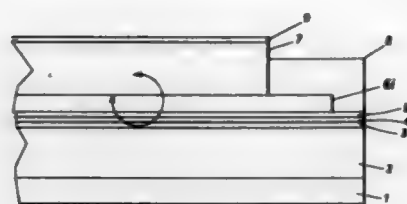
1. A process for determining a value of sharp focus of a photolithographic exposure machine used to insolate structures on a substrate wafer coated with a maskforming resin, using a guide wafer furnished with a series of identical test patterns, said process comprising the steps of:

successively insulating each of the test patterns with white light from an illuminating beam with the illuminating beam having a different adjusted value of focus for each test pattern,

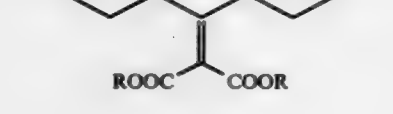
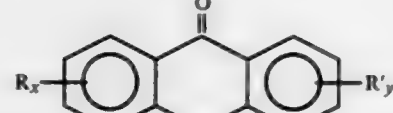
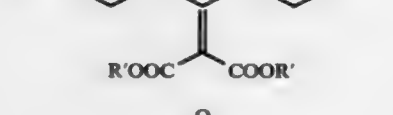
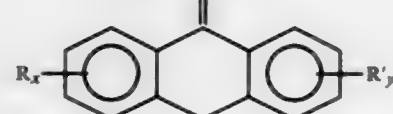
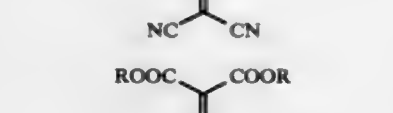
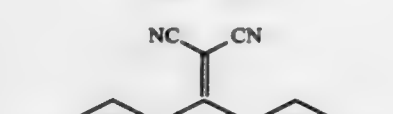
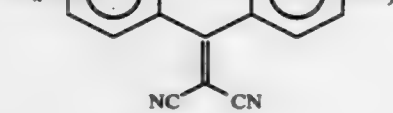
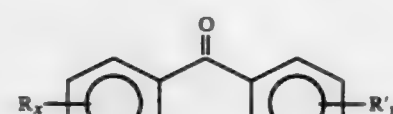
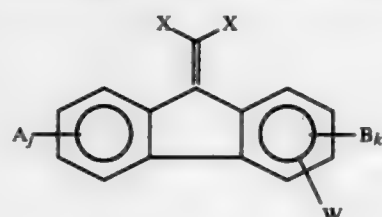
measuring a coefficient of reflectivity of each test pattern, establishing a law of correspondence of the measured coefficients of reflectivity as a function of the different adjusted values of the focus of the illuminating beam used at each respective test pattern, and

determining, by criterion of threshold of the value of the coefficient of reflectivity, a range of corresponding values of focus for the test patterns, and an optimum sharp focus value for the guide wafer and hence for the substrate wafer from this range.

the total weight of said charge generation layer and said electron accepting/transporting compound comprises a compound



iron accepting/transporting compound comprises a compound having a formula selected from the group consisting of:



5,437,949

**COLOR TONER AND PROCESS FOR ITS PRODUCTION**

Makoto Kanbayashi; Tsuyoshi Takiguchi, Kawasaki, and Wakaishi Hida, Higashikurume, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Jun. 23, 1994, Ser. No. 264,345

Claims priority, application Japan, Jun. 28, 1993, 5-178613;  
Jun. 9, 1994, 6-150621

Int. Cl.<sup>6</sup> G03G 9/08

U.S. Cl. 430—45

12 Claims

1. A color toner for developing an electrostatic image, comprising a binder resin and a colorant, wherein:

said color toner has a weight average particle diameter of from 3  $\mu\text{m}$  to 7  $\mu\text{m}$ ; contains from 10% to 70% by number of color toner particles with a particle diameter of 4.00  $\mu\text{m}$  or smaller, not less than 40% by number of color toner particles with a particle diameter of 5.04  $\mu\text{m}$  or smaller, from 2% to 20% by volume of color toner particles with a particle diameter of 8.00  $\mu\text{m}$  or larger, and not more than 6% by volume of color toner particles with a particle diameter of 10.08  $\mu\text{m}$  or larger; and has such a coloring power that an image having been fixed on a transfer medium has an image density ( $D_{0.5}$ ) of from 1.0 to 1.8 when an unfixed color toner on the transfer medium is in a quantity (M/S) of 0.50 mg/cm<sup>2</sup>.

5,437,950

**ELECTROPHOTOGRAPHIC IMAGING MEMBER WITH ENHANCED PHOTO-ELECTRIC SENSITIVITY**

Robert C. U. Yu, Webster, N.Y., and Beng S. Ong, Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

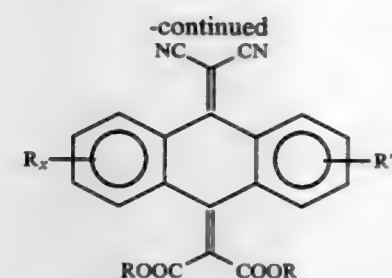
Filed Apr. 5, 1994, Ser. No. 223,336

Int. Cl.<sup>6</sup> G03G 5/09, 5/047

U.S. Cl. 430—58

10 Claims

1. An electrophotographic imaging member comprising a substrate, an optional blocking layer, an optional thermoplastic adhesive interface layer, a thin charge generation layer comprising pigment particles dispersed in a film forming polymer binder having dissolved or molecularly dispersed therein an electron accepting/transporting compound, and a charge transport layer, wherein said charge generation layer comprises between about 1 percent and about 20 percent by weight of said electron accepting/transporting compound based on



wherein

X is an alkoxycarbonyl group,  
A and B are electron withdrawing groups,  
j is a whole number integer ranging from 0 to 2,  
k is a whole number integer ranging from 0 to 1,  
m and n are whole number integers ranging from 0 to 4  
x and y are whole number integers ranging from 0 to 4,  
W is an electron withdrawing group selected from the group consisting of acyl (COR), alkoxycarbonyl (COOR), alkylaminocarbonyl (CONHR), and derivatives thereof, and R and R' are selected from the group consisting of an alkyl group having from 1 to 20 carbon atoms and substituted derivative thereof.

5,437,951

**SELF-ASSEMBLING RECOMBINANT PAPILLOMAVIRUS CAPSID PROTEINS**

Douglas R. Lowy, Washington, D.C.; John T. Schiller, Silver Spring, and Reinhard Kirnbauer, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 941,371, Sep. 3, 1992. This application Mar. 16, 1993, Ser. No. 32,869

Int. Cl.<sup>6</sup> C12N 15/37, 15/81, 15/86, 7/04

U.S. Cl. 435—69.1

23 Claims



1. A genetic construct comprising a papillomavirus L1 gene wherein said construct directs recombinant expression in a transformed eukaryotic host cell of at least one papillomavirus L1 epitope by self-assembly of papillomavirus capsids comprising a L1 polypeptide, wherein said L1 polypeptide is characterized as having the amino acid sequence encoded by the nucleotide sequence of SEQ ID NO:2.

5,437,952

**LITHOGRAPHIC PHOTOSENSITIVE PRINTING PLATE COMPRISING A PHOTOCONDUCTOR AND A NAPHTHO-QUINONE DIAZIDE SULFONIC ACID ESTER OF A PHENOL RESIN**

Katsura Hirai, Hachioji; Yasuo Kojima, Tama, and Kiyoshi Goto, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 26, 1993, Ser. No. 22,918

Claims priority, application Japan, Mar. 6, 1992, 4-049849;  
Apr. 3, 1992, 4-082246

Int. Cl.<sup>6</sup> G03G 5/09; G03F 7/023

U.S. Cl. 430—83

14 Claims

1. A photosensitive lithographic printing plate comprising a conductive support and provided thereon, a photoconductive layer of a composition comprising a photoconductor and an

esterified compound of o-naphthoquinonediazide sulfonic acid with a phenol resin, wherein the phenol resin is a polycondensation compound of m-cresol or p-cresol with an aldehyde or a ketone, and the content of the o-naphthoquinonediazide sulfonic acid residue is  $0.4 \times 10^{-3}$  to  $3.0 \times 10^{-3}$  mole per gram of the photoconductive layer.

5,437,953

**DYE-POLYMER TONERS FOR ELECTROPHOTOGRAPHY**

Dale D. Russell, and James C. Bearas, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.  
Filed Mar. 18, 1994, Ser. No. 210,208

Int. Cl.<sup>6</sup> G03G 9/087

U.S. Cl. 430—106

12 Claims

1. A covalently-bonded macromolecule of dye-polymer toner particle which is 0.1  $\mu\text{m}$  or smaller in size.

5,437,954

**TONER COMPOSITION FOR ELECTROPHOTOGRAPHY WITH ZINC OXIDE ADDITIVE**

Susumu Saito, Minami-ashigara, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1994, Ser. No. 197,341

Claims priority, application Japan, Feb. 17, 1993, 5-049924

Int. Cl.<sup>6</sup> G03G 9/08

U.S. Cl. 430—110

19 Claims

1. An electrophotographic toner composition comprising toner particles containing a binder resin and a colorant and fine particles adhered to the exposed surface of the toner particles, in which said fine particles are zinc oxide fine particles having an average particle size of from 2 to 100 nm and having been surface-treated with a silane coupling agent or a silicone oil.

5,437,955

**DRY TYPE TONER IMPROVEMENT WITH LUBRICANT**

Steven B. Michlin, 5310 Bentley Suite 105, West Bloomfield, Mich. 48322  
Continuation-in-part of Ser. No. 236,374, May 2, 1994, which is a continuation-in-part of Ser. No. 914,530, Jul. 17, 1992, Pat. No. 5,308,515. This application Jun. 3, 1994, Ser. No. 253,410

Int. Cl.<sup>6</sup> G03G 5/08

U.S. Cl. 430—110

6 Claims

1. A dry toner for electrophotography comprising a binder resin, a coloring agent, a mica-group mineral and calcium stearate, said mica-group mineral being coated with said calcium stearate to form a composition of ninety percent by weight or more of said mica-group mineral and ten percent by weight or less of said calcium stearate.

5,437,956

**DYE FIXING ELEMENT**

Yoshisada Nakamura, and Hiroshi Arakatsu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 11, 1994, Ser. No. 241,411

Claims priority, application Japan, May 12, 1993, 5-132379;  
May 24, 1993, 5-121673

Int. Cl.<sup>6</sup> G03C 8/24, 8/52

U.S. Cl. 430—207

5 Claims

1. A dye fixing element for use in an image formation system which is adapted to superimpose a light-sensitive element and a dye fixing element provided on separate supports upon each other so that diffusible dyes are transferred to said dye fixing element to form an image, wherein a matting agent consisting of inorganic compound grains or organic compound grains is incorporated in either a layer nearer to said support than a dye fixing layer in said dye fixing element or a layer provided between said dye fixing layer and a surface protective layer.



5,437,957

## LITHOGRAPHIC PRINTING PLATE

Motono Yamano, Kozo Haino, Akio Yoshida, and Hidetoshi Miura, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Japan

Filed Feb. 4, 1994, Ser. No. 191,498

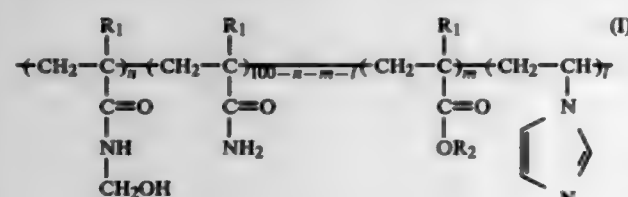
Claims priority, application Japan, Feb. 5, 1993, 5-018964; May 26, 1993, 5-124154

Int. Cl.<sup>6</sup> G03C 3/00

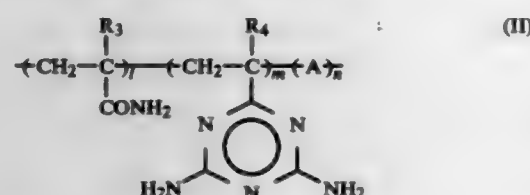
U.S. Cl. 430—232

8 Claims

1. A lithographic printing plate material comprising a support and, provided thereon, at least a silver halide emulsion layer and a physical development nuclei layer wherein the physical development nuclei layer and/or a layer contiguous thereto contains at least one of water-soluble polymers represented by the following formula (I) or at least one of water-soluble polymers represented by the following formula (II):



wherein R<sub>1</sub> represents H or an alkyl group, R<sub>2</sub> represents H or an alkali metal atom, n represents 1–10 mol %, m represents 0–50 mol % and l represents 0–5 mol %;



wherein R<sub>3</sub> and R<sub>4</sub> each represent a hydrogen atom or a lower alkyl group, A represents a residue of an ethylenically unsaturated monomer, l represents 40–99.9 mol %, m represents 0.1–10 mol % and n represents 0–50 mol %.

5,437,958

HUMAN  $\beta_2$  INTEGRIN  $\alpha$  SUBUNIT

William M. Gallatin, Mercer Island, and Monica Van der Vliet, Seattle, both of Wash., assignors to ICOS Corporation, Bothell, Wash.

Filed Dec. 23, 1993, Ser. No. 173,497

Int. Cl.<sup>6</sup> C12N 5/00; C12P 21/06; C07H 19/00; C07K 1/00  
U.S. Cl. 435—240.2

9 Claims

1. A purified and isolated  $\alpha_d$  polynucleotide consisting of the human  $\alpha_d$  protein coding sequence set out in SEQ ID NO: 1.

5,437,959

## PROTECTIVE COATING FOR IMAGING ELEMENTS

Anchi Hsu, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 25, 1994, Ser. No. 186,342

Int. Cl.<sup>6</sup> G03C 1/805

U.S. Cl. 430—256

7 Claims

1. An element consisting essentially of, in order:  
(a) a removable substrate;  
(b) a transparent, nonphotosensitive, polymeric layer having a thickness of less than about 0.002 cm and a glass of 45–70; said polymeric layer consisting essentially of at least one thermoplastic polymer having an elongation at break of greater than 30%, and a glass transition temperature of 35–70° C.; and  
(c) a non-photosensitive elastomeric layer.

5,437,960

## PROCESS FOR LAMINATING PHOTOSENSITIVE LAYER

Hiroshi Nagate, Hiroya Endo, and Ken-ichi Miyata, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

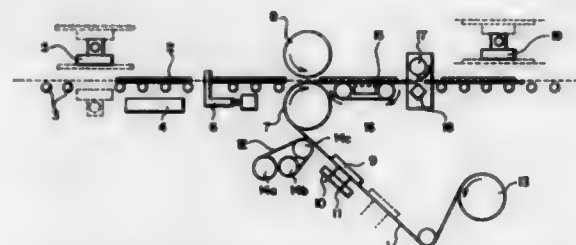
Filed Aug. 5, 1994, Ser. No. 286,457

Claims priority, application Japan, Aug. 10, 1993, 5-198469; Aug. 19, 1993, 5-205394

Int. Cl.<sup>6</sup> G03C 1/805, 11/12

U.S. Cl. 430—256

15 Claims



1. A process for laminating a photosensitive layer which comprises providing (A) a base having a laminating region and a non-laminating region, and (B) a support having thereon, in order, a photosensitive layer and a protective film, where part of the protective film corresponds to the laminating region and part of the protective film corresponds to the non-laminating region, removing the part of the protective film which corresponds to the laminating region from the photosensitive layer such that the photosensitive layer can be laminated to the base in the laminating region, feeding the base and the support having thereon the photosensitive layer from which protective film has been removed to a nip between a pair of heated pressure rollers, passing the base and photosensitive-layer-covered support forward through the rollers while the base and photosensitive-layer-covered support are being nipped and hot-pressed by the rollers, with the photosensitive layer being in contact with the laminating region of the base to laminate the photosensitive layer to the base, and then peeling the support from the photosensitive layer, wherein the removal of protective film from the photosensitive layer is conducted in such a manner that the part of the protective film which corresponds to the non-laminating region of the base is left on the photosensitive layer.

5,437,961

## METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Hiroaki Yano, Yokohama; Haruo Okano, Tokyo; Tohru Watanabe, Yokohama, and Keiji Horioka, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 799,440, Nov. 27, 1991, abandoned. This application Jun. 21, 1994, Ser. No. 263,415  
Claims priority, application Japan, Nov. 27, 1990, 2-320885; Aug. 26, 1991, 3-213851; Nov. 12, 1991, 3-296045; Nov. 12, 1991, 3-296074

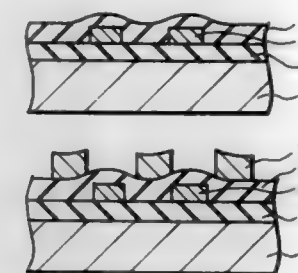
Int. Cl.<sup>6</sup> G03F 7/00

U.S. Cl. 430—316

18 Claims

1. A method of manufacturing a semiconductor device, comprising the steps of:  
forming a layer of carbon having a thickness of 38 to 78 nm on a light-reflective layer;  
forming a photosensitive resin layer on the carbon layer;  
selectively radiating light on the photosensitive resin layer;  
forming a photosensitive resin pattern by developing the photosensitive resin layer selectively irradiated with the light;

forming a carbon pattern by etching the carbon layer using the photosensitive resin pattern as a mask; and



forming a light-reflective pattern by etching the light-reflective layer using the carbon pattern as a mask.

5,437,962

## PHOTOGRAPHIC ELEMENTS CONTAINING PARTICULAR COLOR COUPLERS IN COMBINATION WITH PARTICULAR STABILIZERS

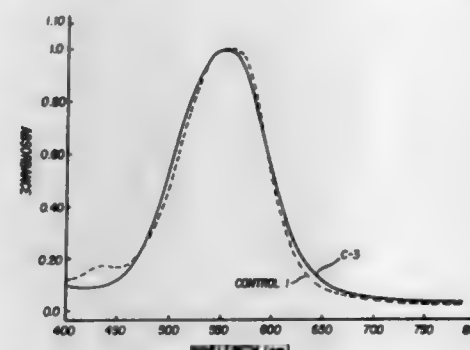
Rakesh Jain, Penfield; Thomas H. Jozefiak, Rochester, both of N.Y., and Hugh M. Williamson, London, England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1993, Ser. No. 42,194

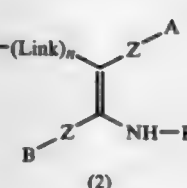
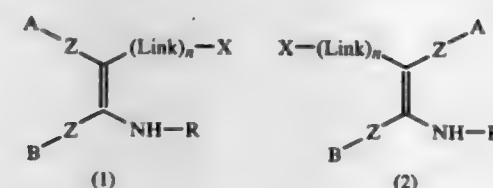
Int. Cl.<sup>6</sup> G03C 7/32, 7/392

U.S. Cl. 430—551

13 Claims

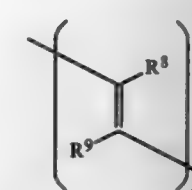


1. A photographic element comprising at least one photosensitive silver halide layer and associated therewith a color coupler of the general formula (1) or (2) and at least one stabilizer of the formula II, III or IV:



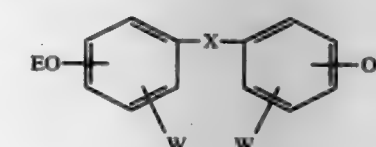
wherein A and B represent the same or different electron-withdrawing group,  
X-(Link)<sub>n</sub> is H or a group which splits off from the carbon atom to which it is attached on coupling with oxidized color developer,  
R is an alkyl, cycloalkyl, aryl or heterocyclic which may be substituted, —COR<sup>1</sup>, —CSR<sup>1</sup>, —SOR<sup>1</sup>, —SO<sub>2</sub>R<sup>1</sup>, —NH—COR<sup>1</sup>, —CONHR<sup>1</sup>, —COOR<sup>1</sup>, —COSR<sup>1</sup>, —NHSO<sub>2</sub>R<sup>1</sup> wherein R<sup>1</sup> is an alkyl, cycloalkyl, or aryl group any of which are optionally substituted,  
and wherein two or more of B, R, and X optionally form part of a ring, and A does not form part of a ring with B, R, or X,  
Link is a linking group;  
n is 0, 1 or 2; and  
Z is a group that will extend the conjugated path from A or

B to the —NH—R group while leaving the whole group electron-withdrawing, and has the formula:



wherein R<sup>8</sup> and R<sup>9</sup> are each hydrogen, halogen, or an alkyl or aryl group that may be substituted,  
or R<sup>8</sup> and R<sup>9</sup> may complete a carbocyclic or heterocyclic ring, and  
each m is independently 0, 1 or 2;

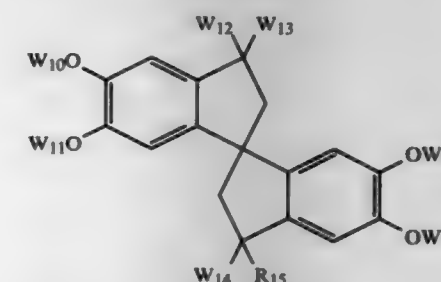
(II)



wherein:

E is a substituted or unsubstituted alkyl, cycloalkyl, trialkylsilyl, alkenyl, alkynyl, aryl, acyl, alkylsulfonyl or arylsulfonyl group, or a phosphate ester;  
X is a single bond or a linking group selected from alkylidene, a heteroatom or sulfonyl; and  
each W independently represents one or more substituents, each substituent independently being a substituted or unsubstituted alkyl, alkenyl, cycloalkyl or aryl group, or each W in combination with the benzene ring to which it is attached independently represents the atoms necessary to complete a fused ring system;

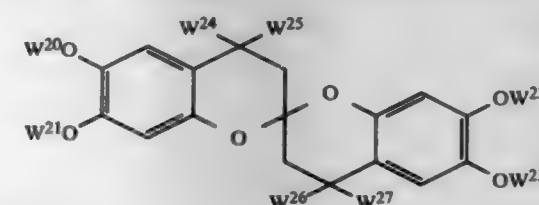
(III)



wherein:

W<sub>10</sub> to W<sub>17</sub> may independently be a hydrogen atom, a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aromatic group, an acylamino group, a mono or dialkylamino group, an aliphatic or aromatic thio group, an aliphatic or aromatic oxycarbonyl group, and any of the rings may be optionally further substituted;

(IV)

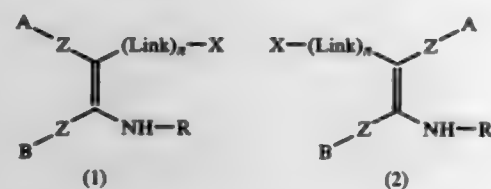


wherein:

W<sub>20</sub> to W<sub>27</sub> may independently be a hydrogen atom, a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aromatic group, an acylamino group, a mono or dialkylamino group, an aliphatic or aromatic thio

group, an aliphatic or aromatic oxycarbonyl group, and any of the rings may be optionally further substituted.

11. A photographic element comprising at least one photosensitive silver halide layer and associated therewith a colour coupler of the general formula (1) or (2) and at least one stabilizer of the formula IIB or formula III:



wherein A and B represent the same or different electron-withdrawing group,

X-(Link)<sub>n</sub> is H or a group which splits off from the carbon atom to which it is attached on coupling with oxidized color developer,

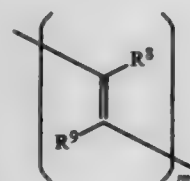
R is an alkyl, cycloalkyl, aryl or heterocyclic which may be substituted, —COR<sup>1</sup>, —CSR<sup>1</sup>, —SOR<sup>1</sup>, —SO<sub>2</sub>R<sup>1</sup>, —NH—COR<sup>1</sup>, —CONHR<sup>1</sup>, —COOR<sup>1</sup>, —COSR<sup>1</sup>, —NHSO<sub>2</sub>R<sup>1</sup> wherein R<sup>1</sup> is an alkyl, cycloalkyl, or aryl group any of which are optionally substituted,

and wherein two or more of B, R, and X optionally form part of a ring, and A does not form part of a ring with B, R, or X,

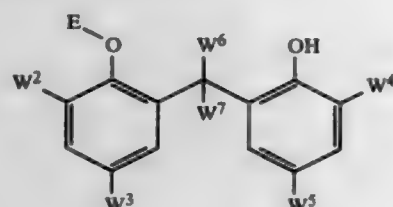
Link is a linking group;

n is 0, 1 or 2; and

Z is a group that will extend the conjugated path from A or B to the —NH—R group while leaving the whole group electron-withdrawing, and has the formula:



wherein R<sup>8</sup> and R<sup>9</sup> are each hydrogen, halogen, or an alkyl or aryl group that may be substituted, or R<sup>8</sup> and R<sup>9</sup> may complete a carbocyclic or heterocyclic ring, and each m is independently 0, 1 or 2;



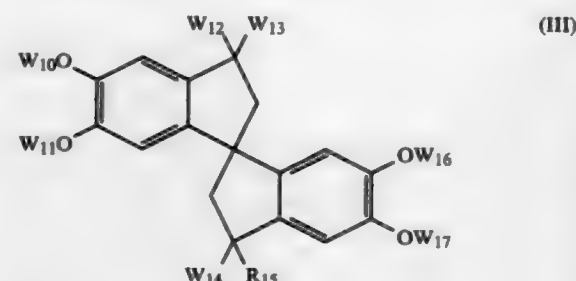
wherein

E is a group selected from substituted or unsubstituted C<sub>1</sub>–C<sub>30</sub> alkyl groups; a substituted or unsubstituted trialkylsilyl group each alkyl group being C<sub>1</sub>–C<sub>30</sub>; a substituted or unsubstituted cycloalkyl group; a substituted or unsubstituted alkenyl or alkynyl group; a substituted or unsubstituted aryl group; a substituted or unsubstituted acyl group; a substituted or unsubstituted aroyl group; a substituted or unsubstituted alkyl sulfonyl or aryl sulfonyl group; a phosphate ester group;

W<sup>2</sup>, W<sup>3</sup>, W<sup>4</sup> and W<sup>5</sup> are, independently, a substituted or unsubstituted alkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted cycloalkyl group, or substituted or unsubstituted aryl group, or in combination with the benzene ring to which it is attached

represents the atoms necessary to complete a fused ring system;

W<sup>6</sup> and W<sup>7</sup> may independently be hydrogen or a substituted or unsubstituted C<sub>1</sub>–C<sub>4</sub> alkyl group;



wherein:

W<sub>10</sub> to W<sub>17</sub> may independently be a substituted or unsubstituted alkyl group.

5,437,963

#### HEAT MODE RECORDING MATERIAL FOR MAKING IMAGES OR DRIODGRAPHIC PRINTING PLATES

Yves Verburgh, Puurs, and Luc Leenders, Herentals, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium Division of Ser. No. 128,244, Sep. 29, 1993, Pat. No. 5,366,844. This application Sep. 8, 1994, Ser. No. 301,405

Claims priority, application European Pat. Off., Sep. 30, 1992, 92203000

Int. Cl.<sup>6</sup> G03F 7/039, 7/075, 7/36; G03C 1/805

U.S. Cl. 430—262

4 Claims

1. A heat mode recording material comprising on the same side of a non-conductive support a conductive recording layer and an elastomeric image forming layer comprising silicone rubber and being non-conductive characterised in that a peelable polymeric film is provided as an outermost layer on the side of said support containing said elastomeric image forming layer.

5,437,964

#### STEREOLITHOGRAPHY USING VINYL ETHER-EPOXIDE POLYMERS

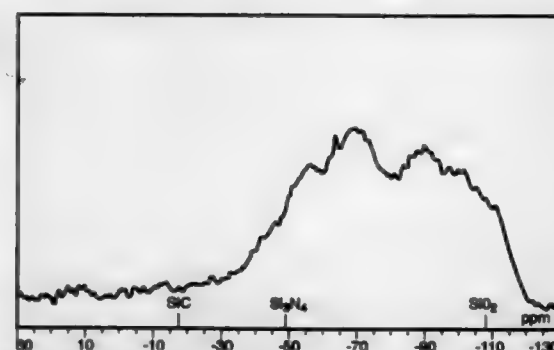
Stephen C. Lapin, Wauconda; James R. Snyder, Chicago; Eugene V. Sitzmann, Des Plaines; Darryl K. Barnes, Bellwood, and George D. Green, Park Ridge, all of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 855,392, Mar. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 693,890, May 1, 1991, abandoned. This application Feb. 24, 1994, Ser. No. 201,146

Int. Cl.<sup>6</sup> G03C 5/00, 1/725; C08F 2/46

U.S. Cl. 430—280

22 Claims



1. A polymer precursor composition for forming three-dimensional objects by stereolithography consisting essentially of

(a) vinyl ether functionalized compounds;

(b) epoxy functionalized compounds;

(c) an effective amount of a cationic photoinitiator; said vinyl ether compounds and epoxy compounds both being curable by acids released by said photoinitiator and having proportions selected to provide a three-dimensional polymeric object having suitable green strength with minimal curl distortion when said composition is polymerized in stereolithography by a light source selected from the group consisting of UV and visible light lasers and defined by the formula M=F/E

where

M is the vinyl ether equivalent weight of the composition and has a value between 80 and 800

F is the total weight in grams of the composition

E is the number of vinyl ether equivalents in the composition.

5,437,965

#### SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Minoru Uchida; Toshio Kawagishi, and Shunichi Tomita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 37,521, Mar. 25, 1993, abandoned, which is a continuation of Ser. No. 792,654, Nov. 15, 1991, abandoned. This application Dec. 20, 1994, Ser. No. 359,866

Claims priority, application Japan, Nov. 15, 1990, 2-310010

Int. Cl.<sup>6</sup> G03C 1/46

U.S. Cl. 430—504

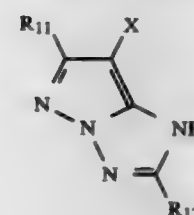
7 Claims

1. A silver halide color photographic material comprising a support having thereon at least one yellow coupler-containing blue-sensitive silver halide emulsion layer (BL), at least one magenta coupler-containing green-sensitive silver halide emulsion layer (GL) and at least one cyan coupler-containing red-sensitive silver halide emulsion layer (RL); wherein the weight-averaged wavelength of the spectral sensitivity distribution of GL ( $\lambda_G$ ) of the photographic material is between 520 nm and 580 nm ( $520 \text{ nm} \leq \lambda_G \leq 580 \text{ nm}$ ), the weight-averaged wavelength of the spectral sensitivity distribution of RL ( $\lambda_R$ ) of the photographic material is between 590 nm and 650 nm ( $590 \text{ nm} \leq \lambda_R \leq 650 \text{ nm}$ ), and the weight-averaged wavelength of the spectral sensitivity distribution of BL ( $\lambda_B$ ) of the photographic material is between 430 nm and 480 nm ( $430 \text{ nm} \leq \lambda_B \leq 480 \text{ nm}$ ); wherein the photographic material satisfies at least one of the following requirements (a), (b) and (c):

(a) the weight-averaged wavelength of the negative interlayer effect relative to RL ( $\lambda_{-R}$ ) is between 490 nm and 560 nm ( $490 \text{ nm} \leq \lambda_{-R} \leq 560 \text{ nm}$ );

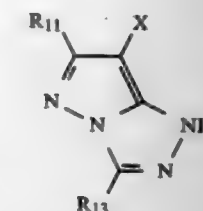
(b) the weight-averaged wavelength of the negative interlayer effect relative to GL ( $\lambda_{-G}$ ) is selected from at least one of the group consisting of between 400 nm and 500 nm ( $400 \text{ nm} \leq \lambda_{-G} \leq 500 \text{ nm}$ ) and between 570 nm and 670 nm ( $570 \text{ nm} \leq \lambda_{-G} \leq 670 \text{ nm}$ ); and

(c) the weight-averaged wavelength of the negative interlayer effect relative to BL ( $\lambda_{-B}$ ) is between 520 nm and 590 nm ( $520 \text{ nm} \leq \lambda_{-B} \leq 590 \text{ nm}$ ); and wherein the photographic material comprises at least one compound represented by formula (P-2) or (P-3) in an interlayer effect donor layer to said RL:



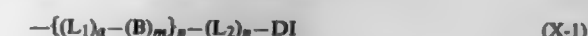
(P-2)

-continued



(P-3)

wherein R<sub>11</sub>, R<sub>12</sub> and R<sub>13</sub> each represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a heterocyclic group, a cyano group, a hydroxyl group, a nitro group, a carboxyl group, an amino group, an alkoxy group, an aryloxy group, an acylamino group, an alkylamino group, an anilino group, a ureido group, a sulfamoylamino group, an alkylthio group, an arylthio group, an alkoxy-carbonylamino group, a sulfonamido group, a carbamoyl group, a sulfamoyl group, a sulfonyl group, an alkoxy-carbonyl group, a heterocyclic-oxy group, an azo group, an acyloxy group, a carbamoyloxy group, a silyloxy group, an aryloxy-carbamoylamino group, an imido group, a heterocyclicthio group, a sulfinyl group, a phosphonyl group, an aryloxy-carbonyl group, an acyl group, or an azolyl group; and X represents a group of formula (X-1):



(X-1)

wherein L<sub>1</sub> represents a group capable of splitting off from the coupler residual group at the left-side bond of L<sub>1</sub> in formula (X-1), followed by cleaving the right-side bond of L<sub>1</sub>, bonding to (B)<sub>m</sub> thereof;

B represents a group capable of cleaving the right-side bond of B in formula (X-1) by reaction with an oxidation product of a developing agent;

L<sub>2</sub> represents a group capable of splitting off from the formula (X-1) at the left-side bond of L<sub>2</sub> in formula (X-1), followed by cleaving the right-side bond, bonding to DI, thereto;

DI represents a development inhibitor residue;

a, m and n each represent 0 or 1; and

p represents an integer of from 0 to 2; provided that when p is 2, then the {(L<sub>1</sub>)<sub>a</sub>—(B)<sub>m</sub>}<sub>p</sub> groups are the same or different; and

wherein a maximum interlayer effect is imparted to said RL at the weight-averaged wavelength  $\lambda_R$  by at least one of the layers selected from the group consisting of BL and GL, and wherein the difference between the weight-averaged wavelength in the color sensitivity distribution of GL ( $\lambda_G$ ) and the weight-averaged wavelength of the negative interlayer effect relative to RL ( $\lambda_{-R}$ ) is 5 nm or more ( $\lambda_G - \lambda_{-R} \geq 5 \text{ nm}$ ).

5,437,966

#### SILVER HALIDE COLOR NEGATIVE PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL

Hideaki Haraga; Toshihiko Yagi; Miki Kom; Hiroshi Shimazaki; Yoshihide Urakawa; Yoshitaka Yamada; Atsuo Ezaki, and Syoji Matsuzaka, all of Hino, Japan, assignors to Konica Corporation, Japan

Continuation of Ser. No. 34,179, Mar. 22, 1993, abandoned, which is a continuation of Ser. No. 943,135, Sep. 10, 1992, abandoned, which is a continuation of Ser. No. 634,069, Dec. 26, 1990, abandoned. This application Mar. 23, 1994, Ser. No. 216,771

Claims priority, application Japan, Jan. 19, 1990, 2-10968; Jan. 19, 1990, 2-10973; Feb. 19, 1990, 2-37766; Feb. 19, 1990, 2-37767

Int. Cl.<sup>6</sup> G03C 1/46

U.S. Cl. 430—505

9 Claims

1. A silver halide color photographic light-sensitive material



having an ISO speed of not less than 300, said material comprising a support having provided thereon a light-sensitive layer unit containing a red-sensitive silver halide emulsion and a cyan coupler, a light-sensitive layer unit containing a green-sensitive silver halide emulsion and a magenta coupler, and a light-sensitive layer unit containing a blue-sensitive silver halide emulsion and a yellow coupler, wherein RMS granularity of said light-sensitive layer unit containing said blue-sensitive silver halide emulsion and said yellow coupler conforms to the following relationships:

$$1.1 \text{ RMS}_0 \leq \text{RMS}_1 \leq 1.5 \text{ RMS}_0 \text{ and}$$

$$0.9 \text{ RMS}_0 \leq \text{RMS}_2 \leq 1.2 \text{ RMS}_0$$

wherein  $\text{RMS}_0$  is a RMS value at a minimum density portion of the layer unit,  $\text{RMS}_1$  is a RMS value at a density portion of the minimum density plus 0.15 of the layer unit which is produced by an exposure amount in terms of  $\log H$ , and  $\text{RMS}_2$  is a RMS value at a density portion produced by an exposure of  $\log H + 0.5$ .

5,437,967

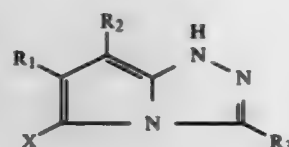
# SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hideaki Naruse, and Makoto Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Division of Ser. No. 982,773, Nov. 27, 1992, Pat. No. 5,340,706.  
This application Apr. 18, 1994, Ser. No. 228,908  
Claims priority, application Japan, Nov. 27, 1991, 3-335905  
Int. Cl. G03C 1/46

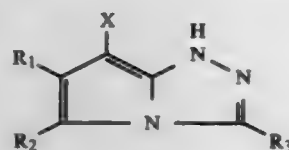
U.S. Cl. 430—505

13 Claims

1. A silver halide color photographic light-sensitive material comprising a support and provided thereon a silver halide light-sensitive layer containing a cyan coupler, a silver halide light-sensitive layer containing a magenta coupler, and a silver halide light-sensitive layer containing a yellow coupler, wherein the silver halide light-sensitive layer containing the cyan coupler contains at least one pyrrolotriazole cyan coupler represented by the following Formula (I-b) or (II-b) as a cyan coupler and the silver halide light-sensitive layer containing the magenta coupler contains a pyrazoloazole magenta coupler represented by the following Formula (M) as a magenta coupler:



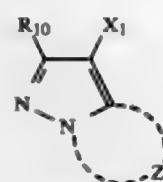
(I-b)



(II-b)

wherein  $R_1$  and  $R_2$  each represents an electron attractive group having a Hammett's substituent constant  $\sigma_p$  of 0.2 or more and the sum of the  $\sigma_p$  values of  $R_1$  and  $R_2$  is 0.65 or more;  $R_3$  represents an alkyl group, an aryl group, a cyano group, a nitro group, a carboxy group, a sulfo group, an acylamino group, an anilino group, a ureido group, a carbamoyl group, a sulfamoyl group, a sulfonyl group, alkoxy carbonyl group, a silyloxy group, an aryloxy carbonyl amino group, a sulfinyl group, a phosphonyl group, an aryloxy carbonyl group, or an acyl group;  $X$  represents a hydrogen atom or a group capable of splitting off upon a reaction with an oxidation product of an aromatic primary amine color developing agent; and the group represented by  $R_1$ ,  $R_2$ ,  $R_3$  or  $X$  may be a divalent group and combine with a polymer which is higher than a dimer and

which has a high molecular weight chain to form a homopolymer or a copolymer;



(M)

wherein  $R_{10}$  represents a hydrogen atom or a substituent;  $Z$  represents a group of non-metallic atoms necessary to form a 5-membered azole ring containing 2 to 3 nitrogen atoms; and  $X_1$  represents a hydrogen atom or a group capable of splitting off upon a coupling reaction with an oxidation product of an aromatic primary amine color developing agent.

5,437,968

# SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Katsuro Nagaoka, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Continuation of Ser. No. 125,664, Sep. 23, 1993, abandoned. This application Oct. 14, 1994, Ser. No. 321,898  
Claims priority, application Japan, Oct. 20, 1992, 4-306241  
Int. Cl. G03C 1/46

U.S. Cl. 430—505

4 Claims

1. A silver halide color photographic light-sensitive material being capable of forming a color reversal image and comprising a support having provided thereon at least one blue-sensitive emulsion layer, at least one green-sensitive emulsion layer, and at least one red-sensitive emulsion layer,

wherein each blue-sensitive emulsion layer, each green-sensitive emulsion layer, and each red-sensitive emulsion layer consists of at least three layers having different sensitivities from each other,

wherein adjacent to at least one blue-sensitive emulsion layer is a layer containing yellow colloidal silver, adjacent to at least one green-sensitive emulsion layer is a layer containing yellow colloidal silver, and adjacent to at least one red-sensitive emulsion layer is a layer containing yellow colloidal silver, and

wherein yellow colloidal silver is not present in the blue-sensitive emulsion layer, the green-sensitive emulsion layer, and the red-sensitive emulsion layer, and said light-sensitive material further comprises a DIR compound represented by the following formula

Formula



wherein  $A$  represents a redox mother nucleus or a precursor thereof, and a group which enables  $-(Time)_t-X$  to leave when the compound is oxidized during the processing of photograph development, and  $X$  represents a development inhibitor;  $L$  represents a divalent linking group, and  $G$  represents an acidic group;  $Time$  represents a group which can further release  $X$  thereafter, and may have a time-adjusting function, or may be a coupler which releases  $X$  when reacted with an oxidized form of a developing agent, or may be a redox group; and  $n$ ,  $m$ , and  $t$  are 0 or 1; provided that when  $n=1$ ,  $m$  cannot be 0.

5,437,969

COLOR PHOTOGRAPHIC RECODING MATERIAL  
Arno Schmuck, Leichlingen; Edgar Draber, Odenthal, and Michael Missfeldt, Bergisch Gladbach, all of, assignors to Agfa-Gevaert AG, Leverkusen, Germany  
Filed Jan. 6, 1994, Ser. No. 178,004

Claims priority, application Germany, Jan. 18, 1993, 43 01 106.3

Int. Cl. G03C 1/08

U.S. Cl. 430—508

18 Claims

1. Color photographic silver halide material comprising on a support, at least one red sensitive layer containing a cyan coupler and a red sensitizer, at least one green sensitive layer containing a magenta coupler and a green sensitizer and at least one blue sensitive layer containing a yellow coupler and a blue sensitizer, wherein at least one blue sensitive silver halide emulsion layer contains an additional spectral sensitizer (gap sensitizer) whose sensitization maximum lies between the sensitization maxima of the red sensitive and the green sensitive silver halide emulsion layer and/or the at least one red sensitive silver halide emulsion layer contains an additional spectral sensitization (gap sensitizer) whose sensitization maximum lies between the sensitization maxima of the green sensitive and the blue sensitive silver halide emulsion layer.

5,437,970

# SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND METHOD FOR FORMING AN IMAGE

Akiko Shono, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Dec. 16, 1993, Ser. No. 167,203  
Claims priority, application Japan, Dec. 18, 1992, 4-356114  
Int. Cl. G03C 1/825

U.S. Cl. 430—522

19 Claims

1. A silver halide color photographic material having, on a reflective support, photographic constitutional layers comprising at least one photosensitive silver halide emulsion layer and at least one non-photosensitive hydrophilic colloid layer, which comprises a reflective support obtained by covering at least a surface with a composition of a resin to form a resin-coated surface, wherein the resin-coated surface is emulsion-coated, wherein said resin, whose major component is polyester, comprises a white pigment mixed and dispersed therein, wherein the major component of the resin is a polyester synthesized by polycondensation of a dicarboxylic acid and a diol; and said at least one non-photosensitive hydrophilic colloid layer contains a dispersion of solid fine particles of at least one compound represented by the following formula (Sa); with the total amount of gelatin contained in the photographic constitutional layers being 8.5 g/m<sup>2</sup> or less; and with the silver chloride content of the silver halide emulsion contained in the at least one photosensitive silver halide emulsion layer being 90 mol % or more:



formula (Sa)

wherein  $D$  represents a compound having a chromophore;  $X$  represents a dissociable proton which is bonded to  $D$  directly or through a divalent linking group or a group having a dissociable proton, and  $y$  is an integer of 1 to 7; wherein the compound represented by formula (Sa) is one represented by the following formula (Sb), (Sc), (Sd), or (Se):



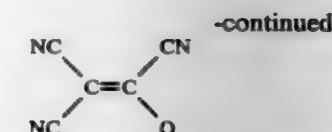
formula (Sb)



formula (Sc)

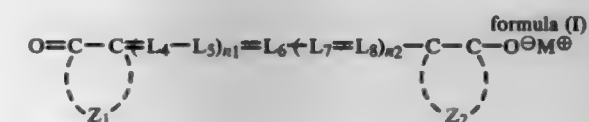


formula (Sd)



formula (Se)

wherein  $A_1$  and  $A_2$  each represent an acid nucleus;  $B_1$  represents a basic nucleus;  $Q$  represents an aryl group or a heterocyclic ring moiety,  $L_1$ ,  $L_2$  and  $L_3$  each represent a methine group;  $m$  is 0, 1 or 2; and  $n$  and  $p$  are each 0, 1, 2, or 3; provided that the compound represented by one of formulae (Sb) to (Se) has at least one group selected from the group consisting of a carboxylic acid group, a sulfonamido group, an arylsulfamoyl group, a sulfonylcarbamoyl group, a carbonylsulfamoyl group, and an enol group, and the compound does not have other water soluble groups; wherein at least one photosensitive silver halide emulsion layer or hydrophilic colloid layer further contains at least one compound represented by the following formula (I), (II), or (III):



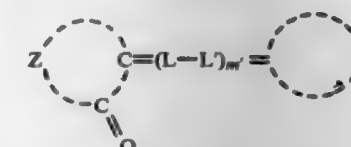
formula (I)

wherein  $Z_1$  and  $Z_2$ , which may be the same or different, each represent a group of nonmetal atoms required to form a heterocyclic ring moiety;  $L_4$ ,  $L_5$ ,  $L_6$ ,  $L_7$ , and  $L_8$  each represent a methine group;  $n_1$  and  $n_2$  each are 0 or 1; and  $M^+$  represents a hydrogen or other monovalent cation,



formula (II)

wherein  $Ar_1$  and  $Ar_2$ , which may be the same or different, each represent an aryl group or a heterocyclic group,



wherein  $L$  and  $L'$  each represent a substituted or unsubstituted methine group or a nitrogen atom,  $Z$  and  $Y$  each represent a group of nonmetal atoms required to form a heterocyclic ring moiety, and  $m'$  is 0, 1, 2 or 3.

5,437,971

# PROCESS FOR PREPARING MONODISPersed SILVER HALIDE EMULSIONS

Marco Loiacono, Albisola Superiore, and Giuseppe Loviglio, Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 10, 1994, Ser. No. 258,507

Claims priority, application European Pat. Off., Jul. 2, 1993, 931105H4

Int. Cl. G03C 1/005, 1/035, 5/16

U.S. Cl. 430—569

23 Claims

1. A process to prepare a monodispersed silver halide grain emulsion characterized in that said process comprises the steps of:

(a) forming silver halide nuclei with single jet precipitation by adding a water-soluble silver salt solution to a reaction vessel containing a water-soluble halide salt solution in a hydrophilic colloid at a pCl of from 1.0 to 2.0 and at a temperature lower than 80° C., said water-soluble silver

salt solution being added in an amount of from 0.1 to 15% by weight of silver relative to the total silver,  
 (b) stabilizing said silver halide nuclei to seed crystals for at least six minutes at a temperature lower than 80° C. and at pCl of from 1.5 to 3.0 by Ostwald ripening, and  
 (c) growing said seed crystals by double jet precipitation of silver and halide salt solutions at a constant chloride ions excess of from 30 to 70% mol and a temperature lower than 80° C.

5,437,972

## SILVER HALIDE PHOTOGRAPHIC MATERIAL

Akihiko Ikegawa, Masayuki Kuramitsu, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 957,042, Oct. 6, 1992, Pat. No. 5,310,645.

This application Jan. 27, 1994, Ser. No. 187,012

Claims priority, application Japan, Oct. 7, 1991, 3-285532; Jan. 14, 1992, 4-23343

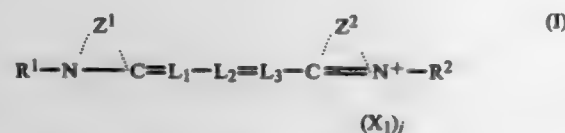
The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl. 6 G03C 1/18

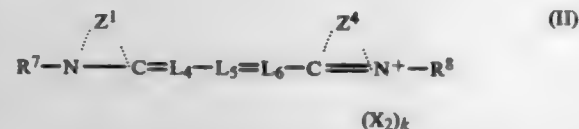
U.S. Cl. 430—574

8 Claims

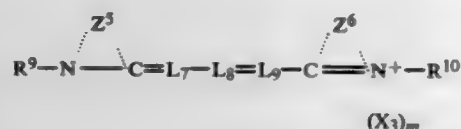
1. A silver halide photographic material comprising a support having thereon (a) a layer containing at least one methine compound represented by the following general formula (I) and (b) a layer containing at least one methine compound represented by the following general formula (II), (III) or (IV):



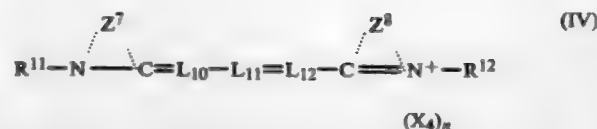
wherein R<sup>1</sup> represents —(CH<sub>2</sub>)<sub>r</sub>—CONHSO<sub>2</sub>—R<sup>3</sup>, —(CH<sub>2</sub>)<sub>r</sub>—SO<sub>2</sub>NHCO—R<sup>4</sup>, —(CH<sub>2</sub>)<sub>r</sub>—CONHCO—R<sup>5</sup> or —(CH<sub>2</sub>)<sub>r</sub>—SO<sub>2</sub>NHSO<sub>2</sub>—R<sup>6</sup> in which R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> each represents an alkyl, alkoxy or amino group, r, s, t and u each represents an integer 1 to 5, and R<sup>2</sup> represents a 2-sulfoethyl, 3-sulfoethyl, 4-sulfoethyl or 3-sulfoethyl group; Z<sup>1</sup> and Z<sup>2</sup> each represents a nonmetallic atom group required to form a benzothiazole nucleus or a benzoselenazole nucleus; L<sub>1</sub>, L<sub>2</sub> and L<sub>3</sub> each represents a methine group; X<sub>1</sub> represents an anion; and j represents an integer required to adjust the charge in the molecule to 0;



wherein R<sup>7</sup> and R<sup>8</sup> each represents an alkyl group other than those represented by R<sup>1</sup>; Z<sup>3</sup> and Z<sup>4</sup> each has the same meaning as Z<sup>1</sup>; L<sub>4</sub>, L<sub>5</sub> and L<sub>6</sub> each has the same meaning as L<sub>1</sub>; X<sub>2</sub> has the same meaning as X<sub>1</sub>; and k has the same meaning as j;



wherein R<sup>9</sup> and R<sup>10</sup> each has the same meaning as R<sup>2</sup>; Z<sup>5</sup> and Z<sup>6</sup> each has the same meaning as Z<sup>1</sup>, with the proviso that at least one of Z<sup>5</sup> and Z<sup>6</sup> is substituted by a carboxyl group; L<sub>7</sub>, L<sub>8</sub> and L<sub>9</sub> each has the same meaning as L<sub>1</sub>; X<sub>3</sub> has the same meaning as X<sub>1</sub>; and m has the same meaning as j;



wherein R<sup>11</sup> and R<sup>12</sup> each has the same meaning as R<sup>2</sup>; Z<sup>7</sup> represents a nonmetallic atom group required to form a benzoxazole nucleus or a benzimidazole nucleus; Z<sup>8</sup> has the same meaning as Z<sup>1</sup>; L<sub>10</sub>, L<sub>11</sub> and L<sub>12</sub> each has the same meaning as L<sub>1</sub>; X<sub>4</sub> has the same meaning as X<sub>1</sub>; and n has the same meaning as j.

5,437,973

## ENZYME-ELECTRODE SENSOR

Pankaj M. Vadgama, Newcastle-Upon-Tyne; Stephen Churchhouse, Gateshead, and William Mullen, Newcastle-Upon-Tyne, all of England, assignors to The Victoria University of Manchester, United Kingdom

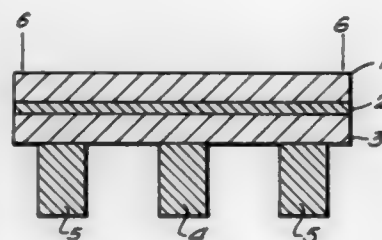
Continuation of Ser. No. 636,560, Jan. 7, 1991, abandoned, which is a continuation of Ser. No. 188,189, May 2, 1988, abandoned, which is a continuation of Ser. No. 909,491, Sep. 16, 1986, abandoned. This application May 7, 1993, Ser. No. 58,037

Claims priority, application United Kingdom, Sep. 16, 1985, 8522834

Int. Cl. 6 C12N 1/34; G01N 27/327

U.S. Cl. 435—4

7 Claims



1. An enzyme-electrode sensor for determining an analyte, which analyte is converted by an enzyme into a species detectable by the sensor, said sensor comprising:

- a) an electrode; and
- b) a membrane, superimposed on said electrode in physical contact therewith, said membrane being permeable to liquids and solutes, and wherein said membrane further comprises a first layer containing at least one enzyme, and a second layer, disposed on that side of the first layer which is further from said electrode, which second layer includes an area of porous material of restricted permeability through which the analyte can pass and has a porosity within a range of 0.001 to 0.5 percent and a mean pore diameter that does not exceed 0.01 microns.

5,437,974

## DNA SEQUENCE AND ENCODED POLYPEPTIDE USEFUL IN THE DIAGNOSIS OF HEPATITIS DISEASE

Terence E. Ryan, Danbury, Conn.; Badr Saeed, Arlington Heights, Ill.; Mark K. Kieselburg, Mansfield, Mass.; Robert E. Byrne, Buffalo Grove; Priscilla W. Stevens, Evanston, both of Ill.; Terukatsu Arima, Kagoshima, Japan, and John Todd, LaFayette, Calif., assignors to Dade International Inc, Deerfield, Ill.

Filed Feb. 4, 1992, Ser. No. 833,838

Int. Cl. 6 C07K 14/005; G01N 33/53

U.S. Cl. 435—5

4 Claims

1. A polypeptide as defined in the Sequence Listing by SEQ ID NO:7.

5,437,975  
 CONSENSUS SEQUENCE PRIMED POLYMERASE  
 CHAIN REACTION METHOD FOR FINGERPRINTING  
 GENOMES

Michael McClelland, Del Mar, and John T. Welsh, Leucadia, both of Calif., assignors to California Institute of Biological Research, La Jolla, Calif.

Filed Feb. 25, 1991, Ser. No. 661,591

Int. Cl. 6 C12Q 1/68; C12P 19/34; C07H 21/04

U.S. Cl. 435—6

4 Claims



1. A method of generating a set of discrete DNA segments characteristic of a genome comprising:

- (a) forming a polymerase chain reaction (PCR) admixture by combining, in a PCR buffer, genomic DNA and at least one structural RNA consensus primer from about 10 to about 50 nucleotide bases in length;
- (b) subjecting said PCR admixture of step (a) to a plurality of PCR thermocycles to produce a plurality of DNA segments, thereby forming a set of discrete DNA segments, wherein said consensus primer is a tRNA consensus primer selected from the group consisting of:  
 (T5A) 5'-AGTCCGGTGCTCTAACCAACTGAG-3' (SEQ ID NO:1),  
 (T5B) 5'-AATGCTCTACCAACTGAACT-3' (SEQ ID NO:2),  
 (T3A) 5'-GGGGGTTTGAATTCGCCGCCGCCCA-3' (SEQ ID NO:3), and  
 (T3B) 5'-AGGTCGCGGGTTCGAATCC-3' (SEQ ID NO:4).

5,437,976

MULTI-DOMAIN DNA LIGANDS BOUND TO A SOLID  
 MATRIX FOR PROTEIN AND NUCLEIC ACID AFFINITY  
 CHROMATOGRAPHY AND PROCESSING OF  
 SOLID-PHASE DNA

Joseph G. Utermohlen, Tucson, Ariz., assignor to Arizona Board of Regents, The University of Arizona, Tucson, Ariz.

Filed Aug. 8, 1991, Ser. No. 742,856

Int. Cl. 6 C12Q 1/68; C07H 21/02, 21/04; C12N 15/11

U.S. Cl. 435—6

16 Claims

1. A molecular binding medium, comprising a solid matrix and an oligonucleotide ligand bound thereto, said oligonucleotide ligand comprising at least one nucleotide sequence defining a first functional domain and at least one nucleotide sequence defining a second functional domain, said first functional domain having a greater binding affinity for said solid matrix than said second functional domain;

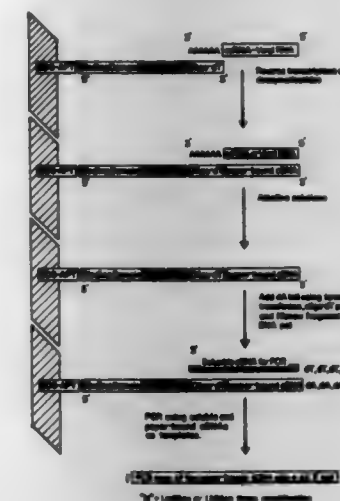
wherein said first functional domain comprises a polynucleotide sequence defining a 5' terminal domain of said oligonucleotide ligand;

wherein said oligonucleotide is substantially directionally bound to said solid matrix at said 5' terminal domain thereof;

wherein said second functional domain is a 3' terminal domain of said oligonucleotide ligand;

wherein said first functional domain comprises a polynucleotide selected from the group consisting of polydeoxyguanosine of from about 4 to about 12 nucleic acid residues, polydeoxyuracil of from about 4 to about 12 nucleic

acid residues, and poly-N-6-aminoethyldeoxyadenosine of from about 4 to about 12 nucleic acid residues; and



wherein said second functional domain comprises a polynucleotide comprising polydeoxythymidine of from about 18 to about 30 nucleic acid residues.

5,437,977

## DNA PROBE SIGNAL AMPLIFICATION

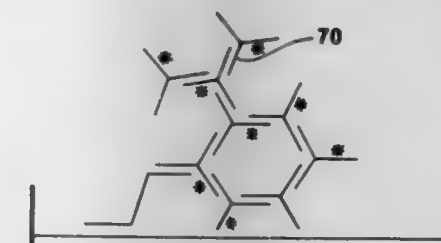
David Segev, 1125 52nd St., Brooklyn, N.Y. 11219, assignor to David Segev, Mazkeret Batya, Israel

Continuation of Ser. No. 503,621, Apr. 3, 1990, abandoned. This application May 29, 1992, Ser. No. 908,584

Int. Cl. 6 C12Q 1/68

U.S. Cl. 435—6

7 Claims



1. A method for detecting target nucleic acid molecules comprising the steps of:

- a) hybridizing a first sequence of a primary oligonucleotide probe to the target nucleic acid molecules wherein the probe has a means for binding to a bridging oligonucleotide, the bridging oligonucleotide being capable of hybridizing to at least one self-complementary developer oligonucleotide;
  - b) exposing the probe to the bridging oligonucleotide and to a plurality of self-complementary developer oligonucleotides having at least three branches, each branch of the developer oligonucleotide having a sequence of at least six nucleotides; each developer oligonucleotide:
    - i) having the same structure as all other developer oligonucleotides; and
    - ii) optionally containing, a detectable label;
- under conditions such that:
- i) the bridging oligonucleotide binds to the primary probe and hybridizes to at least one developer oligonucleotide, and
  - ii) at least two additional developer oligonucleotides hybridize to the first developer oligonucleotide; and
  - iii) a plurality of other developer oligonucleotides hybridize to the hybridized additional developer oligonucleotide.



- tide to form a branched developer oligonucleotide chain; and  
c) detecting the branched developer oligonucleotide chain, thereby detecting the target nucleic acid molecules.

5,437,978

## DETECTION FOR STAPHYLOCOCCUS SPP.

Kimiko Ubukata, Tokyo; Satoru Nakagami, Hiroshima, and Akio Yamane, Miyoshi, all of Japan, assignors to Wakunaga Selyaku Kabushiki Kaisha, Osaka, Japan

Filed Aug. 4, 1992, Ser. No. 924,458

Claims priority, application Japan, Aug. 5, 1991, 3-195398

Int. Cl.<sup>6</sup> C12Q 1/68; C07H 19/10, 21/00

U.S. Cl. 435—6

20 Claims

1. A kit for detecting in a sample *Staphylococcus* spp. carrying the *mec A* gene and encoding the *tst-1* gene which comprises

- (a) a reagent for causing a polymerase chain reaction which contains a detection primer composition consisting essentially of  
(i) a nucleotide fragment of sequence (1)

5'GAAATGACTGAACGTCGGAT (1),

a labeled sequence thereof, or a solid support binding-site labeled sequence thereof;

- (ii) a nucleotide fragment of sequence (2):

5'GCGATCAATGTTACCGTAGT (2),

a labeled sequence thereof, or a solid support binding-site labeled sequence thereof;

- (iii) a nucleotide fragment of sequence (3):

5'AGTATGGGCCAAAGTTCGAT (3),

a labeled sequence thereof, or a solid support binding-site labeled sequence thereof; and

- (iv) a nucleotide fragment of sequence (4):

5'CACTTTGATATGTGGATCCG (4),

a labeled sequence thereof, or a solid support binding-site labeled sequence thereof; and

- (b) a solid support for immobilizing products caused by a polymerase chain reaction with the primer composition.

5,437,979

SOLID PHASE SYSTEM FOR SEQUENTIAL REACTIONS  
Jang B. Rampal, Fremont, and Jon F. Harbaugh, Los Altos, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 384,576, Jul. 24, 1989, abandoned. This application Aug. 24, 1992, Ser. No. 934,286

Int. Cl.<sup>6</sup> C12Q 1/68; C12M 1/36; G01N 35/00, 35/02

U.S. Cl. 435—6

7 Claims



1. A method for performing a sequential series of reactions on a chemical species, said method comprising:

- (a) immobilizing said chemical species on a solid support retained in a pipette tip mounted on an automated apparatus which is programmable to draw reactants into said pipette tip from receptacles at preselected locations and to

expel reactants from said pipette tip in accordance with a preselected time sequence;

- (b) placing said reactants in liquid form in said receptacles; and

- (c) causing said apparatus to draw said reagents into said pipette tip in accordance with a preselected sequence to contact said chemical species so immobilized, thereby causing said sequential series of reactions to occur.

5,437,980

## PHENANTHRIDIUM DYE STAINING OF NUCLEIC ACIDS IN LIVING CELLS

Richard P. Haugland, Eugene, Oreg., assignor to Molecular Probes, Inc., Eugene, Oreg.

Filed May 17, 1993, Ser. No. 63,870

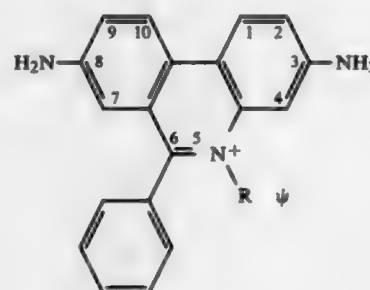
Int. Cl.<sup>6</sup> C12Q 1/68

U.S. Cl. 435—6

20 Claims

1. A method of detecting nucleic acids in living mammalian or bacterial cells comprising:

- a) preparing a biologically compatible staining solution comprising a phenanthridium dye of the formula:



where R is a hydrocarbon substituent that contains from 4 to about 10 carbons and is optionally saturated or unsaturated, and is linear or branched or contains an alicyclic or aromatic ring, and the symbol  $\Psi$  depicts the presence of the counterion used to neutralize the positive charge on the dye; where said dye is present at a concentration sufficient to give a detectable fluorescent signal inside living cells of interest; and

- b) combining the staining solution with a sample containing the living cells of interest;  
c) preparing the sample for observation by illuminating the sample with a light source capable of producing a light at or near the wavelength of maximum absorption of the dye; and  
d) observing the sample with means for detecting the fluorescent signal.

5,437,981

## METHOD FOR THE IMMUNOLOGICAL DETERMINATION OF LIGANDS

Arno Deger, Seeshaupt; Roland Schenk, Weilheim, and Gerhard Bienhaus, Haunshofen, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Continuation-in-part of Ser. No. 656,393, Feb. 15, 1991, abandoned. This application May 20, 1992, Ser. No. 887,587

Claims priority, application Germany, Feb. 26, 1990, 40 06 054.3

Int. Cl.<sup>6</sup> G01N 33/536, 33/542, 33/532, 33/53

U.S. Cl. 435—7.1

10 Claims

1. Method for determining a ligand via a homogeneous assay, comprising:

- contacting a sample with an amount of a labelled substance P<sub>2</sub>, and a receptor R which consists of one molecule of a binding partner P<sub>1</sub>, which monovalently and specifically binds to P<sub>2</sub>, and one molecule of R<sub>1</sub>, which immunologically binds to said ligand,

to form complexes comprising P<sub>1</sub>, P<sub>2</sub>, R<sub>1</sub> and said ligand, and



determining said complexes as a determination of said ligand in said sample.

5,437,982

## METHODS OF IDENTIFYING SPECIFIC INACTIVATION GATE INHIBITORS OF THE SODIUM CHANNEL

William A. Catterall, and Galen Eaholtz, both of Seattle, Wash., assignors to University of Washington, Seattle, Wash.

Filed Sep. 8, 1993, Ser. No. 118,135

Int. Cl.<sup>6</sup> G01N 33/53

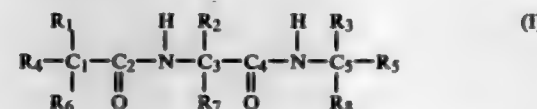
U.S. Cl. 435—7.2

1 Claim

1. An assay for identifying a compound which inactivates a sodium channel by binding to the inactivation gate receptor of said channel, thereby preventing the activation gate of said channel from binding to said receptor, comprising the steps of: establishing first and a second cultures of cells having a wild-type sodium channel and third and a fourth cultures of cells having a noninactivating mutant sodium channel, measuring a baseline sodium current for one or more cells in the first and the second cultures, and a baseline inactivation rate for one or more cells in the third and the fourth cultures,

treating the cells in the first and the third cultures with a candidate inhibitor, and the cells in the second and the fourth cultures with an inactive control peptide, measuring a test sodium current in one or more cells in the first and the second cultures, and a test inactivation rate in one or more cells in the third and the fourth cultures, repeating the previous four steps, except that the cells in the first and the third cultures are treated with an IFM amide control, and

determining that the candidate inhibitor is an inactivation gate inhibitor of the sodium channel if the test sodium current of the cells in the first culture is lower than the baseline of the first culture, the test sodium current of the cells in the second culture is about equal to the baseline of the second culture, the test inactivation rate of the cells in the third culture is higher than the baseline of the third culture, the test inactivation rate of the cells in the fourth culture is about equal to the baseline of the fourth culture, and the candidate inhibitor restores sodium channel inactivation in cells of the third culture to an extent at least equal to the IFM amide control, wherein said candidate inhibitor comprises:



wherein R<sub>1</sub> is straight or branched chain alkyl having a neutral charge; R<sub>2</sub> comprises an aryl group; R<sub>3</sub> is a straight or branched chain thio-alkyl or alkyl chain having a neutral

charge; either R<sub>4</sub> or R<sub>5</sub> or both are positively charged groups; and R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> are hydrogen atoms.

5,437,983

## HETEROGENEOUS BINDING ASSAYS

Richard P. Watts, Brisbane; Mary C. Erickson, Santa Cruz; Hrair Kirakossian, San Jose, and Chiu C. Chang, Sunnyvale, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 389,452, Aug. 4, 1989, abandoned. This application Feb. 1, 1993, Ser. No. 13,116

Int. Cl.<sup>6</sup> G01N 33/543, 33/546

U.S. Cl. 435—7.5

40 Claims

1. A method for carrying out a separation in a liquid binding assay comprising:

- combining in an aqueous medium (a) a first member of a specific binding pair (sbp), and (b) a sample under conditions wherein analyte if present in said sample forms a complex with said first sbp member;  
incubating said first sbp member and said sample;  
adding ceramic or glass beads of said aqueous medium, to which are bound a second sbp member capable of directly or indirectly binding said first sbp member to form a matrix of beads within said aqueous medium, wherein the volume of said aqueous medium is no greater than that which will cover the matrix of beads;  
incubating said aqueous medium with said beads without shaking; and  
aspirating said aqueous medium from said beads by means of a tube inserted into said matrix of beads wherein the size of said beads is large enough to permit removal of said aqueous medium without aspiration of said beads.

5,437,984

Patent Not Issued For This Number

5,437,985

## CONSERVATIVE WHOLE BLOOD SAMPLE PREPARATION TECHNIQUE

Jorge A. Quintana; Thomas R. Russell, both of Miami; Ronald D. Paul, North Miami Beach, and Timothy J. Fischer, Plantation, all of Fla., assignors to Coulter Corporation, Miami, Fla.

Continuation of Ser. No. 128,668, Dec. 4, 1987, Pat. No. 5,030,554. This application Jul. 8, 1991, Ser. No. 726,467

The portion of the term of this patent subsequent to Jul. 9, 2006, has been disclaimed.

Int. Cl.<sup>6</sup> G01N 33/48

U.S. Cl. 435—7.24

11 Claims

1. In a method for preparation of a whole blood sample for analysis by photooptical measurement techniques, wherein sample preparation includes enrichment of the non-erythrocyte cellular fraction of said sample and the labelling of one or more sub-populations of said fraction, the immunochemical interaction of the cells of said fraction with an indicator labelled binding material which is specific for a characteristic cellular component of the sub-population of the fraction, wherein the improvement comprises the steps of:

- (a) providing a reaction vessel of the type which is utilized as a sample container for photooptical instrumentation designed for quantitation and/or differentiation of particulate analytes from other particulates which are endogenous to the sample;  
(b) preparing the sample for analysis in said reaction vessel by subjecting the sample to selective stromatolysis conditions so as to enable effective differentiation of the non-erythrocyte fraction of said sample from the erythrocyte fraction;  
(c) transferring an aliquot of selectively stromatolysed sample to a photooptical analyzer without separation of labelled sub-populations of the non-erythrocyte cellular fraction from unconsumed lysis reagent or unbound indicator labelled binding material; and  
(d) subjecting said aliquot to photooptical analysis.



5,437,986

**EXTRACTION OF HETEROLOGOUS INSOLUBLE PROTEINS FROM BACTERIA**

Yair Alroy, Parsippany; Jingdong Zhu, Westfield, and Russell Condon, New Brunswick, all of N.J., assigns to Schering Corporation, Kenilworth, N.J.

Filed Jun. 22, 1994, Ser. No. 263,961  
Int. Cl.<sup>6</sup> C12P 21/00; C12N 15/00

U.S. Cl. 435—71.2

5 Claims

1. A method of extracting a heterologous protein from bacteria expressing said heterologous protein comprising the following steps:

- fermenting the bacteria in a fermentation broth;
- disrupting the bacteria contained in the fermentation broth;
- cooling or maintaining the fermentation broth at a temperature of between about 0°–15° C.;
- adding an acid to the fermentation broth such that the fermentation broth obtains a pH of about 2.0;
- incubating the acidified fermentation broth at a temperature of between 0°–15° C. so as to kill any remaining undisturbed bacteria;
- centrifuging the fermentation broth so as to obtain an inclusion body pellet and a supernatant liquid;
- removing the supernatant liquid from the inclusion body pellet;
- suspending the inclusion body pellet in a buffer so as to obtain a suspension;
- adding a pH adjusting solution to the suspension so that the suspension obtains a pH of between 6–9;
- disrupting suspended solids contained within the suspension of step (i);
- centrifuging the suspension so as to produce an inclusion body pellet containing the heterologous protein and a supernatant liquid; and
- removing the supernatant liquid so as to obtain isolated inclusion bodies containing heterologous protein.

5,437,987

**TRIPLE GRADIENT PROCESS WITH ANTIBODY PANNING TO RECOVER NUCLEATED FETAL CELLS FROM MATERNAL BLOOD**

Nelson N. H. Teng, Millsborough; Marcia Bieber, Los Altos Hills, and Neelima M. Bhat, Cupertino, all of Calif., assigns to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 951,628, Sep. 25, 1992, Pat. No. 5,275,933. This application Jun. 14, 1993, Ser. No. 77,295  
Int. Cl.<sup>6</sup> G01N 33/53

U.S. Cl. 435—7.25

9 Claims

1. A method for separating nucleated fetal red blood cells from maternal blood, comprising

- applying the maternal blood to a discontinuous gradient gel having at least first, second and third layers, the first and second layers forming a first interface therebetween, and the second and third layers forming a second interface therebetween, the first layer having a density in the range of from about 1.115 to about 1.125 g/ml, the second layer having a density in the range of from about 1.105 to about 1.110 g/ml, and the third layer having a density in the range of from about 1.075 to about 1.085 g/ml;
- exposing the gel to a separating force field for a time sufficient to cause movement of the nucleated fetal red blood cells to the second interface;
- removing the nucleated fetal red blood cells from at least the second interface;
- contacting the removed nucleated fetal red blood cells with a solid support having bound thereto anti-i antibodies which specifically bind the epitope

Galβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ1-3Galβ1-4Glc

on the nucleated fetal red blood cells, wherein at least a

portion of the removed nucleated fetal red blood cells are bound to the solid support through an antigen-antibody complex, thereby separating the nucleated fetal red blood cells from the maternal blood.

8. A method for separating nucleated fetal red blood cells from maternal blood, and testing the separated nucleated fetal red blood cells, comprising

- applying the maternal blood to a discontinuous gradient gel having at least first, second and third layers, the first and second layers forming a first interface therebetween, and the second and third layers forming a second interface therebetween, the first layer having a density in the range of from about 1.115 to about 1.125 g/ml, the second layer having a density in the range of from about 1.105 to about 1.110 g/ml, and the third layer having a density in the range of from about 1.075 to about 1.085 g/ml;
- exposing the gel to a separating force field for a time sufficient to cause movement of the nucleated fetal red blood cells to the second interface;
- removing the nucleated fetal red blood cells from at least the second interface;
- contacting the removed nucleated fetal red blood cells with a solid support having bound thereto anti-i antibodies which specifically bind the epitope

Galβ1-4GlcNAcβ1-3Galβ1-4GlcNAcβ1-3Galβ1-4Glc

on the nucleated fetal red blood cells, wherein at least a portion of the removed nucleated fetal red blood cells are bound to the solid support through an antigen-antibody complex;

- warming the nucleated fetal red blood cells bound to the solid support to release the nucleated fetal red blood cells from the solid support and then probing the nucleated fetal red blood cells for a genetic defect or sex characteristic.

5,437,988

**EXPRESSION AND SECRETION OF MATURE HUMAN BETA INTERLEUKIN-1 IN *BACILLUS SUBTILIS* AND MEANS AND METHODS FOR ITS ACHIEVEMENT**

Ada V. Bellini, Pavia; Giuliano Galli; Giuseppe Lucchese, both of Rome, and Guido Grandi, Milan, all of Italy, assigns to Eniricerche S.p.A., Milan, Italy

Continuation of Ser. No. 554,755, Jul. 19, 1990, abandoned. This application Jun. 7, 1993, Ser. No. 72,692

Claims priority, application Italy, Jul. 19, 1989, 21228/89  
Int. Cl.<sup>6</sup> C07K 14/545; C12N 1/21, 15/25, 15/75

U.S. Cl. 435—69.52

6 Claims

1. A plasmid vector for the expression in *Bacillus subtilis* of a DNA molecule coding for a heterologous protein, said plasmid vector sequentially comprising the following elements operably linked:

- a Cat gene coding for chloramphenicol resistance;
- a DNA molecule consisting of the promoter and ribosome binding site region of the *Bacillus subtilis* neutral protease gene; and
- a DNA molecule coding for mature human interleukin-1 beta fused to a *Bacillus subtilis* subtilisin signal sequence.

5,437,989

**ALCOHOL/ALDEHYDE DEHYDROGENASE FROM *GLUCONOBACTER OXYDANS* DSM 4025 FERM BP-3812**

Akira Asakura, and Tatsuo Hoshino, both of Kanagawa, Japan, assigns to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 3, 1993, Ser. No. 162,736

Claims priority, application European Pat. Off., Dec. 30, 1992, 92811029

Int. Cl.<sup>6</sup> C12N 9/04, 1/12; C12P 7/40

U.S. Cl. 435—190

1 Claim

1. A homogenous alcohol/aldehyde dehydrogenase isolated from *Gluconobacter oxydans* DSM 4025 FERM BP-3812,

which dehydrogenase is capable, in the presence of an electron acceptor, of catalyzing the conversion of L-sorbose to 2-keto-L-gulonic acid via L-sorbose, wherein said dehydrogenase has a molecular weight from 130,000 daltons to 140,000 daltons as determined by gel filtration column chromatography, and is composed of an alpha subunit having a molecular weight from 62,500 daltons to 66,500 daltons, a beta subunit having a molecular weight from 60,500 daltons to 64,500 daltons, and a pyrroloquinoline quinone prosthetic group, wherein the optimum pH for dehydrogenase activity is from 7.0 to 9.0, the optimum temperature for dehydrogenase activity is from about 20° C. to about 40° C., and wherein said dehydrogenase has an isoelectric point of about 4.4.

5,437,990

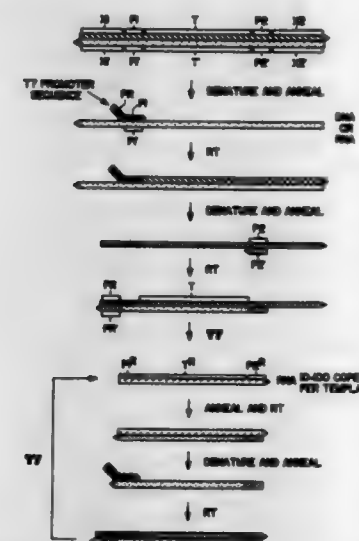
**SELECTIVE AMPLIFICATION OF TARGET POLYNUCLEOTIDE SEQUENCES**

James L. Burg, Foster City; Philippe J. Pouletty, Menlo Park, and John C. Boothroyd, Palo Alto, all of Calif., assigns to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 623,255, Dec. 5, 1990, abandoned, which is a continuation of Ser. No. 80,479, Jul. 31, 1987, abandoned. This application Sep. 13, 1993, Ser. No. 121,034  
Int. Cl.<sup>6</sup> C12P 19/34; C07H 21/02, 21/04

U.S. Cl. 435—91.2

10 Claims



1. A method for increasing the number of copies of a target sequence, or the complement of said target sequence, in a polynucleotide sequence having a 3' region and a 5' region, and said target sequence therebetween, comprising the steps of:

- preparing a first double-stranded DNA comprising a first promoter sequence upstream from said target sequence by:
  - contacting said polynucleotide sequence with a first primer able to bind to a region upstream of said target sequence,
  - extending said first primer with a DNA polymerase to form a primer extension product of said first primer having a sequence complementary to said target sequence,
  - making said primer extension product of said first primer available for hybridization with a second primer,
  - hybridizing said primer extension product of said first primer with a second primer able to bind to said primer extension product of said first primer at a region upstream of the sequence complementary to said target sequence, wherein one of said first and second primers comprises a 5' promoter sequence;
  - extending said second primer, and if necessary said primer extension product of said first primer, with a

DNA polymerase to prepare said first double-stranded DNA comprising a first promoter,

- transcribing multiple RNA copies from said first double-stranded DNA using a DNA-dependent RNA polymerase able to bind said promoter,
- preparing a collection of second double-stranded DNA sequences comprising a second promoter by:
  - contacting said multiple RNA copies transcribed from said first double-stranded DNA with a third primer comprising a sequence able to bind to a region upstream of said target sequence, or the complement of said target sequence,
  - extending said third primer with an RNA dependent DNA polymerase to form a complementary DNA sequence comprising a primer extension product of said third primer comprising said target sequence or the complement of said target sequence,
  - making the primer extension product of said third primer available for hybridization with a fourth primer,
  - hybridizing said primer extension product of said third primer with a fourth primer able to bind to said primer extension product of said third primer at a region upstream of said target sequence, or the complement of said target sequence, wherein at least one of said third and fourth primers comprises a 5' promoter sequence, and wherein said third and fourth primers may be the same or different from said first and second primers, and
  - extending said fourth primer, and if necessary said primer extension product of said third primer, with a DNA polymerase to prepare said collection of second double-stranded DNA comprising a second promoter,
- transcribing multiple RNA copies of said second double-stranded DNA using a DNA-dependent RNA polymerase able to bind said second promoter;
- preparing a second collection of third double-stranded DNA comprising a third promoter by:
  - contacting said multiple RNA copies transcribed from said second double-stranded DNA with a fifth primer comprising a sequence able to bind to a region upstream of said target sequence, or the complement of said target sequence,
  - extending said fifth primer with an RNA-dependent DNA polymerase to form a complementary DNA sequence comprising a primer extension product of said fifth primer comprising said target sequence, or the complement of said target sequence,
  - making the primer extension product of said fifth primer available for hybridization with a sixth primer,
  - hybridizing said primer extension product of said fifth primer with a sixth primer able to bind to said primer extension product of said fifth primer at a region upstream of said target sequence, or the complement of said target sequence, wherein at least one of said fifth and sixth primers comprises a 5' promoter sequence, and wherein said fifth and sixth primers can be the same as or different from said first, second, third, and fourth primers, and
  - extending said sixth primer, and if necessary said primer extension product of said fifth primer, with a DNA polymerase to prepare said collection of third double-stranded DNA sequence comprising a third promoter.

5,437,991

**PROCESS FOR THE SYNTHESIS NATURAL AROMATICS**

Jeanine R. Kittleson, Villa Park, and David P. Pantaleone, Buffalo Grove, both of Ill., assigns to The NutraSweet Company, Deerfield, Ill.

Filed May 2, 1994, Ser. No. 236,612

Int. Cl.<sup>6</sup> C12P 13/00, 7/62

U.S. Cl. 435—128

13 Claims

1. A method for the preparation of natural aromatic ester



flavor compounds selected from the group consisting of methyl anthranilate, ethyl anthranilate, butyl anthranilate, methyl cinnamate and methyl salicylate from their corresponding acids comprising mixing said acid with a C<sub>1</sub>-C<sub>4</sub> alcohol in an aqueous or biphasic reaction medium and catalyzing an esterification reaction with a lipase derived from the microorganism *Candida cylindracea*.

5,437,992

**FIVE THERMOSTABLE XYLANASES FROM MICROTETRASTORA FLEXUOSA FOR USE IN DELIGNIFICATION AND/OR BLEACHING OF PULP**  
Elizabeth A. Bodie, Belmont; William A. Cuevas, San Francisco, both of Calif., and Marja Koljonen, Kaunainen, Finland, assignors to Genencor International, Inc., Rochester, N.Y.

Filed Apr. 28, 1994, Ser. No. 234,338

Int. Cl.<sup>6</sup> C12N 9/24, 1/12; D21C 3/00; C07G 17/00

U.S. Cl. 435—200

11 Claims

1. A xylanase isolated from *Microtetraspora flexuosa* having a molecular weight of about 33,100 daltons, pI of about 8.5, an optimum pH of about 7.0 to about 7.5 and an optimum temperature activity of about 70° C.

5,437,993

**PREPARATION OF CROSS-LINKED GLUCOSE ISOMERASE CRYSTALS**

Kalevi Visuri, Kantvik, Finland, assignor to Strabra AG, Switzerland

Continuation of Ser. No. 974,371, Nov. 10, 1992, abandoned, which is a division of Ser. No. 350,720, May 11, 1989, abandoned. This application Nov. 8, 1993, Ser. No. 149,158

Claims priority, application Finland, May 13, 1988, 882249

Int. Cl.<sup>6</sup> C12N 9/92, 11/00; C12P 19/24

U.S. Cl. 435—234

4 Claims

1. A process for the preparation of a cross-linked crystalline glucose isomerase, the cross-linked crystalline glucose isomerase characterized by maintaining high enzymatic activity and being insoluble in water, salt solutions or sugar solutions, the process comprising:

- adding to a crystalline glucose isomerase suspension a compound containing at least one amino group, said compound selected from the group consisting of an ammonium salt, lysine and tryptophan, said compound being added at a concentration of between about 1% and about 15% and at a pH of about 7.0 to about 8.4;
- adding glutaraldehyde to initiate a cross-linking reaction;
- continuing the cross-linking reaction until cross-linking occurs; and
- separating and washing the cross-linked product of step c) with water or a suitable salt solution.

5,437,994

**METHOD FOR THE EX VIVO REPLICATION OF STEM CELLS, FOR THE OPTIMIZATION OF HEMATOPOIETIC PROGENITOR CELL CULTURES, AND FOR INCREASING THE METABOLISM, GM-CSF SECRETION AND/OR IL-6 SECRETION OF HUMAN STROMAL CELLS**

Stephen G. Emerson; Michael F. Clarke, and Bernhard O. Palmson, all of Ann Arbor, Mich., assignors to Regents of The University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 737,024, Jul. 29, 1991, abandoned, which is a continuation-in-part of Ser. No. 628,343, Dec. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 366,639, Jun. 15, 1989, abandoned. This application Dec. 10, 1993, Ser. No. 164,779

The portion of the term of this patent subsequent to Mar. 21, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> C12N 5/00

U.S. Cl. 435—240.2

53 Claims

1. A method for obtaining ex vivo human stem cell division comprising culturing a human hematopoietic stem cell composition in a liquid culture medium which is replaced at a rate of

from 50 to 100% daily replacement, while maintaining said culture under physiologically acceptable conditions.

5,437,995

**MONOCLONAL ANTIBODY AGAINST AN ACIDIC FGF PROTEIN AND HYBRIDOMA FOR ITS PRODUCTION**  
Yuzo Ichimori, Osaka; Koichi Kondo; Koichi Igarashi, both of Kyoto, and Masaharu Senda, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 588,343, Sep. 26, 1990, abandoned. This application Mar. 4, 1993, Ser. No. 26,257

Claims priority, application Japan, Sep. 26, 1989, 1-251177; Dec. 20, 1989, 1-331600

Int. Cl.<sup>6</sup> C12N 5/12; C07K 16/22

U.S. Cl. 435—240.27

2 Claims

1. A monoclonal antibody which recognizes a human acidic fibroblast growth factor (aFGF) protein and has the following characteristics:

- molecular weight; about 140000 to about 160000,
- non-cross reactive with basic fibroblast growth factor,
- belonging to the immunoglobulin class IgG; and
- the binding affinity of said antibody is not significantly inhibited by heparin wherein said antibody is selected from the group consisting of AF1-52, AF1-81, AF1-114 and HaF 1C10.

5,437,996

**MICROTETRASTORA STRAIN FOR PREPARATION OF INDOLOPYRROLOCARBAZOLE DERIVATIVES**

Katsuhisa Kojiri; Hajime Suzuki; Hisao Kondo, and Hiroyuki Suda, all of Tsukuba, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 68,097, May 28, 1993, which is a continuation-in-part of Ser. No. 981,070, Nov. 24, 1992. This application Dec. 14, 1993, Ser. No. 166,364

Claims priority, application Japan, Dec. 14, 1992, 4-353623; Feb. 18, 1993, 5-053035

Int. Cl.<sup>6</sup> C12N 1/20

U.S. Cl. 435—252.1

1 Claim

1. A biologically pure culture of *Microtetraspora sp.* A34549 (FERM BP-4206).

5,437,997

**CAROTENOID PRODUCING CULTURE USING NESPOGIOCOCUM EXCENTRICUM**

Hans H. Liao, Madison, Wis.; Richard D. Medwid, Fort Collins, Colo.; Donald L. Heefner, Longmont, Colo.; Kathleen S. Sniff, Arvada, Colo.; Randal A. Hassler, Lafayette, Colo., and Michael J. Yarus, Boulder, Colo., assignors to Universal Foods Corporation, Milwaukee, Wis.

Continuation of Ser. No. 58,512, Jun. 5, 1987, abandoned. This application Feb. 5, 1990, Ser. No. 474,248

Int. Cl.<sup>6</sup> C12N 1/12, 1/00; A01H 13/00

U.S. Cl. 435—257.1

4 Claims

1. An alga having the identifying characteristics of *Nesopogonococcus excentricum* ATCC Accession No. 40335 and mutants thereof having said identifying characteristics, wherein said identifying characteristics comprise having a dry weight xanthophyll content of at least about 0.65% and being capable of growing to a cell density of greater than about 40 g/l.

5,437,998

**GAS PERMEABLE BIOREACTOR AND METHOD OF USE**

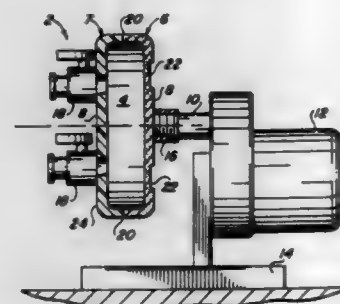
Ray P. Schwarz, Friendswood, and Frederick A. Archibald, III, Clear Lake Shores, both of Tex., assignors to Synthecon, Inc., Houston, Tex.

Filed Sep. 9, 1993, Ser. No. 118,512

Int. Cl.<sup>6</sup> C12M 1/04, 1/10, 3/02

U.S. Cl. 435—286

9 Claims



1. A gas permeable bioreactor comprising: a tubular vessel with outer walls constructed at least partially of a gas permeable material, said tubular vessel having closed ends and a substantially horizontal longitudinal central axis; means for rotating tubular about said substantially horizontal longitudinal central axis; and one or more vessel access ports for transferring materials into and out the tubular vessel; wherein the tubular vessel is constructed with a first half comprised of gas permeable material and a second half comprised of a non-gas permeable material.

5,437,999

**ELECTROCHEMICAL SENSOR**

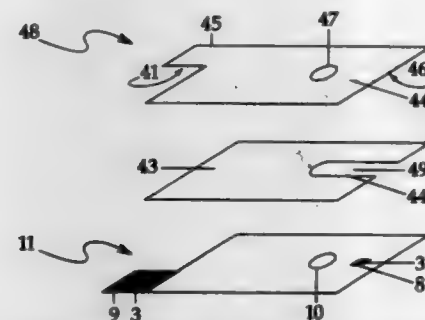
Eric R. Diebold, Fishers; Richard J. Kordal, Zionsville; Nigel A. Surridge, Indianapolis, and Christopher D. Wilsey, Carmel, all of Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Feb. 22, 1994, Ser. No. 200,174

Int. Cl.<sup>6</sup> C12M 1/40, 1/34

U.S. Cl. 435—288

22 Claims



1. An electrochemical sensor useful for measuring the concentration of an analyte in a fluid sample, comprising: (a) opposing working and counter electrode elements, spatially displaced by a spacer having a first cutout portion forming a capillary space between the working and counter electrode elements and a second cutout portion allowing electrical connection between the counter electrode element and a meter and power source, wherein the capillary space is vented by a port in the working or counter electrode elements, the working electrode element including 1) a first insulating substrate,

- 2) an electrically conducting material affixed to the first insulating substrate, and
- 3) a second insulating substrate affixed to the electrically conducting material and the spacer, the second insulating substrate having a first cutout portion for exposing a portion of the electrically conducting material to the capillary space and a second cutout portion which allows contact between the electrically conducting material and the meter and power source, the counter electrode element including 1) an insulating substrate, and 2) an electrically conducting material affixed to the insulating substrate and the spacer; and (b) a reagent disposed in the capillary space, the reagent being specifically reactive with the analyte in the fluid sample to produce an electrochemically-measurable signal which can be correlated to the concentration of the analyte in the fluid sample.

5,438,000

**SERUM SEPARATION SEALANT**

Ronald Legario, Suita; Toshio Nakamura, Yokohama, and Toshiko Shibata, Ichikawa, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Nov. 12, 1993, Ser. No. 151,199

Claims priority, application Japan, Nov. 12, 1992, 4-302405; Nov. 5, 1993, 5-276288

Int. Cl.<sup>6</sup> B01D 21/26

U.S. Cl. 436—17

12 Claims

1. A serum separation sealant having a specific gravity at 20° C. of 1.035 to 1.065, a viscosity of 100 to 400 Pa.S at 20° C. and a yield stress of 100 to 400 dyne/cm<sup>2</sup> at 20° C. and comprising: (A) 100 parts by weight of a polymer having a specific gravity at 20° C. of 0.94 to 1.06 and a viscosity of 10 to 140 Pa.S, derived from an alkyl acrylate or alkyl methacrylate monomer having the formula (I):



- wherein R<sup>1</sup> denotes H or CH<sub>3</sub>, R<sup>2</sup> denotes an alkyl group having 1 to 18 carbon atoms;
- 0.5 to 10 parts by weight of at least one component selected from the group consisting of silica and bentonite; and
  - 0.01 to 2 parts by weight of at least one surfactant selected from the group consisting of: (C-1) fluorocarbon-based surfactants; and (C-2) polyester modified alkylpolysiloxane based surfactants.

5,438,001

**METHOD AND DEVICE FOR MEASURING VARIATION IN DECOMPOSITION RATE OF SPECIAL MATERIAL GAS**

Tadahiro Ohmi, 1-17-301, Ko-megabukuro 2-chome, Aoba-ku Miyagi-ken Sendai-shi, Japan

PCT No. PCT/JP92/00606, § 371 Date Jan. 31, 1994, § 102(e) Date Jan. 31, 1994, PCT Pub. No. WO92/21967, PCT Pub. Date Oct. 12, 1992

PCT Filed May 13, 1992, Ser. No. 150,128

Claims priority, application Japan, May 31, 1991, 3-157653

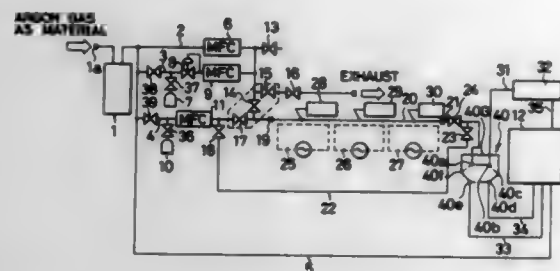
Int. Cl.<sup>6</sup> G01N 30/06

U.S. Cl. 436—34

5 Claims

1. A method for measuring variation in a decomposition rate of a material gas which decomposes during manufacture of semiconductors, which comprises: a first step, in which an inert gas of ultrahigh purity is caused to flow in a reaction pipe, an inner surface of which has been subjected to electrolytic polishing so as to be stable with respect to at least said material gas; a second step, in which an interior of said reaction pipe is

baked so as to achieve a specified purity level; a third step, wherein said interior of said reaction pipe is placed in an atmosphere having a specified temperature; a fourth step, in which a material gas having a specified purity is supplied at a speci-



fied flow rate into said reaction pipe; and a fifth step, in which a decomposition rate of said material gas within said reaction pipe is measured under varying flow rate, purity, and reaction pipe atmospheric temperature conditions.

5,438,002

# COLORIMETRIC PROCESSES FOR THE DETERMINATION AND CONTROL OF THE PERACID CONTENT IN A SOLUTION, IN THE PRESENCE OF HYDROGEN PEROXIDE

Jean Mallard de la Varenne, Boulogne, and Pascal Crisinel, Versailles, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

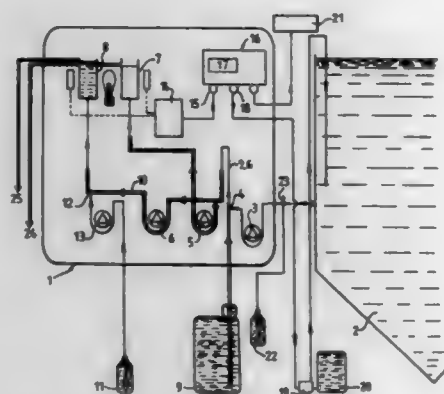
PCT No. PCT/FR91/00203, § 371 Date Oct. 1, 1991, § 102(e) Date Oct. 1, 1991, PCT Pub. No. WO91/14172, PCT Pub. Date Sep. 19, 1991

PCT Filed Mar. 13, 1991, Ser. No. 768,279

Claims priority, application France, Mar. 16, 1990, 90 03374 Int. Cl.<sup>6</sup> G01N 35/08

U.S. Cl. 436—55

16 Claims



1. Colorimetric process for adjustment of a content of peracid in the presence of hydrogen peroxide in an at least partially aqueous solution, in which a molar ratio between concentration of hydrogen peroxide and concentration of peracid does not exceed about 100, comprising the steps of:

drawing the solution to be adjusted by a first suction means into suction circuits of a second and a third suction means, the second and third suction means operating at equivalent flow rates and which simultaneously draw at least one of a dilution and pH control liquid;

feeding at least a solution to be adjusted to a reference vat of a two-beam photometer using the second suction means; feeding at least a solution to be adjusted to a measuring vat of said photometer using the third suction means;

adjusting the flow rates of the three suction means so that a concentration of peracid in the measuring flow drawn by

said second and third suction means is lower than about 100 ppm by weight; adding an excess of iodide to a measuring flow which exists from the third suction means, by using a fourth suction means; comparing intensity of an iodine color formed in the measuring vat to a reference in the reference vat, the measuring vat and reference vat being connected to a measuring unit; and transferring a difference of intensity between the iodine color in the measurement vat and the reference in the reference vat to a regulator, said regulator operating a pump for injection of a solution of peracid into the solution to be adjusted.

5,438,003

# REAGENT COMPOSITIONS FOR USE IN THE IDENTIFICATION AND CHARACTERIZATION OF RETICULOCYTES IN WHOLE BLOOD

Gregory M. Colella, Bloomfield, N.J.; Daniel Ben-David, Shrub Oak, N.Y.; Albert Cupo, Scarsdale, N.Y.; Sophie S. Fan, Millwood, N.Y.; Gena Fischer, Harrington Park, N.J.; Grace E. Martin, Mount Kisco, N.Y., and Leonard Ornstein, White Plains, N.Y., assignors to Miles Inc., Tarrytown and Mount Sinai School of Medicine of the City University of New York, New York, both of N.Y.

Division of Ser. No. 802,593, Dec. 5, 1991, Pat. No. 5,350,695.

This application Oct. 15, 1992, Ser. No. 961,591

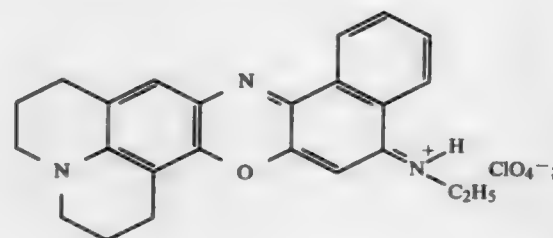
The portion of the term of this patent subsequent to May 2, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> G01N 33/48

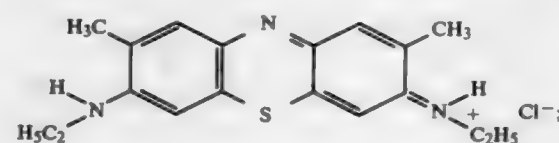
U.S. Cl. 436—63

20 Claims

1. A reagent composition for the identification of subclasses of cells of interest in a whole blood sample by flow cytometry, which comprises an effective amount of a dye compound for staining the ribonucleic acid of said cells, wherein the dye compound is Oxazine 750 having the formula:



or the dye compound is New Methylene Blue having the formula:



a zwitterionic surfactant which effects isovolumetric sphering of said cells and which does not precipitate said dye compound; and a buffer solution for maintaining the pH of the composition at about 6 to about 9.

5,438,004

Patent Not Issued For This Number

5,438,005

# DEEP COLLECTION GUARD RING

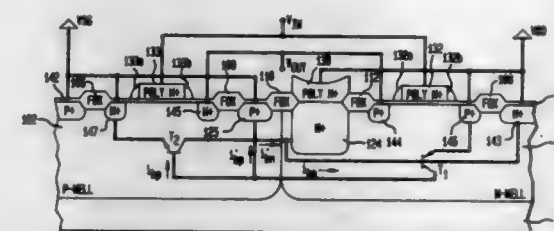
Wen-Yueh Jang, Hsin Chu, Taiwan, assignor to Winbond Electronics Corp., Hsinchu, Taiwan

Filed Apr. 13, 1994, Ser. No. 227,356

Int. Cl.<sup>6</sup> H01L 21/8238

U.S. Cl. 437—34

7 Claims



1. A CMOS manufacturing process comprising the steps of: forming an N-well and a P-well in a substrate, forming a polysilicon layer having at least a portion which is heavily doped with a first conductivity type in a vicinity of at least a portion of a surface of one of said wells, forming a guard ring by deep diffusing impurities from said polysilicon layer portion into said surface of said one well, and after said step of forming a guard ring, forming P+source and drain regions in said N-well and N+source and drain regions in said P-well, said drains in said N-well and said P-well being separated from each other by said guard ring, wherein said guard ring has a depth greater than said source and drain regions.

5,438,006

# METHOD OF FABRICATING GATE STACK HAVING A REDUCED HEIGHT

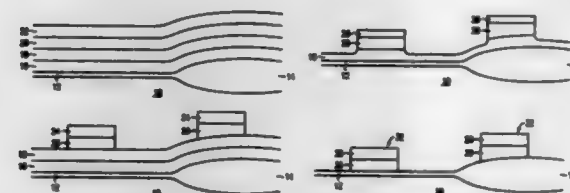
Chong-Ping Chang, Union County, N.J.; Kuo-Hua Lee; Chun-Ting Liu, both of Westborough, Pa., and Ruichen Liu, Warren, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jan. 3, 1994, Ser. No. 176,600

Int. Cl.<sup>6</sup> H01L 21/8232

U.S. Cl. 437—40

5 Claims



1. A process of fabricating a gate stack in an integrated circuit including the steps of:

- forming a polysilicon layer on a substrate,
- forming a refractory metal layer over said polysilicon layer,
- forming an oxide layer over said metal layer,
- forming a photo-resist layer over said oxide layer,
- patterning said photoresist layer and said underlying oxide layer,
- removing said patterned photoresist,
- using said remaining patterned oxide layer as a hard mask, etching away the exposed portion of said metal layer,
- removing said oxide hard mask, and
- using said patterned metal layer as a mask, etching away the exposed polysilicon layer.

5,438,007

# METHOD OF FABRICATING FIELD EFFECT TRANSISTOR HAVING POLYCRYSTALLINE SILICON GATE JUNCTION

Albert W. Vinal, Cary, and Michael W. Dennen, Raleigh, both of N.C., assignors to Thunderbird Technologies, Inc., Research Triangle Park, N.C.

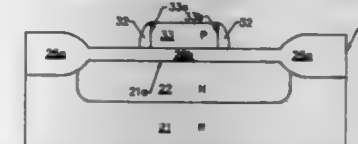
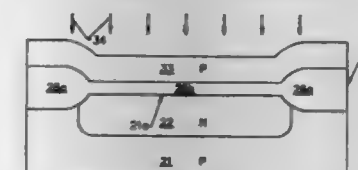
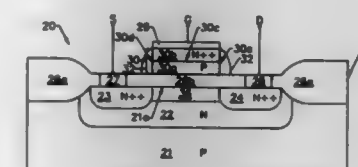
Division of Ser. No. 87,509, Jul. 2, 1993, Pat. No. 5,371,396.

This application Sep. 28, 1993, Ser. No. 127,767

Int. Cl.<sup>6</sup> H01L 21/265, 21/44, 21/48

U.S. Cl. 437—41

7 Claims



1. A method of forming a field effect transistor comprising the steps of:

- providing a semiconductor substrate having an insulating layer on a face thereof;
- forming a single polycrystalline silicon layer of first conductivity type on said insulating layer, said single polycrystalline silicon layer including a pair of opposing ends;
- simultaneously doping a portion of said single polycrystalline silicon layer, and portions of said semiconductor substrate adjacent said pair of opposing ends, with dopant ions of a second conductivity type, to simultaneously form a semiconductor junction in said single polycrystalline silicon layer extending parallel to said substrate face, and spaced apart source and drain regions in said substrate at said opposing ends of said single polycrystalline silicon layer.

5,438,008

# METHOD OF MAKING A SEMICONDUCTOR DEVICE HAVING TWO TRANSISTORS FORMING A MEMORY CELL AND A PERIPHERAL CIRCUIT, WHEREIN THE IMPURITY REGION OF THE FIRST TRANSISTOR IS NOT SUBJECTED TO AN ETCHING ATMOSPHERE

Taiji Ema, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 956,479, Oct. 2, 1992, Pat. No. 5,286,998,

which is a continuation of Ser. No. 528,392, May 25, 1990,

abandoned. This application Nov. 9, 1993, Ser. No. 149,345

Claims priority, application Japan, May 31, 1989, 1-137861

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—41

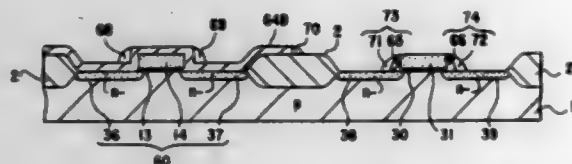
9 Claims

1. A method of producing a semiconductor device comprising the steps of:

- forming a first gate of a first transistor and a second gate of a second transistor on a semiconductor substrate which has a field oxide layer for isolating said first and second transistors;
- forming impurity diffusion regions in said semiconductor substrate to make a first source diffusion region and a first



drain diffusion region of said first transistor and a second source diffusion region and a second drain diffusion region of said second transistor;  
forming a first insulator layer which covers a surface of said semiconductor substrate including a surface of a region formed by said first transistor but excluding a surface of a region formed by said second transistor; and  
forming a second insulator layer which covers said first



insulator layer and the surface of said second transistor; and  
forming a side wall insulation layer at a side wall portion of said first insulator layer and a side wall portion of said second gate electrode of said second transistor by carrying out an anisotropic etching with respect to said second insulator layer; and wherein said side wall portion of said second insulator layer remains up to a final stage of the process of producing the semiconductor device.

5,438,009

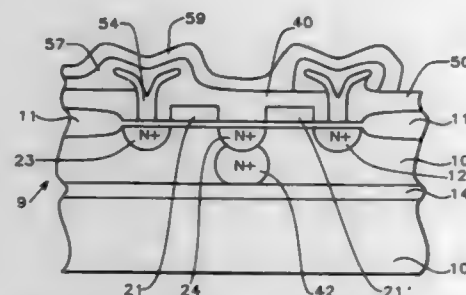
# METHOD OF FABRICATION OF MOSFET DEVICE WITH BURIED BIT LINE

Ming-Tzong Yang, and Gary Hong, both of Hsin-Chu, Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Apr. 2, 1993, Ser. No. 100,307  
Int. Cl.<sup>6</sup> H01L 27/00, 21/70

U.S. Cl. 437-52

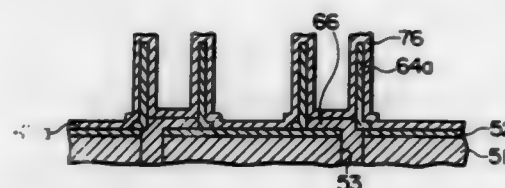
14 Claims



1. A method of fabrication of a DRAM MOSFET comprising

- forming a FOX structure on the surface of a semiconductor substrate, and applying field oxidation,
- implanting a buried bit line into said substrate,
- forming a gate oxide onto said substrate,
- applying polysilicon and etching with a mask,
- forming source/drain regions in said substrate,
- forming a doped contact PLUG beneath a first one of said source/drain regions in said substrate said PLUG providing connection between said one source/drain region and said buried bit line, and
- forming a polysilicon structure connected to a second one of said source/drain regions in said substrate, and
- forming a polysilicon/ONO/polysilicon capacitor.

5,438,010  
METHOD OF RELIABLY AND READILY MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A CYLINDRICAL ELECTRODE  
Takanori Saeki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
Filed Nov. 1, 1993, Ser. No. 143,719  
Claims priority, application Japan, Oct. 30, 1992, 4-292831  
Int. Cl.<sup>6</sup> H01L 27/00, 21/70  
U.S. Cl. 437-52 4 Claims



1. A method of manufacturing a semiconductor device having a principal surface and a cylindrical electrode on said principal surface, said cylindrical electrode having a first, a second, and a third electrode elements each of which is cylindrical around an axis perpendicular to said principal surface, said method comprising the steps of:

- forming a support member on said principal surface;
- forming a first electrode-forming film to cover said support member, said first electrode-forming film being made of one of a conductive material and a semiconductive material and having a first electrode portion surrounding said support member for forming said first electrode element;
- providing a first protective film to cover said first electrode portion;
- etching said first electrode-forming film with said support member and said first protective film preventing said first electrode portion from being etched, thereby forming said first electrode element around said support member;
- etching said support member and said first protective film while said first electrode element remains unetched;
- providing a second protective film to cover said first electrode film portion;
- forming a second electrode-forming film to cover said first electrode film portion and said second protective film, said second electrode-forming film being made of one of a conductive material and a semiconductive material and having a second and a third electrode portions for forming said second and said third electrode elements, respectively;
- providing a third protective film to cover said second and said third electrode portions, respectively; and
- etching said second electrode-forming film with said second, and said third protective films preventing said first, said second, and said third electrode portions from being etched, thereby producing said second electrode element around said first electrode element, and said third electrode element in the area previously occupied by said support member and surrounded by said first and second electrode elements.

5,438,011

# METHOD OF FORMING A CAPACITOR USING A PHOTORESIST CONTACT SIDEWALL HAVING STANDING WAVE RIPPLES

Guy T. Blalock, and Bradley J. Howard, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.  
Filed Mar. 3, 1995, Ser. No. 397,885  
Int. Cl.<sup>6</sup> H01L 21/70, 27/00

U.S. Cl. 437-52

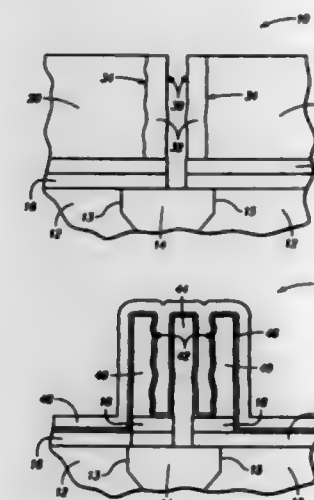
25 Claims

1. A semiconductor processing method of forming a stacked container capacitor comprising the following steps:  
providing a substrate having a node to which electrical connection to a capacitor is to be made;

providing a layer of photoresist over the substrate and node; patterning the photoresist to form a photoresist contact which overlaps within lateral confines of the node, the photoresist being patterned in a manner which produces inner photoresist contact sidewalls having standing wave ripples, the photoresist contact opening having an open width;

providing a layer of sacrificial material over the patterned photoresist and within the photoresist contact, the sacrificial layer being provided to a thickness which is less than one half the open width to less than completely fill the photoresist contact, the standing wave ripples first transferring to those regions of the sacrificial layer which overlap the photoresist contact inner sidewall standing wave ripples;

anisotropically etching the sacrificial material to produce a male molding ring having outer sidewalls possessing the first transferred standing wave ripples;



- stripping the photoresist from the substrate;
- providing a layer of electrically conductive material over and within the male molding ring, the first transferred standing wave ripples second transferring to those regions of the conductive layer which overlap the first transferred standing wave ripples;
- anisotropically etching the conductive layer to outwardly expose upper portions of the male molding ring and to produce a capacitor container ring having inner sidewalls possessing the second transferred standing wave ripples, the capacitor container ring making electrical connection with the node;
- stripping the male molding ring from the substrate;
- providing a capacitor dielectric layer over the capacitor container rippled inner sidewalls; and
- providing an outer capacitor plate over the capacitor dielectric layer.

5,438,012

# METHOD OF FABRICATING CAPACITOR ELEMENT IN SUPER-LSI

Satoshi Kamiyama, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 5, 1993, Ser. No. 102,634

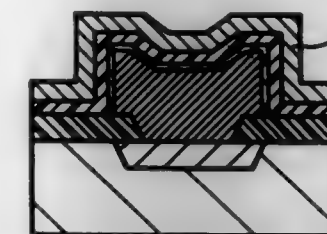
Claims priority, application Japan, Aug. 6, 1992, 4-209879  
The portion of the term of this patent subsequent to Apr. 13, 2010, has been disclaimed.  
Int. Cl.<sup>6</sup> H01L 21/70

U.S. Cl. 437-60

9 Claims

1. A method of fabricating a semiconductor device comprising the steps of:  
removing a natural oxide film on a surface of a lower electrode of polysilicon;

forming on the surface of said lower electrode a tantalum oxide film doped with impurities; and



forming on said tantalum oxide film an upper electrode with at least a bottom of said upper electrode constituted by titanium nitride.

5,438,013

# METHOD OF MAKING A SEMICONDUCTOR MEMORY DEVICE HAVING A CAPACITOR

Yun-gi Kim, Wonju, and Jeung-gil Lee, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

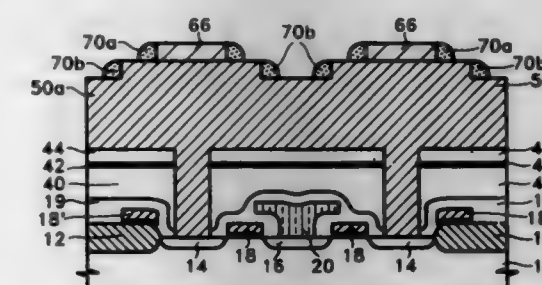
Filed Aug. 26, 1993, Ser. No. 112,090

Claims priority, application Rep. of Korea, Aug. 26, 1992, 92-15349

Int. Cl.<sup>6</sup> H01L 21/8242

U.S. Cl. 437-60

8 Claims



1. A method of manufacturing a capacitor electrode of a semiconductor device comprising the steps of:

- forming at least one first conductive layer pattern in a first conductive layer defined by at least one groove formed therearound;
- forming a first material pattern on each said at least one first conductive layer pattern which is smaller than said first conductive layer pattern;
- forming a first spacer on a sidewall of each said first material pattern and forming a second spacer on a sidewall of said at least one first conductive layer pattern such that a portion of said at least one first conductive layer pattern is left exposed therebetween;
- removing each said first material pattern; and
- partially anisotropically etching each said at least one first conductive layer pattern using said first and second spacers as etching masks to obtain at least one double-walled storage electrode of said capacitor.

5,438,014

# METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Takasuke Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 14, 1994, Ser. No. 355,906

Claims priority, application Japan, Dec. 17, 1993, 5-0318691  
Int. Cl.<sup>6</sup> H01L 21/329, 21/225

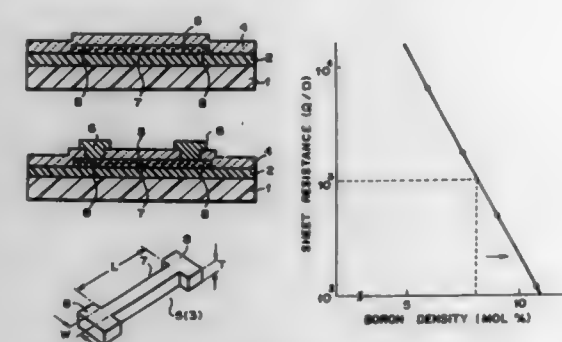
U.S. Cl. 437-60

5 Claims

1. Method of manufacturing a semiconductor device comprising steps of:

patterning a polycrystalline silicon film formed on an insulating film provided on the principal surface of a semiconductor substrate to form a polycrystalline silicon film pattern having a thickness of below 120 nm on said insulating film;

covering said polycrystalline silicon film pattern with a silicate glass film having a p-type or n-type impurity;



diffusing said impurity from said silicate glass film to said polycrystalline silicon film pattern by heat treatment to make said polycrystalline silicon film pattern contain said impurity at a density of above  $1 \times 10^{19}$  atoms/cm<sup>3</sup> to form a resistance element comprising a polycrystalline silicon film.

5,438,015

# SILICON-ON-INSULATOR TECHNIQUE WITH BURIED GAP

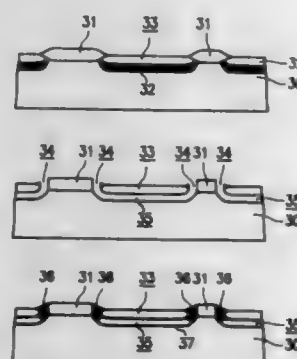
Water Lur, Taipei, Taiwan, assignor to United Microelectronics Corp., Hsinchu, Taiwan

Division of Ser. No. 241,183, May 11, 1994. This application Nov. 21, 1994, Ser. No. 342,873

Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 437-62

11 Claims



1. A method of forming an isolation structure on a silicon substrate, which comprises the following steps:

- forming at least one field oxide on the surface portion of the substrate;
- implanting nitrogen ions into the substrate using said field oxide as a mask to form and forming at least one buried silicon nitride layer in said substrate; and
- removing said buried silicon nitride layer to leave a buried gap.

5,438,016

# METHOD OF SEMICONDUCTOR DEVICE ISOLATION EMPLOYING POLYSILICON LAYER FOR FIELD OXIDE FORMATION

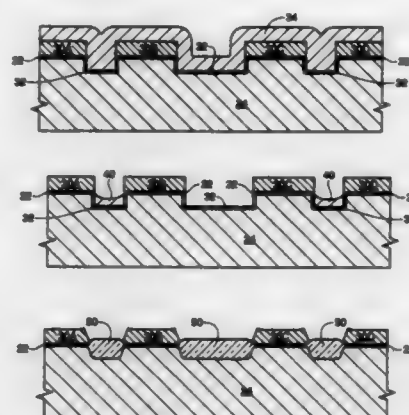
Thomas A. Figura, and Nanseng Jeng, both of Boise, Id., assignors to Micron Semiconductor, Inc., Boise, Id.

Filed Mar. 2, 1994, Ser. No. 205,663

Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 437-67

21 Claims



1. A process for forming a semiconductor device, comprising the following steps:

- forming a patterned protective layer over a semiconductor substrate, said protective layer having at least first, second, and third disconnected protective structures such that a first distance between said first and second protective structures is narrower than a second distance between said second and third protective structures;
- removing a portion of said substrate between said protective structures thereby exposing portions of said substrate;
- forming a blanket polycrystalline silicon layer over said substrate;
- isotropically etching said polycrystalline silicon layer to remove said polycrystalline silicon from between said second and third protective structures and leaving a portion of said polycrystalline silicon between said first and second protective structures;
- oxidizing said substrate between said second and third protective structures and said polycrystalline silicon layer between said first and second protective structures.

5,438,017

# ASSAYS FOR SULFHYDRYL AMINO ACIDS AND METHYLMALONIC ACID AND THEIR APPLICATION TO DIAGNOSIS OF COBALAMIN DEFICIENCY

Robert H. Allen, Englewood, and Sally P. Stabler, Denver, both of Colo., assignors to The University of Colorado Foundation, Inc., Colo.

Continuation of Ser. No. 345,885, May 1, 1989, abandoned. This application Oct. 14, 1992, Ser. No. 960,783

Int. Cl.<sup>6</sup> G01N 24/00; C12Q 1/00

U.S. Cl. 436-89

22 Claims

1. In a gas chromatography/mass spectrometry method for assaying a sample of a body fluid for the presence and concentration of one or more different endogenous sulfhydryl amino acid species comprising the steps:

- adding an internal reference standard sulfhydryl amino acid for each of said amino acid species to be assayed;
- adding reducing agent to said sample to insure randomization of said added internal reference sulfhydryl amino acids or the endogenous sulfhydryl amino acids present in said sample;
- partially purifying said sulfhydryl amino acids in said sample;

- derivatizing said reference sulfhydryl amino acids and said endogenous sulfhydryl amino acids in said sample;
- analyzing said sample in a gas chromatography/mass spectrometer to determine the presence and concentration of endogenous sulfhydryl amino acid present in said sample;

wherein the improvement comprises one or both of the steps: treating said samples, between steps b and c, with iodacetamide to insure that the sulfhydryl amino acids present do not recombine with each other and partially purifying said samples at step c in a single ion exchange chromatographic extraction.

5,438,018

# METHOD OF MAKING SEMICONDUCTOR DEVICE BY SELECTIVE EPITAXIAL GROWTH

Toshihiko Mori, and Yoshiaki Sakuma, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

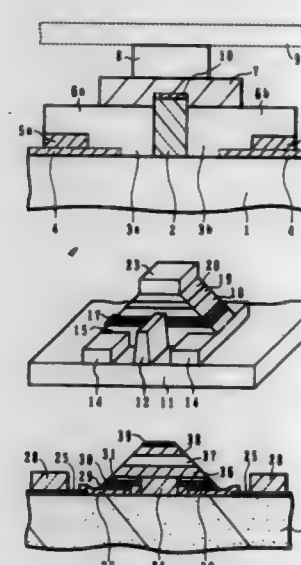
Filed Dec. 7, 1993, Ser. No. 162,703

Claims priority, application Japan, Dec. 7, 1992, 4-326944

Int. Cl.<sup>6</sup> H01L 21/20

U.S. Cl. 437-89

15 Claims



1. A method of manufacturing a semiconductor device comprising:

- a growth mask forming step for forming an opening defining member on the surface of a single crystal semiconductor substrate, said opening defining member defining a pair of openings on both sides of a first insulating region and having a pair of first conductive regions at least on partial areas on both the sides of said pair of openings;
  - a first epitaxial growth step of epitaxially growing a pair of first semiconductor single crystal structures separated from each other and electrically connected to said pair of first conductive regions, said pair of first semiconductor single crystal structures growing upward from the surface of said single crystal semiconductor substrate exposed by said pair of openings and growing laterally and outwardly at least on the surface of said opening defining member for selectively and epitaxially growing semiconductor layers;
  - a second epitaxial growth step of epitaxially growing semiconductor regions having a conductivity type on said pair of semiconductor single crystal structures, said semiconductor regions having a conductivity type being electrically connected above said first insulating region to form a second conductive region;
  - a third epitaxial growth step of epitaxially growing a second semiconductor single crystal structure on said second conductive region; and
- wherein said growth mask forming step includes a step of forming a first insulating film, a step of forming a striped mask on said first insulating film, a step of etching said first

insulating film to form an undercut of said first insulating film by using said striped mask as an etching mask, a step of depositing a conductive material to form a conductive film without removing said striped mask, and a step of removing said striped mask and a portion of said conductive film to expose the surface of said single crystal semiconductor substrate under said undercut.

5,438,019

# LARGE AREA THIN FILM GROWING METHOD

Gurtej S. Sandhu, Boise, Id., assignor to Micron Semiconductor, Inc., Boise, Id.

Filed Jul. 11, 1994, Ser. No. 273,291

Int. Cl.<sup>6</sup> H01L 21/205

U.S. Cl. 437-101

7 Claims



7. A process for forming a uniform Si thin film on a substrate in a conventional chemical vapor deposition reactor, which comprises the steps of:

- admitting a gaseous mixture comprising a diluting gas and a plurality of silicon source gases having different adsorption coefficients at a given temperature, during a first period of time;
  - allowing uniform adsorption on said substrate under a constant temperature, for a second period of time;
  - evacuating at least a portion of said silicon source gases;
  - heating said substrate, for a third period of time; and
  - repeating said admitting, allowing, and heating until a desired number of successive layers of silicon have been deposited over said substrate;
- wherein said diluting gas is chosen from the group consisting of a noble gas and hydrogen and said silicon source gases are selected from the group consisting of silane, disilane, and other polysilanes; and
- wherein: said admitting, allowing and evacuating are conducted under a pressure of less than 100 Torr, and a temperature between 0° C. and 500° C.; and said heating comprises heating said substrate to a temperature up to 1000° C. under pressure of up to 760 Torr.

5,438,020

# PROCESS FOR FLIP-CHIP BONDING A SEMICONDUCTOR CHIP USING WIRE LEADS

Alain Grancher, Vemars, and Ludovic Michel, Plaisir, both of France, assignors to Thomson-CSF, Paris, France

Filed Sep. 17, 1993, Ser. No. 121,881

Claims priority, application France, Sep. 25, 1992, 92 11447

Int. Cl.<sup>6</sup> H01L 21/283, 21/58, 21/603

U.S. Cl. 437-183

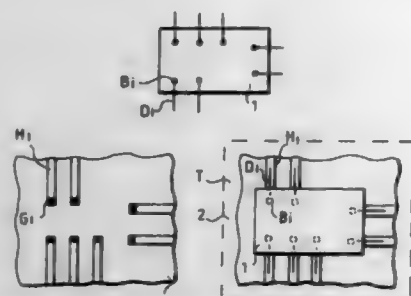
3 Claims

1. A method of flip-chip mounting a semiconductor chip having contacts on a face thereof onto a surface of a receiver substrate which faces said contacts, said method comprising the steps of:

- soldering, on each of said contacts, gold balls obtained by



- melting a gold wire, by pressing said gold balls against each of said contacts;  
 (b) positioning said semiconductor chip on an intermediate tool substrate;  
 (c) soldering a point on said gold wire at a distance from each of said gold balls to points on said tool substrate;



- (d) breaking off said gold wire beyond said points at which it is soldered to said tool substrate; and  
 (e) separating said semiconductor chip from said tool substrate by detaching the solderings carried out in step (c).

5,438,021

# METHOD OF MANUFACTURING A MULTIPLE-CHIP SEMICONDUCTOR DEVICE WITH DIFFERENT LEADFRAMES

Tomohide Tagawa; Takashi Takahashi, Kawanishi, and Takayoshi Kawasaki, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 10,849, Jan. 29, 1993, Pat. No. 5,313,095.

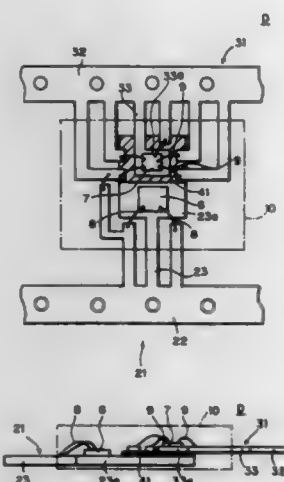
This application Mar. 21, 1994, Ser. No. 215,459

Claims priority, application Japan, Apr. 17, 1992, 4-097859

Int. Cl.<sup>6</sup> H01L 21/28

U.S. Cl. 437-207

13 Claims



1. A method of manufacturing a multiple-chip semiconductor device in which the same package envelops a semiconductor power chip and a control semiconductor chip for controlling said semiconductor power chip, comprising the steps of:

- (a) preparing a first leadframe which has a first external lead, said first external lead includes a power chip mounting area for mounting said semiconductor power chip;  
 (b) preparing a second leadframe which has a second external lead which includes a control chip mounting area for mounting said control semiconductor chip said second leadframe being thinner than said first leadframe;  
 (c) mounting said semiconductor power chip on said power chip mounting area and electrically connecting said semiconductor power chip with said first leadframe;  
 (d) mounting said semiconductor control chip on said con-

- trol chip mounting area and electrically connecting said semiconductor control chip with said second leadframe; and  
 (e) thereafter packaging said semiconductor power chip, said control semiconductor chip and said first and said second leadframes in the same package.

5,438,022

# METHOD FOR USING LOW DIELECTRIC CONSTANT MATERIAL IN INTEGRATED CIRCUIT FABRICATION

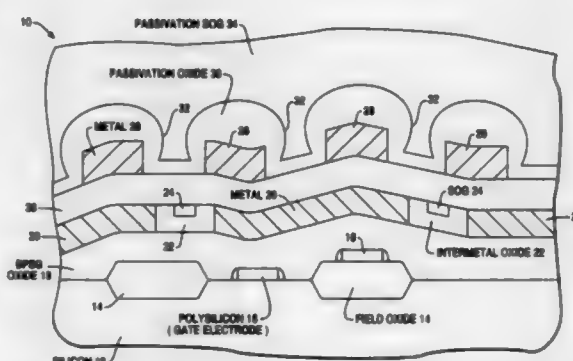
Derryl D. J. Allman; Kenneth P. Fuchs; Gayle W. Miller, and Samuel C. Gioia, all of Colorado Springs, Colo., assignors to AT&T Global Information Solutions Company, Dayton, Ohio and Hyundai Electronics America, Milpitas, Calif.

Filed Dec. 14, 1993, Ser. No. 165,872

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 437-231

4 Claims



1. A method of producing an integrated circuit device in which cross talk between metal lines is reduced, comprising the following steps:

- (a) providing a integrated circuit device having a plurality of metal interconnect lines and a passivation layer disposed thereover;  
 (b) applying a low dielectric constant material over said passivation layer, in which the low dielectric constant material comprises polyimide; and  
 (c) applying a high dielectric constant material over said low dielectric constant material.

5,438,023

# PASSIVATION METHOD AND STRUCTURE FOR A FERROELECTRIC INTEGRATED CIRCUIT USING HARD CERAMIC MATERIALS OR THE LIKE

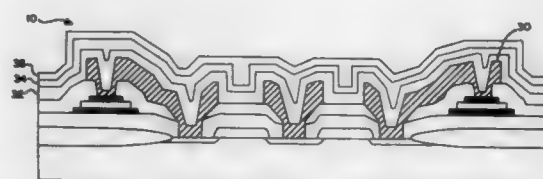
George Argos, Jr.; John D. Spano, and Steven D. Traynor, all of Colorado Springs, Colo., assignors to Ramtron International Corporation, Colorado Springs, Colo.

Filed Mar. 11, 1994, Ser. No. 212,495

Int. Cl.<sup>6</sup> H01L 21/02

U.S. Cl. 437-235

11 Claims



1. A method for passivating a surface of an integrated circuit comprising the steps of:  
 completely fabricating ferroelectric devices in the integrated circuit; and  
 depositing a passivation layer over the entire surface of the integrated circuit,

- wherein the passivation layer is comprised of a ceramic material selected from a group consisting of doped and undoped titanates, zirconates, niobates, tantalates, stannates, hafnates, and manganates, and having a Mohs hardness level of seven or greater.

5,438,024

# TRANSPARENT, FIXED TINT GLASS LENSES

James R. Bolton, LeRoy, and J. Raymond Hensler, Rochester, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 188,532, Jan. 28, 1994, Pat. No. 5,366,940. This application Aug. 2, 1994, Ser. No. 284,716

The portion of the term of this patent subsequent to Nov. 22, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C03C 3/085

U.S. Cl. 501-55

14 Claims

1. A transparent, fixed tint glass lens derived from an alkali silicate glass composition containing at least 6.3% by weight iron oxides, at least 0.03% by weight cobalt oxides and at least 0.12% by weight nickel oxides as the essential colorants in the presence of an oxidizing agent, said lens having a thickness of 1.0 mm to 1.8 mm.

5,438,025

# SILICON OXYCARBONITRIDE BY PYROLYSIS OF POLYCYCLOSILOXANES IN AMMONIA

Roger Yu-Kwan Leung, Schaumburg; Jon F. Nebo, Palatine, and Stephen T. Gonczy, Mt. Prospect, all of Ill., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 890,413, May 29, 1992, Pat. No. 5,322,825.

This application Dec. 14, 1993, Ser. No. 166,428

Int. Cl.<sup>6</sup> C04B 35/571, 35/589

U.S. Cl. 501-87

8 Claims

1. A silicon oxycarbonitride ceramic having the formula  $\text{Si}_x\text{N}_y\text{C}_z\text{O}_w$ , where x is greater than zero up to 2.0, y is 0.5 up to 3.0, and z is greater than zero and up to 1.5.

5,438,026

# MAGNESITE-CARBON REFRACTORIES AND SHAPES MADE THEREFROM WITH IMPROVED THERMAL STRESS TOLERANCE

William G. Slusser, West Mifflin, Pa., assignor to Indresco Inc., Dallas, Tex.

Filed Apr. 25, 1994, Ser. No. 232,381

Int. Cl.<sup>6</sup> C04B 35/52

U.S. Cl. 501-100

15 Claims

1. A magnesite-carbon refractory mix for forming refractory shapes comprising magnesite, graphite, and a fine particle size metallic additive consisting essentially of a magnesium-aluminum alloy co-milled with magnesite.

5,438,027

# CHROMIUM COMPOUNDS AND USES THEREOF

William K. Reagen, Stillwater, Minn., and Max P. McDaniel, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 13, 1991, Ser. No. 807,299

The portion of the term of this patent subsequent to Mar. 30, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> B01J 31/12, 31/14

U.S. Cl. 502-117

16 Claims

1. A composition comprising:  
 a) a modified inorganic oxide composition comprising an inorganic oxide selected from the group consisting of silica, silica-alumina, alumina, fluorinated alumina, silated alumina, thoria, aluminophosphate, aluminum phosphate, phosphated silica, phosphated alumina, silica-titania, co-precipitated silica/titania, fluorinated/silated alumina, and mixtures thereof; a metal alkyl selected from the group consisting of alkyl aluminum compounds, alkyl boron compounds, alkyl magnesium compounds, alkyl zinc com-

- pounds, alkyl lithium compounds, and mixtures thereof; and an unsaturated hydrocarbon;  
 b) a metal source which is a chromium compound and;  
 c) a pyrrolide compound;  
 d) wherein said metal source and said pyrrolide compound are supported on the modified inorganic oxide support.

5,438,028

# METHOD OF ENHANCING FINISHED CATALYSTS

Jeffrey G. Weissman, Wappingers Falls; Elaine C. DeCanio, Montgomery; Thomas G. C. Nelson, Beacon, and Denise C. Tebbens, Poughkeepsie, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 15, 1993, Ser. No. 136,144

Int. Cl.<sup>6</sup> B01J 21/02, 27/06, 27/138, 27/132

U.S. Cl. 502-202

6 Claims

1. A method of increasing the activity of a finished catalyst for the hydroprocessing of hydrocarbons consisting essentially of active metals from the group consisting of VIB, VIIB, and VIII deposited on a porous refractory oxide support from the group consisting of alumina, silica, zeolites, titanias, zirconias, carbon and mixtures thereof, which consists essentially of:

- a) applying to a finished catalyst a modifier selected from the group consisting of elements of boron, fluoride, tin, arsenic, antimony, bismuth, chlorine, bromide, iodide, lithium, sodium, potassium, rubidium cesium, and a boron-containing compound, dissolved in a solvent selected from the group consisting of water, hydrogen peroxide solutions and acetone, wherein the volume of said solvent corresponds to the pore volume capacity of said finished catalyst to provide a modified finished catalyst;  
 b) drying said modified, finished catalyst to remove all free solvent from said catalyst and produce a modified, dried finished catalyst;  
 c) wherein the catalyst contains from about 0.01 to about 5 wt % of the modifier;  
 d) heating said modified, dried, finished catalyst at a temperature of about 120° C. to about 1000° C. at a rate of 1°-20° C. per minute and holding said dried finished catalyst at a temperature of about 120° C. to about 1000° C. up to 48 hours to provide a finished catalyst having increased activity over the finished catalyst prior to modification; and  
 e) recovering said modified, dried finished catalyst having increased activity.

5,438,029

# ACTIVATED CARBON AND PRODUCTION THEREOF

Takeji Kobata, and Yoshihiro Ikenaga, both of Sapporo, Japan, assignors to The Social Welfare Foundation Hokkaido Rehabil, Hokkaido, Japan

Filed Feb. 17, 1994, Ser. No. 197,964

Claims priority, application Japan, Apr. 9, 1993, 5-083486;

May 17, 1993, 5-114764

Int. Cl.<sup>6</sup> B01J 20/20

U.S. Cl. 502-430

2 Claims

1. Activated carbon characterized in that particle size of activated carbon is distributed substantially in a range of 90 to 110 mesh and the CEC (cation exchange capacity) falls within 30 to 40 milligram equivalent.

2. A process of preparing activated carbon comprising steps of:  
 combusting scrap tires containing metal wire at 400° to 900° C. under the presence of oxygen, carbon dioxide and water vapor thereby generating combustible gases;  
 reheating the generated combustible gases at a temperature from 800° C. to 900° C. by combustion of additional fuel thereby generating exhaust gas;  
 causing the exhaust gas to heat-exchange with a water pipe boiler so that the temperature of the exhaust gas is reduced to 180° C. to 250° C.; and

introducing the exhaust having a temperature of 180° C. to 250° C. into an electric dust collector so as to collect activated carbon.

5,438,030

# DYE-DONOR ELEMENT COMPRISING TRICYANOVINYLANILINE DYES

Luc Vanmaele, Lochristi, and Wilhelms Janssens, Aarschot, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Oct. 20, 1993, Ser. No. 138,256

Claims priority, application European Pat. Off., Oct. 20, 1992, 92203207

Int. Cl. B41M 5/035, 5/38

U.S. Cl. 503—227

7 Claims

1. Dye-donor element for use according to thermal dye transfer methods, said element comprising a support having thereon a dye layer comprising a binder and at least one tricyanovinylaniline dye, wherein the amino group of the aniline function of said dye carries an aryl group and a hydrocarbon group linked by a secondary carbon atom to said amino group.

5,438,031

# PRINTING SHEET HAVING A DYE RECEIVING LAYER

Satoru Shinohara, Yoshinori Nakamura, and Huy Sam, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 21, 1994, Ser. No. 230,767

Claims priority, application Japan, Apr. 22, 1993, 5-119127

Int. Cl. B41M 5/035, 5/38

U.S. Cl. 503—227

4 Claims



1. A printing sheet including a substrate having a dye image-receiving layer thereon, the dye image-receiving layer consisting essentially of:

- 100 parts by weight of a thermoplastic resin selected from the group consisting of polyesters and cellulose esters;
- from about 1 to about 15 parts by weight per 100 parts by weight of component (a) of an isocyanate component comprising an aromatic isocyanate and an aliphatic isocyanate present in an equivalent ratio of from about 0.1:1 to about 5:1, respectively; and,
- from about 0.5 to about 10 parts by weight per 100 parts by weight of component (a) of a hydroxyl-terminated silicone, the hydroxyl-terminated silicone having an OH equivalent of from about 5 to about 100, said printing sheet exhibiting good sebum resistance, such that artificial sebum may be applied onto a surface of the dye-receiving layer which has been printed on with a colored ink ribbon and rubbed five times substantially without any color removal, and the said printing sheet exhibiting good writing properties, such that an oil based ink pen may be used to write on the image-receiving layer and after about 5 seconds, the writing may be rubbed with a finger substantially without any ink trail being formed.

5,438,032

# CRYSTAL MODIFICATIONS OF 2-M-TOLUIDINO-3-METHYL-6-DI-N-BUTYLAMINO-FLUORAN, PROCESS FOR PREPARING THEREOF, AND RECORDING MATERIALS CONTAINING SAID CRYSTAL MODIFICATIONS

Shigeo Fujita, Osaka; Mansuke Matsumoto, Hyogo; Yojiro Kumagai, Osaka; Sayuri Wada, Osaka, and Shuichi Hashimoto, Osaka, all of Japan, assignors to Yamamoto Chemicals, Inc., Osaka, Japan

Division of Ser. No. 922,847, Jul. 3, 1992, Pat. No. 5,342,967.

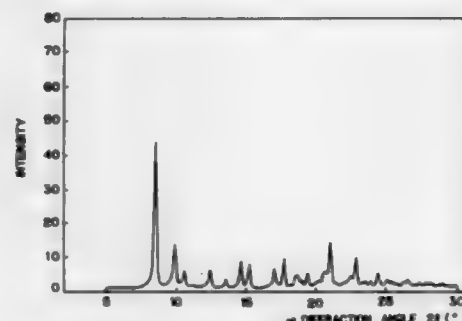
This application May 4, 1994, Ser. No. 237,899

Claims priority, application Japan, Aug. 1, 1991, 3-193246

Int. Cl. B41M 5/145, 5/30; C09D 11/00

U.S. Cl. 503—221

9 Claims



1. In a recording composition that utilizes the color forming reaction between an electron donating color former and an electron accepting color developer, the improvement wherein the electron donating color former contains an  $\alpha$ -type crystal modification of 2-m-toluidino-3-methyl-6-di-n-butylamino-fluoran that is characterized by characteristic peaks at diffraction angles  $2\theta \pm 0.2^\circ$  of  $8.4^\circ$ ,  $9.8^\circ$ ,  $17.7^\circ$ ,  $21.0^\circ$  and  $22.8^\circ$  on X-ray diffractometry using Cu-K $\alpha$  rays.

2. A pressure-sensitive recording material comprising a base and the recording composition according to claim 1.

5,438,033

# SUBSTITUTED PYRIDINE HERBICIDES

Joseph E. Drumm, Newark; Renee M. Lett, Wilmington; Dennis R. Rayner, Centerville; Morris P. Rorer, Newark, and Chi-Ping Tseng, Wilmington, all of Del., assignors to E. I. duPont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US92/04644, § 371 Date Dec. 9, 1993, § 102(e) Date Dec. 9, 1993, PCT Pub. No. WO92/22203, PCT Pub. Date Dec. 23, 1992

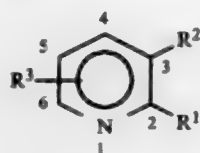
Continuation-in-part of Ser. No. 713,909, Jun. 12, 1991, abandoned. This PCT application Jun. 9, 1992, Ser. No. 150,193

Int. Cl. A01N 43/40, 43/36, 43/84

U.S. Cl. 504—130

10 Claims

1. Agriculturally suitable compositions for controlling the growth of undesired vegetation in a crop comprising an effective amount of a compound of Formula I



wherein

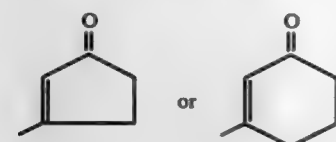
R<sup>1</sup> is Cl, Br, I, OCH<sub>3</sub>, OCHF<sub>2</sub> or OCF<sub>3</sub>;

R<sup>2</sup> is CN, CO<sub>2</sub>R<sup>4</sup>, CHO, C(X)NR<sup>17</sup>R<sup>18</sup>, C(S)OR<sup>6</sup>, C=CH, CHR<sup>19</sup>OR<sup>20</sup>, CH=NOR<sup>7</sup> or CH=CR<sup>21</sup>R<sup>22</sup>;

R<sup>3</sup> is n-propyl; C<sub>4</sub>-C<sub>10</sub> alkyl; n-propyl or C<sub>4</sub>-C<sub>7</sub> alkyl substituted with one or more halogen, OR<sup>8</sup>, SR<sup>9</sup> or NR<sup>10</sup>R<sup>11</sup>; C<sub>1</sub>-C<sub>3</sub> alkyl substituted with OR<sup>16</sup>, CO<sub>2</sub>(C<sub>1</sub>-C<sub>2</sub> alkyl) or

phenyl optionally substituted with one or more CH<sub>3</sub>, CF<sub>3</sub>, OCH<sub>3</sub>, SCH<sub>3</sub> or halogen; C<sub>3</sub>-C<sub>6</sub> cycloalkyl; CH<sub>2</sub>(C<sub>3</sub>-C<sub>6</sub> cycloalkyl); phenyl optionally substituted with one or more CH<sub>3</sub>, CF<sub>3</sub>, OCH<sub>3</sub>, SCH<sub>3</sub> or halogen; C<sub>2</sub>-C<sub>6</sub> alkenyl optionally substituted with one or more halogen or CO<sub>2</sub> (C<sub>1</sub>-C<sub>2</sub> alkyl); OR<sup>12</sup>; SR<sup>13</sup>; or NR<sup>14</sup>R<sup>15</sup>;

R<sup>4</sup> is H, C<sub>1</sub>-C<sub>2</sub> alkyl,



R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup> and R<sup>11</sup> are independently H or C<sub>1</sub>-C<sub>2</sub> alkyl;

R<sup>12</sup> and R<sup>13</sup> are independently C<sub>2</sub>-C<sub>10</sub> alkyl optionally substituted with one or more halogen, OR<sup>8</sup>, SR<sup>9</sup> or NR<sup>10</sup>R<sup>11</sup>; phenyl optionally substituted with one or more CH<sub>3</sub>, CF<sub>3</sub>, OCH<sub>3</sub>, SCH<sub>3</sub> or halogen; or benzyl;

R<sup>14</sup> and R<sup>15</sup> are independently H or C<sub>1</sub>-C<sub>2</sub> alkyl, or may be taken together as —(CH<sub>2</sub>)<sub>4</sub>—, —(CH<sub>2</sub>)<sub>5</sub>— or —(CH<sub>2</sub>-C<sub>2</sub>H<sub>4</sub>OCH<sub>2</sub>CH<sub>2</sub>)—;

R<sup>16</sup> is H, C<sub>1</sub>-C<sub>8</sub> alkyl; benzyl optionally substituted with one or more CH<sub>3</sub>, CF<sub>3</sub>, OCH<sub>3</sub>, SCH<sub>3</sub> or halogen; or phenyl optionally substituted with one or more CH<sub>3</sub>, CF<sub>3</sub>, OCH<sub>3</sub>, SCH<sub>3</sub> or halogen;

R<sup>17</sup> is H, C<sub>1</sub>-C<sub>2</sub> alkyl or phenyl optionally substituted with one or more CH<sub>3</sub>, CF<sub>3</sub>, OCH<sub>3</sub>, SCH<sub>3</sub> or halogen;

R<sup>18</sup> is H, C<sub>1</sub>-C<sub>2</sub> alkyl, C<sub>3</sub>-C<sub>6</sub> cycloalkyl, CH<sub>2</sub>(C<sub>3</sub>-C<sub>6</sub> cycloalkyl), O(C<sub>1</sub>-C<sub>4</sub> alkyl), O-allyl or may be taken together with R<sup>17</sup> as —(CH<sub>2</sub>)<sub>4</sub>—, —(CH<sub>2</sub>)<sub>5</sub>— or —(CH<sub>2</sub>-C<sub>2</sub>H<sub>4</sub>OCH<sub>2</sub>CH<sub>2</sub>)—;

R<sup>19</sup> is H or C<sub>1</sub>-C<sub>2</sub> alkyl;

R<sup>20</sup> is H or C(O)CH<sub>3</sub>;

R<sup>21</sup> and R<sup>22</sup> are independently H, CN, CO<sub>2</sub>R<sup>4</sup>, C(X)NR<sup>17</sup>R<sup>18</sup> or halogen;

X is O or S;

or their N-oxides or agriculturally suitable salts thereof provided that when R<sup>1</sup> is Cl, Br or I, and R<sup>2</sup> is CN, CO<sub>2</sub>R<sup>4</sup> or C(O)NR<sup>17</sup>R<sup>18</sup>, then R<sup>3</sup> is other than optionally substituted 5-phenyl and at least one of the following: surfactant, solid, or liquid diluent.

5,438,034

# QUATERNARY AMMONIUM CARBONATE COMPOSITIONS AND PREPARATION THEREOF

Leigh E. Walker, Macungie, Pa., assignor to Lonza, Inc., Annandale, N.J.

Filed Jun. 9, 1993, Ser. No. 74,312

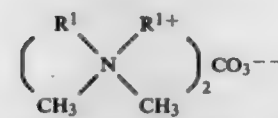
Int. Cl. A01N 33/12; C07C 211/63

U.S. Cl. 504—158

28 Claims

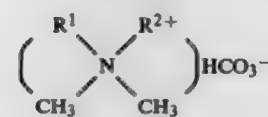
1. A wood preservative composition comprising

(a) at least one di C<sub>8</sub>-C<sub>12</sub> alkyl quaternary ammonium carbonate having the formula



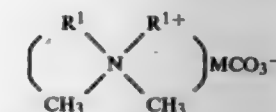
wherein R<sup>1</sup> is a C<sub>8</sub>-C<sub>12</sub> alkyl group; and

(b)(1) at least one di C<sub>8</sub>-C<sub>12</sub> alkyl quaternary ammonium bicarbonate having the formula



wherein R<sup>1</sup> is the same or a different C<sub>8</sub>-C<sub>12</sub> alkyl group as in (a); or

(2) at least one di C<sub>8</sub>-C<sub>12</sub> alkyl quaternary ammonium metal carbonate having the formula



wherein R<sup>1</sup> is the same or a different C<sub>8</sub>-C<sub>12</sub> alkyl group as in (a) or (b) and M is a non-coupler metal, or

(3) a combination of (b)(1) and (b)(2);

said composition being metal coupler-free.

5,438,035

# METHODS FOR CONTROLLING UNDESIRABLE PLANT SPECIES WITH BENZODIAZEPINE COMPOUNDS

Michael A. Guaciaro, Hightstown; Philip M. Harrington, Cranbury, and Gary M. Karp, Princeton Junction, all of N.J., assignors to American Cyanamid Company, Wayne, N.J.

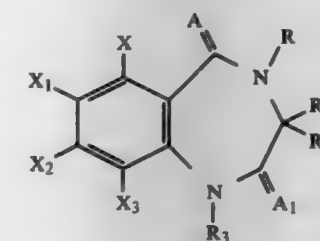
Filed Jun. 24, 1994, Ser. No. 265,478

Int. Cl. A01N 43/48

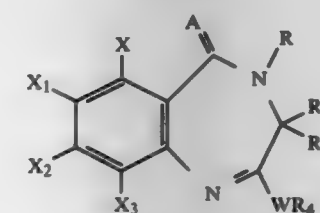
U.S. Cl. 504—191

15 Claims

1. A method for controlling undesirable plant species which comprises applying to the foliage of said plants or to the soil or water containing seeds or other propagating organs thereof, a herbicidally effective amount of a compound having the structural formula



(I)



(II)

wherein

X is hydrogen, halogen, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, C<sub>1</sub>-C<sub>4</sub>haloalkoxy, C<sub>2</sub>-C<sub>3</sub>alkenyl, C<sub>2</sub>-C<sub>3</sub>alkynyl, CO<sub>2</sub>R<sub>5</sub>, C(O)NR<sub>6</sub>R<sub>7</sub>, S(O)<sub>m</sub>R<sub>8</sub>, C(O)R<sub>9</sub>, or benzyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups;

X<sub>1</sub> is hydrogen, halogen, methyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, C<sub>1</sub>-C<sub>4</sub>haloalkoxy, C<sub>2</sub>-C<sub>3</sub>alkenyl, CO<sub>2</sub>R<sub>5</sub>, C(O)NR<sub>6</sub>R<sub>7</sub>, S(O)<sub>m</sub>R<sub>8</sub>, C(O)R<sub>9</sub>, or benzyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups;

X<sub>2</sub> is hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, C<sub>1</sub>-C<sub>4</sub>haloalkoxy, C<sub>2</sub>-C<sub>3</sub>alkenyl, C<sub>2</sub>-C<sub>3</sub>alkynyl, CO<sub>2</sub>R<sub>5</sub>, C(O)NR<sub>6</sub>R<sub>7</sub>, S(O)<sub>m</sub>R<sub>8</sub>, C(O)R<sub>9</sub>, or benzyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups;

X<sub>3</sub> is hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>haloalk-



oxy, C<sub>2</sub>-C<sub>3</sub>alkenyl, C<sub>2</sub>-C<sub>3</sub>alkynyl, CO<sub>2</sub>R<sub>5</sub>, C(O)NR<sub>6</sub>R<sub>7</sub>, S(O)<sub>n</sub>R<sub>8</sub>, C(O)R<sub>9</sub>, or benzyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups;

R<sub>5</sub> is hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, benzyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups, or an alkali metal, alkaline earth metal, manganese, copper, zinc, cobalt, silver, nickel, ammonium or organic ammonium cation;

R<sub>6</sub> and R<sub>7</sub> are each independently C<sub>1</sub>-C<sub>4</sub>alkyl, benzyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups, phenyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups, or R<sub>6</sub> and R<sub>7</sub> are taken together to form a ring in which R<sub>6</sub>R<sub>7</sub> is represented by  $-(CH_2)_n-$  where n is an integer of 2, 3, 4 or 5;

m is an integer of 0, 1 or 2;

R<sub>8</sub> is hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, NR<sub>10</sub>R<sub>11</sub>, OR<sub>12</sub> or phenyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups;

R<sub>10</sub> and R<sub>11</sub> are each independently hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, benzyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups, phenyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups, or R<sub>10</sub> and R<sub>11</sub> are taken together to form a ring in which R<sub>10</sub>R<sub>11</sub> is represented by  $-(CH_2)_q-$  where q is an integer of 2, 3, 4 or 5;

R<sub>12</sub> is hydrogen or C<sub>1</sub>-C<sub>4</sub>alkyl;

R<sub>9</sub> is hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl or phenyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups;

A, A<sub>1</sub> and W are each independently O or S with the proviso that when A<sub>1</sub> is S then A is O;

R is C<sub>3</sub>-C<sub>6</sub>cycloalkyl, C<sub>2</sub>-C<sub>3</sub>alkenyl, C<sub>2</sub>-C<sub>3</sub>alkynyl, C<sub>1</sub>-C<sub>4</sub>alkyl optionally substituted with one CO<sub>2</sub>R<sub>13</sub> group, one phenyl group optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups, or one 5- or 6-membered heterocycle group containing one to three nitrogen atoms, one oxygen atom and/or one sulfur atom and two to five carbon atoms optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups, phenyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups with the proviso that the para-position of the phenyl ring is not substituted, a 5- or 6-membered heterocycle group containing one to three nitrogen atoms, one oxygen atom and/or one sulfur atom and two to five carbon atoms optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups, or R may be taken together with R<sub>1</sub> and the atoms to which they are attached to form a five membered saturated ring substituted with one to three C<sub>1</sub>-C<sub>4</sub>alkyl groups;

R<sub>13</sub> is hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, benzyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups, or an alkali metal, alkaline earth metal, manganese, copper, zinc, cobalt, silver, nickel, ammonium or organic ammonium cation;

R<sub>1</sub> and R<sub>2</sub> are each independently hydrogen, methyl, ethyl, or R<sub>1</sub> may be taken together with R and the atoms to which they are attached to form a five membered saturated ring substituted with one to three C<sub>1</sub>-C<sub>4</sub>alkyl groups, and when taken together, R<sub>1</sub> and R<sub>2</sub> may form a ring in which R<sub>1</sub>R<sub>2</sub> is represented by  $-(CH_2)_r-$  where r

is an integer of 2, 3, 4, 5 or 6 with the proviso that when R<sub>1</sub> is methyl or ethyl then R<sub>2</sub> is hydrogen;

R<sub>3</sub> is hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl or hydroxy with the proviso that when R<sub>3</sub> is hydroxy, X<sub>2</sub> is other than C<sub>1</sub>-C<sub>4</sub>alkyl, and further with the proviso that when R<sub>3</sub> is C<sub>1</sub>-C<sub>4</sub>alkyl, X<sub>1</sub> is other than hydrogen or methyl; and

R<sub>4</sub> is C<sub>1</sub>-C<sub>6</sub>alkyl, C<sub>3</sub>-C<sub>6</sub>cycloalkyl, C<sub>1</sub>-C<sub>6</sub>haloalkyl, C<sub>2</sub>-C<sub>6</sub>alkenyl, C<sub>2</sub>-C<sub>6</sub>alkynyl, benzyl optionally substituted with one or more halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy groups, or phenyl optionally substituted with one halogen, nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or C<sub>1</sub>-C<sub>4</sub>haloalkoxy group;

and the optical isomers and diastereomers thereof; and mixtures thereof.

5,438,036

#### PLANAR SQUID OF OXIDE SUPERCONDUCTOR

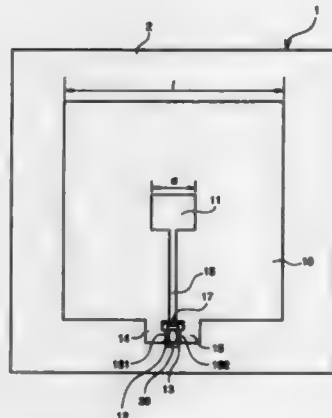
Takashi Matsura, and Hideo Itozaki, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan  
Filed Apr. 19, 1993, Ser. No. 48,001

Claims priority, application Japan, Apr. 17, 1992, 4-124315

Int. Cl.<sup>6</sup> G01R 33/00; H01L 39/22, 39/14, 39/24

U.S. Cl. 505—162

20 Claims



#### 1. A SQUID comprising:

- a substrate;
  - a rectangular washer of an oxide superconductor thin film disposed on a surface of the substrate and having a hole therein and a slit through a side of the washer; and
  - a connecting member including at least one Josephson junction, the connecting member connecting portions of the washer across the slit,
- wherein an outer dimensional length of one side of the rectangular washer is at least 100 times greater than a length of a corresponding side of the hole in the washer.

5,438,037

#### METHOD FOR DEPOSITING ANOTHER THIN FILM ON AN OXIDE THIN FILM HAVING PEROVSKITE CRYSTAL STRUCTURE

So Tanaka, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 14, 1994, Ser. No. 227,389

Claims priority, application Japan, Apr. 14, 1993, 5-111113

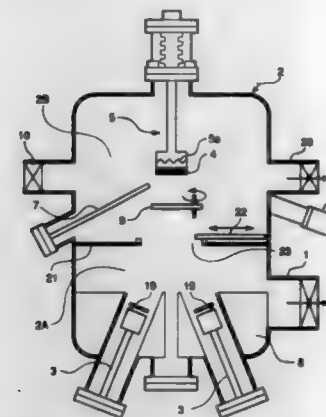
Int. Cl.<sup>6</sup> H01L 39/24

U.S. Cl. 505—329

18 Claims

1. A method for depositing a thin film of a material on an oxide thin film that has a perovskite crystal structure formed on a substrate comprising steps of depositing a single crystal seed layer of the material on the oxide thin film that has the perovskite crystal structure at a first temperature, and depositing a thin film of the material on the seed layer at a second substrate temperature lower than the first substrate temperature.

ture, wherein the second temperature is selected so that there is an interface between the thin film and the oxide thin film that



has said perovskite crystal structure as the result of little mutual diffusion at the interface.

5,438,038

#### SUPERCONDUCTING BEARING DEVICE STABILIZED BY TRAPPED FLUX

Ryoichi Takahata, Nara, and Shoji Eguchi, Osaka, all of Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Continuation of Ser. No. 730,164, Jul. 16, 1991, Pat. No.

5,330,967. This application Dec. 3, 1993, Ser. No. 160,796

Claims priority, application Japan, Jul. 17, 1990, 2-188693;

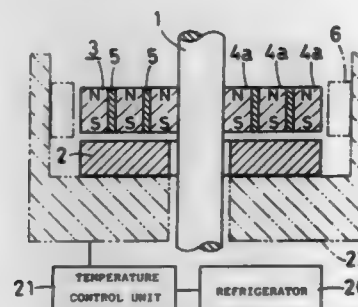
Dec. 18, 1990, 2-403263

The portion of the term of this patent subsequent to Jul. 19, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B60L 13/04; H02K 55/00, 7/09

U.S. Cl. 310—90.5

10 Claims



#### 1. A superconducting bearing device comprising:

- a rotatable shaft having an axis of rotation;
- an annular permanent magnet having two axial ends, an axial end face, radially inner and outer sides, and a radially outer periphery, and said permanent magnet generating a magnetic flux distribution;
- said annular permanent magnet being provided around said rotatable shaft integrally and concentrically therewith, said rotatable shaft not altering the magnetic flux distribution around the axis of rotation of the rotatable shaft;
- a cooling case fixedly positioned radially outwardly from said rotatable shaft with a predetermined spacing therebetween, and said cooling case creating a temperature environment for realizing a Type II superconducting state; and
- a Type II superconductor being penetrated by said rotatable shaft with a spacing therebetween and being fixedly supported to be in contact with said cooling case, said superconductor permitting penetration of the magnetic flux of said permanent magnet, and said superconductor being positioned so as to be spaced from said permanent magnet by a distance permitting a predetermined quantity of the magnetic flux of said permanent magnet to penetrate

thereinto and said superconductor being positioned so as not to permit a rotation of said rotatable shaft to alter the distribution of penetrating magnetic flux.

5,438,039

#### EFFECTIVE HYDROCARBON BLEND FOR REMOVING ASPHALTENES FROM OIL WELLS

Alberto Del Bianco, Magenta, and Fabrizio Stroppa, San Giuliano Milanese, both of Italy, assignors to AGIP S.p.A. and Eniricherche S.p.A., both of Milan, Italy

Division of Ser. No. 136,755, Oct. 15, 1993, Pat. No. 5,382,728.

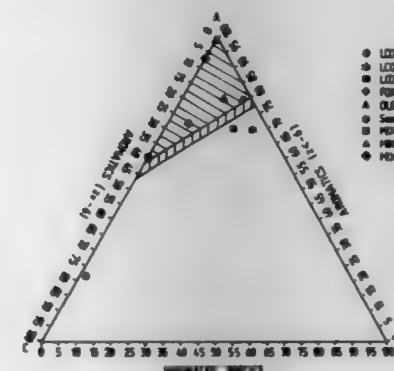
This application Aug. 3, 1994, Ser. No. 285,290

Claims priority, application Italy, Sep. 17, 1993, MI93A2008

Int. Cl.<sup>6</sup> E21B 37/00, 43/12

U.S. Cl. 507—203

7 Claims



1. A process for dissolving asphaltenic formations in oil wells, which consists in introducing into said oil wells, a hydrocarbon blend comprising a composition selected from compositions on a ternary chart, in which the vertex (A) represents 100% by weight of polyaromatics with  $z < -6$ , the vertex (B) represents 100% by weight of saturated species, and the vertex (C) represents 100% by weight of alkylbenzenes with  $z = -6$ , between points corresponding to:

- (i) 100 weight % polyaromatics;
  - (ii) 77 weight % polyaromatics, and 23 weight % of saturated species; and
  - (iii) 58 weight % of polyaromatics, and 42 weight % of alkylbenzenes;
- wherein the initial boiling point of said hydrocarbon blend is higher than 150° C., and said hydrocarbon blend comprises at least two members selected from the group consisting of polyaromatics, alkylbenzenes and saturated species.

5,438,040

#### CONJUGATION-STABILIZED POLYPEPTIDE COMPOSITIONS, THERAPEUTIC DELIVERY AND DIAGNOSTIC FORMULATIONS COMPRISING SAME, AND METHOD OF MAKING AND USING THE SAME

Naochiri N. Ekwuribe, Southfield, Mich., assignor to Protein Delivery, Inc., Durham, N.C.

Division of Ser. No. 59,701, May 10, 1993, Pat. No. 5,359,030.

This application Jul. 19, 1994, Ser. No. 276,890

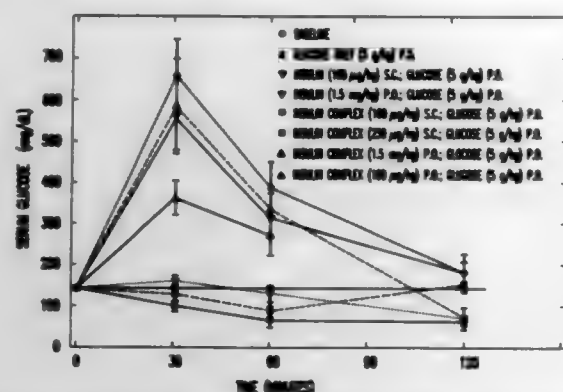
Int. Cl.<sup>6</sup> A61K 38/28; C07K 14/62; C08H 1/02

U.S. Cl. 514—3

1 Claim

1. A method of treating insulin deficiency in a human or non-human mammalian subject exhibiting such deficiency, comprising orally administering to the subject an effective

amount of a conjugated insulin composition comprising a stable, aqueously soluble, conjugated insulin complex compris-



ing insulin covalently coupled to a physiologically compatible polyethylene glycol modified glycolipid moiety.

5,438,041

## OXYGEN CARRYING MULTIPLE EMULSIONS

Shuming Zheng, Chicago; Richard L. Beisinger, Oak Park; Darsh T. Wasan, Darien; Lakshman R. Sehgal, Glenview, and Arthur L. Rosen, Wilmette, all of Ill., assignors to Illinois Institute of Technology, Chicago and Northfield Laboratories, Inc., Evanston, both of Ill.

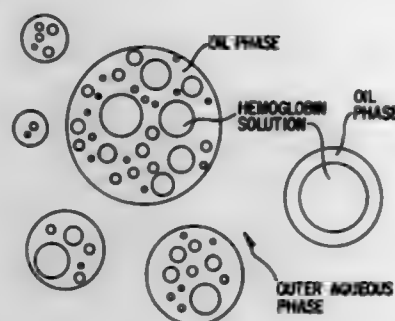
Continuation of Ser. No. 776,062, Oct. 11, 1991, Pat. No. 5,217,648, which is a continuation-in-part of Ser. No. 234,386, Aug. 19, 1988, Pat. No. 5,061,688. This application Mar. 3, 1993, Ser. No. 25,608

The portion of the term of this patent subsequent to Oct. 29, 2006, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 9/113, 37/14; B01J 13/00

U.S. Cl. 514—6

19 Claims



1. An oxygen containing multiple liquid emulsion comprising a primary emulsion comprising aqueous solution of oxygen carrying material in oil selected from the group consisting of vegetable oil, animal oil triglyceride and mixtures thereof, emulsified with a primary emulsifier having primary emulsion droplet sizes of up to about 5 microns and a secondary emulsion comprising said primary emulsion in an outer aqueous phase emulsified with a secondary emulsifier having secondary emulsion droplet sizes up to about 10 microns, said multiple emulsion having a viscosity of about 3 to about 9 cp, yield about 85 to about 99 percent, and oxygen carrying capacity about 7 to about 20 volume percent.

15. A blood substitute comprising a sterile oxygen carrying multiple emulsion comprising a primary emulsion comprising aqueous solution of oxygen carrying material in oil selected from the group consisting of vegetable oil, animal oil triglyceride and mixtures thereof, emulsified with a hydrophobic primary emulsifier having primary emulsion droplet sizes of up to about 5 microns and a secondary emulsion comprising said primary emulsion in an outer aqueous phase emulsified with a hydrophilic secondary emulsifier having secondary emulsion droplet sizes up to about 10 microns, said multiple emulsion

having a viscosity of about 3 to about 9 cp, yield about 85 to about 99 percent, and oxygen carrying capacity about 7 to about 20 volume percent.

5,438,042

## ENTERAL NUTRITIONAL COMPOSITION HAVING BALANCED AMINO ACID PROFILE

Mary K. Schmidt, Arden Hills, and Candis Kvamme, Brooklyn Park, both of Minn., assignors to Sandoz Nutrition Ltd., Berne, Switzerland

Filed Oct. 8, 1993, Ser. No. 134,226

Int. Cl.<sup>6</sup> A61K 38/01, 33/14; A23L 1/202, 1/30

U.S. Cl. 514—21

1 Claim

1. An enteral nutritional composition comprising, based on total caloric content of said composition,

- a) from 4% to 30% lipid component,
- b) from 65% to 80% carbohydrate component, and
- c) from 16% to 25% protein component, wherein said composition has a nonprotein calorie to grams of nitrogen ratio ranging from 150:1 to 80:1, and has the following formulation by solid weight:

Ingredient	Wt %
maltodextrin	69.32
L-glutamine	3.773
modified food starch	3.773
L-leucine	2.547
L-arginine acetate	2.536
soybean oil	2.505
magnesium gluconate	1.729
L-lysine acetate	1.486
L-valine	2.374
L-isoleucine	1.273
calcium glycerophosphate	1.258
L-phenylalanine	1.078
L-methionine	0.9265
citric acid	0.7755
L-threonine	0.7114
potassium chloride	0.5450
L-tyrosine	0.4569
L-histidine monohydrochloride	0.4528
sodium citrate	0.4402
L-aspartic acid	0.4192
L-proline	0.3878
potassium citrate	0.3668
sodium phosphate dibasic	0.2851
L-tryptophan	0.2587
L-serine	0.2159
choline bitartrate	0.2154
L-alanine	0.1937
glycine	0.1886
potassium sorbate	0.1467
polyglycerol esters of fatty acids	0.1308
taurine	0.08300
vitamin E acetate	0.05659
ascorbic acid	0.05072
L-carnitine	0.04150
biotin	0.01761
zinc sulfate	0.01572
ferrous sulfate	0.01404
niacinamide	0.01199
vitamin A palmitate	0.01006
calcium pantothenate	0.006749
cyanocobalamin	0.003668
copper gluconate	0.003668
manganese sulfate	0.002369
folic acid	0.002348
vitamin K	0.002306
vitamin D	0.001761
pyridoxine hydrochloride	0.001467
potassium iodide	0.001149
riboflavin	0.001048
thiamin hydrochloride	0.000950
chromic acetate	0.000179
sodium molybdate	0.000159
sodium selenite	0.000055

5,438,043

## BEVERAGE FOR PREOPERATIVE INTAKE

Olle Ljungqvist, Stockholm, Sweden, assignor to Olle Ljungqvist Medical AB, Bromma, Sweden

PCT No. PCT/SE91/00897, § 371 Date Jun. 21, 1993, § 102(e) Date Jun. 21, 1993, PCT Pub. No. WO92/10947, PCT Pub. Date Jul. 9, 1992

PCT Filed Dec. 20, 1991, Ser. No. 81,334

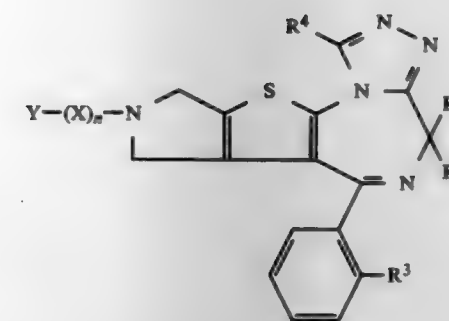
Claims priority, application Sweden, Dec. 21, 1990, 9004131

Int. Cl.<sup>6</sup> A61K 31/70, 31/715

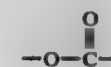
U.S. Cl. 514—23

7 Claims

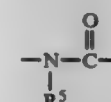
1. A method for suppressing insulin resistance resulting from surgical operation, and increasing available carbohydrate reserves during or after surgery, which method comprises oral administration within about four hours prior to surgical operation to a patient of an effective amount of a hypotonic aqueous solution of between 8 and 20 grams of a carbohydrate mixture per 100 ml, said carbohydrate mixture a monosaccharide, a disaccharide and a polysaccharide.



wherein R<sup>1</sup> and R<sup>2</sup> are the same or different and represent a hydrogen atom or a lower alkyl group, R<sup>3</sup> represents a hydrogen atom or a halogen atom, R<sup>4</sup> represents a hydrogen atom or a lower alkyl group, X represents a group of the formula,



(b) a group of the formula,

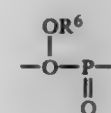


wherein R<sup>5</sup> represents a hydrogen atom or a lower alkyl group,

(c) a group of the formula,



(d) a group of the formula,

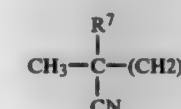


wherein R<sup>6</sup> represents a lower alkyl group, or (e) a group of the formula,



n is an integer of 0 or and Y represents

- (1) a cycloalkyl group,
- (2) a cycloalkylalkyl,
- (3) an alkynyl group,
- (4) a group of the formula,



in which R<sup>7</sup> is hydrogen or methyl and r is zero, 1 or 2, (5) a group of the formula, NC-(CH<sub>2</sub>)<sub>p</sub>, wherein p is an integer of from 1 to 6,

5,438,044

## PHOSPHOLIPID COMPOSITION

Rainer Losch, Bonn; Bernd-Rainer Gther, Bergheim, and Jörg Hager, Cologne, all of Germany, assignors to Rhone-Poulenc Rorer, Cologne, Germany

Continuation of Ser. No. 906,620, Jun. 30, 1992, Pat. No. 5,310,734. This application Oct. 28, 1993, Ser. No. 144,712

Int. Cl.<sup>6</sup> A61K 31/685, 47/00, 9/14

U.S. Cl. 514—78

6 Claims

1. A phospholipid composition having a phosphatidylcholine and lyophosphatidylcholine content of at least 80% by weight, said phospholipid composition being substantially free from additives, wherein said phospholipid composition is in granular form, with a particle size between 18 mm and 0.07 mm.

5,438,045

## 1,4-DIAZEPINE DERIVATIVE AND ITS PHARMACEUTICAL USE

Kazuo Okano; Shuhei Miyazawa; Richard S. J. Clark; Shinya Abe; Tetsuya Kawahara; Naoyuki Shimomura; Osamu Asano; Hiroyuki Yoshimura; Mitsuaki Miyamoto; Yoshimori Sakuma; Kenzo Muramoto; Hiroshi Obaishi; Kouichi Harada; Hajime Tsunoda; Satoshi Katayama; Kouji Yamada; Shigeru Souda; Yoshimasa Machida; Kouichi Katayama, and Isao Yamatsu, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 778,563, Oct. 17, 1991, Pat. No. 5,221,671, which is a division of Ser. No. 751,632, Aug. 26, 1991, which is a continuation of Ser. No. 506,928, Apr. 10, 1990, abandoned, which is a continuation-in-part of Ser. No. 421,929, Oct. 16, 1989, abandoned. This application Apr. 27, 1993, Ser. No. 52,721 Claims priority, application Japan, Oct. 31, 1988, 63-275460; Nov. 24, 1988, 63-297068; Dec. 16, 1988, 63-318016; Dec. 28, 1988, 63-331622

Int. Cl.<sup>6</sup> A61K 31/55; C07D 495/22

U.S. Cl. 514—81

12 Claims

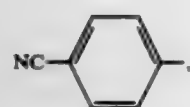
1. A triazolo-1,4-diazepine compound or a pharmacologically acceptable salt thereof, having the formula:



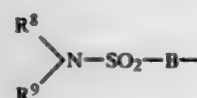
(6) a group of the formula  $A-(CH_2)_q-$  wherein A represents a group selected from a pyridyl group, a pyranil group and a morpholino group and q is an integer of from 0 to 6,

(7) an alkynyl group having from 1 to 6 carbon atoms wherein a phenyl group or a cycloalkyl group is joined to any carbon atom,

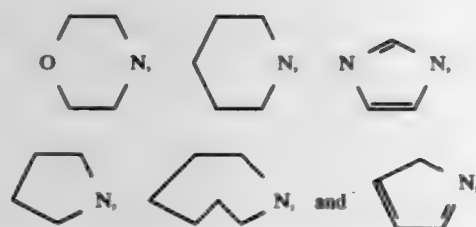
(8) a group of the formula,



(9) a group of the formula,

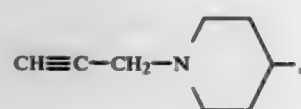


wherein  $R^8$  and  $R^9$  are the same or different and represent a hydrogen atom, a lower alkyl group, a pyridylmethyl group or a cycloalkyl group or  $R^8$  and  $R^9$  may be joined along with a nitrogen atom to form a ring selected from the group consisting of

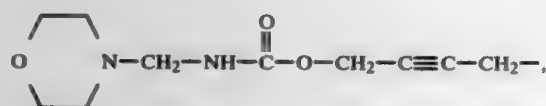


and B represents a phenylene group or a lower alkylene group having from 1 to 3 carbon atoms,

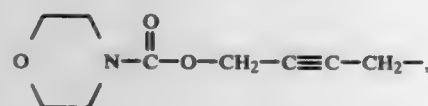
(10) a group of the formula,



(11) a group of the formula,



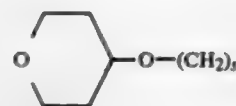
(12) a group of the formula,



(15) a lower alkyl group,

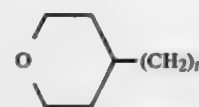
(16) a cycloalkylalkenyl group,

(17)



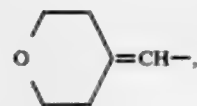
in which s is 1 or 2,

(18)



in which t is 1 or 2,

(19)



(20) an arylalkyl,

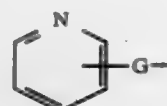
(21) an arylalkenyl,

(22)

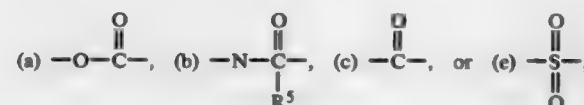


in which  $R^{10}$  is hydrogen or phenyl,  $R^{11}$  is hydrogen or a lower alkyl, E is an alkenylene and u is zero or 1 with the proviso that  $R^{10}$  and  $R^{11}$  are not both hydrogen at the same time,

(23)



in which G is an alkenylene or  $-J-(CH_2)_k-$ , wherein J is oxygen or sulfur, and k is zero, 1 or 2, provided that when X is a group of the formula



Y is a group selected from (1) to (12) and (16) to (23), when X is a group of the formula (d), Y is a lower alkyl of group (15), and when n is zero, Y is an alkynyl group of (3).

10. A method for treating a disease against which anti-PAF activity is effective, which comprises administering a pharmacologically effective amount of the compound or the salt thereof as defined in claim 1.

5,438,046

# N-HETEROARYL SUBSTITUTED DERIVATIVES OF PROPANAMIDE USEFUL IN THE TREATMENT OF CARDIOVASCULAR DISEASES

Gabriele Norcini, Vizzola Ticino, and Francesco Santangelo, Milan, both of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

Filed Jul. 27, 1994, Ser. No. 280,675

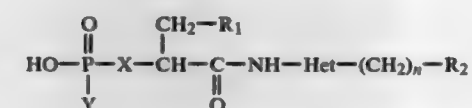
Claims priority, application Italy, Jul. 30, 1993, MI93A1772

Int. Cl. A61K 31/675; C07F 9/06, 9/02

U.S. Cl. 514-89

7 Claims

1. A compound of formula



(I)

wherein

Y is a  $C_1$ - $C_4$  alkyl group or an OR group; R is a hydrogen atom, a  $C_1$ - $C_4$  alkyl group or a phenylalkyl group having from 1 to 4 carbon atoms in the alkyl moiety;

$R_1$  is a hydrogen atom, a phenyl group, a biphenyl group or a 5 or 6 membered heterocycle containing 1 or 2 heteroatoms selected from the group consisting of nitrogen, oxygen and sulphur, optionally substituted by one or two groups selected from the group consisting of  $C_1$ - $C_4$  alkyl or alkoxy groups, hydroxy, halogen and trifluoromethyl groups;

$R_2$  is a carboxylic group or a  $COOR_3$  or



group;  $R_3$  is a  $C_1$ - $C_4$  alkyl group or a phenylalkyl having from 1 to 4 carbon atoms in the alkyl moiety;  $R_4$  and  $R_5$ , the same or different, are hydrogen atoms,  $C_1$ - $C_4$  alkyl or  $C_5$ - $C_7$  cycloalkyl groups;

n is 0 or 1;

Het is a heterocycle selected from the group consisting of thiazole, oxazole, isothiazole, isoxazole, pyrazole, imidazole, thiophene, pyrrole and pyridine;

X is NH or  $CH_2$ ; or a pharmaceutically acceptable salt thereof.

5,438,047

# DIPHOSPHATES OF CATECHOLAMINES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Francesco Santangelo, Milan; Cesare Casagrande, Arese, and Gabriele Norcini, Maddalena Somma Campagna, all of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

Filed Mar. 28, 1994, Ser. No. 204,394

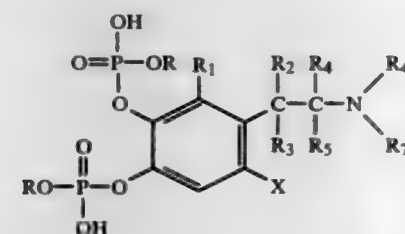
Claims priority, application Italy, Jul. 30, 1992, MI92A1855

Int. Cl. C07F 9/12; A61K 31/66

U.S. Cl. 514-104

4 Claims

1. A compound of formula



wherein

R is hydrogen, phenyl, phenylalkyl or a  $C_1$ - $C_6$  alkyl option-

ally substituted by hydroxy, alkoxy, acyloxy, amino, carboxy or alkoxy carbonyl groups;

$R_1$  is hydrogen, halogen, alkyl, alkoxy or, together with  $R_3$  or  $R_5$ , has the meanings indicated below;

X is hydrogen or, together with  $R_3$  or  $R_5$ , has the meanings indicated below;

$R_2$  is hydrogen or hydroxy;

$R_3$  is hydrogen or, together with  $R_1$  or X, constitutes a chain of methylenes forming a ring having from 5 to 8 members;

$R_4$  is hydrogen, alkyl or alkoxy carbonyl;

$R_5$  is hydrogen, alkyl or, together with  $R_1$  or X, constitutes a chain of methylenes forming a ring having from 5 to 8 members;

$R_6$  is hydrogen, allyl, acyl deriving from a natural amino acid,  $C_1$ - $C_6$  alkyl optionally substituted by phenyl, 4-hydroxyphenyl or by a phenylalkylamino or phenoxyalkylamino group having from 1 to 3 carbon atoms in the alkyl moiety and optionally substituted on the phenyl;

$R_7$  is hydrogen or a  $C_1$ - $C_6$  alkyl;

and its pharmaceutically acceptable salts.

5,438,048

# METHYLENEBISPHOSPHONIC ACID DERIVATIVES

Hannu Nikander, Paattinen; Marjaana Heikkilä-Hoikka, Vanhalinna; Esko Pohjala, Tampere; Hannu Hanhijärvi, and Leena Laurén, both of Turku, all of Finland, assignors to Leiras Oy, Turku, Finland

PCT No. PCT/FI91/00394, § 371 Date Oct. 20, 1993, § 102(e)

Date Oct. 20, 1993, PCT Pub. No. WO92/11267, PCT Pub.

Date Sep. 7, 1992

PCT Filed Dec. 18, 1991, Ser. No. 78,157

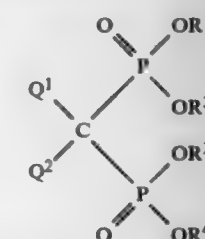
Claims priority, application Finland, Dec. 20, 1990, 906294

Int. Cl. A61K 31/66

U.S. Cl. 514-108

4 Claims

1. Pharmaceutical composition characterized in that it has as the active agent a compound having the formula I



wherein one of the groups  $R_1$ - $R_4$  is selected from the group consisting of methyl, ethyl and isopropyl, the remaining groups being hydrogen; and

wherein  $Q^1$  is hydroxy and  $Q^2$  is selected from the group consisting of methyl, ethyl, propyl, isopropyl, 2,2-dimethylpropyl, 1,1-dimethylethyl, butyl, cyclohexyl, 2-hydroxyethyl, 3-hydroxypropyl, 2-aminoethyl, 3-aminoethyl, (3-dimethylamino)propyl, [3-methyl(pentyl) amino]propyl, [2-methyl(pentyl)amino]ethyl, and 5-amino-pentyl.

5,438,049

# 16-EPIESTRIOL TO PREVENT, INHIBIT, OR REDUCE INFLAMMATION WITHOUT GLYCOGENIC EFFECTS

Neal S. Latman, 513 Bowie St., Borger, Tex. 79007; Virmal Kishore, 4632 Nottingham Dr., New Orleans, La. 70127; Brent C. Bruot, 620 Woodside Dr., Kent, Ohio 44240, and Harold H. Flanders, 3310 Ault Dr., Amarillo, Tex. 79121

Filed Aug. 12, 1993, Ser. No. 105,391

Int. Cl. A61K 51/56

U.S. Cl. 514-182

2 Claims

1. A method of treating inflammation by administering 16-epiestriol as an anti-inflammatory agent, alone or in combination with one or more glucocorticoids, wherein it is administered to individuals with diabetes mellitus, osteoporosis, severe

wounds, pregnancy, continuing growth or other conditions which would limit the use of anti-inflammatory agents with glycogenic activities and wherein the glycogenic related adverse side-effects of the glucocorticoid(s) are reduced, resulting in a higher anti-inflammatory benefit/glycogenic risk ratio by the use of 16-epiestriol.

5,438,050

# INDOLOCARBAZOLE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Jürgen Kleinschroth, Denzlingen; Johannes Hartenstein, Stegen-Wittental; Hubert Barth, Emmendingen; Christoph Schächtele, Freiburg; Claus Rudolph, Vorstetten; Gunter Weinheimer, Denzlingen, and Hartmut Oswald, Tübingen, all of Germany, assigns to Gödecke Aktiengesellschaft, Berlin, Germany

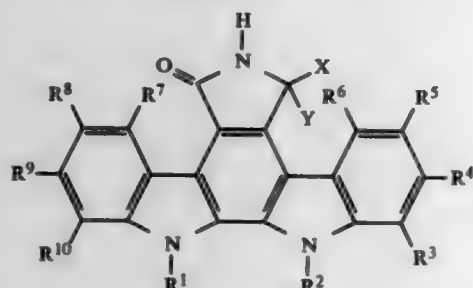
Continuation-in-part of Ser. No. 484,445, Feb. 20, 1990, abandoned, which is a continuation of Ser. No. 304,061, Jan. 30, 1989, abandoned, and Ser. No. 73,255, Jun. 7, 1993, abandoned, which is a continuation of Ser. No. 424,015, Oct. 19, 1989, abandoned. This application Jan. 21, 1994, Ser. No. 184,538 Claims priority, application Germany, Feb. 6, 1988, 38 03 620.7; Oct. 21, 1988, 38 35 842.5

Int. Cl.<sup>6</sup> A61K 31/40, 31/495; C07D 241/36, 245/04

U.S. Cl. 514—183

14 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof wherein R<sup>1</sup> and R<sup>2</sup> taken together are alkylene of from 2-4 carbon atoms unsubstituted or substituted by hydroxyl, alkoxy of 1-4 carbon atoms or amino which is unsubstituted or is mono- or di-substituted by benzyl or by alkyl of from 1-4 carbon atoms;

X and Y are each hydrogen or one is hydrogen and the other is hydroxyl or alkoxy of from 1-4 carbon atoms;

R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>10</sup> are each independently

hydrogen,

bromine,

chlorine,

methyl,

ethyl,

hydroxyl

methoxy,

2-aminoethoxy,

3-aminopropoxy,

1-amino-2-propoxy,

2-dimethylaminoethoxy,

3-dimethylamino-1-propoxy,

3-dimethylamino-2-propoxy, or

2-diethylaminoethoxy;

R<sup>6</sup> and R<sup>7</sup> are hydrogen with the proviso that at least one and as many as four of R<sup>3</sup> to R<sup>4</sup> are not hydrogen.

5,438,051

# COMPOSITIONS OF PORPHYRIN DERIVATIVES

Alan R. Morgan, Swanton, and Steven H. Selman, Toledo, both of Ohio, assigns to University of Toledo and Medical College of Ohio, Toledo, Ohio

Continuation-in-part of Ser. No. 818,133, Jan. 8, 1992, Pat. No. 5,250,668, which is a continuation-in-part of Ser. No. 562,168, Aug. 3, 1990, Pat. No. 5,109,129, which is a division of Ser. No. 448,738, Dec. 11, 1989, Pat. No. 4,988,808, which is a continuation-in-part of Ser. No. 142,034, Jan. 11, 1988, abandoned. This application Oct. 4, 1993, Ser. No. 131,485

Int. Cl.<sup>6</sup> A61K 31/40

U.S. Cl. 514—185

21 Claims

1. A solution in a solvent which comprises an organic material of a benzochlorin having the structure of FIG. 3, a metal complex of a benzochlorin having the structure of FIG. 1, a verdin having the structure of FIG. 4, a metal complex of a verdin having the structure of FIG. 2, or a metal complex of a porphyrin derivative having the structure of FIG. 8:

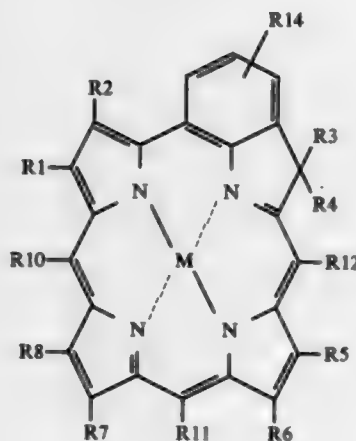


Fig. 1

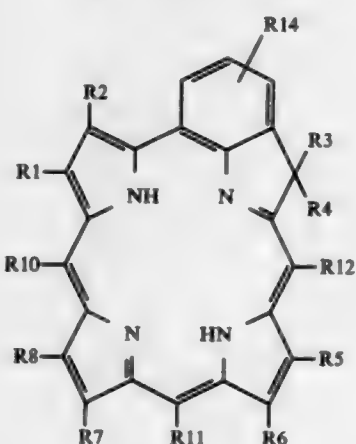


Fig. 3

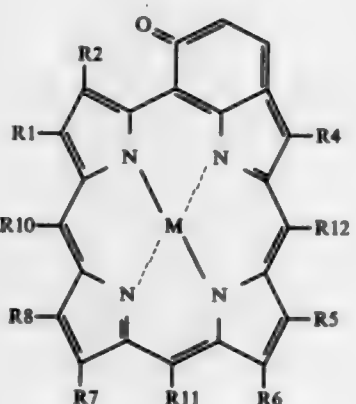


Fig. 2

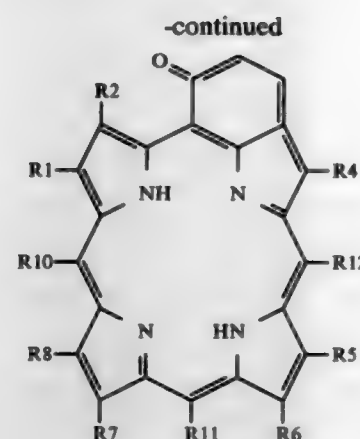


Fig. 4

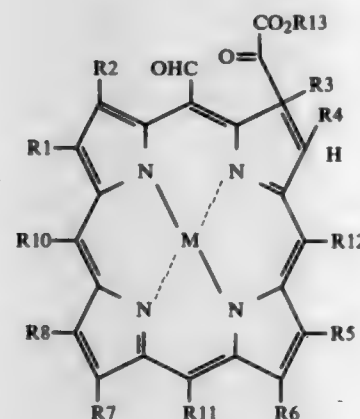


Fig. 8

wherein M is Ag, Al, Ce, Co, Cr, Cu, Dy, Er, Eu, Fe, Ga, Gd, Hf, Ho, In, La, Lu, Mn, Mo, Nd, Pb, Pd, Pr, Pt, Rh, Sb, Sc, Sn, Ta, Tb, Th, Ti, Tm, U, V, Y, Yb, Zn or Zr,

R<sup>13</sup> is an alkyl group having from 1 to 4 carbons, and each of R<sup>1</sup> through R<sup>8</sup>, R<sup>10</sup> through R<sup>12</sup> and R<sup>14</sup> is H or CHO,

an alkyl group other than t-butyl having from 1 to 4 carbon atoms,

an alkylene group having from 2 to 4 carbon atoms,

a group having the formula R<sub>2</sub>N(R<sub>3</sub>)<sub>2</sub> where R<sub>2</sub> is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; R<sub>3</sub> is hydrogen or an alkyl radical having from 1 to 2 carbon atoms and the two R<sub>3</sub> groups can be the same or different,

a group having the formula R<sub>2</sub>N(R<sub>4</sub>)<sub>3</sub> A where R<sub>2</sub> is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; A is a physiologically acceptable anion; and R<sub>4</sub> is an alkyl group having from 1 to 2 carbon atoms and the three R<sub>4</sub> groups can be the same or different,

a group having the formula R<sub>2</sub>OH where R<sub>2</sub> is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond, or

CO<sub>2</sub>R', CH<sub>2</sub>CO<sub>2</sub>R' or CH<sub>2</sub>CH<sub>2</sub>CO<sub>2</sub>R' where R' is H, or an alkyl group other than t-butyl having from one to four carbon atoms, with the proviso that R<sup>14</sup> can be SO<sub>3</sub>H or a salt thereof, and that not more than one of R<sup>1</sup> through R<sup>8</sup>, R<sup>10</sup> through R<sup>12</sup> and R<sup>14</sup> is CHO, a group having the formula R<sub>2</sub>N(R<sub>3</sub>)<sub>2</sub> or a group having the formula R<sub>2</sub>N(R<sub>4</sub>)<sub>3</sub>, and with the further proviso that two verdins are excluded from the claim, both having the structure of FIG. 4, one where R<sup>1</sup>, R<sup>4</sup>, R<sup>5</sup> and R<sup>7</sup> are methyl, R<sup>2</sup> is CH<sub>2</sub>CH<sub>2</sub>CO<sub>2</sub>CH<sub>3</sub>, R<sup>6</sup> and R<sup>8</sup> are CH<sub>2</sub>CH<sub>3</sub>, and R<sup>10</sup> through R<sup>12</sup> are hydrogen and the second R<sup>1</sup>, R<sup>4</sup>, R<sup>6</sup> and R<sup>8</sup> are methyl, R<sup>2</sup> is CH<sub>2</sub>CH<sub>2</sub>CO<sub>2</sub>CH<sub>3</sub>, R<sup>5</sup> and R<sup>7</sup> are

CH<sub>2</sub>CH<sub>3</sub>, and R<sup>10</sup> through R<sup>12</sup> are hydrogen and wherein the solution is one which is physiologically acceptable and of a suitable concentration or dilutable to a suitable concentration for intravenous or local administration.

5,438,052

# CEPHALOSPORIN DERIVATIVES

Peter Angehrn, Bockten; André Furlenmeier, Basel; Paul Hebeisen, Reinach; Werner Hofheinz, Bottmingen, and Helmut Link, Basel, all of Switzerland, assigns to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 20, 1992, Ser. No. 979,519

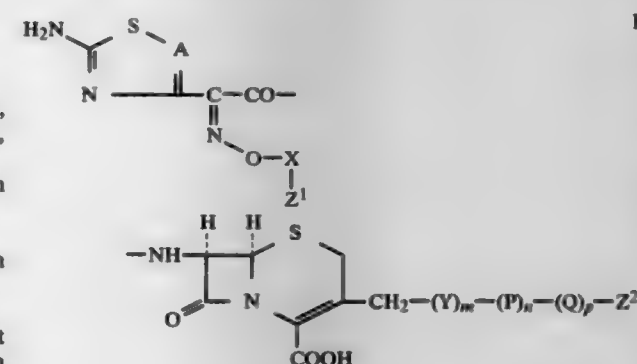
Claims priority, application Switzerland, Nov. 26, 1991, 3463/91; Nov. 26, 1991, 3464/91; Sep. 4, 1992, 2787/92

Int. Cl.<sup>6</sup> C07D 501/36; A61K 31/545

U.S. Cl. 514—202

30 Claims

1. A cephalosporin derivative of the formula:





5,438,053

## CEPHEM COMPOUNDS COMPOSITIONS AND METHOD

Michiyuki Sendai, Suita, and Kenji Okomogi, Shimamoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 16, 1993, Ser. No. 92,080

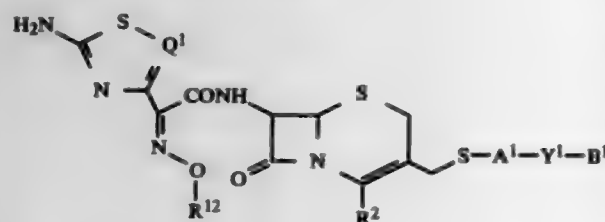
Claims priority, application Japan, Jul. 17, 1992, 4-191158; Feb. 10, 1993, 5-022896

Int. Cl.<sup>6</sup> C07D 501/36; A61K 31/545

U.S. Cl. 514-206

6 Claims

1. A compound of the formula



wherein Q<sup>1</sup> is N or CH;

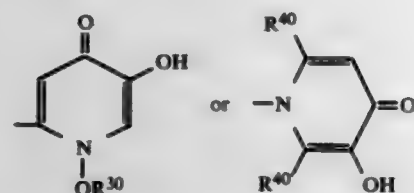
R<sup>12</sup> is hydrogen, C<sub>1-6</sub> alkyl, C<sub>1-4</sub> alkoxy-C<sub>1-6</sub> alkyl or carboxy-C<sub>1-6</sub> alkyl;

R<sup>2</sup> is a carboxy group or an esterified carboxy group;

A<sup>1</sup> is a divalent group minus two hydrogen atoms selected from thiazole, isothiazole, thiadiazole, triazole or tetrazole

Y<sup>1</sup> is —CH<sub>2</sub>—, —CH<sub>2</sub>CH<sub>2</sub>—, —S—CH<sub>2</sub>—, —NH—CO—CH<sub>2</sub>—; and

B<sup>1</sup> is either



wherein each of R<sup>30</sup>, R<sup>40</sup> and R<sup>40'</sup> is independently hydrogen, C<sub>1-4</sub> alkyl or hydroxy-C<sub>1-4</sub> alkyl or a pharmaceutically acceptable salt thereof.

5,438,054

## 2-(SUBSTITUTED PYRROLIDINYLSULFONAMIDE) CARBAPENEM DERIVATIVES

Sasumu Nakagawa, Norikazu Ohtake, Fumio Nakano, Koji Yamada, Ryosuke Ushijima, Satoshi Murase, and Hiroshi Fukatsu, all of Okazaki, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 25,804, Mar. 3, 1993, abandoned, which is a continuation of Ser. No. 674,971, Mar. 26, 1991, abandoned.

This application Mar. 9, 1994, Ser. No. 208,046

Claims priority, application Japan, Mar. 27, 1990, 2-77431; Apr. 12, 1990, 2-96654; Dec. 27, 1990, 2-414637

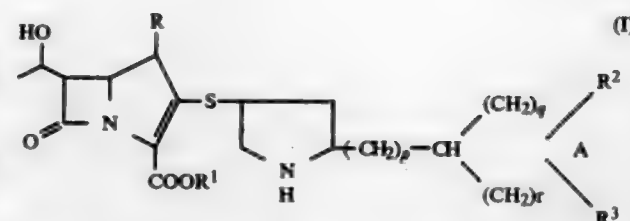
The portion of the term of this patent subsequent to Dec. 13, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A01N 43/00; A61K 31/395; C07D 487/04

U.S. Cl. 514-210

19 Claims

1. A compound of the formula:



wherein R is a hydrogen atom or a methyl group, R<sup>1</sup> is a hydrogen atom or a negative charge each of R<sup>2</sup> and R<sup>3</sup>, which may be the same or different, is a hydrogen atom, a lower alkyl group, a hydroxy lower alkyl group, a formimidoyl group, an acetoimidoyl group, —COOR<sup>4</sup>, —CON(R<sup>5</sup>)R<sup>6</sup>, —N(R<sup>5</sup>)R<sup>6</sup>, —CH<sub>2</sub>COOR<sup>4</sup>, —CH<sub>2</sub>N(R<sup>5</sup>)R<sup>6</sup> or —CH<sub>2</sub>CON(R<sup>5</sup>)R<sup>6</sup> (wherein R<sup>4</sup> is a hydrogen atom or a lower alkyl group, each of R<sup>5</sup> and R<sup>6</sup>, which may be the same or different, is a hydrogen atom or a lower alkyl group, or R<sup>5</sup> and R<sup>6</sup> form together with the adjacent nitrogen atom a heterocyclic group selected from the group consisting of an aziridinyl group, an azetidinyll group, a pyrrolidinyl group and a piperidinyl group), A is —NR<sup>7</sup>, —N<sup>+</sup>(R<sup>7</sup>)R<sup>8</sup>, —CON(R<sup>7</sup>)—, —CON(R<sup>7</sup>)CO—, —CON(R<sup>7</sup>)CON(R<sup>8</sup>)—, —N(R<sup>7</sup>)CO(CH<sub>2</sub>)<sub>s</sub>N(R<sup>8</sup>)—, —N(R<sup>7</sup>)CO(CH<sub>2</sub>)<sub>s</sub>CON(R<sup>8</sup>)—, —CON(R<sup>7</sup>)N(R<sup>8</sup>)— or —N(R<sup>7</sup>)CH<sub>2</sub>N(R<sup>8</sup>)— (wherein each of R<sup>7</sup> and R<sup>8</sup>, which may be the same or different is a hydrogen atom, a lower alkyl group, a hydroxy lower alkyl group, a formimidoyl group, an acetoimidoyl group, —COOR<sup>4</sup>, —CON(R<sup>5</sup>)R<sup>6</sup>, —N(R<sup>5</sup>)R<sup>6</sup>, —CH<sub>2</sub>COOR<sup>4</sup>, —CH<sub>2</sub>N(R<sup>5</sup>)R<sup>6</sup> or —CH<sub>2</sub>CON(R<sup>5</sup>)R<sup>6</sup> (wherein R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are as defined above), s is an integer of from 1 to 3), p is an integer of from 0 to 3, and each of q and r, which may be the same or different, is an integer of from 0 to 5, provided that q and r are not simultaneously 0 and q+r ≤ 6; or a pharmaceutically acceptable salt or ester thereof; with the proviso that when A is —N<sup>+</sup>(R<sup>7</sup>)R<sup>8</sup>, R<sup>1</sup> is a negative charge.

5,438,055

## ANTIARRHYTHMIC BENZODIAZEPINES

John J. Baldwin, Gwynedd Valley; Jason M. Elliott, Blue Bell; David A. Claremont, Maple Glen; Nigel Liverton, Harleysville; David C. Remy, North Wales, and Harold G. Selnick, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

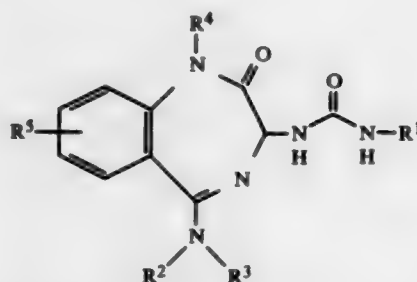
Filed Nov. 22, 1993, Ser. No. 156,183

Int. Cl.<sup>6</sup> A61K 31/55

U.S. Cl. 514-221

4 Claims

1. A method of treating arrhythmia in a patient in need of such treatment which comprises the administration of a therapeutically effective amount of a compound of structural formula I:



or a pharmaceutically acceptable salt thereof, wherein

R<sup>1</sup> is

- 1) phenyl, either unsubstituted or substituted with one or two substituents selected from Cl, F, CF<sub>3</sub>, C<sub>1-3</sub> alkyl and C<sub>1-3</sub> alkoxy,
- 2) indan-5-yl;

R<sup>2</sup> and R<sup>3</sup> taken together form

- 1) a 5-7 membered azacycle with the nitrogen atom to

which they are attached and may include another nitrogen atom as one of the members and may be substituted with one or two substituents selected from

- a) C<sub>1-3</sub> alkyl, and
- b) —NCH<sub>2</sub>CF<sub>3</sub>; or

- 2) a 6-10 membered azabicyclic;

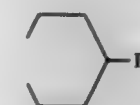
R<sup>4</sup> is 1) C<sub>1-5</sub> alkyl either unsubstituted or substituted with phenyl, or

- 2) phenyl; and

R<sup>5</sup> is

- 1) hydrogen or
- 2) C<sub>1-3</sub> alkyl.

R<sup>3</sup> and R<sup>4</sup> are joined to form



wherein R<sup>8</sup> is alkyl containing 1 to 3 carbon atoms.

5,438,057

## PHARMACEUTICAL COMPOSITIONS

Andrew M. Creighton, Mill Hill, England, assignor to British Technology Group Limited, London, England

Filed Apr. 23, 1993, Ser. No. 39,464

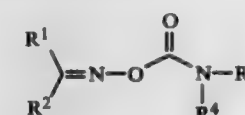
Claims priority, application United Kingdom, Jul. 12, 1991, 9115596

Int. Cl.<sup>6</sup> A61K 31/495

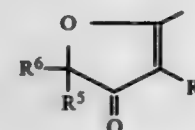
U.S. Cl. 514-252

7 Claims

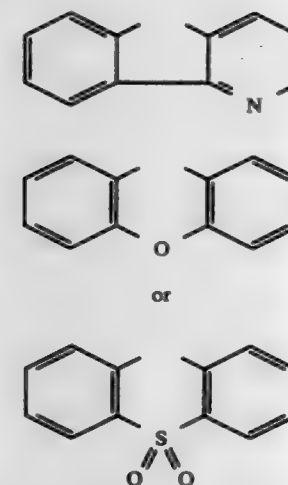
1. A method for the treatment of a patient in need of cardio-protection which comprises administering to said patient a therapeutically effective amount of a compound of formula (II):



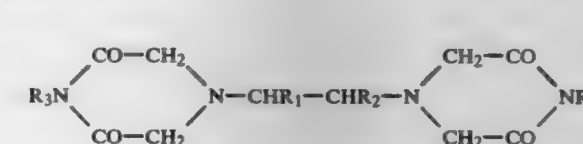
wherein R<sup>1</sup> and R<sup>2</sup> are independently phenyl, thienyl, naphthyl, substituted phenyl wherein the substituent is selected from the group consisting of halogen, methoxy, and dialkyl-amino wherein alkyl contains 1 to 3 carbon atoms; or R<sup>1</sup> and R<sup>2</sup> are independently substituted furanone of the structure



wherein R<sup>5</sup> and R<sup>6</sup> are independently alkyl containing 1 to 3 carbon atoms, cycloalkyl containing 5 to 7 carbon atoms, phenyl or substituted phenyl wherein the substituent is alkyl containing 1 to 5 carbon atoms or halogen; R<sup>7</sup> is hydrogen or halogen; or R<sup>1</sup> and R<sup>2</sup> are joined to form



R<sup>3</sup> and R<sup>4</sup> are independently hydrogen, hydrocarbyl containing 4 to 20 branched, straight chain, cyclic, saturated or unsaturated carbon atoms; or



in which R<sub>1</sub> and R<sub>2</sub> together form an ethylene bridging group and R<sub>3</sub> is hydrogen, an acyclic aliphatic hydrocarbon group having a maximum of six carbon atoms or a group CH<sub>2</sub>R<sub>4</sub> in which R<sub>4</sub> is a C<sub>1-5</sub> alkyl group substituted by a hydroxy group or by a C<sub>1-6</sub> alkoxy group, or a salt thereof formed with a physiologically acceptable inorganic or organic acid.

5,438,058

## COMPOSITION INTENDED TO BE USED FOR RETARDING HAIR LOSS AND FOR INDUCING AND STIMULATING HAIR GROWTH, CONTAINING

2-ALKYL-4-AMINOPYRIMIDINE (OR 2,4-DIALKYL-PYRIMIDINE) 3-OXIDE DERIVATIVES AND NEW COMPOUNDS DERIVED FROM 2-ALKYL-4-AMINOPYRIMIDINE 3-OXIDE

Didier Dufetel, Chelles; Francoise Estradier, and Michel Hocquaux, both of Paris, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 707,747, May 30, 1991, abandoned.

This application Apr. 1, 1994, Ser. No. 221,443

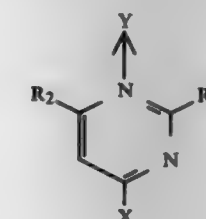
Claims priority, application France, May 30, 1990, 90 06693

Int. Cl.<sup>6</sup> A61K 31/505; C07D 239/24

U.S. Cl. 514-252

17 Claims

1. A composition comprising in a physiologically acceptable medium, an effective amount of at least one compound corresponding to formula (I):



in which:

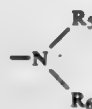
R<sub>1</sub> denotes a hydrogen atom or a C<sub>1</sub>-C<sub>8</sub> saturated straight-chain alkyl radical;

R<sub>2</sub> denotes a C<sub>1</sub>-C<sub>8</sub> saturated straight-chain alkyl radical, an —NHR<sub>3</sub> group in which R<sub>3</sub> denotes a hydrogen atom, or

the group  $-\text{COOR}_4$ , where  $R_4$  represents a  $\text{C}_1$ - $\text{C}_{12}$  straight-chain alkyl radical;

X denotes:

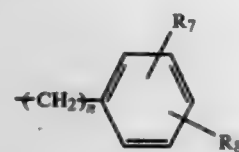
(i) a



group

in which:

$R_5$  and  $R_6$ , which may be identical or different, denote a hydrogen atom, a straight-chain or branched  $\text{C}_1$ - $\text{C}_{12}$  alkyl group, which may be substituted by one or more halogen atoms, a  $\text{C}_2$ - $\text{C}_{12}$  straight-chain alkenyl group, a  $\text{C}_3$ - $\text{C}_{10}$  cycloalkyl group or an aryl or aralkyl group corresponding to the formula:



where

n ranges from 0 to 4; and

$R_7$  and/or  $R_8$ , independently of one another, denote a hydrogen atom, a  $\text{C}_1$ - $\text{C}_6$  lower alkyl or alkoxy group or a trifluoromethyl radical; or

$R_5$  and  $R_6$ , together with the nitrogen atom to which they are bonded, form a saturated or unsaturated heterocycle selected from the group consisting of aziridinyl, azetidinyl, pyrrolidinyl, piperidinyl, hexamethyleneimino, heptamethyleneimino, octamethyleneimino, tetrahydropyridinyl, dihydropyridyl, pyrrolyl, pyrazolyl, imidazolyl, triazolyl, 4-alkylpiperazinyl, morpholino and thiomorpholino;

(ii) an  $-\text{OR}_9$  group, in which  $R_9$  denotes a straight-chain or branched  $\text{C}_1$ - $\text{C}_{12}$  alkyl radical, which is optionally substituted by one or more halogen atoms, a  $\text{C}_2$ - $\text{C}_{12}$  alkenyl radical, a  $\text{C}_3$ - $\text{C}_{10}$  cycloalkyl radical, a  $\text{C}_7$ - $\text{C}_{12}$  aralkyl radical or a phenyl radical, which is optionally substituted by one or two groups which, independently of one another, denote a  $\text{C}_2$ - $\text{C}_6$  alkyl radical, a  $\text{C}_1$ - $\text{C}_6$  alkoxy radical, a halogen atom or a trifluoromethyl radical; or

(iii) an  $\text{SR}_{10}$  group, in which  $R_{10}$  has one of the same meanings as  $R_9$ ; and

Y denotes an oxygen atom or an  $-\text{OSO}_3^-$  group; or a physiologically acceptable acid addition salt thereof.

5,438,059

#### CERTAIN ACRYLATES HAVING FUNGICIDAL ACTIVITY

John M. Clough, Marlow; Christopher R. A. Godfrey, Bracknell; Paul J. de Fraine, Wokingham; Michael G. Hutchings, Prestwich, and Vivienne M. Anthony, Maidenhead, all of England, assignors to Zeneca Limited, London, United Kingdom

Continuation of Ser. No. 667,805, Mar. 11, 1991, abandoned, which is a continuation of Ser. No. 151,522, Feb. 2, 1988, Pat. No. 5,021,581. This application Jul. 6, 1993, Ser. No. 88,098

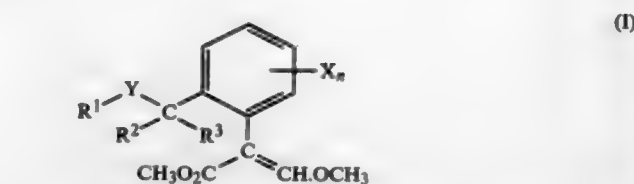
Claims priority, application United Kingdom, Feb. 9, 1987, 8702845; May 5, 1987, 8710594

Int. Cl.<sup>6</sup> C07D 239/34, 213/64; C07C 69/76; A01N 43/54

U.S. Cl. 514-256

5 Claims

1. A compound of the formula (I):



or a stereoisomer thereof, wherein  $R^1$  is phenyl or naphthyl each of which is optionally substituted by one, two or three of: halogen, hydroxy, mercapto,  $\text{C}_1$ - $\text{C}_4$  alkyl,  $\text{C}_2$ - $\text{C}_4$  alkenyl,  $\text{C}_2$ - $\text{C}_4$  alkynyl,  $\text{C}_1$ - $\text{C}_4$  alkoxy,  $\text{C}_2$ - $\text{C}_4$  alkenyloxy,  $\text{C}_2$ - $\text{C}_4$  alkynyloxy, halo( $\text{C}_1$ - $\text{C}_4$ )alkyl, halo( $\text{C}_1$ - $\text{C}_4$ )alkoxy,  $\text{C}_1$ - $\text{C}_4$  alkylthio, hydroxy( $\text{C}_1$ - $\text{C}_4$ )alkyl, ( $\text{C}_1$ - $\text{C}_4$ )alkoxy( $\text{C}_1$ - $\text{C}_4$ )alkyl,  $\text{C}_3$ - $\text{C}_6$  cycloalkyl,  $\text{C}_3$ - $\text{C}_6$  cycloalkyl( $\text{C}_1$ - $\text{C}_4$ )alkyl, phenyl, heteroaryl, phenoxy, heteroaryloxy, phenyl( $\text{C}_1$ - $\text{C}_4$ )alkyl in which the alkyl moiety is optionally substituted with hydroxy, heteroaryl( $\text{C}_1$ - $\text{C}_4$ )alkyl, phenyl( $\text{C}_2$ - $\text{C}_4$ )alkenyl, heteroaryl( $\text{C}_2$ - $\text{C}_4$ )alkenyl, phenyl( $\text{C}_1$ - $\text{C}_4$ )alkoxy, heteroaryl( $\text{C}_1$ - $\text{C}_4$ )alkoxy, phenoxy( $\text{C}_1$ - $\text{C}_4$ )alkyl, heteroaryloxy( $\text{C}_1$ - $\text{C}_4$ )alkyl, acyloxy, cyano, thiocyanato, nitro,  $-\text{CH}_2\text{NHR}$ ,  $-\text{NR}'\text{R}''$ ,  $-\text{NHCOR}'$ ,  $-\text{NHCONR}'\text{R}''$ ,  $-\text{CONR}'\text{R}''$ ,  $-\text{COOR}'$ ,  $-\text{O}-\text{SO}_2\text{R}'$ ,  $-\text{SO}_2\text{R}'$ ,  $-\text{COR}'$ ,  $-\text{CR}'=\text{NR}''$  or  $-\text{N}=\text{CR}'\text{R}''$  in which R is hydrogen,  $\text{C}_1$ - $\text{C}_4$  alkyl or phenyl and  $R'$  and  $R''$  are independently hydrogen,  $\text{C}_1$ - $\text{C}_4$  alkyl,  $\text{C}_1$ - $\text{C}_4$  alkoxy,  $\text{C}_1$ - $\text{C}_4$  alkylthio,  $\text{C}_3$ - $\text{C}_6$  cycloalkyl,  $\text{C}_3$ - $\text{C}_6$  cycloalkyl( $\text{C}_1$ - $\text{C}_4$ )alkyl, phenyl or phenyl( $\text{C}_1$ - $\text{C}_4$ )alkyl, the phenyl and heteroaryl moieties of any of the foregoing substituents being optionally substituted in the same way as the phenyl or naphthyl value of  $R^1$ , provided that  $R^1$  includes at least one substituent selected from the group consisting of: hydroxy, mercapto,  $\text{C}_2$ - $\text{C}_4$  alkenyl,  $\text{C}_2$ - $\text{C}_4$  alkynyl,  $\text{C}_2$ - $\text{C}_4$  alkenyloxy,  $\text{C}_2$ - $\text{C}_4$  alkynyloxy, hydroxy( $\text{C}_1$ - $\text{C}_4$ )alkyl,  $\text{C}_3$ - $\text{C}_6$  cycloalkyl( $\text{C}_1$ - $\text{C}_4$ )alkyl, heteroaryl, heteroaryloxy, phenyl( $\text{C}_1$ - $\text{C}_4$ )alkyl in which the alkyl moiety is substituted with hydroxy, heteroaryl( $\text{C}_1$ - $\text{C}_4$ )alkyl, phenyl( $\text{C}_2$ - $\text{C}_4$ )alkenyl, heteroaryl( $\text{C}_2$ - $\text{C}_4$ )alkenyl, Phenyl( $\text{C}_1$ - $\text{C}_4$ )alkoxy, heteroaryl( $\text{C}_1$ - $\text{C}_4$ )alkoxy, phenoxy( $\text{C}_1$ - $\text{C}_4$ )alkyl, heteroaryloxy( $\text{C}_1$ - $\text{C}_4$ )alkyl, acyloxy,  $-\text{CH}_2\text{NHR}$ ,  $-\text{CR}'=\text{NR}''$  or  $-\text{N}=\text{CR}'\text{R}''$ ; Y is oxygen or sulphur;  $R^2$  and  $R^3$  are both hydrogen; X is halogen,  $\text{C}_1$ - $\text{C}_4$  alkyl,  $\text{C}_1$ - $\text{C}_4$  alkoxy, nitro or cyano; and n is 0 or an integer of 1 to 3, the heteroaryl moieties in all instances being either pyridinyl or pyrimidinyl.

5,438,060

#### METHOD OF REDUCING ELEVATED INTRAOCULAR PRESSURE

Hirohisa Miyazaki, Osaka; Kumiko Fujinaga, Higashiosaka, and Hitoshi Tanaka, Nara, all of Japan, assignors to Rohto Pharmaceutical Co., Ltd., Japan

Filed Jul. 12, 1994, Ser. No. 273,806

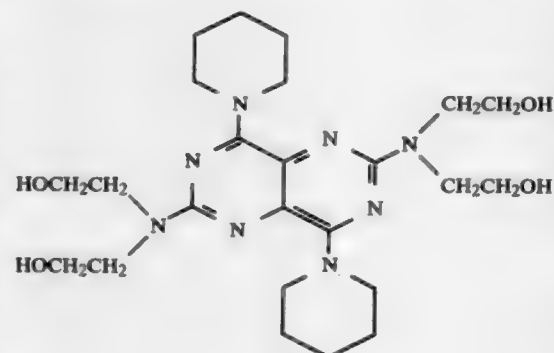
Claims priority, application Japan, Mar. 17, 1994, 6-047096

Int. Cl.<sup>6</sup> A61K 31/505

U.S. Cl. 514-258

2 Claims

1. A method of reducing intraocular pressure which comprises administering an effective amount of the compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof to patients suffering from elevated intraocular pressure.

5,438,061

#### 7-SUBSTITUTED-8,6-AZASTEROID DERIVATIVES AS 5 $\alpha$ -REDUCTASE INHIBITORS

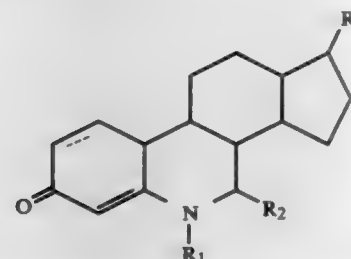
Jeffrey P. Bergman, Ridgefield Park; Donald W. Graham, Mountainside; Gary H. Rasmussen, Watchung; Richard L. Tolman, Warren, and Derek Von Langen, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 16, 1993, Ser. No. 93,107

Int. Cl.<sup>6</sup> C07D 221/18; A61K 31/44

U.S. Cl. 514-284

1. A compound of the formula I



or a pharmaceutically acceptable salt thereof, wherein:

$R_1$  is selected from the group consisting of hydrogen and methyl;

$R_2$  is methyl;

$R_3$  is selected from the group consisting of hydrogen, [Alk- $R_4$ ], X-Alk,  $\text{C}_1$ -X-Alk, XCO-Alk, and [CN, CO-Alk,] CO-Ar, [CO-O-Alk, CO-NH-Alk, CO-NH-Ar, CO-NH-Het and CO-N(Alk)<sub>2</sub>];

Alk is  $\text{C}_1$ - $\text{C}_{12}$  straight or branched alkyl;

Ar is phenyl; and

X is selected from the group consisting of O, NH and S.

5,438,062

#### BENZO(5,6)CYCLOHEPTAPYRIDINES, COMPOSITIONS AND METHODS OF USE

John J. Piwinski, Parsippany; Ashit K. Ganguly, Upper Montclair; Michael J. Green, Skillman; Frank J. Villani, Fairfield, and Jesse Wong, Union, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 816,777, Jan. 2, 1992, abandoned, which is a division of Ser. No. 345,604, May 1, 1989, Pat. No. 5,089,496, which is a continuation-in-part of Ser. No. 181,860, Apr. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 925,342, Oct. 31, 1986, Pat. No. 4,826,853. This application Sep. 23, 1992, Ser. No. 950,986

Claims priority, application European Pat. Off., Oct. 29, 1987, 87115890

The portion of the term of this patent subsequent to Feb. 18, 2009, has been disclaimed.

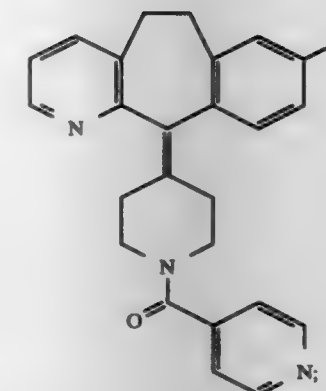
Int. Cl.<sup>6</sup> C07D 221/06, 401/14; A61K 31/44, 31/495

U.S. Cl. 514-290

8 Claims

1. A compound having the name:

1-(4-pyridinylcarbonyl)-4-(8-chloro-5,6-dihydro-11H-benzo[5,6]cyclohepta-[1,2-b]pyridin-11-ylidene)piperidine, i.e.,



4 Claims

1-(2-pyridinylcarbonyl)-4-(8-chloro-5,6-dihydro-11H-benzo[5,6]cyclohepta-[1,2-b]pyridin-11-ylidene)piperidine; 1-(3-pyridinylcarbonyl)-4-(8-chloro-5,6-dihydro-11H-benzo[5,6]cyclohepta-[1,2-b]pyridin-11-ylidene)piperidine; 1-(2-pyrazinylcarbonyl)-4-(8-chloro-5,6-dihydro-11H-benzo[5,6]cyclohepta[1,2-b]pyridin-11-ylidene)piperidine; or 1-(4-pyridazinylcarbonyl)-4-(8-chloro-5,6-dihydro-11H-benzo[5,6]cyclohepta[1,2-b]pyridin-11-ylidene)piperidine.

5,438,063

#### IMIDAZOPYRIDINES AS ANGIOTENSIN II ANTAGONISTS

Mathias Osswald, Zwingenberg; Werner Mederski, Erzhausen; Dieter Dorsch, Ober-Ramstadt; Pierre Schelling, Muhlthal; Norbert Beier, Reinheim; Ingeborg Lues, Darmstadt, and Klaus-Otto Minck, Ober-Ramstadt, all of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Germany

Filed Jun. 6, 1994, Ser. No. 254,834

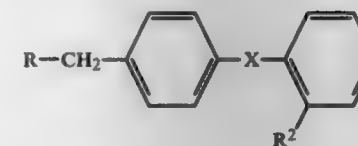
Claims priority, application Germany, Jun. 7, 1993, 43 18 813.3

Int. Cl.<sup>6</sup> A61K 31/435; C07D 471/04

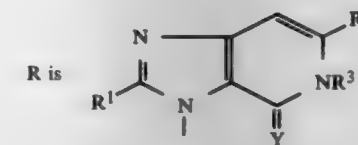
U.S. Cl. 514-303

30 Claims

1. An imidazopyridine of formula I:



wherein



$R^1$  is A,  $\text{C}_2$ - $\text{C}_6$ -alkenyl,  $\text{C}_2$ - $\text{C}_6$ -alkynyl,  $\text{C}_3$ - $\text{C}_8$ -cycloalkyl  $-\text{C}_6\text{H}_4$ , or  $\text{C}_1$ - $\text{C}_6$ -alkyl in which a  $\text{CH}_2$  group is replaced by O or S;

$R^2$  is  $-\text{SO}_2\text{NH}-\text{COOR}^5$ ,  $-\text{SO}_2\text{NH}-\text{COR}^5$ ,  $-\text{SO}_2\text{NH}-\text{SO}_2\text{R}^5$ ,  $-\text{SO}_2\text{NH}-\text{CONR}^5\text{R}^6$ ,  $-\text{C}(\text{NH}_2)=\text{NOH}$ , 4,5-dihydro-5-oxo-1,2,4-oxadiazol-3-yl, 4,5-dihydro-5-thioxo-1,2,4-oxadiazol-3-yl, 2-oxo-3H-1,2,3,5-oxathiadiazol-4-yl, 2,2-dioxo-3H-1,2,3,5-oxathiadiazol-4-yl, 2,3-dihydro-3-oxo-1,2,4-oxadiazol-5-yl, 2,5-dihydro-2,5-dioxo-1H-imidazol-4-yl, 4,5-dihydro-5-oxo-1H-1,2,4-triazol-3-yl, 4,5-dihydro-5-thioxo-1H-1,2,4-triazol-3-yl, 2,3-dihydro-2-oxo-1,3,4-thiadiazol-5-yl or 4,5-dihydro-5-oxo-1,2,4-thiadiazol-3-yl;



$R^3$  is  $-C_6H_2R^{12}$ ,  $CHR^{13}-C_6H_2R^{14}$ , or cinnamyl;  
 $R^4$  is H or Hal;  
 $R^5$  and  $R^6$  are each, independently, H,  $C_1-C_6$ -alkyl wherein one  $CH_2$  group can be replaced by O, or S or can contain a C-C double bond and which can additionally be substituted by OH, OR<sup>7</sup>, Ar, Het<sup>2</sup>, NR<sup>7</sup>R<sup>8</sup>, NR<sup>7</sup>-COOR<sup>8</sup>, NR<sup>7</sup>-COO- $C_6H_2R^{12}$ -Ar, NR<sup>2</sup>-COO- $C_6H_2R^{12}$ -Het<sup>2</sup> and/or COOR<sup>7</sup>, or are  $C_2-C_6$ -cycloalkyl, CF<sub>3</sub>, Ar or Het<sup>2</sup>;  
 $R^7$  and  $R^8$  are each, independently, A,  $C_2-C_6$ -alkenyl,  $C_2-C_6$ -alkynyl,  $C_3-C_8$ -cycloalkyl- $C_6H_2R^{12}$  or  $C_1-C_6$ -alkyl wherein one  $CH_2$  group is replaced by O or S;  
 $R^9$  and  $R^{10}$  are each, independently, H, A,  $C_2-C_6$ -alkenyl or  $C_2-C_6$ -alkynyl, Ar,  $ArC_6H_2R^{12}$  or Het<sup>2</sup>;  
 $R^9$  can also be  $-CH_2COOA$ ,  $-SO_2-A$  or  $-SO_2-Ar$ ;  
 $R^9$  and  $R^{10}$  together can also be an alkylene chain having 2-5 C atoms, which can be monosubstituted or polysubstituted by carbonyl oxygen, Ar, Het<sup>2</sup>,  $-CO-Ar$ ,  $-COOA$ ,  $-CO-N(A)_2$ ,  $-CH_2OH$ ,  $-SO_2-Ar$  and/or  $-NH-CO-A$  and/or interrupted by O or by  $-NR^{19}$ ;  
 $R^{11}$  is  $C_1-C_5$ -alkyl, wherein one or more H atoms can be replaced by F;  
 $R^{12}$  is Ar, Het<sup>1</sup>, 1H-tetrazol-5-yl,  $-CO-NR^9R^{10}$ ,  $-CO-R^{17}$ ,  $-C(=NR^{15})-A$ ,  $-C(=NR^{15})-Het^2$ ,  $-S(O)_m-A$ ,  $-S(O)_m-Ar$ ,  $-S(O)_m-Het^2$ ,  $-SO_2-NH-Het^2$  or  $-SO_2-OR^{18}$ ;  
 $R^{13}$  is COOH, COOA,  $CONR^9R^{10}$ , CN, NO<sub>2</sub>, NHCOR<sup>14</sup>,  $NHSO_2R^{14}$  or 1H-tetrazol-5-yl;  
 $R^{14}$  is Ar or cycloalkyl having 3-8 C atoms;  
 $R^{15}$  is H, OH, CN, R<sup>16</sup>, OR<sup>16</sup> or OAr;  
 $R^{16}$  is A,  $C_2-C_6$ -alkenyl or  $C_2-C_6$ -alkynyl;  
 $R^{17}$  is  $-NH-CHR^{18}-COOH$ ,  $-NH-CHR^{18}-COOA$ ,  $-CH_2S(O)_m-Ar$ ,  $-CH_2-COOA$ ,  $-C_6H_2R^{12}-NHC(O)OA$ ;  
 $R^{18}$  is H or A;  
 $R^{19}$  is H, A, Ar, COOA, Het<sup>2</sup> or  $SO_2-Ar$ ;  
X is absent or is  $-NH-CO-$  or  $-CO-NH-$ ;  
Y is O or S;  
A is  $C_1-C_6$ -alkyl;  
Ar is unsubstituted phenyl or phenyl monosubstituted or disubstituted by R<sup>11</sup>, OH, OR<sup>11</sup>, COOH, COOA, CN, NO<sub>2</sub>, NH<sub>2</sub>, NHA, N(A)<sub>2</sub>, NHCOR<sup>11</sup>, NHC(O)OA,  $NHSO_2R^{11}$ , Hal and/or 1H-tetrazol-5-yl;  
Het<sup>1</sup> is a five- or six-membered saturated heterocyclic radical having 1 to 3 N, O and/or S atoms, which can be monosubstituted by carbonyl oxygen or  $=NR^{15}$  and/or whose ring N atom(s) can in each case be substituted by A or Ar;  
Het<sup>2</sup> is a five- or six-membered heteroaromatic radical having 1 to 3 N, O and/or S atoms, which is unsubstituted or substituted by one or more A groups and which can be fused with a benzene or pyridine ring;  
Hal is F, Cl, Br or I;  
k is 0, 1, 2, 3 or 4;  
m is 0, 1 or 2;  
n is 1, 2, 3, 4, 5 or 6; and  
t is 1, 2, 3 or 4; or a salt thereof.

5,438,064

#### DERIVATIVES OF 4-ANILINOQUINOLINE-3-CARBOXAMIDE AS ANALGESIC AGENTS

Dominick Mobilio, Somerset, and Albert J. Molinari, Princeton, both of N.J., assignors to American Home Products Corporation, Madison, N.J.

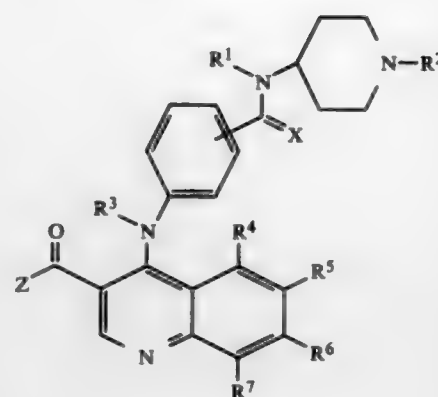
Filed Dec. 23, 1991, Ser. No. 812,791

Int. Cl.<sup>6</sup> C07D 215/46; A61K 31/47

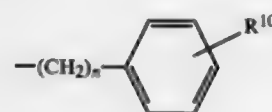
U.S. Cl. 514-313

21 Claims

1. A compound of the formula:

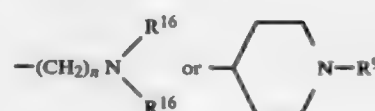


wherein:

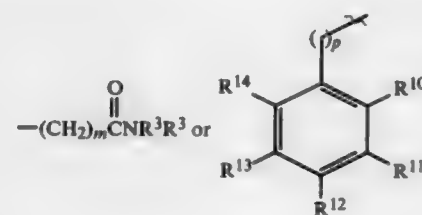
X=O or H<sub>2</sub>;R<sup>1</sup>=H when X=O, or H or R<sup>15</sup>CO when X=H<sub>2</sub>;R<sup>2</sup>=lower alkyl, cycloalkyl,  $-(CH_2)_m$ -cycloalkyl, $-(CH_2)_mCONR^3R^3$ , or

where

m is 1 to 10 and n is 1 to 4;

R<sup>3</sup>=H or lower alkyl;R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> are independently H, lower alkyl, fluoro, chloro, bromo, iodo, lower alkoxy, or perfluorolower alkyl;Z=R<sup>8</sup>N-R<sup>17</sup> where R<sup>17</sup> is

wherein

R<sup>8</sup>=H, or R<sup>16</sup> wherein R<sup>16</sup> is lower alkyl andR<sup>9</sup>=lower alkyl,

and

P is 1 to 4;

R<sup>10</sup>, R<sup>11</sup>, R<sup>12</sup>, R<sup>13</sup> and R<sup>14</sup> are independently H, lower alkyl, fluoro, chloro, bromo, iodo, lower alkoxy, perfluorolower alkyl,  $-CONR^{16}R^{16}$ ,  $-CONHR^{16}$ ,  $-CONH_2$ , NO<sub>2</sub>, OH, NH<sub>2</sub>,  $-NHCONH_2$ ,  $-NR^3CONR^3R^3$ , or  $-SO_2R^{16}$  wherein y=0, 1 or 2,R<sup>15</sup>=H, lower alkyl, phenyl, phenylalkyl, perfluorolower alkyl, or  $-(CH_2)_m$ -cycloalkyl;

or a pharmaceutically acceptable salt thereof.

5,438,065

## DIAMINOETHYLENE COMPOUNDS

Hideki Uneme, Osaka; Isao Minamida, Kawabe, and Tetsuo Okauchi, Hirakata, all of Japan, assignors to Takeda Chemical Industries, Osaka, Japan

Filed Apr. 12, 1990, Ser. No. 507,776

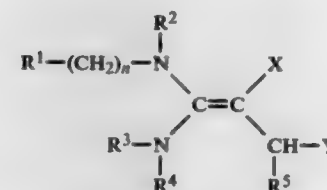
Claims priority, application Japan, Apr. 14, 1989, 1-95580; Aug. 2, 1989, 1-201980

Int. Cl.<sup>6</sup> A61K 31/44; C07D 213/38

U.S. Cl. 514-353

21 Claims

1. A diaminoethylene compound of the formula:



wherein R<sup>1</sup> is a heterocyclic group which may be substituted; R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> may be the same or different and are a hydrogen atom or a hydrocarbon group which may be substituted, or R<sup>3</sup> and R<sup>4</sup> are combined to form a cyclic amino group together with the adjacent nitrogen atom; R<sup>5</sup> is a hydrogen atom, a hydrocarbon group which may be substituted or a heterocyclic group which may be substituted; n is 0 or 1, X is an electron attractive group; Y is a group of the formula  $-OR^6$  (in which R<sup>6</sup> is a hydrogen atom, a hydrocarbon group which may be substituted or a heterocyclic group which may be substituted), a group of the formula  $-NR^7R^8$  (in which R<sup>7</sup> and R<sup>8</sup> are the same or different, a hydrogen atom or a hydrocarbon group which may be substituted, or R<sup>7</sup> and R<sup>8</sup> are combined to form a cyclic amino group with the adjacent nitrogen atom), or a group of the formula:  $-S(O)_mR^9$  (in which R<sup>9</sup> is a hydrocarbon group which may be substituted or a heterocyclic group which may be substituted, and m is 0, 1 or 2) or its salt.

5,438,066

## OXA- AND THIADIAZOLE DERIVATIVES

Ian R. Matthews, Wokingham, United Kingdom, assignor to Zeneca Limited, London, England

Filed Oct. 27, 1993, Ser. No. 144,179

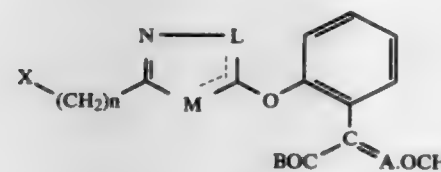
Claims priority, application United Kingdom, Nov. 4, 1992, 9223047; Jan. 22, 1993, 9301207; Jan. 22, 1993, 9301249; May 14, 1993, 9309964; May 14, 1993, 9309965

Int. Cl.<sup>6</sup> C07D 271/06, 285/10; A01N 43/82

U.S. Cl. 514-361

11 Claims

1. A compound having the general formula (I):



or a stereoisomer thereof, wherein A is CH or N; B is OCH<sub>3</sub> or NHCH<sub>3</sub>; one of L and M is N and the other is S or O; n is 0 or 1; and X is an optionally substituted carbocyclic or heterocyclic group selected from phenyl, naphthyl, pyridinyl, pyrimidinyl, pyridazinyl, pyrazinyl, triazinyl, furyl, thienyl, pyrrolyl, pyrazolyl, imidazolyl, triazolyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, quinolinyl, isoquinolinyl, cinnolinyl, quinazolinyl, quinoxalinyl, indolinyl, isoindolinyl, benzofuranyl, benzothienophenyl, benzimidazolinyl, benzoxazolyl, benzthiazolyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, norbornanyl, adamantyl, cyclopentenyl, cycloheptenyl, cyclooctenyl, cyclohexenyl, norbornenyl, oxiranyl, aziridinyl, azetidyl, pyrrolidinyl, tetrahydrofuranlyl, tetrahydrothiophenyl, piperidinyl, tetrahydropyranlyl, tetrahydrothi-

opyranlyl, morpholinyl and morpholino, the carbocyclic or heterocyclic group being optionally substituted with one or more of the following: halo, hydroxy, mercapto,  $C_{1-4}$  alkyl,  $C_{2-4}$  alkenyl,  $C_{2-4}$  alkynyl,  $C_{1-4}$  alkoxy,  $C_{2-4}$  alkenyloxy,  $C_{2-4}$  alkynyloxy, halo( $C_{1-4}$ )alkyl, halo( $C_{1-4}$ )alkoxy,  $C_{1-4}$  alkylthio, hydroxy( $C_{1-4}$ )alkyl,  $C_{1-4}$  alkoxy( $C_{1-4}$ )alkyl,  $C_{3-6}$  cycloalkyl,  $C_{3-6}$  cycloalkyl( $C_{1-4}$ )alkyl, methylenedioxy or ethylenedioxy in which the methylene or ethylene group is optionally substituted with fluorine or  $C_{1-4}$  alkyl, phenyl, pyridyl, pyrimidinyl, phenoxy, pyridyloxy, pyrimidinyl, phenyl( $C_{1-4}$ )alkyl in which the alkyl moiety is optionally substituted with hydroxy, pyridyl( $C_{1-4}$ )alkyl, pyrimidinyl( $C_{1-4}$ )alkyl, phenyl( $C_{2-4}$ )alkenyl, pyridyl( $C_{2-4}$ )alkenyl, pyrimidinyl( $C_{2-4}$ )alkenyl, phenyl( $C_{1-4}$ )alkoxy, pyridyl( $C_{1-4}$ )alkoxy, pyrimidinyl( $C_{1-4}$ )alkoxy, phenoxy( $C_{1-4}$ )alkyl, pyridyloxy( $C_{1-4}$ )alkyl, pyrimidinyl( $C_{1-4}$ )alkyl,  $C_{1-4}$  alkanoyloxy, benzoyloxy, cyano, thiocyanato, nitro,  $-NR^7R^8$ ,  $-NHCOR^9$ ,  $-NHCONR^7R^8$ ,  $-CONR^7R^8$ ,  $-COOR^9$ ,  $-OSO_2R^9$ ,  $-SO_2R^9$ ,  $-COR^9$ ,  $-CR^9=NR^9$  or  $-N=CR^9R^9$  in which R<sup>7</sup> and R<sup>8</sup> are independently hydrogen,  $C_{1-4}$  alkyl,  $C_{1-4}$  alkoxy,  $C_{1-4}$  alkylthio,  $C_{3-6}$  cycloalkyl,  $C_{3-6}$  cycloalkyl( $C_{1-4}$ )alkyl, phenyl or benzyl, the phenyl and benzyl groups being optionally substituted with halogen,  $C_{1-4}$  alkyl or  $C_{1-4}$  alkoxy, and the phenyl, pyridyl and pyrimidinyl rings of any of the foregoing substituents other than R<sup>7</sup> and R<sup>8</sup> being optionally substituted with one or more of the following: halo, hydroxy, mercapto,  $C_{1-4}$  alkyl,  $C_{2-4}$  alkenyl,  $C_{2-4}$  alkynyl,  $C_{1-4}$  alkoxy,  $C_{2-4}$  alkenyloxy,  $C_{2-4}$  alkynyloxy, halo( $C_{1-4}$ )alkyl, halo( $C_{1-4}$ )alkoxy,  $C_{1-4}$  alkylthio, hydroxy( $C_{1-4}$ )alkyl,  $C_{1-4}$  alkoxy( $C_{1-4}$ )alkyl,  $C_{3-6}$  cycloalkyl,  $C_{3-6}$  cycloalkyl( $C_{1-4}$ )alkyl, alkanoyloxy, benzoyloxy, cyano, thiocyanato, nitro,  $-NR^7R^8$ ,  $-NHCOR^9$ ,  $-NHCONR^7R^8$ ,  $-CONR^7R^8$ ,  $-COOR^9$ ,  $-OSO_2R^9$ ,  $-SO_2R^9$ ,  $-COR^9$ ,  $-CR^9=NR^9$  or  $-N=CR^9R^9$  in which R<sup>7</sup> and R<sup>8</sup> have the meanings given above.

5,438,067

MEDETOMIDINE PREPARATIONS FOR  
TRANSDERMAL ADMINISTRATION

Harry Jalonen, Turku, and Arto Karjalainen, Oulu, both of Finland, assignors to Orion-yhtymä Oy, Espoo, Finland

Filed Nov. 12, 1993, Ser. No. 146,201

Claims priority, application United Kingdom, May 31, 1991, 9111732.5

Int. Cl.<sup>6</sup> A61L 15/44; A61K 9/70; A61F 13/00, 13/02

U.S. Cl. 514-396

17 Claims

1. A transdermal preparation comprising a lipophilic salt of medetomidine or its optically active enantiomer with a carboxylic acid of 5 to 16 carbon atoms containing an aliphatic chain of at least 5 carbon atoms, as an active ingredient and a hydrophilic water soluble vehicle.

5,438,068

METHOD OF TREATING COLON DISTURBANCES  
WITH PHARMACEUTICAL COMPOSITIONS  
CONTAINING IMIDAZOL-1-YL COMPOUNDS

Christian Eeckhout, Bad Pyrmont; Ulf Preuschoff, Uelzen, and Samuel David, Hanover, all of Germany, assignors to Kali-Chemie Pharma, Hanover, Germany

Filed Nov. 3, 1993, Ser. No. 145,164

Claims priority, application Germany, Nov. 14, 1992, 42 38 553.9

Int. Cl.<sup>6</sup> A61K 31/415

U.S. Cl. 514-397

11 Claims

1. A method of treating a mammal suffering from a functional disturbance of its lower intestine associated with increased pain sensitivity upon stool passage through the lower intestine and/or anomalies in stool passage through the lower intestine, said method comprising administering to said mammal an effective intestinal function promoting amount of an imidazol-1-yl compound corresponding to the formula I:





- (1) a methacrylic acid type A copolymer, an anionic copolymer based on methacrylic acid and methylmethacrylate wherein the ratio of free carboxyl groups to the ester groups is approximately 1:1;
- (2) a methacrylic acid type B copolymer, an anionic copolymer based on methacrylic acid and methylmethacrylate wherein the ratio of free carboxyl groups to the ester groups is approximately 1:2;
- (3) a dimethylaminoethylacrylate/ethylmethacrylate copolymer, a copolymer based on acrylic and methacrylic acid esters with a low content of quaternary ammonium groups wherein the molar ratio of the ammonium groups to the remaining neutral (meth)acrylic acid esters is 1:20; and
- (4) an ethyl methacrylate/chlorotrimethylammoniumethyl methacrylate copolymer, a copolymer based on acrylic and methacrylic acid esters with a low content of quaternary ammonium groups wherein the molar ratio of the ammonium groups to the remaining neutral (meth)acrylic acid esters is 1:40.

5,438,077

# ION EXCHANGE RESINS CONTAINING GLYCIDYL ETHER SPACER GROUPS

Katsuo Komiya, Hikari; Toshikuni Koga, Shinnanyo, and Yoshio Kato, Shinnanyo, all of Japan, assignors to Toson Corporation, Yamaguchi, Japan

Continuation of Ser. No. 939,596, Sep. 2, 1992, abandoned. This application Jan. 19, 1994, Ser. No. 183,241

Claims priority, application Japan, Sep. 6, 1991, 3-254311

Int. Cl.<sup>6</sup> B01J 39/18, 39/20, 39/22

U.S. Cl. 521—37

10 Claims

1. An ion exchanger comprising a base material, a connecting group and at least one ion exchange group, where the base material has an alcoholic hydroxyl group, the connecting group is a glycidyl-adduct of a polyol and/or its oligomer, and the at least one ion exchange group is a sulfonic acid group or a quaternary ammonium group, the ion exchanger consisting essentially of porous particles having an average pore diameter of 30–1,000 nm in diameter and having a porosity of 30 to 95%, the base material being an insoluble crosslinked polymer material which is in gel form, where:

- the connecting group has a first terminal end and a second terminal end;
- the first terminal end of the connecting group is bonded to the base material through the alcoholic hydroxyl group of the base material; and
- the second terminal end of the connecting group is bonded to the at least one ion exchange group by at least one glycidyl group of the glycidyl-adduct of a polyol and/or its oligomer.

5,438,078

# METHOD FOR DEPOLYMERIZATION OF RUBBER

Jared A. Butcher, Jr., Athens, Ohio, and Huw Kidwell, West Glam, United Kingdom, assignors to Ohio University, Athens, Ohio

Filed Jan. 18, 1994, Ser. No. 183,016

Int. Cl.<sup>6</sup> C08C 19/08; C08F 8/18; C08J 11/18

U.S. Cl. 521—41

19 Claims

1. A method of degrading an organic vulcanized rubber for the purpose of recycling the components thereof, said rubber containing at least one organic component, said method comprising the steps of:

- (a) obtaining a portion of organic vulcanized rubber to be recycled;
- (b) treating said portion of said rubber with an effective amount of:
- (i) a solution of at least one organic hypochlorite; and
- (ii) at least one organic solvent;
- for sufficient time and at sufficient temperature whereby substantially all of said portion of said rubber is degraded to an

extent so as to be dispersed in said organic solvent, whereby said at least one organic component is extracted therefrom.

5,438,079

# METHOD FOR REDUCING THE MELT FLOW RATE OF FLAME RETARDANT EXPANDED POLYSTYRENE

Franklin A. Paris, late of Santa Cruz, Calif. by Darlene Paris, legal representative, assignor to Gary De Laurentiis, Scotts Valley; Gary Peterson, Pacific Palisades and Robert Schibel, Los Angeles, all of Calif.

Continuation of Ser. No. 68,558, May 27, 1993, Pat. No. 5,302,625. This application Apr. 11, 1994, Ser. No. 225,668

The portion of the term of this patent subsequent to Apr. 12, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C08J 9/36, 9/40

U.S. Cl. 521—146

16 Claims

1. A method for lowering the melt flow rate of flame retardant expanded polystyrene, comprising exposing the polystyrene to an aqueous solution of an alkali metal bicarbonate for a time sufficient to reduce the melt flow rate of said flame retardant expanded polystyrene.

5,438,080

# ULTRAVIOLET-CURABLE COATING COMPOSITION

Yoshifumi Ohama, Hyogo; Yoshihide Chihara, Osaka; Yasufumi Honda, Hyogo, and Yasuhiro Miyamoto, Hyogo, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 842,771, Mar. 2, 1992, abandoned, which is a continuation of Ser. No. 449,406, Dec. 19, 1989, abandoned, which is a continuation of Ser. No. 54,691, May 27, 1987, abandoned. This application Sep. 18, 1992, Ser. No. 946,778

Claims priority, application Japan, May 27, 1986, 61-120158; Apr. 10, 1987, 62-88479

Int. Cl.<sup>6</sup> C08F 2/46

U.S. Cl. 522—97

13 Claims

1. A process for forming a resin coating to a dry thickness of at least 60  $\mu$ m in a single coating step, said process comprising (i) coating on a substrate an ultraviolet-curable coating composition comprising:

- (A) an ultraviolet-curable polyfunctional (meth)acrylate which is at least one selected from the group consisting of:
- (a) an ester between a polyhydric alcohol and a (meth)acrylic acid,
- (b) a polyester acrylate composed of n mols of adipic acid, (n+1) mols of hexanediol and 2 mols of (meth)acrylic acid,
- (c) an epoxy(meth)acrylate obtained by esterifying an epoxy group of an epoxy compound with a (meth)acrylic acid, and
- (d) a polyurethane (meth)acrylate obtained by reacting hexamethylene diisocyanate with a (meth)acrylate having a hydroxyl group,

and which contains at least two (meth)acryloyl groups in the molecule thereof and has a number average molecular weight of from 190 to 2,000,

- (B) a homopolymer of a hydroxyl-containing monomer selected from the group consisting of hydroxyethyl (meth)acrylate, hydroxypropyl (meth)acrylate, polyethylene glycol mono(meth)acrylate, polypropylene glycol mono(meth)acrylate, neopentyl glycol mono(meth)acrylate, and glycerin mono(meth)acrylate, or a copolymer comprising said hydroxyl-containing monomer and one or more of other monomers copolymerizable therewith selected from the group consisting of methyl (meth)acrylate, ethyl (meth)acrylate, propyl (meth)acrylate, butyl (meth)acrylate, 2-ethylhexyl (meth)acrylate, and styrene, said homopolymer or copolymer having a hydroxyl number of from 10 to 200,
- (C) a non-yellowing polyisocyanate compound,

- (D) a photo stabilizer selected from an ultraviolet absorbent and an antioxidant, and
- (E) a photopolymerization initiator, wherein said component (A) is present in an amount of from 20 to 80% by weight, and the total amount of components (B) and (C) is from 80 to 20% by weight, based on the total amount of the components (A), (B), and (C) with said component (C) having an isocyanate equivalent of from 0.2 to 1.5 per hydroxyl equivalent of the component (B), said composition providing a cured film having a gloss retention of 90% or more and a color difference  $\Delta E^*$  of 2 or less when tested with a sunshine weatherometer for an exposure time of 1,000 hours, and
- (ii) curing said coating composition with UV irradiation.

5,438,081

# MICROWAVE-ACTIVATED PREPARATION OF SILICONE FOAMS, AND COMPOSITIONS USEFUL THEREIN

Larry N. Lewis, Scotia; William N. Schultz, Niskayuna; Lionel M. Levinson, Schenectady; Chris A. Sumpter, Scotia, and Judith Stein, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1994, Ser. No. 325,913

Int. Cl.<sup>6</sup> C08F 2/46; C08G 7/06; C08J 9/02

U.S. Cl. 522—99

10 Claims

1. A method for preparing a silicone foam which comprises exposing to microwave radiation a composition comprising a mixture of:

- (A) at least one polyorganosiloxane wherein about 0.0002–3.0% by weight of the organo groups bonded to silicon are vinyl groups;
- (B) 0.5–50 parts, per 100 parts of reagent A, of at least one hydride polysiloxane comprising organosiloxane units having one Si—H moiety and containing about 0.2–2.0% by weight hydrogen as Si—H groups;
- (C) at least about 2 parts, per 100 parts of reagent A, of at least one active hydrogen compound selected from the group consisting of water and hydroxyaliphatic compounds, at least part of said active hydrogen compounds being water;
- (D) as a catalyst, at least one cyclodextrin inclusion compound of a platinum group metal coordination complex in an amount effective to cause hydrosilylation of reagent A with reagent B and generation of hydrogen as a blowing agent; and
- (E) at least about 2%, based on said mixture, of at least one filler;
- all parts and percentages being by weight.

5,438,082

# POLYMER ELECTROLYTE MEMBRANE, AND PROCESS FOR THE PRODUCTION THEREOF

Freddy Helmer-Metzmann, Mainz; Frank Osan, Kelkheim/-Taunus; Arnold Schneller, Mainz; Helmut Ritter, Wuppertal; Konstantin Ledjeff, Krozingen; Roland Nolte, Freiburg, and Ralf Thorwirth, Wuppertal, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 10, 1993, Ser. No. 75,219

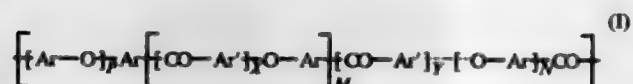
Claims priority, application Germany, Jun. 13, 1992, 42 19 412.1; Dec. 17, 1992, 42 42 692.8

Int. Cl.<sup>6</sup> C08G 12/00; C08J 3/24; C08F 2/48

U.S. Cl. 522—149

11 Claims

1. A process for the production of a polymer electrolyte membrane from sulfonated, aromatic polyether ketone, in which an aromatic polyether ketone of the formula (I)



in which

Ar is a phenylene ring having p- and/or m-bonds,  
Ar' is a phenylene, naphthylene, biphenylene, or anthrylene divalent aromatic unit,  
X, N and M, independent of one another are 0 or 1,  
Y is 0, 1, 2 or 3,  
P is 1, 2, 3 or 4,

is sulfonated, the sulfonic acid is isolated and dissolved in an organic solvent, and the solution is converted into a film, which comprises converting at least 5% of the sulfonic acid groups in the sulfonic acid into sulfonyl chloride groups, reacting the sulfonyl chloride groups with an amine containing at least one ethylenically unsaturated polymerizable radical or a furfuryl functional group, where from 5% to 25% of the original sulfonic groups are converted into sulfonamide groups, subsequently hydrolyzing unreacted sulfonyl chloride groups, isolating the resultant aromatic sulfonamide and dissolving it in an organic solvent, converting the solution into a film, and then crosslinking the ethylenically unsaturated polymerizable radicals and/or furfuryl functional groups in the film.

5,438,083

# COLLOIDAL PARTICLE DISPERSION AND WATER-BASED COATING COMPOSITION

Masaaki Takimoto, Osaka; Minoru Izumi, Hyogo, and Hirotaka Yamamoto, Tokyo, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jan. 21, 1994, Ser. No. 183,855

Claims priority, application Japan, Jan. 21, 1993, 5-008636

Int. Cl.<sup>6</sup> C08K 3/20; C08L 63/02

U.S. Cl. 523—401

10 Claims

1. A water-based coating composition which comprises a colloidal particle dispersion comprising mainly (1) a fumed silica or fumed aluminum silicate, (2) a colloidalizing agent (aid) which is at least one compound selected from the group consisting of a phosphoric acid compound, a molybdic acid compound, a boric acid compound, and a silicic acid compound, and (3) water.

5,438,084

# FLAME-RETARDANT POLYAMIDE-CONTAINING RESIN COMPOSITION AND FLAME RETARDANT

Takeshi Imahashi, Nagao, Japan, assignor to Kyowa Chemical Industry Co., Ltd., Kagawa, Japan

Continuation of Ser. No. 27,059, Mar. 5, 1993, abandoned. This application Jan. 12, 1995, Ser. No. 371,616

Claims priority, application Japan, Mar. 16, 1992, 4-090103

Int. Cl.<sup>6</sup> C08L 77/02, 77/06; C08K 3/02, 3/22

U.S. Cl. 523—440

4 Claims

1. A flame-retardant polyamide-containing resin composition containing 100 parts by weight of an aliphatic polyamide-containing resin, 2 to 50 parts by weight of magnesium hydroxide, 1 to 15 parts by weight of red phosphorus and 0.1 to 5 parts by weight of an epoxy resin.

5,438,085

# SIMULATED LEATHER-LIKE COATING FOR A VEHICLE SUBSTRATE

John Burkett, 4705 Meadowbrook, Clarkston, Mich. 48016

Continuation-in-part of Ser. No. 898,918, Jun. 12, 1992, abandoned. This application Jun. 11, 1993, Ser. No. 76,007

Int. Cl.<sup>6</sup> C08L 1/00; C08K 5/06, 3/34

U.S. Cl. 524—31

7 Claims

1. A lacquer composition for producing a leather-like appearance coating on an acrylic lacquer substrate, said composition comprising:

- from about 35% to about 85% of a lacquer constituent, wherein said lacquer constituent comprises an acrylic lacquer paint and a drying retarder; and
- from about 25% to about 75% of a flattening agent, wherein said flattening agent comprises from about 1% to about 40% of a silicon dioxide, from about 3% to about 10% of



a nitrocellulose constituent from about 15% to about 30% of an alcohol constituent, with any remainder comprising volatile solvents the total amount of said lacquer constituent and said flattening agent not exceeding 100%, whereby a leather grained coating is formed on said substrate upon application of said coating.

5,438,086

# HYDROLYTICALLY STABLE PENTAERYTHRITOL DIPHOSPHITES

Donald R. Stevenson, 1532 Tremont, Dover, Ohio 44622, and Satyanarayana Kodali, 31 Candle Light La., Dover, Ohio 44622

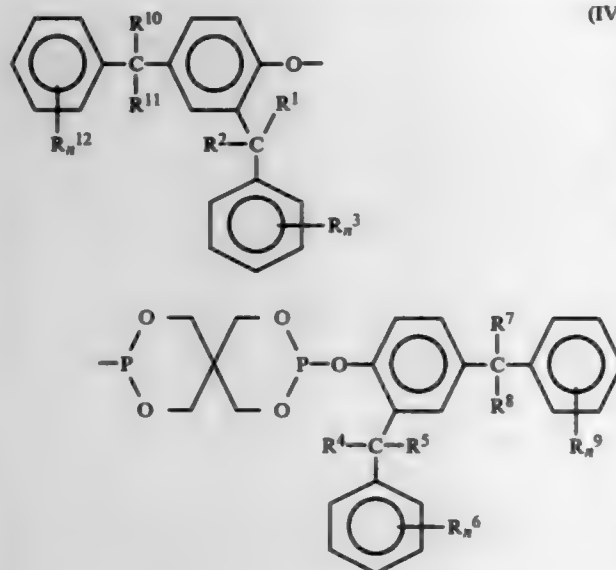
Continuation-in-part of Ser. No. 108,658, Aug. 30, 1993, Pat. No. 5,364,895. This application Apr. 25, 1994, Ser. No. 232,950. The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C07F 9/6578; C08K 5/527

U.S. Cl. 524—120

14 Claims

1. A diphosphite of formula (IV) with improved resistance to hydrolysis and increased thermal stability comprising:



and wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>10</sup> and R<sup>11</sup> are selected independently from the group consisting of hydrogen and alkyl radicals of generic formula C<sub>m</sub>H<sub>2m+1</sub> wherein m ranges from 1 to 4 and R<sup>3</sup>, R<sup>6</sup>, R<sup>9</sup> and R<sup>12</sup> are selected independently from the group consisting of hydrogen, halogens and alkyl radicals of generic formula C<sub>n</sub>H<sub>2n+1</sub> wherein n ranges from 1 to 4, and further wherein n ranges from 1 to 3.

5,438,087

# PAPER SIZING COMPOSITION

Tsuyoshi Ikeda; Kiyoshi Iwai; Koji Ohta; Satoshi Hyuga, and Masatoshi Hotta, all of Ichihara, Japan, assignors to Japan PMC Corporation, Tokyo, Japan

Continuation of Ser. No. 632,540, Dec. 24, 1990, abandoned. This application Jun. 21, 1993, Ser. No. 79,454

Claims priority, application Japan, Dec. 28, 1989, 1-338363; Jul. 6, 1990, 2-177534

Int. Cl.<sup>6</sup> C08L 93/04

U.S. Cl. 524—272

9 Claims

1. A paper sizing emulsion composition which comprises (A) at least one rosin material and (B) a cationic acrylamide copolymer containing 50–95 mol % of monomeric units selected from the group consisting of acrylamide and methacrylamide, 3–50 mol % of at least one hydrophobic monomer selected from the group consisting of alkyl esters of methacrylic acid, alkyl esters of acrylic acid, styrene or a derivative thereof, C<sub>6</sub>–C<sub>22</sub> olefin, acrylonitrile, methacrylonitrile, vinyl ester and

C<sub>1</sub>–C<sub>22</sub> alkylvinyl ether and 2–30 mol % of cationic monomer selected from the group consisting of (mono- or dialkyl) aminoalkyl acrylate or methacrylate, (mono- or dialkyl) aminoalkyl acrylamide or methacrylamide, vinylimidazole, diallylamine, (mono- or dialkyl)amino-hydroxyalkyl acrylate or methacrylate, (mono- or dialkyl) aminohydroxyalkylvinylether, vinyl-pyridine and quaternized salts thereof, wherein said rosin material is directly dispersed in water and stabilized with said copolymer.

5,438,088

# SETTLING STABILIZATION OF POLYMER CONTAINING PARTICLE DISPERSIONS IN OIL

Anthony G. Sommes, and R. Nagarajan, both of Naperville, Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Mar. 3, 1994, Ser. No. 205,225

Int. Cl.<sup>6</sup> C08K 3/10

U.S. Cl. 524—310

10 Claims

1. A method for stabilizing a water-in-oil latex dispersion, suitable for pumping against sedimentation comprising adding a stabilizing amount of hydrogenated castor oil to the latex wherein the dispersion includes a water soluble vinyl addition polymer particle suspended in an oil.

5,438,089

# PROCESS FOR THE MANUFACTURE OF POLYMERIC OBJECTS STARTING FROM A SOLUTION

Roderik H. Höppener, Maastricht, Netherlands, assignor to DSM N.V., Netherlands

Filed Dec. 14, 1993, Ser. No. 165,854

Claims priority, application Belgium, Dec. 21, 1992, 9201116

Int. Cl.<sup>6</sup> D01F 6/04; C08K 5/01; C08L 23/06

U.S. Cl. 524—487

9 Claims

1. A process for manufacture of an object comprising providing a solvent-containing polymeric object wherein the solvent is comprised of a first and a second component wherein the first component is more volatile than the second component; shaping the solvent-containing polymeric object; removing the first component from said solvent-containing polymeric object; and drawing the polymeric object in the presence of the second component.

5,438,090

# MASTERBATCH COMPOSITION FOR THERMOPLASTIC RESIN MODIFICATION AND METHOD FOR PREPARING SAID MASTERBATCH COMPOSITION

Saburo Matsubara, and Yoshihiro Goushi, both of Yokohama, Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan. Continuation of Ser. No. 301,358, Jan. 25, 1989, abandoned. This application Mar. 27, 1990, Ser. No. 501,415

Claims priority, application Japan, Feb. 5, 1988, 63-23843

The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.

Int. Cl.<sup>6</sup> C08K 5/01; C08J 3/20

U.S. Cl. 524—490

10 Claims

1. A method for preparing a masterbatch composition for thermoplastic resin modification which comprises kneading and extruding a component mixture at a temperature ranging from the maximum peak temperature (T<sub>m</sub>) to (T<sub>m</sub>-45)° C. in accordance with differential scanning calorimetry (DSC) of an ethylene-α-olefin copolymer, the component mixture comprising:

(A) 30–95 parts by weight of an ethylene-α-olefin copolymer obtained by copolymerizing ethylene with an α-olefin having 3–12 carbon atoms in the presence of a catalyst composed of an organic aluminum compound and a solid component containing at least magnesium and titanium, and characterized by the properties (I)–(IV):  
(I) Melt index of 0.01–100 g/10 min,

- (II) Density of 0.860–0.910 g/cm<sup>3</sup>, (III) Maximum peak temperature (T<sub>m</sub>) of at least 100° C. in accordance with differential scanning calorimetry (DSC), and  
(IV) Boiling n-hexane insoluble matter of at least 10%; and  
(B) 5–70 parts by weight of a polybutene having a number average molecular weight of 300–4000.

5,438,091

# RESIN COMPOSITION HAVING EXCELLENT PAINT COATABILITY

Yoshiharu Saito; Masao Sakaizawa; Kunio Iwanami; Kitsuho Kitano; Michihisa Tasaka, all of Kawasaki; Kenji Kawazu, Aichi; Shizuo Miyazaki, Okazaki; Takao Nomura, Toyota; Takeyoshi Nishio, Okazaki, and Hisayuki Iwai, Aichi, all of Japan, assignors to Tonen Chemical Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Aichi, both of Japan

Continuation of Ser. No. 42,653, Apr. 2, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 329,136

Claims priority, application Japan, Jun. 4, 1992, 4-170149; Jun. 4, 1992, 4-170154

Int. Cl.<sup>6</sup> C08L 53/00

U.S. Cl. 524—505

3 Claims

1. A resin composition having excellent paint coatability comprising:

- (a) 50–80 weight % of a multi-stage polymerized propylene-ethylene block copolymer consisting essentially of (i) 80–95 weight % of a propylene homopolymer portion, (ii) 5–20 weight % of a propylene-ethylene random copolymer portion, and (iii) 10 weight % or less of an ethylene homopolymer portion, said propylene homopolymer portion (i) having an intrinsic viscosity of 0.9–1.2 dl/g, said propylene-ethylene random copolymer portion (ii) having an intrinsic viscosity of 4.0 dl/g or more, an ethylene content in said propylene-ethylene random copolymer portion (ii) being 30–70 weight %;  
(b) 10–20 weight % of an ethylene-propylene copolymer elastomer and 10–20 weight % of an ethylene-butene copolymer elastomer, the total amount of said ethylene-propylene copolymer and said ethylene-butene copolymer elastomer being 25–35 weight %, and  
(c) 20 weight % or less of an inorganic filler, wherein an elastomeric component consisting essentially of said propylene-ethylene random copolymer portion (ii) in said multi-stage polymerized propylene-ethylene block copolymer, said ethylene-propylene copolymer elastomer and said ethylene-butene copolymer elastomer, which is soluble in p-xylene at room temperature, meets at least one of the following requirements of:  
(i) a number-average molecular weight of 4×10<sup>4</sup> or more and a weight-average molecular weight of 20×10<sup>4</sup> or more;  
(ii) a crystallinity of 20–30%; and  
(iii) a melting point of 50° C. or higher.

5,438,092

# HYDROPHILIC AND AMPHIPHATIC MONOMERS, THEIR POLYMERS AND GELS AND HYDROPHOBIC ELECTROPHORESIS

Branko Kozulic, and Urs Heimgartner, both of Zurich, Switzerland, assignors to Elchrom, Ltd., Horgen, Switzerland. Division of Ser. No. 972,343, Nov. 6, 1992, Pat. No. 5,278,270, and a continuation-in-part of Ser. No. 696,696, May 7, 1991, Pat. No. 5,202,007, which is a continuation-in-part of Ser. No. 688,752, Apr. 22, 1991, Pat. No. 5,185,466, and Ser. No. 293,840, Jan. 5, 1989, abandoned, said Ser. No. 972,343, is a division of Ser. No. 688,752, Jan. 5, 1989. This application Nov. 4, 1993, Ser. No. 145,635

Claims priority, application United Kingdom, Apr. 20, 1990, 9008473

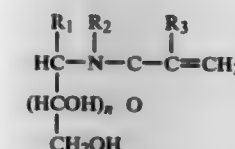
Int. Cl.<sup>6</sup> C08L 39/00

U.S. Cl. 524—555

8 Claims

1. A crosslinked aqueous gel comprising a water-insoluble

copolymer comprising repeating units derived from a monomer of the formula:



wherein

R<sub>1</sub> is H, CH<sub>2</sub>OH or (CHOH)<sub>m</sub>CH<sub>2</sub>OH, m being 1 or 2;  
R<sub>2</sub> is H, monohydroxyalkyl, polyhydroxyalkyl or hydrocarbon radical;  
R<sub>3</sub> is H or CH<sub>3</sub>; and  
n is an integer of 1–4  
and units derived from a cross-linker with at least two polymerizable double bonds.

5,438,093

# MODIFIED POLYCYCLOOLEFINS

Paul T. Strichartz; Robert J. Minchak, Parma Heights; Timothy J. Kettering, Middleburg Heights; Dennis J. Janda, Parma, and Glen R. Gribble, Jr., Barberton, all of Ohio, assignors to B. F. Goodrich Company, Akron, Ohio. Continuation of Ser. No. 810,359, Dec. 18, 1991, abandoned, which is a continuation of Ser. No. 511,698, Apr. 20, 1990, abandoned, which is a continuation of Ser. No. 275,182, Nov. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 118,571, Nov. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 933,426, Nov. 21, 1986, abandoned. This application Jun. 26, 1992, Ser. No. 905,197

Int. Cl.<sup>6</sup> C08F 4/629, 4/628, 32/06

U.S. Cl. 524—708

32 Claims

1. A process for producing a polymer which comprises polymerizing, in bulk within a mold, cycloolefin monomers comprising dicyclopentadiene or a mixture of dicyclopentadiene and another cycloolefin containing a norbornene group in the presence of a metathesis ring-opening polymerization catalyst system and an activator and continuing polymerization until conversion of said cycloolefin monomer in excess of 95%, measured by thermogravimetric analysis, is achieved, wherein the polymerization catalyst system comprises:

- (a) an organoammonium molybdate or organoammonium tungstate; and  
(b) an alkylaluminum compound and the activator has the following formula R<sub>n</sub>YX<sub>m</sub>, wherein n is 1–4, m is 0–3, R is hydrogen, Y is silicon and X is chlorine, and is selected from monochlorosilanes, dichlorosilanes, trichlorosilanes and tetrachlorosilanes.

5,438,094

# ADHESIVE SILICONE COMPOSITIONS

Hironao Fujiki, Takasaki; Hiroyasu Hara; Mikio Shiono, both of Annaka, and Masayuki Ikano, Maebashi, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan. Filed Jul. 1, 1994, Ser. No. 266,336

Claims priority, application Japan, Jul. 6, 1993, 5-191957

Int. Cl.<sup>6</sup> C08K 5/54

U.S. Cl. 524—730

20 Claims

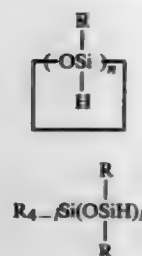
1. Adhesive silicone composition comprising  
(A) an alkenyl group-containing organopolysiloxane,  
(B) an organohydrogenpolysiloxane having at least three hydrogen atoms each directly bonded to a silicon atom in a molecule, selected from those represented by the following general formulae (1), (2), or (3):



(1)



-continued



wherein R is a substituted or unsubstituted monovalent hydrocarbon group, letter l is an integer of 3 or 4 and letter n is an integer of at least 3,

(C) a compound having at least one aliphatic unsaturated group and at least two phenylene skeletons in a molecule, and

(D) a platinum catalyst.

5,435,095

## PRECURED SILICONE EMULSION

Donald T. Liles, Midland, Mich., and Nick E. Shephard, Blacksburg, Va., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 30, 1993, Ser. No. 113,029

Int. Cl.<sup>6</sup> C08K 3/10

U.S. Cl. 524—785

5 Claims

1. An aqueous silicone emulsion which yields an elastomer upon removal of the water comprising the product obtained by mixing

(A) 100 parts by weight of polydiorganosiloxane having alkoxyethyl endblocking groups with at least 2 alkoxy radicals attached to the silicon atom, as an aqueous emulsion which is ionically or non-ionically stabilized,

(B) sufficient titanium catalyst to crosslink the polydiorganosiloxane of (A), where the titanium catalyst is a beta-dicarbonyl titanium compound, and

(C) optionally a filler.

5,438,096

## FLAME RETARDANT BROMINATED STYRENE-BASED LATICES

Jin-liang Wang, Nicolai A. Favstitsky, both of Lafayette, and Richard S. Rose, West Lafayette, all of Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

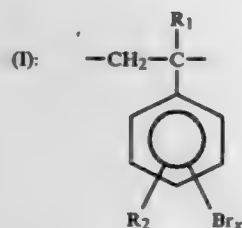
Continuation of Ser. No. 875,740, Apr. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 579,063, Sep. 6, 1990, abandoned. This application May 16, 1994, Ser. No. 243,050

Int. Cl.<sup>6</sup> C08L 27/10

U.S. Cl. 524—832

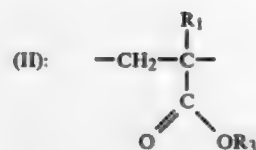
14 Claims

1. A flame retardant polymer latex coating composition comprising ring-brominated aromatic monomer units of the formula (I):



and alkyl (meth)acrylate monomer units of the formula (II):

(2)



(3)

in which X=1 to 4, R<sub>1</sub> is —H or —CH<sub>3</sub>, R<sub>2</sub> is —H or an alkyl group having from 1 to 4 carbon atoms, and R<sub>3</sub> is an alkyl group having from 1 to 20 carbon atoms, said ring-brominated aromatic monomer units including an average of at least about 1.5 bromines per unit, said flame retardant polymer latex coating composition having a glass transition temperature of between —33.4° C. and 25.4° C., and in which the ring-brominated aromatic monomer units are present in an amount to provide from 7 to 20 percent bromine by weight of the overall composition.

5,438,097

## POLYSTYRENE MODIFIED WITH SILICONE RUBBER POWDER

Donald T. Liles, 1205 Wakefield, Midland, Mich. 48640; Kenneth M. Lee, 2417 25th St., Bay City, Mich. 48706; David J. Romenecko, 4102 Elm Ct., Midland, Mich. 48640; James W. White, 22 Heol Pent'r Felin, Llantwit Major, South Glamorgan, CE61, 2XS, Wales, United Kingdom, and David L. Murray, 1411 W. Hines St., Midland, Mich. 48640

Continuation-in-part of Ser. No. 814,860, Dec. 30, 1991, abandoned. This application Jan. 18, 1994, Ser. No. 183,003

Int. Cl.<sup>6</sup> C08L 51/00

U.S. Cl. 525—63

22 Claims

1. A composition consisting essentially of a blend of

(A) a polystyrene polymer; and

(B) a silicone rubber powder uniformly dispersed in said polystyrene polymer, said silicone rubber powder being prepared by the steps comprising

(I) forming an aqueous emulsion consisting essentially of a plurality of particles of a hydroxyl-terminated polydiorganosiloxane having a weight average molecular weight greater than 50,000;

(II) precuring the polydiorganosiloxane particles within said emulsion with an organotin catalyst and a silane having the general formula: and partial hydrolysis condensation products thereof to produce a non-cross linked, end-capped polymer, wherein X is a hydrolyzable group selected from the group consisting of alkoxy radicals having 1 to 6 carbon atoms, chloro, hydrido, acetoxy, diorganoamino, oximate and amido groups and in which Q represents a monovalent radical which contains an unsaturated group;

(III) thereafter co-polymerizing an unsaturated monomer onto said end-capped non-crosslinked emulsion polymer formed in step (II); and

(IV) harvesting the particles resulting from step (III), said silicone rubber powder is present in an amount such that the polysiloxane content is in the range of 5 to 50 parts by weight for each 100 parts by weight of said polystyrene polymer.

5,438,098

## THERMOPLASTIC RESIN COMPOSITION

Yuichi Orikasa, Yokohama, and Suehiro Sakazume, Fujisawa, both of Japan, assignors to Nippon Petrochemicals Co., Ltd. and Nippon Oil & Fats Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 857,472, Mar. 25, 1992, Pat. No. 5,296,538.

This application Jan. 31, 1994, Ser. No. 189,517

Claims priority, application Japan, Mar. 25, 1991, 3-83044

Int. Cl.<sup>6</sup> C08G 63/48, 63/91

U.S. Cl. 525—63

9 Claims

1. A thermoplastic resin composition comprising 60 to 80% by weight of a polyarylenesulfide resin (I),

20 to 40% by weight of at least one resin (II) selected from the group consisting of polycarbonate resins and ABS resins (II), and

0.1 to 100 parts by weight, on the basis of 100 parts by weight of the aforesaid resins (I)+(II), of a graft copolymer as compatibilizer (III) for the resins (I) and (II), said compatibilizer having a multi-phase structure and composed of 5 to 95% by weight of an epoxy group-containing olefin copolymer selected from the group consisting of ethylene-glycidyl(meth)acrylate copolymers and ethylene-glycidyl(meth)acrylate-(meth)acrylic acid alkyl ester copolymers, and 95 to 5% by weight of a vinyl (co)polymer having a polymerization degree of 5 to 10,000 and which is a styrene homopolymer or a styrene-acrylonitrile copolymer containing 50% by weight or more of styrene unit, one of the (co)polymer components of the graft copolymer being in the form of a dispersion phase having a particle diameter of 0.001 to 10 μm.

5,438,099

## PARTICULATE GRAFT COPOLYMER AND THERMOPLASTIC MOLDING MATERIALS OBTAINED THEREFROM

Wolfgang Fischer, Ludwigshafen, and Norbert Guentherberg, Speyer, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Dec. 13, 1993, Ser. No. 165,465

Claims priority, application Germany, Dec. 16, 1992, 42 42 485.2

Int. Cl.<sup>6</sup> C08L 51/04; C08F 291/02, 265/04

U.S. Cl. 525—67

4 Claims

1. A particulate graft copolymer comprising, based on the sum of A and B,

A: 30 to 90% by weight of at least one elastomeric grafting base A having a weight average particle size of from 30 to 1,000 nm comprising, based on A,

A11: 85 to 99.8% by weight of at least one alkyl acrylate A11 having 1 to 8 carbon atoms in the alkyl radical, p'A12: 0.1 to 5% by weight of at least one polyfunctional, crosslinking monomer A12, and

A13: 0.1 to 10% by weight of at least one hydroxyalkyl acrylate or hydroxyalkyl methacrylate A13,

or

A111: at least 50% by weight of one or more dienes A111, A112: up to 50% by weight of one or more ethylenically unsaturated monomers A112, and

A113: 0.1 to 10% by weight of at least one hydroxyalkyl acrylate or hydroxyalkyl methacrylate A113,

and

B: 10 to 70% by weight of a graft sheath B comprising, based on B,

B1: up to 99.9% by weight of at least one aromatic vinyl monomer B1,

B2: up to 99.9% by weight of at least one polar, copolymerizable, ethylenically unsaturated monomer B2, and

B3: 0.1 to 20% by weight of a monomer containing an acidic group selected from the group consisting of acrylic acid, methacrylic acid, citraconic acid, crotonic acid, fumaric acid, itaconic acid, maleic acid, vinylsulfonic acid, vinylbenzenesulfonic acid, vinylphosphoric acid, and cinnamic acid; or a basic group selected from the group consisting of dimethylaminoethyl (meth) acrylate, morpholinemethyl acrylate, n-vinyl-imidazole, p-dimethylaminostyrene, N-vinylcarbazole, N-vinylindole, N-vinylpyrrole, 4-vinylpyrimidine, 2-vinylpyridine, 3-vinylpyridine, and 4-vinylpyridine, and mixtures thereof.

5,438,100

## OLEFIN POLYMER COMPOSITION

Tetsunori Shinozaki, and Mamoru Kioka, both of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 82,054, Jun. 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 929,518, Aug. 14, 1992, abandoned. This application Jan. 18, 1994, Ser. No. 182,403

Claims priority, application Japan, Aug. 14, 1991, 3-204464; Aug. 14, 1991, 3-204465; Aug. 14, 1991, 3-204466; Aug. 14, 1991, 3-204467

Int. Cl.<sup>6</sup> C08L 47/00

U.S. Cl. 525—240

16 Claims

1. An α-olefin polymer composition comprising:

[I] an α-olefin/polyene copolymer-containing polymer in an amount of 0.005 to 99% by weight, said α-olefin/polyene copolymer-containing polymer comprising:

(i) an α-olefin/polyene copolymer, and

(ii) an olefin polymer; and

[II] an olefin polymer in an amount of 1 to 99.995% by weight

wherein the polyene has 7 or more carbon atoms and has an olefinic double bond at both terminals, and the α-olefin/polyene copolymer contains constituent units derived from the α-olefin in an amount of 99.999 to 70 mol % and contains constituent units derived from the polyene in an amount of 0.001 to 30 mol %,

the olefin polymer (ii) is a polymer of olefin having 3 or more carbon atoms,

the α-olefin/polyene copolymer-containing polymer [I] contains the α-olefin/polyene copolymer (i) in an amount of 0.001 to 99% by weight and contains the olefin polymer (ii) in an amount of 99.999 to 1% by weight, and

the olefin polymer [II] is a polymer of olefin having 3 or more carbon atoms,

wherein the melt tension of said α-olefin polymer composition satisfies the following relation:

$$MT > \frac{W_I}{W_I + W_{II}} \times MT_I + \frac{W_{II}}{W_I + W_{II}} \times MT_{II}$$

wherein

MT is a melt tension of an α-olefin copolymer composition comprising the α-olefin/polyene copolymer-containing polymer [I] and the olefin polymer [II],

MT<sub>I</sub> is a melt tension of the α-olefin/polyene copolymer-containing polymer [I],

MT<sub>II</sub> is a melt tension of the olefin polymer [II]

W<sub>I</sub> is a weight percentage of the α-olefin/polyene copolymer-containing polymer [I], and

W<sub>II</sub> is a weight percentage of the olefin polymer [II].

5,438,101

## RUBBER COMPOSITION

Keisaku Yamamoto, Kiyoshi Ikeda, both of Ichihara, and Masahiro Fukuyama, Sodegaura, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 27, 1993, Ser. No. 52,742

Claims priority, application Japan, May 11, 1992, 4-117221; Aug. 24, 1992, 4-223830

Int. Cl.<sup>6</sup> C08F 255/02, 265/04

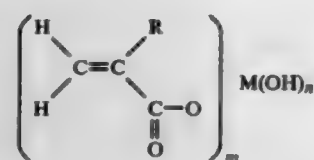
U.S. Cl. 525—274

16 Claims

1. A vulcanized rubber which is obtained by vulcanizing a rubber composition which comprises 100 parts by weight of the following component (A), 5 to 300 parts by weight of the following component (B), 0.1 to 50 parts by weight of the following component (C) and at least one vulcanizer:

component (A): at least one of ethylene-methyl(meth)acrylate copolymer rubbers and ethylene-methyl(meth)acrylate-unsaturated glycidyl ester copolymer rubbers, wherein the molar ratio of ethylene:methyl(meth)acrylate

in said ethylene-methyl(meth)acrylate copolymer rubber is 50 to 85:50 to 15, and the molar ratio of (ethylene+methyl(meth)acrylate):unsaturated glycidyl ester in said ethylene-methyl(meth)acrylate-unsaturated glycidyl ester copolymer rubber is 1:0.0005 to 0.05, component (B): a hydroxide of a metallic element belonging to Group II or III of Mendeleev's periodic table, component (C): at least one metallic acrylate compound represented by the following formula (I):



wherein R represents a hydrogen atom or an alkyl group of 1 to 8 carbon atoms, M represents a mono- to tri-valent metal atom, m represents an integer of 1 to 3 and n represents an integer of 0 to 2.

5,438,102

**SOLID ELASTOMERIC BLOCK COPOLYMERS**  
Ellen B. Brandes, Plainsboro, N.J., and Frederick C. Loveless, Yardley, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.  
Filed Jun. 24, 1993, Ser. No. 80,638  
Int. Cl.<sup>6</sup> C08F 297/04

U.S. Cl. 525-314 50 Claims

1. A solid elastomeric block copolymer wherein the terminal blocks are each a polymer of at least one conjugated diene D (D polymer), said diene D being a hydrocarbon containing a 1,3-conjugated diene structure wherein the 2 and 3 carbon atoms are each additionally bonded to a hydrocarbyl side group, with a preponderance of polymerized D units being 1,4-units; and at least one interior block is a hydrogenated polymer of at least one conjugated diene I (I polymer), said diene I being a hydrocarbon containing a 1,3-conjugated diene structure wherein one of the 2- and 3-carbon atoms is additionally bonded to a hydrocarbyl side group and the other is additionally bonded to a hydrogen atom, substantially all of the residual double bonds of said I polymer being hydrogenated and the number of unsaturated polymerized diene D units in said D polymer blocks being sufficient to vulcanize said block copolymer, said copolymer comprising about 1 to 50 wt. % of D polymer units and about 50 to 99 wt. % of I polymer units.

5,438,103

**BLOCK COPOLYMERS OF MONOVINYLAROMATIC AND CONJUGATED DIENE MONOMERS**  
Craig D. DePorter, Ralph C. Farrar, Jr., Nathan E. Stacy, and George A. Moczygemba, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.  
Filed Mar. 23, 1994, Ser. No. 216,725  
Int. Cl.<sup>6</sup> C08F 297/04

U.S. Cl. 525-314 11 Claims

1. A method of preparing a polymer comprising: sequentially contacting under polymerization conditions and in the presence of a randomizer (a) a monovinyldiarylomatic monomer and an initiator; thereafter (b) an initiator and a monovinyldiarylomatic monomer; thereafter (c) a conjugated diene; thereafter (d) an initiator and a mixture of monovinyldiarylomatic monomer and conjugated diene monomer; thereafter (e) a conjugated diene; and thereafter (f) a coupling agent; and wherein no more than three initiator charges are present.

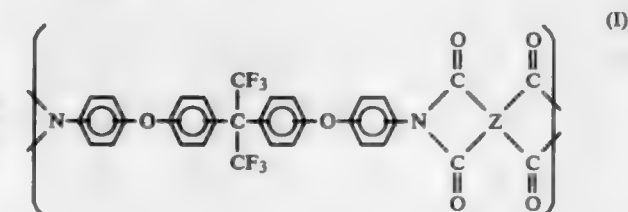
5,438,104

# MALEIMIDE COMPOSITION, PREPREG AND FIBER-REINFORCED PLASTIC

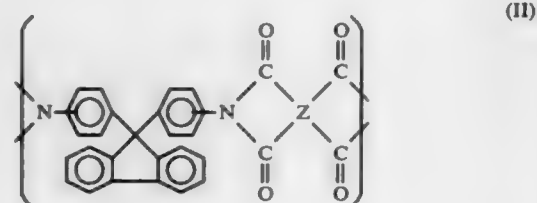
Hajime Kishi, Masazumi Tokunoh, and Nobuyuki Odagiri, all of Iyo, Japan, assignors to Toray Industries, Inc., Tokyo, Japan  
Filed Oct. 22, 1992, Ser. No. 964,854  
Claims priority, application Japan, Oct. 22, 1991, 3-274268  
Int. Cl.<sup>6</sup> C08L 79/08

U.S. Cl. 525-426 11 Claims

1. A maleimide resin composition comprising: a maleimide resin (A); a polyimide resin (B) containing recurring units of the formula (I) and (II) or containing a recurring unit of the formula (II):



wherein Z represents a tetracarboxylic acid dianhydride residue



wherein Z has the same meaning as in formula (I), said polyimide has amino groups at the ends of the polyimide molecules; and an aromatic allyl compound (C) as a reactive diluent of said maleimide resin (A).

5,438,105

# POLYAMIC ACID COMPOSITE, POLYIMIDE COMPOSITE AND PROCESSES FOR PRODUCING THE SAME

Yasuhisa Nagata, Shizuoka, Japan, assignor to Toho Rayon Co., Ltd., Tokyo, Japan  
Continuation-in-part of Ser. No. 691,884, Apr. 26, 1991, abandoned. This application Feb. 28, 1994, Ser. No. 202,872  
Claims priority, application Japan, Apr. 27, 1990, 2-112540; Apr. 27, 1990, 2-112541; Aug. 1, 1990, 2-204171; Aug. 1, 1990, 2-204172

Int. Cl.<sup>6</sup> C08L 79/08

U.S. Cl. 525-436 20 Claims

1. A polyimide resin composite produced by dehydrating and cyclizing a polyamic acid in a polyamic acid composite comprising i) a polyamic acid having three dimensional network molecular structure obtained by a ring-opening polyaddition reaction of a tetracarboxylic acid dianhydride with an aromatic diamine and a tri- or tetramino compound and ii) (a) a high polymer component having a different molecular structure from the polyamic acid, which is dispersed in the three dimensional network molecular structure of the polyamic acid and of which molecular chains are interpenetrated with molecular chains of the polyamic acid or (b) a curable resin composition which is dispersed in the three dimensional network molecular structure of the polyamic acid and which is capable of forming a cured resin of which molecular chains are interpenetrated with molecular chains of the polyamic acid.

5,438,106

# FREE RADICAL-CURED COATING COMPOSITIONS

Stanley F. Siranovich, Imperial, Pa.; Manfred Bock, Leverkusen, Germany; Lanny D. Venham, Paden City, W. Va., and Terry A. Potter, Beaver, Pa., assignors to Miles Inc., Pittsburgh, Pa.  
Continuation of Ser. No. 942,544, Sep. 9, 1992, abandoned. This application Nov. 12, 1993, Ser. No. 153,841  
Int. Cl.<sup>6</sup> C08F 283/04

U.S. Cl. 525-440 8 Claims

1. A method for preparing an NCO-free, free radical curable polyurethane coating comprising (i) preparing an isocyanate based prepolymer by reacting a polyisocyanate and a polyol to produce a prepolymer having an NCO content of about 8 to 12 percent by weight and (ii) end capping said prepolymer with trimethylolpropane diallylether and with at least one member selected from the group consisting of 2-hydroxyethyl acrylate and 2-hydroxyethyl methacrylate to produce an end-capped prepolymer, and (iii) mixing said end-capped prepolymer with an initiator, provided however that said polyol includes about 5 to 20 percent relative to the weight of said polyol of a polyester polyol having a molecular weight of about 300 to 8000 and that said polyol is free of polyether polyol.

5,438,107

# CONDENSED RESIN DISPERSION AND PROCESS FOR ITS PRODUCTION

Takao Doi, Yokohama; Noriko Itaya, Tokyo, and Masami Yamashita, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan  
Division of Ser. No. 961,059, Oct. 14, 1992, Pat. No. 5,290,898, which is a continuation of Ser. No. 814,032, Dec. 24, 1991, abandoned, which is a continuation of Ser. No. 518,427, May 3, 1990, abandoned. This application Sep. 16, 1993, Ser. No. 121,574

Claims priority, application Japan, May 10, 1989, 1-114978; Mar. 26, 1990, 2-73269; Mar. 26, 1990, 2-73270  
Int. Cl.<sup>6</sup> C08J 9/30; C08K 5/06; C08G 12/32; C08L 61/28  
U.S. Cl. 525-456 6 Claims

1. A process for producing a condensed resin dispersion, which comprises precipitating fine condensed resin particles by reacting an aldehyde and a compound condensable with the aldehyde, or their precondensate, in an isocyanate-modified polyether (b) obtained by reacting an organic polyisocyanate with a polyether (a) having at least one active hydrogen group reactive with an isocyanate group, or with such a polyether (a) and a low molecular weight active hydrogen-containing compound having at least one active hydrogen group, and having substantially no free isocyanate group, or in a mixture of such an isocyanate-modified polyether (b) with water or a solvent, then adding a polyether polyol (c), and in the case where water or a solvent exists, removing the water or the solvent before or after the addition of the polyether polyol (c), wherein the polyether (a) is a compound having a molecular weight per active hydrogen group of from 1,500 to 20,000, which is higher by at least 300 than the molecular weight per hydroxyl group of the following polyether polyol (c), and having a total of from 2 to 8 hydroxyl and/or primary amino groups, and the polyether polyol (c) is a compound having from 2 to 8 hydroxyl groups and having a molecular weight per hydroxyl group of from 600 to 5,000.

5,438,108

# GRAFT PRECURSOR AND PROCESS FOR PRODUCING GRAFTED AROMATIC POLYCARBONATE RESIN

Toshikazu Umemura; Takayuki Watanabe; Tatsuo Iwai, all of Tokyo, and Motoyuki Sugita, Anjou, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc. and NOF Corporation, both of Chiyoda, Japan  
Filed Jan. 23, 1994, Ser. No. 187,158  
Claims priority, application Japan, Jan. 26, 1993, 5-029926  
Int. Cl.<sup>6</sup> C08F 283/02; C08L 69/00

U.S. Cl. 525-467 4 Claims

1. A process for producing a grafted aromatic polycarbonate resin, which comprises: preparing an aqueous suspension of aromatic polycarbonate resin particles; adding at least one vinyl monomer to the aqueous suspension, thereby making 35 to 95% by weight of the aromatic polycarbonate resin particles and 65 to 5% by weight of the at least one vinyl monomer, further adding 0.1 to 10 parts by weight of at least one radically polymerizable organic peroxide and 0.01 to 5 parts by weight of at least one radical polymerization initiator to the aqueous suspension per 100 parts by weight of the vinyl monomers, impregnating the aromatic polycarbonate resin particles with the at least one vinyl monomer under conditions substantially incapable of decomposing the at least one radically polymerizable organic peroxide and the at least one radical polymerization initiator, then polymerizing the at least one vinyl monomer and the at least one radically polymerizable organic peroxide, thereby forming a vinylic copolymer and obtaining a graft precursor containing the vinylic copolymer in the aromatic polycarbonate resin particles, and melt-kneading the graft precursor at a temperature of 100° C. to 300° C., thereby subjecting the aromatic polycarbonate resin particles and the at least one vinyl monomer to graft reaction and obtaining a grafted aromatic polycarbonate resin.

5,438,109

# GAS BARRIER COATINGS OF POLYEPOXIDE/POLYAMINE PRODUCTS

Richard M. Nugent, Jr.; Ken W. Niederst, both of Allison Park, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.  
Division of Ser. No. 767,458, Sep. 30, 1991, Pat. No. 5,300,541, which is a continuation-in-part of Ser. No. 656,662, Feb. 19, 1991, abandoned, which is a division of Ser. No. 367,992, Jun. 19, 1989, Pat. No. 5,008,137, which is a continuation of Ser. No. 152,176, Feb. 4, 1988, abandoned. This application Dec. 17, 1993, Ser. No. 168,351

The portion of the term of this patent subsequent to Apr. 5, 2011, has been disclaimed.  
Int. Cl.<sup>6</sup> C08G 59/50

U.S. Cl. 525-526 11 Claims

1. A polymeric gas barrier material comprising a cured amine-functional polymeric resin which is a reaction product of polyamine and polyepoxide, the polymeric gas barrier material characterized as containing at least about 17 percent by weight total of amine nitrogen and hydroxyl groups based on total weight of polymeric polyamine-polyepoxide reaction product.



5,438,110

## PROCESS FOR POLYMERIZING OLEFINS AND POLYMERIZATION CATALYST THEREFOR

Naoshi Ishimaru, Waki; Mamoru Kioka, and Akinori Toyota, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan  
Continuation of Ser. No. 97,908, Jul. 29, 1993, abandoned, which is a continuation of Ser. No. 607,361, Oct. 31, 1990, abandoned, which is a division of Ser. No. 366,547, Jun. 15, 1989, Pat. No. 4,990,479. This application Oct. 24, 1994, Ser. No. 328,568  
Claims priority, application Japan, Jun. 17, 1988, 63-149503; Jan. 24, 1989, 1-014595; Mar. 2, 1989, 1-050871  
Int. Cl.<sup>6</sup> C08F 4/654, 10/00

U.S. Cl. 526-125

5 Claims

1. A polymerization process which comprises polymerizing or copolymerizing olefins in the presence of an olefin polymerization catalyst formed from

(A) a solid titanium component which contains magnesium, titanium, halogen and an electron donor as the essential components prepared by contacting of a magnesium compound with a titanium compound and an electron donor, said magnesium compound or a complex of said magnesium compound with said electron donor being reacted with the titanium compound in the liquid phase, or said magnesium compound having no reducibility and said titanium compound, both in liquid form, being reacted in the presence of said electron donor;

(B) an organoaluminum compound; and

(C) an organosilicon compound represented by the following formula



wherein R<sup>21</sup> represents a cyclopentyl group, a cyclopentyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, an alkyl group having 2 to 4 carbon atoms substituted by a cyclopentyl group or a cyclopentyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, a cyclopentenyl group, a cyclopentenyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, a cyclopentadienyl group, a cyclopentadienyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, an indenyl group, an indenyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, an indanyl group, an indanyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, a tetrahydroindenyl group, a tetrahydroindenyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms, a fluorenyl group or a fluorenyl group substituted by 1 to 4 alkyl groups having 1 to 4 carbon atoms; R<sup>22</sup> to R<sup>23</sup> are identical or different and each represents a hydrocarbon group; and 0 ≤ m < 3.

5,438,111

## FORMED, POLYMERIC TRANSITION-METAL COMPLEX CATALYSTS WITH ORGANOSILOXANE DIPHENYLPHOSPHINE LIGANDS

Peter Panster, Rodenbach; Robert Gradl, Alzenau, and Peter Kleinschmitt, Hanau, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany  
Division of Ser. No. 43,604, May 5, 1993, Pat. No. 5,340,895, which is a continuation of Ser. No. 786,796, Nov. 1, 1991, abandoned. This application Apr. 14, 1994, Ser. No. 227,529  
Claims priority, application Germany, Nov. 3, 1990, 40 35 033.9

The portion of the term of this patent subsequent to Feb. 16, 2010, has been disclaimed.

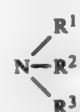
Int. Cl.<sup>6</sup> C08G 77/06

U.S. Cl. 528-9

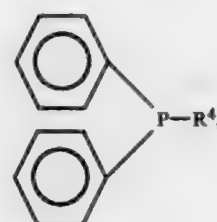
21 Claims

1. A method of preparing the formed spherical, polymeric metal complexes comprising at least one member selected from the metal containing group consisting of iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium and platinum

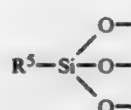
compounds; and a ligand which comprises a formed organosiloxane copolycondensate of units of the formula



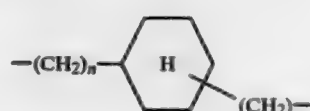
and of units of the formula



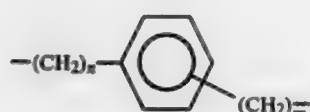
wherein the central metal atom is coordinatively bound via the phosphorus atoms of the phosphine units (II) and optionally via the nitrogen atoms of the amine units (I), R<sup>2</sup> to R<sup>4</sup> are the same or different and represent a group of the formula



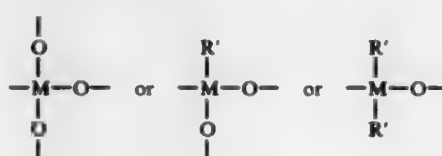
in which R<sup>5</sup> is bound directly to said phosphorus atom or to said nitrogen atom and represents a linear or branched alkylene group with 1 to 10 C atoms, a cycloalkylene group with 5 to 8 C atoms, or a unit of the formula



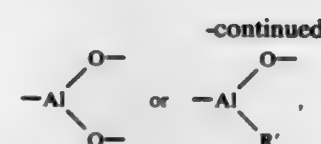
or



in which n and m are a number from 0 to 6, said n indicates the number of methylene groups bound to the N position or bound to the P position and m the number of methylene groups bound to the Si position, R<sup>1</sup> represents a group selected from the group consisting of formula (III), H, CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, and C<sub>3</sub>H<sub>7</sub>, wherein the free valences of said oxygen atoms bound to said Si atom are saturated by silicon atoms of further groups of formula (III) and/or via the metal atoms in one or several cross-linking bridge members

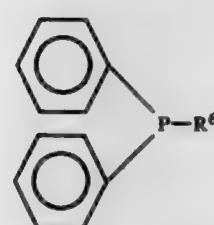


or



where M is an Si, Ti or Zr atom and R' is a linear or branched alkyl group with 1 to 5 C atoms or a phenyl group, and the ratio of said silicon atoms from the groups of formula (III) to said metal atoms in the cross-linking bridge members (IV) is 1:0 to 1:20 and the molar ratio of phosphine units (II) to complexed metal units is 1:1 to 1000:1, and wherein said polymeric metal complexes are spherical particles with a diameter of 0.01 to 3.0 mm, a BET specific surface of >0 to 1000 m<sup>2</sup>/g, a specific pore volume of 0.01 to 6.5 ml/g, and a bulk density of 50 to 1000 g/l; said method comprises

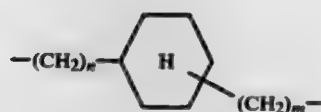
(a) reacting in a solvent or a solvent mixture, optionally at elevated temperature, for a period of 1 minute to 48 hours, at least one member of the metal containing group consisting of hydrous or anhydrous metal compounds FeX<sub>3</sub>, FeX<sub>2</sub>, COX<sub>3</sub>, COX<sub>2</sub>, NiX<sub>2</sub>, RuX<sub>3</sub>, RuX<sub>3</sub>(CH<sub>3</sub>CN)<sub>3</sub>, RuX<sub>3</sub>(C<sub>6</sub>H<sub>5</sub>CN)<sub>3</sub>, M<sub>3</sub>RhX<sub>6</sub>, RhX<sub>3</sub>, RhX<sub>3</sub>(CH<sub>3</sub>CN)<sub>3</sub>, RhX<sub>3</sub>(C<sub>6</sub>H<sub>5</sub>CN)<sub>3</sub>, RhX<sub>2</sub>, RhX, (RhX(diene))<sub>2</sub>, M<sub>2</sub>PdX<sub>6</sub>, M<sub>2</sub>PdX<sub>4</sub>, PdX<sub>2</sub>, OsX<sub>3</sub>, OsX<sub>3</sub>(CH<sub>3</sub>CN)<sub>3</sub>, OsX<sub>3</sub>(C<sub>6</sub>H<sub>5</sub>CN)<sub>3</sub>, M<sub>3</sub>IrX<sub>6</sub>, IrX<sub>3</sub>, IrX<sub>3</sub>(CH<sub>3</sub>CN)<sub>3</sub>, IrX<sub>3</sub>(C<sub>6</sub>H<sub>5</sub>CN)<sub>3</sub>, (IrX(diene))<sub>2</sub>, M<sub>2</sub>PtX<sub>6</sub>, M<sub>2</sub>PtX<sub>4</sub>, and PtX<sub>2</sub>, in which X is selected from the group consisting of Cl, Br, I, acetyl acetate, acetate, SO<sub>4</sub>, NO<sub>3</sub>, and CN, and diene is selected from the group consisting of cyclooctadiene and norbornadiene, and M is selected from the group consisting of H, Na, K, and NH<sub>4</sub>, with a phosphine of the formula



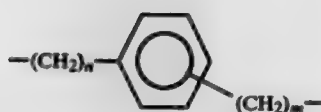
in which R<sup>6</sup> represents a group of the formula



where R<sup>5</sup> is a linear or branched alkylene group with 1 to 10 C atoms, a cycloalkylene group with 5 to 8 C atoms or a unit of the formula

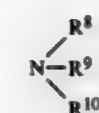


or



where f is a linear or branched alkyl group with 1 to 5 C atoms, to form a metal complex, wherein the ratio between the number of moles of phosphine of formula (VIII) and the number of moles of the totally complexly bound metal atoms in said metal compounds is at least 1:1 to 1000:1,

(b) adding to the product of step (a) an amino silane of the general formula



(X)



(XI)

in which M is an Si, Ti, Zr or Al atom, R' is a linear or branched alkyl group with 1 to 5 C atoms or a phenyl group, R signifies a linear or branched alkyl group with 1 to 5 C atoms, and the ratio of the silicon atoms from the groups of formula (IX) to the metal atoms in the cross-linking agents (IX) is 1:0 to 1:20;

(c) adding to the product of step (b) an amount of water under agitation which suffices at least for a complete hydrolysis and condensation, and hydrolyzing the resulting reaction mixture for a period of time up to 6 hours;

(d) allowing the product of step (c) to gel under further agitation at a temperature in the range of room temperature to 200° C., wherein at the start of said gelling or up to one hour thereafter the product of step (c) is compounded with 10 to 2000% by weight, relative to the entire amount of said phosphine (VIII), aminoorganosilane (X) and optionally cross-linking agent (XI), of a solvent which is non-water-soluble but which dissolves the product of step (c), which has gelled or started to gel, in order to form a homogenate or part or all of said solvent is added in step (c);

(e) adding, immediately or in a time period of up to 10 hours, 100 to 2000% by weight of water, relative to the total amount of phosphine (VIII), aminoorganosilane (X) and optionally cross-linking agent (XI), to the viscous homogenate of step (d), optionally with elevation of the originally adjusted temperature, whereby the organic phase containing the monomeric metal complex is dispersed in the liquid two-phase system and a solid in the shape of spheres is formed;

(f) separating the solid formed in step (d) from the liquid phase after a reaction time sufficient for this purpose at a temperature of room temperature to 200° C.;

(g) extracting the solid from step (f), optionally with a low-boiling solvent;

(h) drying the solid from step (g) at room temperature to 250° C., optionally under protective gas or in a vacuum; and

(i) tempering the solid from step (h) for 1 to 100 hours at temperatures of 150° C. to 300° C. and/or classifying said solid from step (h).

5,438,112

METHOD FOR CURING SILICONE RESINS  
Ching-Ping Wong, Lawrenceville, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Jun. 13, 1994, Ser. No. 259,101

Int. Cl.<sup>6</sup> C08G 77/08

U.S. Cl. 528-15

17 Claims

1. A method for curing a silicone resin, said method comprising the steps of:

adding to the silicone resin particles of essentially pure platinum suspended in a liquid carrier, the liquid carrier being miscible in silicone resin and being selected from the group consisting of silicone oil and liquid hydrocarbon.

5,438,113

## THERMOSETTING RESIN COMPOSITION

Hiroshi Shimozawa, Yokohama; Shinetsu Fujieda; Shuzi Hayase, both of Kawasaki; Yoshihiko Nakano, Tokyo; Akira Yoshizumi, Yokohama, and Ken Uchida, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1993, Ser. No. 40,267

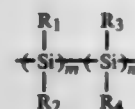
Claims priority, application Japan, Mar. 30, 1992, 4-071990; Jul. 29, 1992, 4-201709

Int. Cl.<sup>6</sup> C08G 77/04

U.S. Cl. 528-25

10 Claims

1. A thermosetting resin composition, comprising:  
(a) a silane compound having the formula (I):



wherein each of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> is a monovalent organic group, at least one of R<sub>1</sub> and R<sub>2</sub> is a monovalent organic group having a phenolic hydroxyl group, and m and n are integers having values such that (4 ≤ m + n ≤ 12); and

- (b) an organic compound having at least two functional groups capable of reaction with the phenolic hydroxyl groups of said silane compound.

5,438,114

## METHOD FOR CONVERTING MACROCYCLIC POLYIMIDE OLIGOMERS TO LINEAR POLYIMIDES

Dwain M. White, and Jane M. Terry, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

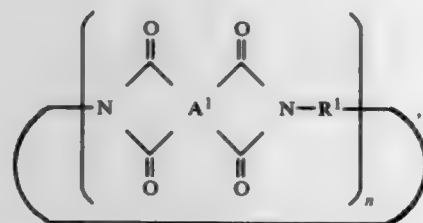
Filed Jun. 17, 1994, Ser. No. 262,101

Int. Cl.<sup>6</sup> C08G 73/10

U.S. Cl. 528-322

13 Claims

1. A method for preparing a linear polyimide which comprises heating, at a temperature in the range of about 300°-350° C. with a primary amine in the presence of a tertiary amine, tertiary phosphine, quaternary ammonium salt, quaternary phosphonium salt or hexaalkylguanidinium salt or heterocyclic analog thereof as a macrocyclic polyimide polymerization catalyst, a composition comprising macrocyclic polyimide oligomers of the formula



wherein each A<sup>1</sup> is independently a mono- or polycyclic aromatic radical, each R<sup>1</sup> is independently an organic or bis(alkylene)polydiorganosiloxane radical and n is at least 1.

5,438,115

## PROCESS FOR PREPARING POLY(ARYLENE SULFIDE) POLYMERS

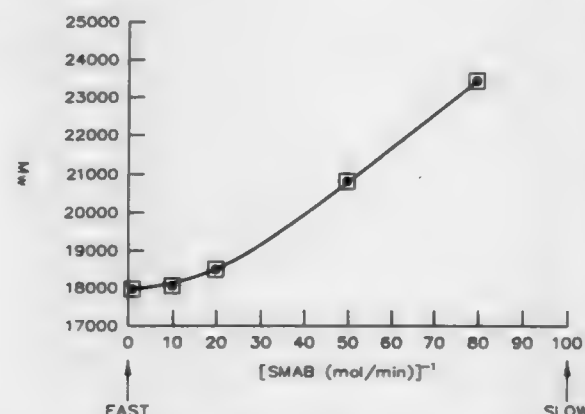
Darryl R. Fahey, Bartlesville, Okla.; Owen H. Decker, Reading, Pa.; Carlton E. Ash, Sugarland, Tex.; Jon F. Geibel, Bartlesville, Okla.; Fernando C. Vidaurri, Jr., Bartlesville, Okla.; Lacey E. Scoggins, Bartlesville, Okla.; Harvey D. Hensley, Bartlesville, Okla.; Wei-Teh W. Shang, Bartlesville, Okla.; Jimmie J. Straw, Bartlesville, Okla., and Paul J. DesLauriers, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 30, 1993, Ser. No. 159,411

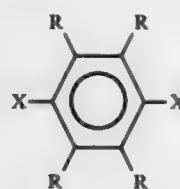
Int. Cl.<sup>6</sup> C08G 75/14

U.S. Cl. 528-386

17 Claims



1. A poly(arylene sulfide) polymerization process which comprises:  
contacting a polymerization mixture comprising at least one dihaloaromatic compound having the formula



where each X is selected from the group consisting of chlorine, bromine, and iodine, and each R is individually selected from the group consisting of hydrogen and a hydrocarbyl group, wherein the hydrocarbyl group is selected from the group consisting of an alkyl group, a cycloalkyl group, an aryl group or combinations thereof and wherein the total number of carbon atoms in each group is within the range of 6 to about 24, a sulfur source, and a polar organic compound selected from the group consisting of amides and sulfones with at least one suitable base under polymerization conditions of a temperature within the range of about 170° C. to about 325° C., for a period in the range of about 10 minutes to about 72 hours, wherein said at least one suitable base is added slowly and continuously, or in small portions at spaced intervals, to said polymerization mixture during said polymerization, and wherein said suitable base is non-nucleophilic and soluble in said polymerization mixture.

5,438,116

## POLYMERS AND PREPOLYMERS AND THEIR USE IN A METHOD FOR THE TREATMENT OF WOOL

David L. Connell, West Underwood, United Kingdom, assignor to Precision Processes (Textiles) Limited, Derby, United Kingdom

Filed Jul. 24, 1990, Ser. No. 556,976

Claims priority, application United Kingdom, Jul. 24, 1989, 8916906

Int. Cl.<sup>6</sup> C08G 59/10

U.S. Cl. 528-407

6 Claims

1. A polymer or prepolymer having the following structural formula:



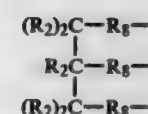
where N is nitrogen;

J represents a grouping:

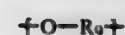


where Z is a C<sub>2</sub>-C<sub>6</sub> alkylene group; and

Z<sup>1</sup> represents:



where each R<sub>2</sub> is the same or different and is selected from hydrogen, or a C<sub>1</sub>-C<sub>6</sub> alkyl group, and each R<sub>8</sub> is the same or different and is selected from: a direct bond, or a C<sub>1</sub>-C<sub>6</sub> alkylene group; where A represents:



and is always linked to Z by the oxygen atom (O); where R<sub>9</sub> represents a C<sub>2</sub>-C<sub>6</sub> alkylene group, with the proviso that each individual group R<sub>9</sub> in any structure is the same or different from any other group R<sub>9</sub> in that structure;

B is a bi- or polyfunctional bridging or connecting group; R<sub>1</sub> represents a residue derived from monofunctional reaction of an epihalohydrin, an alkyl or alkyl aryl polyhalide, or is alkyl, monohydroxyalkyl or hydrogen, with the proviso that each individual group R<sub>1</sub> in any structure may be the same or different from any other group R<sub>1</sub> in that structure;

n is 2 or 3, with the proviso that, where n is 3, the nitrogen atom involved also bears a formal positive charge;

r is either 2 or 3;

t is a number representing the functionality of the residue B; s=1 when r=2, and s=2 when r=3;

with the proviso that wherever a formal positive charge is present in the structure, then a counteranion is present.

5,438,117

## HEXAPEPTIDES DERIVING FROM AGLUCOTEICOPLANIN AND A PROCESS FOR PREPARING THEM

Adriano Malabarba, Binasco, and Romeo Ciabatti, Novate Milanese, both of Italy, assignors to Gruppo Lepetit S.p.A., Gerezano, Italy

Continuation of Ser. No. 64,096, May 20, 1993, abandoned. This application Jun. 23, 1994, Ser. No. 264,228

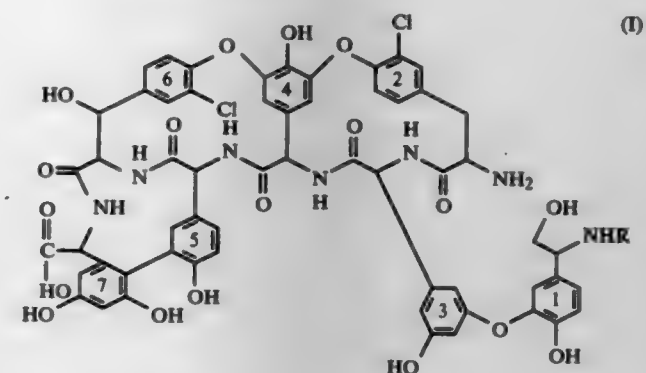
Claims priority, application European Pat. Off., Dec. 20, 1990, 90124926; Jul. 10, 1991, 91111456

Int. Cl.<sup>6</sup> C07K 9/00; A61K 38/00

U.S. Cl. 530-317

15 Claims

1. A compound of the formula:



wherein:

R is either hydrogen or a protecting group of the amino function in which said protecting group is a lower alkoxy carbonyl or a phenyl lower alkoxy carbonyl or an acid addition or basic addition salt thereof.

5,438,118

## HIV PROTEASE INHIBITORS

James F. Callahan, Philadelphia; William F. Huffman, Malvern; Michael L. Moore, Media, and Kenneth A. Newlander, West Chester, all of Pa., assignors to SmithKline Beecham Corp., Philadelphia, Pa.

PCT No. PCT/US91/08850, § 371 Date Jul. 26, 1993, § 102(e) Date Jul. 26, 1993, PCT Pub. No. WO92/09297, FCT Pub. Date Jun. 11, 1992

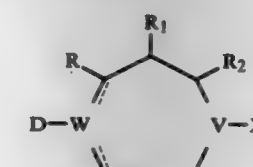
Continuation-in-part of Ser. No. 620,978, Nov. 30, 1990, abandoned. This PCT application Nov. 25, 1991, Ser. No. 66,136

Int. Cl.<sup>6</sup> A61K 38/00; C07K 5/00, 7/00, 17/00

U.S. Cl. 530-330

10 Claims

1. A compound of the formula:



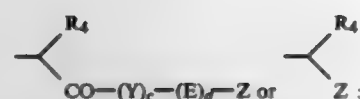
in which:

D is A' or



X is





V and W are each independently N or C;  
one of -- indicated bonds is a double bond and the other is a single bond or, when W is N, -- both are single bonds;  
R is hydrogen or OH, or when W is N, R is =O;  
R<sub>1</sub> is C<sub>1-6</sub> alkyl, (CH<sub>2</sub>)<sub>n</sub> Ar, (CH<sub>2</sub>)<sub>n</sub> Het, (CH<sub>2</sub>)<sub>n</sub>CONHR', (CH<sub>2</sub>)<sub>n</sub>OR' or (CH<sub>2</sub>)<sub>n</sub>SR';  
R<sub>2</sub> is:  
a) 2H, when V is N;  
b) OH, OR', =CHR' or NHR', when  
c) =O, when W and V are both N;  
A' is hydrogen, C<sub>1-6</sub> alkyl, benzyl, halobenzyl, dihalobenzyl or tosyl;  
A is hydrogen or an amino protecting group;  
B is a D or L amino acid or is a covalent bond;  
Q is a D or L amino acid selected for Ser, Thr, Asp, His, Cys, Arg and Ala;  
G is Glx, Asx, Ala, β-Ala, Arg, Gly, Ile, Leu, Lys, Ser, Thr, Val, Met or His;  
Y and E are each independently a D or L amino acid;  
a, b, c and d are each independently 0 or 1;  
Z is hydrogen (CH<sub>2</sub>)<sub>n</sub>OR', (CH<sub>2</sub>)<sub>n</sub>NHR', C<sub>1-6</sub>alkyl, (CH<sub>2</sub>)<sub>n</sub>SR', O(CH<sub>2</sub>)<sub>p</sub>OR', NH(CH<sub>2</sub>)<sub>p</sub>OR', O(CH<sub>2</sub>)<sub>p</sub>SR' or NH(CH<sub>2</sub>)<sub>p</sub>SR';  
R<sub>3</sub> and R<sub>4</sub> are each independently hydrogen, C<sub>1-6</sub>alkyl, (CH<sub>2</sub>)<sub>n</sub>Het, (CH<sub>2</sub>)<sub>n</sub>Ar, (CH<sub>2</sub>)<sub>n</sub>CONHR', (CH<sub>2</sub>)<sub>n</sub>OR', (CH<sub>2</sub>)<sub>n</sub>SR', (CH<sub>2</sub>)<sub>n</sub>NHR', CH(OH)CH<sub>3</sub> or (CH<sub>2</sub>)<sub>3</sub>NHC(=NH)NH<sub>2</sub>;  
R' is hydrogen, C<sub>1-6</sub>alkyl or benzyl;  
n is 0 to 3;  
p is 1 to 3;  
Het is indolyl or imidazolyl, or pyridyl or thienyl optionally substituted by one or two C<sub>1-6</sub>alkyl, OR' or SR'; and  
Ar is phenyl optionally substituted by one or two C<sub>1-6</sub>alkyl, OR', NO<sub>2</sub>, NH<sub>2</sub>, halogen, CF<sub>3</sub> or SR'; or a pharmaceutically acceptable salt thereof.

5,438,119

## METHOD OF OBTAINING A PEPTIDE WITH DESIRED TARGET PROPERTY

William J. Rutter, and Daniel V. Santi, both of San Francisco, Calif., assignors to The Regents of The University of California, Berkeley, Calif.

Continuation of Ser. No. 525,899, May 18, 1990, Pat. No. 5,266,684, which is a division of Ser. No. 189,318, May 2, 1988, Pat. No. 5,010,175. This application Nov. 25, 1992, Ser. No. 981,759

Int. Cl.<sup>6</sup> A61K 38/00; C07K 5/00, 7/00, 17/00

U.S. Cl. 530-333

19 Claims

1. A method of obtaining a peptide having a desired target property, comprising the steps of:  
providing a mixture of candidate peptides containing 8,000 or more different peptides of distinct, unique and different amino acid sequences, wherein the presence of each peptide in the mixture is predetermined, each peptide is present in the mixture in retrievable and analyzable amounts and the mixture includes at least one biologically active peptide in a retrievable and analyzable amount; and  
selecting from among the mixture of candidate peptides a peptide having a desired target property by exposing the mixture of candidate peptides to a substance to which the peptide having a desired target property will preferentially bind.

5,438,120  
ANTIGENIC PREPARATION AND ISOLATION OF SUCH PREPARATIONS

Pavel Novotny, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 58,227, May 10, 1993, abandoned, which is a continuation of Ser. No. 806,839, Dec. 9, 1991, Pat. No. 5,237,052, which is a continuation of Ser. No. 521,741, May 10, 1990, abandoned, which is a division of Ser. No. 142,261, Jan. 7, 1988, abandoned, which is a division of Ser. No. 894,435, Jul. 30, 1986, abandoned, which is a division of Ser. No. 729,257, May 1, 1985, abandoned. This application May 11, 1994, Ser. No. 240,814

Claims priority, application United Kingdom, May 12, 1984, 8412207

The portion of the term of this patent subsequent to Aug. 17, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 39/10; C07K 14/235

U.S. Cl. 530-350

1 Claim

1. A purified *Bordetella pertussis* antigen characterized by the following features:  
a relative molecular weight of between 67,000 and 69,000 as determined by 12% (W/W) polyacrylamide gel electrophoresis; and  
a ratio of proline to glutamic acid of substantially 1:1 as determined by amino acid analysis.

5,438,121

## BRAIN DERIVED NEUROTROPHIC FACTOR

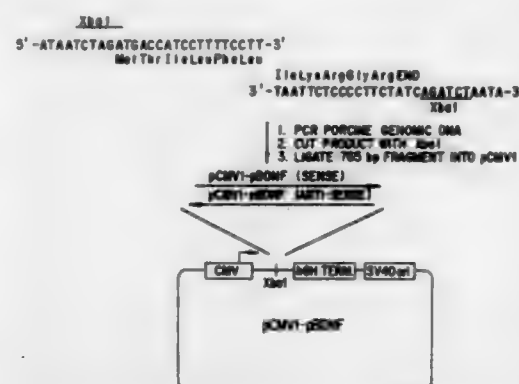
Yves-Alain Barde, Munich; Joachim Leibrock, Gauting; Friedrich Lottspeich, Neuried, all of Germany; David Edgar, Liverpool, England; George Yancopoulos, New York, N.Y., and Hans Thoenen, Munich, Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Martinsried, Germany and Regeneron Pharmaceuticals, Inc., Tarrytown, N.Y.

Continuation-in-part of Ser. No. 570,657, Aug. 20, 1990, Pat. No. 5,229,500, which is a continuation-in-part of Ser. No. 400,591, Aug. 30, 1989, Pat. No. 5,180,820. This application Apr. 25, 1991, Ser. No. 691,612

The portion of the term of this patent subsequent to Jul. 20, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 37/24; C07K 3/00; A23J 1/00; C12P 21/06  
U.S. Cl. 530-399

11 Claims



1. An essentially purified, isolated and non-denatured protein having neurotrophic activity and an amino acid sequence as follows:

His Ser Asp Pro Ala Arg Arg Gly Glu Leu Ser Val Cys Asp Ser Ile Ser Glu Trp Val Thr Ala Ala Asp Lys Lys Thr Ala Val Asp Met Ser Gly Gly Thr Val Thr Val Leu Glu Lys Val Pro Val Ser Lys Gly Gln Leu Lys Gln Tyr Phe Tyr Glu Thr Lys Cys Asn Pro Met Gly Tyr Thr Lys Glu Gly Cys Arg Gly Ile Asp Lys Arg His Trp Asn Ser Gln Cys Arg Thr Thr Gln Ser Tyr Val Arg Ala Leu Thr Met

Asp Ser Lys Lys Arg Ile Gly Trp Arg Phe Ile Arg Ile Asp Thr Ser Cys Val Cys Thr Leu Thr Ile Lys Arg Gly Arg.

5,438,122

## TRIAZENE DYES FOR USE IN THERMAL TRANSFER PRINTING

Luc Vanmaele, Lochristi, Belgium, assignor to AGFA-Gevaert, N.V., Mortsel, Belgium

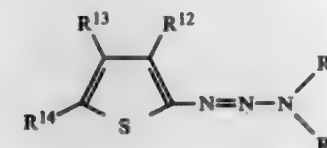
Division of Ser. No. 61,568, May 17, 1993, Pat. No. 5,356,857. This application Aug. 23, 1994, Ser. No. 294,358

Int. Cl.<sup>6</sup> C09B 26/06

U.S. Cl. 534-551

1 Claim

1. A dye according to the following formula:



wherein R<sup>1</sup> and R<sup>2</sup> independently represent hydrogen, an alkyl group, an alkenyl group, and aryl group, a cycloalkyl group, an aralkyl group, or R<sup>1</sup> and R<sup>2</sup> together represent the atoms necessary to complete a ring system;

R<sup>12</sup> represents H or an electron withdrawing group

R<sup>13</sup> represents H, halogen, an alkoxy group, an alkyl group, an aryl group, an acylamido group, CN, an alkylthio group, an arylthio group CO<sub>2</sub>R<sup>10</sup>, CONR<sup>10</sup>R<sup>11</sup>, SO<sub>2</sub>R<sup>10</sup>, SO<sub>3</sub>R<sup>10</sup>, SO<sub>2</sub>NR<sup>10</sup>R<sup>11</sup>, a heterocyclic group, a cycloalkoxy group, an aryloxy group;

R<sup>14</sup> represents H, CN, alkyl, halogen, NO<sub>2</sub>, SO<sub>2</sub>R<sup>15</sup>, SO<sub>3</sub>R<sup>15</sup> or R<sup>5</sup>-C≡B;

B represents O, N-R<sup>7</sup> or CR<sup>8</sup>R<sup>9</sup>;

R<sup>7</sup> represents H, CN, NR<sup>10</sup>R<sup>11</sup>, OR<sup>10</sup>, OCO<sup>10</sup>, OCO<sub>2</sub>R<sup>10</sup>, OCONR<sup>10</sup>R<sup>11</sup>, OSO<sub>2</sub>R<sup>10</sup>, OP(O)(OR<sup>10</sup>)(OR<sup>11</sup>), alkyl, aryl, cycloalkyl, a heterocyclic ring;

R<sup>8</sup> and R<sup>9</sup> independently represent an electron withdrawing group or a heterocyclic ring or R<sup>8</sup> and R<sup>9</sup> together represent the necessary atoms for completing a ring system

R<sup>12</sup> and R<sup>13</sup> or R<sup>13</sup> and R<sup>14</sup> may together represent the necessary atoms for completing a ring system including fused-on ring system;

R<sup>10</sup> and R<sup>11</sup> independently represent hydrogen, alkyl, aryl, cycloalkyl, a heterocyclic ring, or R<sup>10</sup> and R<sup>11</sup> together represent the atoms necessary for completing a heterocyclic nucleus;

R<sup>5</sup> represents hydrogen, alkyl, aryl, an electron withdrawing group, an aryloxy group, an alkoxy group, an alkylthio group, an amino group or R<sup>5</sup> and R<sup>8</sup>, R<sup>9</sup> or R<sup>7</sup> together represent the necessary atoms for completing a ring system;

R<sup>15</sup> represents hydrogen, alkyl, aryl, cycloalkyl, a heterocyclic ring.

5,438,123

## INSECTICIDAL PHENYLHYDRAZINE DERIVATIVES

Mark A. Dekeyser, Waterloo, Canada, and Paul T. McDonald, Middlebury, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn. and Uniroyal Chemical Ltd./Ltee, Elmira, Canada

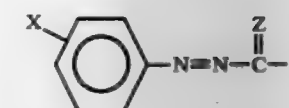
Division of Ser. No. 979,095, Nov. 10, 1992, Pat. No. 5,367,093, which is a continuation-in-part of Ser. No. 796,506, Nov. 22, 1991, abandoned. This application Aug. 5, 1994, Ser. No. 286,738

Int. Cl.<sup>6</sup> C07C 245/06; A01N 37/30

U.S. Cl. 534-885

4 Claims

1. A compound having the structural formula:



wherein

X is a) phenyl; lower phenylalkoxy; phenoxy; or benzyl; the phenyl ring of each substituent being optionally substituted with one or more of halogen, nitro, lower alkyl, lower alkoxy, lower haloalkyl or dialkylamino; or b) one substituent from group a) and one or more substituents selected from C<sub>1</sub>-C<sub>4</sub> alkoxy; halogen; lower alkyl; and lower alkylthio;

R is H, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> haloalkyl, or C<sub>3</sub>-C<sub>6</sub> cycloalkyl; and  
Z is O.

5,438,124

## GLYCOSYLATING REAGENT FOR THE SYNTHESIS OF LINEAR AND OTHER α-L-FUCOSYL OLIGOSACCHARIDES

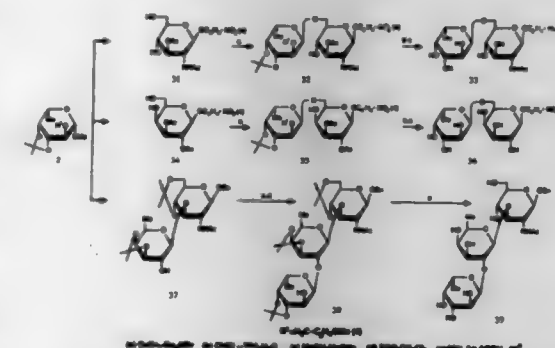
Khushi L. Matta, Williamsville; Rakesh K. Jain, Amherst, and Robert D. Locke, Buffalo, all of N.Y., assignors to Health Research, Inc., Buffalo, N.Y.

Filed Jul. 16, 1991, Ser. No. 730,662

Int. Cl.<sup>6</sup> C07G 3/00; C07H 15/00, 15/24

U.S. Cl. 536-4.1

6 Claims



1. The compound R-3,4-O-isopropylidene-2-O-(4-methoxybenzyl)-1-thio-β-L-fucopyranoside wherein R is a lower alkyl or lower alkenyl of 1 to 8 carbon atoms.

5,438,125

## SIALIC ACID DERIVATIVES

Kaoru Okamoto, and Shinji Morita, both of Hyogo, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

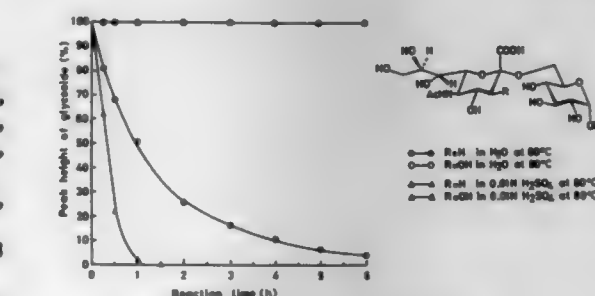
Filed Mar. 4, 1992, Ser. No. 845,665

Claims priority, application Japan, Mar. 6, 1991, 3-068017

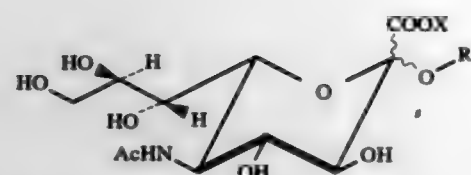
Int. Cl.<sup>6</sup> C07H 15/00, 15/24; C08B 37/00

U.S. Cl. 536-4.1

10 Claims



1. A sialic acid compound of the formula



wherein X is hydrogen, a C<sub>1-4</sub> alkyl or benzyl group, Ac is acetyl,

R is alkyl, glucose, cholesterol, alkylglycerol dialkylglycerol, diacylglycerol or uridine; or a pharmaceutically acceptable salt thereof.

5,438,126

## HUMAN THYROID HORMONE RECEPTOR DNA

Leslie J. DeGroot, and Akira Nakai, both of Chicago, Ill., assignors to Arch Development Corporation, Chicago, Ill. Continuation of Ser. No. 405,342, Sep. 11, 1989, abandoned. This application Feb. 3, 1992, Ser. No. 830,766

Int. Cl.<sup>6</sup> C12Q 1/68; C07H 21/14; C07K 14/435

U.S. Cl. 536—23.5

5 Claims

1. A purified and isolated nucleic acid molecule having a contiguous, uninterrupted sequence encoding human hTRα1 as defined by the amino acid sequence of FIG. 1A, FIG. 1B, and FIG. 1C.

5,438,127

DNA PURIFICATION BY SOLID PHASE EXTRACTION USING A PCL<sub>3</sub> MODIFIED GLASS FIBER MEMBRANE

Daniel L. Woodard; Adriann J. Howard, both of Raleigh, and James A. Down, Cary, all of N.C., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 27, 1993, Ser. No. 127,404

Int. Cl.<sup>6</sup> C07H 21/04; B01J 20/10

U.S. Cl. 536—25.4

2 Claims

1. A modified glass fiber membrane which exhibits sufficient hydrophilicity and sufficient electropositivity to bind DNA from a suspension containing DNA and permit elution of the DNA from the membrane, said glass fiber membrane treated first with NaOH, then with PCl<sub>3</sub> and finally with H<sub>2</sub>O.

2. A method for purifying DNA comprising the steps of: (a) contacting a suspension containing DNA with the modified glass fiber membrane of claim 1 under conditions suitable to bind DNA to said membrane; (b) washing said membrane having bound DNA; and (c) eluting the DNA from said membrane.

5,438,128

## METHOD FOR RAPID PURIFICATION OF NUCLEIC ACIDS USING LAYERED ION-EXCHANGE MEMBRANES

Yolanda Nieuwkerk, La Jolla, Calif.; Robert J. Barry, Kittery, Me.; Malcolm G. Pluskal, Acton, and Richard A. Hamilton, Beverly, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Feb. 7, 1992, Ser. No. 832,284

Int. Cl.<sup>6</sup> C07H 1/06, 1/08

U.S. Cl. 536—25.4

9 Claims

1. A method for the rapid isolation and purification of a nucleic acid of interest from a cell lysate sample containing the nucleic acid of interest using ion-exchange membranes, comprising the steps of:

a) applying a buffered solution of sample containing nucleic acid to a membrane assembly which contains a plurality of stacked microporous membranes with pore sizes of 0.1 to 12 microns functionalized with ion-exchange groups capable of adsorbing ionized nucleic acids thereto, wherein the nucleic acid is retained by the membrane;

b) washing the membrane assembly with an elution buffer of a determined ionic strength sufficient to release weakly

adsorbed elute contaminating substances contained in said sample from the membrane;

c) washing the membrane assembly with an elution buffer of determined ionic strength sufficient to release the bound nucleic acid from the membrane; and

d) recovering the purified nucleic acid.

5,438,129

## DNA PURIFICATION BY SOLID PHASE EXTRACTION USING PARTIALLY FLUORINATED ALUMINUM HYDROXIDE ADSORBANT

Daniel L. Woodard; Adriann J. Howard, both of Raleigh, and James A. Down, Cary, all of N.C., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 27, 1993, Ser. No. 127,407

Int. Cl.<sup>6</sup> C07H 21/04

U.S. Cl. 536—25.4

3 Claims

1. A method for purifying DNA comprising the steps of: (a) contacting a suspension containing DNA with a fluorinated surface prepared by reacting Al(OH)<sub>3</sub> with about 0.05 to about 1.5 equivalents of fluoride under conditions suitable to bind DNA to said surface;

(b) washing said fluorinated surface having bound DNA; and

(c) eluting the DNA from said fluorinated surface.

2. A method for purifying DNA comprising the steps of: (a) contacting a suspension containing DNA with a fluorinated surface prepared by reacting Al(OH)<sub>3</sub> with about 0.1 to about 0.9 equivalents of fluoride under conditions suitable to bind DNA to said surface;

(b) washing said fluorinated surface having bound DNA; and

(c) eluting the DNA from said fluorinated surface.

3. A method for purifying DNA comprising the steps of: (a) contacting a suspension containing DNA with a fluorinated surface prepared by reacting Al(OH)<sub>3</sub> with about 0.3 equivalents of fluoride under conditions suitable to bind DNA to said surface;

(b) washing said fluorinated surface having bound DNA; and

(c) eluting the DNA from said fluorinated surface.

5,438,130

## FUCOSYLATED GUANOSINE DISULFATES AS EXCITATORY AMINO ACID ANTAGONISTS

Stanley Goldin, Lexington; James Fisher; Kazumi Kobayashi, both of Arlington; Laxma Reddy, Malden; Andy Knapp, Salem; Lee Margolin, Belmont, all of Mass., and Kevin D. McCormick, Ithaca, N.Y., assignors to Cambridge Neuroscience, Inc., Cambridge, Mass. and Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jan. 15, 1993, Ser. No. 4,928

Int. Cl.<sup>6</sup> C07H 19/167

U.S. Cl. 536—27.81

38 Claims

1. A compound consisting of a base, a ribose and a fucose, in which said base is a purine, said ribose has R<sub>1</sub> and R<sub>2</sub> attached respectively to any two of 2'-O, 3'-O and 5'-O, and said fucose has R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> attached respectively to any three of 1'-O, 2'-O, 3'-O and 4'-O, wherein each R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> is H, acetate, sulfate, or phosphate; and said base is linked to said ribose via a bond between 9-N of said base and 1'-C of said ribose, and said ribose is linked to said fucose via a bond between any one of 2'-O, 3'-O and 5'-O of said ribose and 1'-C of said fucose.

24. The compound of claim 1 is guanosine-3',5'-disulfate-2'-α-D-(4'-acetyl)fucose, guanosine-3',5'-disulfate-2'-β-D-(4'-acetyl)fucose, guanosine-3',5'-disulfate-2'-α-L-(4'-acetyl)fucose, or guanosine-3',5'-disulfate-2'-β-L-(4'-acetyl)fucose.

5,438,131

## 3-NITROPYRROLE NUCLEOSIDE

Donald E. Bergstrom, 903 Fifth St., West Lafayette, Ind. 47906; Philip C. Andrews; Ruthann Nichols, both of 108 South Revena Blvd., Ann Arbor, Mich. 48103, and Peiming Zhang, 2429-1A N. Armstrong, West Lafayette, Ind. 47906

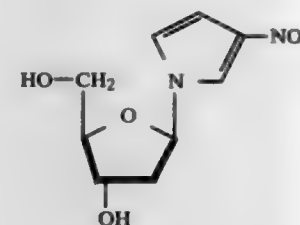
Filed Sep. 16, 1992, Ser. No. 946,971

Int. Cl.<sup>6</sup> C07H 15/12, 17/00, 5/04, 19/00

U.S. Cl. 536—28.6

1 Claim

1. A nucleoside of the formula:



5,438,132

## METHOD FOR REMOVING OSMIUM FROM NUCLEOSIDES

Brian L. Bray, Graham; Maynard E. Lichty, Durham; John J. Partridge, Chapel Hill, all of N.C., and John P. Turnbull, Greenford, United Kingdom, assignors to Glaxo Group Limited, London, United Kingdom

Division of Ser. No. 772,738, Oct. 7, 1991, Pat. No. 5,233,041.

This application May 14, 1993, Ser. No. 61,869

Int. Cl.<sup>6</sup> C07H 19/00, 19/067, 19/167; C01G 55/00

U.S. Cl. 536—55.3

2 Claims

1. A method of removing osmium contamination from a nucleoside which comprises:

- dissolving said nucleoside in an aqueous solution,
- contacting said solution with hydrogen sulfide, an aromatic pi base and a mineral acid,
- precipitating an osmium-containing residue from the solution, and
- removing said residue from said solution.

5,438,133

## CYCLODEXTRIN CATENANE COMPOUNDS CAPABLE OF FORMING INCLUSION COMPLEXES

Christopher P. Moore, Harrow; Trevor J. Wear, South Harrow; James F. Stoddart, and Dominique Armspach, both of Edgbaston, all of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/EP93/01295, § 371 Date Jan. 27, 1994, § 102(e)

Date Jan. 27, 1994, PCT Pub. No. WO93/24532, PCT Pub. Date Sep. 12, 1993

PCT Filed May 24, 1993, Ser. No. 190,010

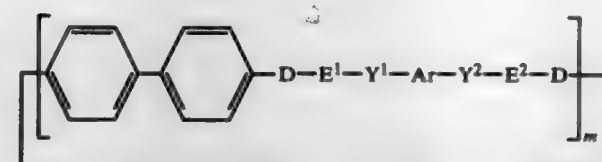
Claims priority, application United Kingdom, May 30, 1992, 9211573

Int. Cl.<sup>6</sup> C08B 37/16

U.S. Cl. 536—103

7 Claims

1. A cyclodextrin catenane comprising one or two per-2,6-di-O-alkyl-β-cyclodextrin macrocycles and another macrocycle wherein each per-2,6-di-O-alkyl-β cyclodextrin macrocycle is interpenetrated by the other macrocycle which has the formula



wherein

D represents —CH<sub>2</sub>— or —CO—;

E<sup>1</sup> represents —(XCH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>—;

E<sup>2</sup> represents —(CH<sub>2</sub>CH<sub>2</sub>X)<sub>n</sub>—;

each X independently represents —O— or —NR—;

Y<sup>1</sup> represents —NRCO—, —NRSO<sub>2</sub>—, —SCO— or —S—

SO<sub>2</sub>—;

Y<sup>2</sup> represents —CONR—, —SO<sub>2</sub>NR—, —COS— or

—SO<sub>2</sub>S—;

R represents hydrogen or alkyl;

Ar is an aromatic group;

n is an integer from 4 to 6; and,

m is 1 or 2, provided that when the catenane comprises two

per-2,6-di-O-alkyl-β-cyclodextrin macrocycles then m is

2.

5,438,134

## PROCESS FOR THE PRODUCTION OF UNSATURATED 17 α-CYANOMETHYL-17 β-HYDROXY STEROIDS

Gerhard Teichmüller, and Gerd Müller, both of Jena, Germany, assignors to Jenapharm GmbH, Jena, Germany

PCT No. PCT/DE91/00562, § 371 Date Jan. 1, 1993, § 102(e)

Date Jan. 1, 1993, PCT Pub. No. WO92/00991, PCT Pub.

Date Jan. 23, 1992

PCT Filed Jul. 5, 1991, Ser. No. 927,633

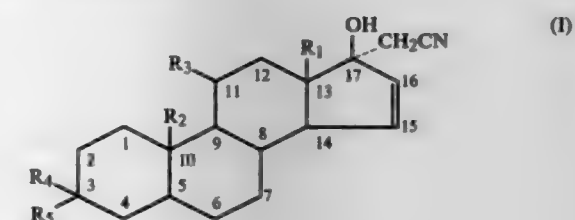
Claims priority, application Germany, Jul. 9, 1990, C 07 J3 42 603.3; Jul. 9, 1990, C 07 J3 42 604.1; Jul. 9, 1990, C 07 J3 42 605.8

Int. Cl.<sup>6</sup> C07J 1/00, 41/00

U.S. Cl. 540—32

33 Claims

1. Unsaturated 15-dehydro-17α-cyanomethyl-17β-hydroxy steroids of the formula



wherein

R<sub>1</sub> is methyl or ethyl;

R<sub>2</sub> is selected from the group consisting of hydrogen and methyl;

R<sub>3</sub> is selected from the group consisting of hydrogen, hydroxy, acetoxy and alkoxy having 1 to 6 carbon atoms;

R<sub>4</sub> is hydrogen and R<sub>5</sub> is selected from the group consisting of hydroxy, acetoxy and alkoxy having 1 to 6 carbon atoms, or

R<sub>4</sub> and R<sub>5</sub> are both methoxy or both ethoxy, or

R<sub>4</sub> and R<sub>5</sub>, together, represent a keto group or a ketal group selected from the group consisting of —O—CH<sub>2</sub>—CH—

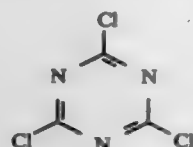
2—O—; —O—CH<sub>2</sub>—C(CH<sub>3</sub>)<sub>2</sub>—CH<sub>2</sub>—O— and —OPCH(CH<sub>3</sub>)—CH<sub>2</sub>—CH(CH<sub>3</sub>)—O—;

wherein said steroids of formula (I) also have at least one other double bond between the 1 and 2 positions, the 2 and 3 positions, the 3 and 4 positions, the 4 and 5 positions, the 5 and 6 positions, the 5 and 10 positions, the 9 and 10 positions and the 9 and 11 positions, said 1,2,3,4,5,6,9,10 and 11 positions being shown in the formula I above; and with the proviso that R<sub>2</sub> cannot be methyl, when said at least one other double bond is between the 5 and 10 positions or between the 9 and 10 positions.





wherein X is a bromine or chlorine atom, and R<sup>1</sup> and R<sup>2</sup> are as defined above, in tetrahydrofuran with magnesium metal to form the corresponding Grignard reagent, and reacting the resultant solution with cyanuric chloride of formula III



such that, when Z is —Cl, at least 1.05 mol or, when, Z is a radical of formula Ib, at least 2.1 mol, of the Grignard reagent is used per 1 mol of cyanuric chloride.

#### 5,438,139 ACRIDINIUM COMPOUNDS AND CONJUGATES THEREOF

Naofumi Sato, Saitama; Hiroshi Mochizuki, Tokyo, and Toshinori Kanamori, Saitama, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1994, Ser. No. 188,724

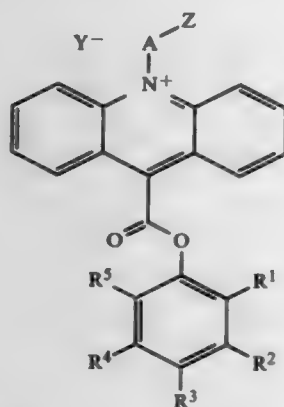
Claims priority, application Japan, Feb. 4, 1993, 5-017465

Int. Cl.<sup>6</sup> C07D 219/08

U.S. Cl. 546—102

12 Claims

1. An acridinium compound represented by the general formula (I):



wherein A is an alkylene group having 1-4 carbon atoms or an arylene group, in which one or more carbon atoms may be replaced by hetero atoms or which may optionally have substituents; Z is a carboxyl group, an alkoxycarbonyl group, a carbamoyl group, an aryloxycarbonyl group, a hydroxyl group, a cyano group, a carboxyimide group, an isocyanate group, an isothiocyanate group, an azide group, a sulfonic acid group, a sulfonamide group, a halogenated sulfonyl group, a halogenated carbonyl group, an N-succinimidylloxycarbonyl group or an N-phthalimidylloxycarbonyl group; R<sup>1</sup> is a halogen atom, an alkyl group or an aryl group; R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> which may be the same or different represent a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an acetyl group, a nitro group, a halogen atom or a carbonyl group, provided that adjacent groups as selected from among R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> may combine to form a ring; and Y is a counter ion.

#### 5,438,140 PRODUCTION OF NICKELIZED SHAPED ARTICLES

Alfred Oefring, Bad Dürkheim; Bernd Burkhardt, Mutterstadt; Volker Schwendemann, Neustadt, and Klaus Glaser, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP92/02180, § 371 Date Apr. 28, 1994, § 102(e) Date Apr. 28, 1994, PCT Pub. No. WO93/09275, PCT Pub. Date May 13, 1993

PCT Filed Sep. 21, 1992, Ser. No. 211,726

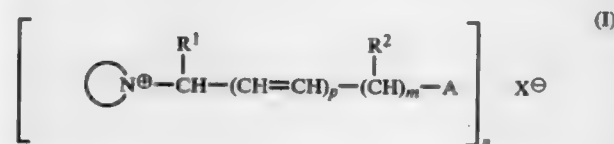
Claims priority, application Germany, Oct. 30, 1991, 41 35 710.8

Int. Cl.<sup>6</sup> C07D 217/00

U.S. Cl. 546—147

11 Claims

1. A process for producing nickelized shaped articles, comprising electrodepositing nickel from aqueous acidic baths containing as essential constituents one or more nickel salts, one or more inorganic acids and one or more brighteners, said brighteners being cyclic ammonium compounds of the general formula I



where the nitrogen atom is part of a pyridine, quinoline or isoquinoline ring system which can additionally carry one or two C<sub>1</sub>-C<sub>4</sub>-alkyl substituents,

R<sup>1</sup> and R<sup>2</sup> are each hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl,

A is a group of the formula —CO—R<sup>3</sup>, —CO—O—R<sup>3</sup>, —CO—CH<sub>2</sub>—CO—O—R<sup>3</sup>, —O—CO—R<sup>3</sup> or —O—R<sup>3</sup>,

where

R<sup>3</sup> is C<sub>1</sub>-C<sub>12</sub>-alkyl, C<sub>5</sub>-C<sub>8</sub>-cycloalkyl, C<sub>7</sub>-C<sub>12</sub>-phenylalkyl or phenyl which can be substituted by one or two C<sub>1</sub>-C<sub>4</sub>-alkyl radicals, C<sub>1</sub>-C<sub>4</sub>-alkoxy radicals, halogen atoms, hydroxyl groups, phenyl radicals or C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl groups,

m is from 0 to 10, n is from 1 to 4, p is 0 or 1, and

X<sup>+</sup> is an n-valent inorganic or organic anion which promotes water solubility,

with the proviso that for p=0 and A=—CO—O—C<sub>1</sub>-C<sub>12</sub>-alkyl m must not be 1, 2 or 3 and under the same conditions R<sup>1</sup> must not be hydrogen when m is 0.

#### 5,438,141 HETEROARYL AND HALOARYL QUINOLINE DERIVATIVES OF CYCLOPROPANECARBOXYLIC ACID AS LEUKOTRIENE ANTAGONISTS

Marc LaBell, Ile Perrot; Yves LeBlanc, Kirkland; Michel Belley, Pierrefonds; Erich L. Grimm, Baie d'Urfe; Daniel Guay, Notre Dame De L'île Perrot, all of Canada, and Yi B. Xiang, Lexington, Mass., assignors to Merck Frosst Canada, Inc., Kirkland, Canada

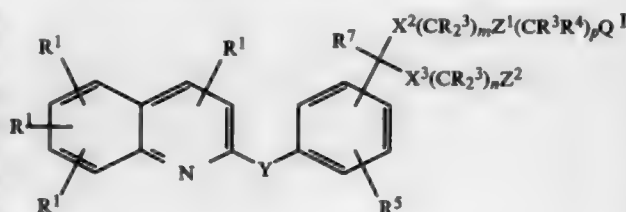
Filed May 21, 1993, Ser. No. 65,734

Int. Cl.<sup>6</sup> C07D 401/06, 215/16; A61K 31/41, 31/47

U.S. Cl. 546—176

11 Claims

1. A compound of the Formula I:



wherein:

R<sup>1</sup> is H, halogen, —CF<sub>3</sub>, —CN, —NO<sub>2</sub>, or —N<sub>3</sub>;

#### 5,438,142 FUNCTIONALIZED TRIS (HYDROXYPHENYL) COMPOUNDS

John R. Fritsch; Olan S. Fruchey; Debasish Kulla; George Kvaszky; Mark A. Murphy; Michael T. Sheehan; James R. Sounik, and Richard Vicari, all of Corpus Christi, Tex., assignors to Hoechst Celanese Corp., Somerville, N.J.

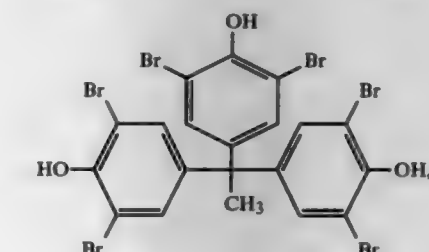
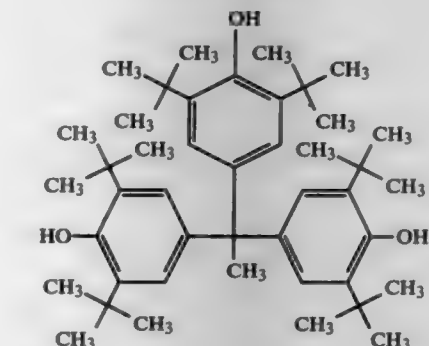
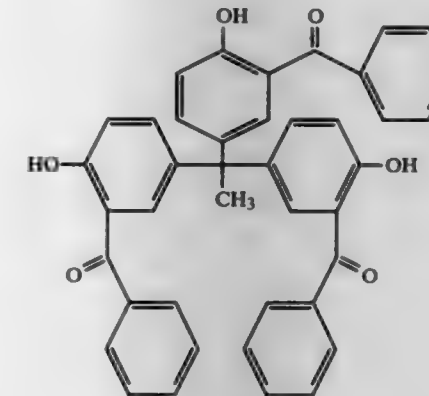
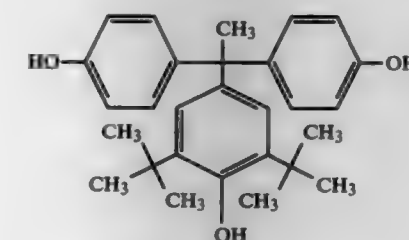
Continuation-in-part of Ser. No. 921,450, Jul. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 829,123, Feb. 3, 1992, abandoned. This application Aug. 10, 1993, Ser. No. 105,824

Int. Cl.<sup>6</sup> C07D 249/16, 249/20; C08F 26/06; C08K 5/34

U.S. Cl. 546—240

2 Claims

1. A tris(hydroxyphenyl) ethane compound selected from the group consisting of:



R<sup>2</sup> is lower alkyl, lower alkenyl, lower alkynyl, —CF<sub>3</sub>, —CH<sub>2</sub>F, —CHF<sub>2</sub>, Ph(R<sup>25</sup>)<sub>2</sub>, CH<sub>2</sub>Ph(R<sup>25</sup>)<sub>2</sub>, or CH<sub>2</sub>CH<sub>2</sub>Ph(R<sup>25</sup>)<sub>2</sub>, or two R<sup>2</sup> groups joined to the same atom may form a saturated carboxylic ring of up to 8 members;

R<sup>3</sup> is H or R<sup>2</sup>;

R<sup>4</sup> is R<sup>3</sup>, halogen, —NO<sub>2</sub>, —CN, —CF<sub>3</sub>, —OR<sup>3</sup>, N(R<sup>3</sup>)<sub>2</sub>, NR<sup>3</sup>COR<sup>7</sup>, —SR<sup>2</sup>, S(O)R<sup>2</sup>, S(O)<sub>2</sub>R<sup>2</sup>, CHR<sup>7</sup>OR<sup>3</sup>, or CHR<sup>7</sup>SR<sup>2</sup>;

CR<sup>3</sup>R<sup>4</sup> may be the radical of a standard amino acid;

R<sup>5</sup> is H, halogen, —NO<sub>2</sub>, —N<sub>3</sub>, —CN, —SR<sup>2</sup>—S(O)R<sup>2</sup>, S(O)<sub>2</sub>R<sup>2</sup>, —N(R<sup>12</sup>)<sub>2</sub>, —OR<sup>3</sup>, —COR<sup>3</sup>, or lower alkyl;

R<sup>6</sup> is —(CH<sub>2</sub>)<sub>2</sub>—C(R<sup>7</sup>)<sub>2</sub>—(CH<sub>2</sub>)<sub>2</sub>—R<sup>8</sup> or —CH<sub>2</sub>CON(R<sup>20</sup>)<sub>2</sub>;

R<sup>7</sup> is H or lower alkyl;

R<sup>8</sup> is B) the radical W—R<sup>9</sup>;

R<sup>9</sup> contains up to 21 carbon atoms and is (1) a hydrocarbon radical or (2) an acyl radical of an organic acyclic or monocyclic carboxylic acid containing not more than 1 heteroatom in the ring;

R<sup>10</sup> is H, lower alkyl, or halogen;

R<sup>11</sup> is lower alkyl, —COR<sup>14</sup>, p(R<sup>25</sup>)<sub>2</sub>, CH<sub>2</sub>Ph(R<sup>25</sup>)<sub>2</sub>, or CH<sub>2</sub>CH<sub>2</sub>Ph(R<sup>25</sup>)<sub>2</sub>;

R<sup>12</sup> is H or R<sup>11</sup>;

R<sup>13</sup> is lower alkyl, lower alkenyl, lower alkynyl, —CF<sub>3</sub>, Ph(R<sup>25</sup>)<sub>2</sub>, CH<sub>2</sub>Ph(R<sup>25</sup>)<sub>2</sub>, or CH<sub>2</sub>CH<sub>2</sub>Ph(R<sup>25</sup>)<sub>2</sub>;

R<sup>14</sup> is H or R<sup>13</sup>;

R<sup>16</sup> is H, lower alkyl, or OH;

R<sup>17</sup> is lower alkyl, lower alkenyl, lower alkynyl, Ph(R<sup>25</sup>)<sub>2</sub>, CH<sub>2</sub>Ph(R<sup>25</sup>)<sub>2</sub>, or CH<sub>2</sub>CH<sub>2</sub>Ph(R<sup>25</sup>)<sub>2</sub>;

R<sup>18</sup> is R<sup>13</sup>;

R<sup>19</sup> is H, lower alkyl, lower alkenyl, lower alkynyl, —CF<sub>3</sub>, Ph, CH<sub>2</sub>Ph, or CH<sub>2</sub>CH<sub>2</sub>Ph;

R<sup>20</sup> is H, lower alkyl, Ph(R<sup>25</sup>)<sub>2</sub>, CH<sub>2</sub>Ph(R<sup>25</sup>)<sub>2</sub>, or CH<sub>2</sub>CH<sub>2</sub>Ph(R<sup>25</sup>)<sub>2</sub>;

R<sup>21</sup> is H or R<sup>17</sup>;

R<sup>22</sup>, R<sup>23</sup>, and R<sup>24</sup> are each independently H, lower alkyl, CF<sub>3</sub>, CF<sub>2</sub>H, CH<sub>2</sub>CF<sub>3</sub>, halogen, OR<sup>3</sup>, SR<sup>2</sup>, or an electron pair;

R<sup>25</sup> is H, —CO<sub>2</sub>R<sup>7</sup>, —COR<sup>7</sup>, —CN, CF<sub>3</sub>, NO<sub>2</sub>, SCF<sub>3</sub>, lower alkyl, —SR<sup>26</sup>, —OR<sup>27</sup>, N(R<sup>27</sup>)<sub>2</sub>, CON(R<sup>27</sup>)<sub>2</sub>, or halogen.

R<sup>26</sup> is lower alkyl, phenyl, or benzyl;

R<sup>27</sup> is R<sup>26</sup>, H, or COR<sup>7</sup>;

m, n, and p is each independently 0-8;

m+p is 1-10 when X<sup>2</sup> is O, S, S(O), or S(O)<sub>2</sub> and Z<sub>1</sub> is a bond;

n+p is 0-10 when Z<sub>1</sub> is HET (R<sup>22</sup>R<sup>23</sup>R<sup>24</sup>);

m+p is 0-10 when X<sup>2</sup> is CR<sup>3</sup>R<sup>16</sup>;

s is 0-3;

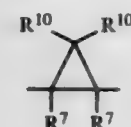
Q is tetrazol-5-yl, —CO<sub>2</sub>R<sup>3</sup>, —CO<sub>2</sub>R<sup>6</sup>, —CONHS(O)<sub>2</sub>R<sup>13</sup>, —CN, —CON(R<sup>20</sup>)<sub>2</sub>, —NR<sup>21</sup>S(O)<sub>2</sub>R<sup>13</sup>, —NR<sup>22</sup>CON(R<sup>20</sup>)<sub>2</sub>, —NR<sup>21</sup>COR<sup>14</sup>, OCON(R<sup>20</sup>)<sub>2</sub>, —COR<sup>19</sup>, —S(O)<sub>2</sub>R<sup>18</sup>, —S(O)<sub>2</sub>R<sup>18</sup>, —S(O)<sub>2</sub>N(R<sup>20</sup>)<sub>2</sub>, —NO<sub>2</sub>, NR<sup>21</sup>CO<sub>2</sub>R<sup>17</sup>, —C(N(R<sup>20</sup>)<sub>2</sub>)=NR<sup>21</sup>, —C(R<sup>19</sup>)=NOH, or —C(R<sup>3</sup>)<sub>2</sub>OH;

W is S or NR<sup>3</sup>;

X<sup>1</sup> is —NR<sup>3</sup>, —C(R<sup>3</sup>)<sub>2</sub>—, or a bond;

X<sup>2</sup> and X<sup>3</sup> are each independently O, S, S(O), S(O)<sub>2</sub>, CR<sup>3</sup>R<sup>16</sup>, or a bond;

Y is —CR<sup>3</sup>=CR<sup>3</sup>—, —C(R<sup>3</sup>)<sub>2</sub>—X<sup>1</sup>—, —X<sup>1</sup>—C(R<sup>3</sup>)<sub>2</sub>—, —C(R<sup>3</sup>)<sub>2</sub>—X<sup>1</sup>—C(R<sup>3</sup>)<sub>2</sub>—, —C=CO—, —CO—, —NR<sup>3</sup>CO—, —CONR<sup>3</sup>—, NR<sup>3</sup>, or

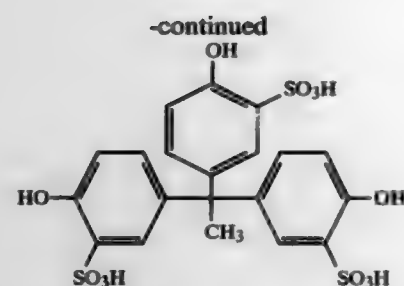


Z<sub>1</sub> is a bond;

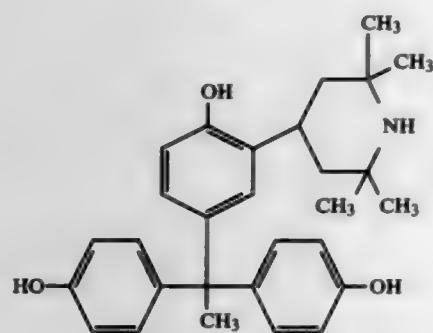
Z<sub>2</sub> is benzylene or a heterocyclic moiety derived from pyridine, furan, thiophene, thiazole, pyrazine, benzimidazole, quinoline, benzothiazole, 5,6,7,8-tetrahydroquinoline, or 1,2,5-thiadiazole;

or a pharmaceutically acceptable salt thereof.





or



2. 1-(3'-(benzotriazol-2''-yl)-4'-hydroxyphenyl)-1,1-bis(4-hydroxyphenyl) ethane.

5,438,143

# PROCESS FOR THE PREPARATION OF SUBSTITUTED PYRIDINES VIA 1-AZA-1,3-BUTADIENES AND THE 1-AZA-1,3-BUTADIENE INTERMEDIATES

Anna M. C. F. Castelljans, Stein, and Henricus J. Arts, Sittard, both of Netherlands, assignors to DSM N.V., Netherlands  
PCT No. PCT/NL91/00148, § 371 Date May 21, 1993, § 102(e)  
Date May 21, 1993, PCT Pub. No. WO92/02505, PCT Pub. Date Feb. 20, 1992

PCT Filed Aug. 7, 1991, Ser. No. 963,556

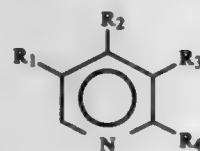
Claims priority, application Netherlands, Aug. 8, 1990, 9001786

Int. Cl.<sup>6</sup> C07D 213/08, 213/09, 213/12

U.S. Cl. 546—250

19 Claims

1. A process for the preparation of a substituted pyridine by reaction of a 1-aza-1,3-butadiene wherein, a pyridine represented by formula 1

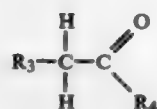


wherein R<sub>1</sub> is H or R<sub>1</sub> and R<sub>3</sub> can be a 1-20 carbon atom group independently selected from the group consisting of (cyclo)alkyl, aryl, and alkoxy and R<sub>2</sub> is H or a 1-20 carbon atom group independently selected from the group consisting of aryl and (cyclo)alkyl, wherein only one of R<sub>1</sub> and R<sub>2</sub> may be H, R<sub>4</sub> is selected from the group consisting of H, aryl having 6 to 20 carbon atoms and (cyclo)alkyl with 1-20 carbon atoms, or R<sub>3</sub> and R<sub>4</sub> form together with the C atoms to which they are attached a cycloalkyl group with 4-8 C-atoms, is formed by allowing an 1-aza-1,3-butadiene represented by formula (2)



wherein R<sub>5</sub> is a OH, alkyl having 1-20 carbon atoms, aryl having 6-20 carbon atoms or alkoxy group having 1-20 C-atoms and R<sub>1</sub> and R<sub>2</sub> have the meaning described above, to

react, in the presence of a catalytic amount of secondary amine and acid, with an aldehyde or ketone represented by formula (3)



(3)

wherein R<sub>3</sub> and R<sub>4</sub> have the meaning described above.

5,438,144

# USE OF 1,4-DIHYDROPYRIDINES IN DIABETES

Jörg Traber, Lohmar, Germany, and Willem H. Gispen, Bilthoven, Netherlands, assignors to Troponwerke GmbH & Co. KG, Cologne, Germany  
Continuation-in-part of Ser. No. 917,552, Jul. 21, 1992, abandoned. This application Jul. 9, 1993, Ser. No. 90,224  
Claims priority, application Germany, Jul. 30, 1991, 41 25 116.4

Int. Cl.<sup>6</sup> C07D 211/22

U.S. Cl. 546—321

4 Claims

1. A method of controlling neuropathies in human patients afflicted with diabetes mellitus which comprises administering to such patient an amount effective therefor of a calcium antagonist which is a nitrophenyl substituted 1,4-dihydropyridine with alkyl groups in the 3- and 5- positions provided that said antagonist is not nifedipine.

5,438,145

# PROCESS FOR THE PREPARATION OF AMLODIPINE BENZENESULPHONATE

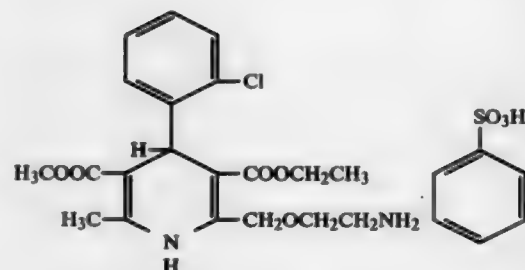
Borut Furlan, Ljubljana; Anton Čopar, Šmartno pri Litiji, and Alenka Jeriha, Ljubljana-Polje, all of Slovenia, assignors to LEK, tovarna farmacevtskih in kemičnih izdelkov, Slovenia  
Division of Ser. No. 149,735, Nov. 10, 1993, Pat. No. 5,389,654.  
This application Aug. 25, 1994, Ser. No. 295,023

Int. Cl.<sup>6</sup> C07D 211/86

U.S. Cl. 546—321

5 Claims

1. A process for the preparation of 3-ethyl 5-methyl (±) 2-[(2-aminoethoxy)methyl]-4-(2-chlorophenyl)-1,4-dihydro-6-methyl-3,5-pyridinedicarboxylate monobenzenesulphonate (amlodipine benzenesulphonate) of formula



(2)

characterized in that 3-ethyl 5-methyl (±) 2-[(N-tritylamino)-ethoxymethyl]-4-(2-chlorophenyl)-1,4-dihydro-6-methyl-3,5-pyridinedicarboxylate is reacted with benzenesulphonic acid in a methanolic or an aqueous methanolic medium at a temperature from 20° C. to the reflux temperature.

5,438,146

# ENHANCED CHEMILUMINESCENCE FROM 1,2-DIOXETANES THROUGH ENERGY TRANSFER TO TETHERED FLUORESCERS

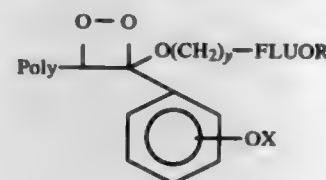
Arthur P. Schaap, and Hashem Akhavan-Tafti, both of Detroit, Mich., assignors to Board of Governors of Wayne State University, Detroit, Mich.

Continuation of Ser. No. 289,837, Dec. 27, 1988, which is a continuation-in-part of Ser. No. 887,139, Jul. 17, 1986. This application Jan. 24, 1994, Ser. No. 185,031  
Int. Cl.<sup>6</sup> C07F 7/08, 9/28; C07D 277/64

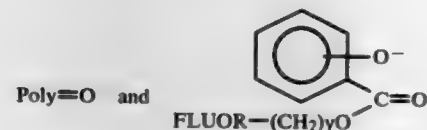
U.S. Cl. 548—110

10 Claims

1. A dioxetane compound of the formula:



wherein Poly is a spirofused polycyclic alkylene group containing 6 to 30 carbon atoms and optionally containing atoms selected from the group consisting of oxygen and nitrogen in place of a carbon atom, wherein FLUOR is a fluorescent benzothiazole substituent containing group wherein the fluorescent substituent exhibits fluorescence between 400 and 900 nanometers, wherein y is an integer between 1 and 14, and wherein X is a leaving group selected from the group consisting of hydroxyl, alkyl or aryl carboxyl ester, inorganic oxyacid salt, alkyl or aryl silyloxy and wherein aryl is a single ring, which when removed by an activating agent in an organic solvent or aqueous solution produces an oxide intermediate of the dioxetane compound which spontaneously decomposes to form light because of FLUOR and carbonyl containing molecules of the formulae



5,438,147

# IMIDOCARBOXYLIC ACID ACTIVATORS AND SULFIMIDOCARBOXYLIC ACID ACTIVATORS, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Frank Jaekel; Gerd Reinhardt, both of Kelkheim, and Wolf-Dieter Möller, Hofheim am Taunus, all of Germany, assignors to Hoechst AG, Frankfurt, Germany

Filed Apr. 30, 1992, Ser. No. 876,517

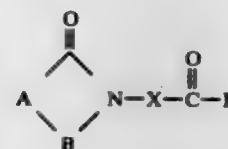
Claims priority, application Germany, May 4, 1991, 41 14 583.6

Int. Cl.<sup>6</sup> C07D 209/48

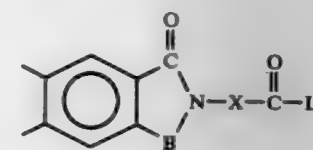
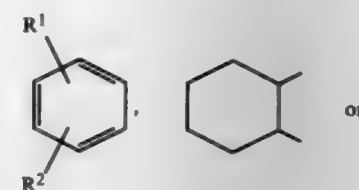
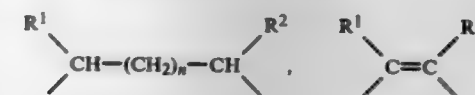
U.S. Cl. 548—210

6 Claims

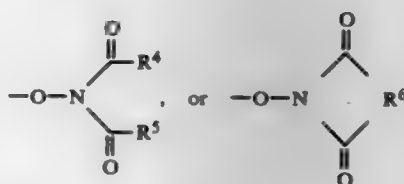
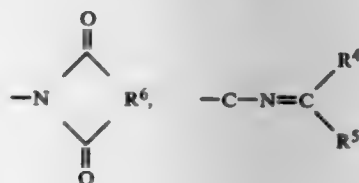
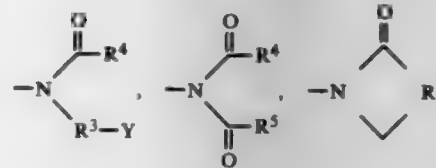
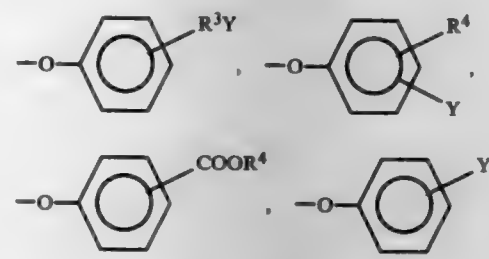
1. A persalt activator or salt thereof which is derived from an imidocarboxylic acid or sulimidocarboxylic acid of the formula I:



in which A is a group of the formula



n is the number 0, 1 or 2,  
R<sup>1</sup> is hydrogen, chlorine, bromine, C<sub>1</sub>-C<sub>20</sub>-alkyl, C<sub>2</sub>-C<sub>20</sub>-alkenyl, aryl, or alkylaryl,  
R<sup>2</sup> is hydrogen, chlorine, bromine or a group of the formula —SO<sub>3</sub>M, —CO<sub>2</sub>M or —OSO<sub>3</sub>M,  
X is C<sub>1</sub>-C<sub>19</sub>-alkylene or arylene  
B is a group of the formula C=O or SO<sub>2</sub>,  
L is a leaving group of the formula



R<sup>3</sup> is C<sub>1</sub>-C<sub>19</sub>-alkylene,  
R<sup>4</sup> and R<sup>5</sup> are C<sub>1</sub>-C<sub>20</sub>-alkyl,  
R<sup>6</sup> is C<sub>1</sub>-C<sub>19</sub>-alkylene or C<sub>2</sub>-C<sub>20</sub>-alkenylene,  
R<sup>61</sup> is C<sub>2</sub>-C<sub>20</sub>-alkenylene,  
Y is hydrogen, chlorine, bromine or a group of the formula —SO<sub>3</sub>M, —CO<sub>2</sub>M, —OSO<sub>3</sub>M, —CONH<sub>2</sub>, —N(R<sup>7</sup>)<sub>3</sub>Z or —P(R<sup>7</sup>)<sub>4</sub>Z,

$Y^1$  is hydrogen or a group of the formula  $-SO_3M$ ,  $-CO_2M$ ,  $-OSO_3M$ ,  $-CONH_2$ ,  $-N(R^7)_3Z$  or  $-P(R^7)_4Z$ ,  $R^7$  is  $C_1-C_{30}$ -alkyl,  $Z$  is fluoride, chloride, bromide or iodide and  $M$  is hydrogen, an alkali metal or ammonium ion or the equivalent of an alkaline earth metal ion.

5,438,148

**PROCESS FOR THE SYNTHESIS  
[R-(R\*,R\*-)]-5-(3-CHLOROPHENYL)-3-[2-(3,4-DIHYDROXYPHENYL)-1-METHYLETHYL]-2-OXAZOLIDINONE**

Arthur G. Mohan, Somerville, and David M. Blum, Saddle River, both of N.J., assignors to American Cyanamid Company, Wayne, N.J.

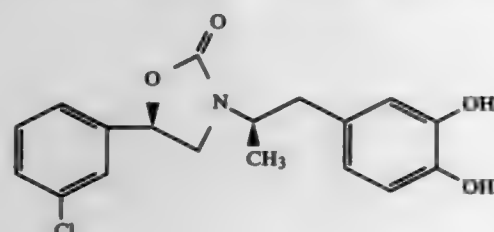
Filed Sep. 20, 1994, Ser. No. 309,303

Int. Cl.<sup>6</sup> C07D 263/20

U.S. Cl. 548-229

1 Claim

1. A process for producing a compound of the formula:



which comprises:

- adding a methylene chloride solution of [R-(R\*,R\*-)]-5-(3-chlorophenyl)-3-[2-(3,4-dimethoxyphenyl)-1-methylethyl]-2-oxazolidinone to methylene chloride while simultaneously adding boron tribromide at about  $-5^\circ$  to about  $10^\circ$  C. under inert gas at a rate so the ratio of boron tribromide to substrate is 2.10:1.00;
- quenching the reaction mixture with methyl alcohol at about  $-5^\circ$  to about  $10^\circ$  C.;
- concentrating the reaction mixture by distillation of the methylene chloride and a portion of methyl alcohol;
- adding water to the reaction mixture;
- collecting the product by filtration and drying.

5,438,149

**DIFLUOROMETHYLATION OF A PHENYL  
TRIAZOLINONE**

Marc Halfon, Cranbury, and Eric W. Sortore, Trenton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed May 27, 1994, Ser. No. 250,210

Int. Cl.<sup>6</sup> C07D 249/12

U.S. Cl. 548-263.2

5 Claims

1. In a process for the difluoromethylation of a 1-phenyl-1H-1,2,4-triazol-5-one (the triazolinone) at the 4-position of the triazole ring with chlorodifluoromethane, the improvement that comprises

- reacting the triazolinone with potassium carbonate in a solvent selected from dimethylformamide, 1-methyl-2-pyrrolidone, and N,N-dimethylacetamide at a carbonate to triazolinone ratio in the range of about 0.55 to 1.0;
- reducing the water content of the reaction mixture to below about 2400 ppm by distillation;
- in a sealed autoclave, heating the reaction mixture to  $110^\circ$  to  $180^\circ$  C., adding a 10 to 15 percent molar excess of chlorodifluoromethane, heating the reaction mixture at a temperature of  $140^\circ$  to  $210^\circ$  C. for 5 to 60 minutes, and recovering the difluoromethylated triazolinone.

5,438,150

**PROCESS FOR MAKING  
1-BENZOCYCLOALKYL-1,3-DIHYDROIMIDAZOLE-2-  
THIONE DERIVATIVES**

Rekha P. Bansal, Santa Clara; Owen W. Gooding, Los Gatos; Alexander V. Muehldorf, and Counde O-Yang, both of Sunnyvale, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

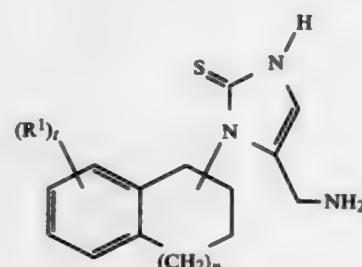
Filed Apr. 26, 1994, Ser. No. 233,655

Int. Cl.<sup>6</sup> C07D 233/84; C07C 231/08

U.S. Cl. 548-324.5

19 Claims

1. A process for the preparation of an acid addition salt of a compound of Formula 1:

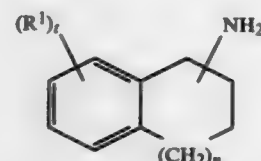


in which:

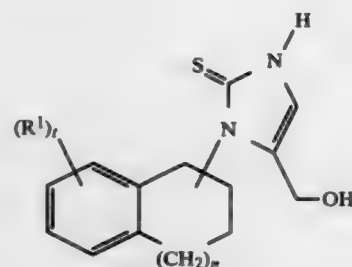
$n$  is 0, 1 or 2;  
 $t$  is 0, 1, 2 or 3;

$R^1$  is independently halo, hydroxy or  $(C_{1-4})$ alkyloxy; or the free base, an individual stereoisomer, or a mixture of stereoisomers thereof; which process comprises:

(A) reacting a compound of Formula 4:

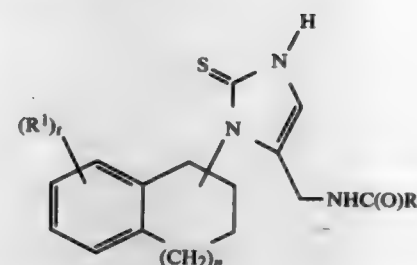


in which  $n$ ,  $t$  and  $R^1$  are as defined above, with thiocyanic acid and dihydroxyacetone to give a compound of Formula 3:



in which  $n$ ,  $t$  and  $R^1$  are as defined above;

(B) reacting the compound of Formula 3 with a compound of the formula  $H_2NC(O)R^2$  or an ammonium salt of the formula  $NH_4^+ - OC(O)R^2$  (in which  $R^2$  is hydrogen,  $(C_{1-4})$ alkyl or trifluoro $(C_{1-4})$ alkyl) to give a compound of Formula 2:



- in which  $n$ ,  $t$ ,  $R^1$  and  $R^2$  are as defined above; and  
(C) hydrolyzing the compound of Formula 2 with acid; and  
(D) optionally reacting the acid addition salt form of a compound of Formula 1 with an inorganic or organic base to give the corresponding free base form; and  
(E) optionally reacting the free base form of a compound of Formula 1 with a pharmaceutically acceptable acid to give the corresponding acid addition salt; and  
(F) optionally separating a mixture of stereoisomers of a compound of Formula 1 to give a single stereoisomer.

5,438,151

**PROCESS FOR THE PREPARATION OF  
ERGOTHIONEINE**

Jean C. Y. Yadan, Paris, and Jinzhu Xu, Ivry sur Seine, both of France, assignors to Bioxytech, Bonneuil-Sur-Marne, France

Filed Feb. 8, 1994, Ser. No. 194,457

Claims priority, application France, Jun. 28, 1993, 93 07839; Dec. 22, 1993, 93 15457

Int. Cl.<sup>6</sup> C07D 233/64

U.S. Cl. 548-324.1

28 Claims

1. A process for the chemical synthesis of the different optical forms of ergothioneine comprising the following successive steps:

5,438,152

**HIGH PIGMENT, REDUCED BLOSSOM END SCAR  
SIZE, DISEASE RESISTANT TOMATO VARIETIES**

Robert A. Morrison, and David A. Evans, both of Cinnaminson, N.J., assignors to DNA Plant Technology Corporation, Cinnaminson, N.J.

Continuation-in-part of Ser. No. 769,309, Oct. 1, 1991, abandoned, which is a continuation of Ser. No. 638,259, Jan. 4, 1991, abandoned, which is a continuation of Ser. No. 291,800, Dec. 29, 1988, abandoned. This application Apr. 30, 1992, Ser. No. 876,839

Int. Cl.<sup>6</sup> A01H 5/00, 5/10, 4/00; C12N 5/04

U.S. Cl. 800-200

4 Claims

1. A tomato plant produced from seed having the accession number ATCC 40450.
2. A tomato plant produced from seed having the accession number ATCC 40506.

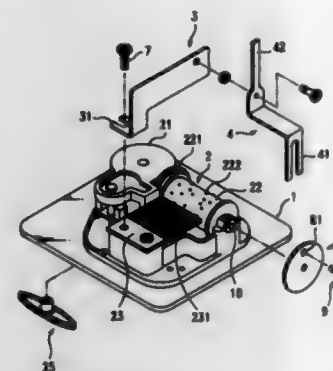


## ELECTRICAL

5,438,153  
MUSIC BOX CAPABLE OF CAUSING A DOLL TO SWAY  
BACKWARDS AND FORWARDS  
Joseph Chen, P.O.Box 82-144, Taipei, Taiwan  
Filed Sep. 8, 1994, Ser. No. 302,274  
Int. Cl.<sup>6</sup> G10F 1/06

U.S. Cl. 84—95.1

1 Claim

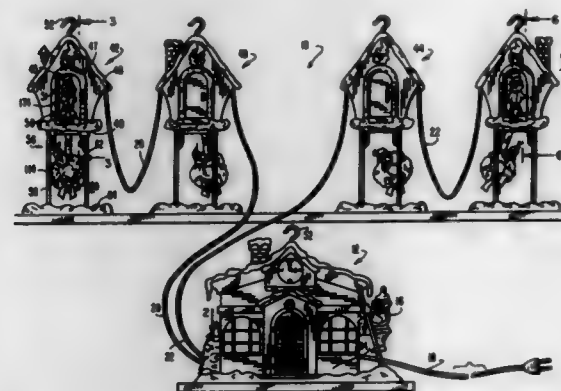


1. A music box comprising:

- a base;
  - a seat fixedly mounted on said base and provided with a casing in which is fitted a spiral spring, said spiral spring being connected with a control lever and a gear train, said gear train being engaged with a gear fixedly mounted on an end of a drum provided with a plurality of protuberances thereon;
  - a hitting member fixedly mounted on said seat and having a plurality of tines in contact with said drum; and
  - a disc rotatably connected with another end of said drum and formed with a hole near a circumference thereof;
- the improvement comprising a frame provided at an end with a leg fixedly mounted on said hitting member by a screw, an arm pivotally connected with another end of said frame and has a forked end at a lower portion, the forked end of said arm being movably connected with said disc by a pin engaged with the hole of said disc, and a doll connected with an upper end of said arm.

5,438,154  
HOLIDAY ACTION AND MUSICAL DISPLAY  
Marc H. Segan, New York, N.Y.; Michael R. Newsome, Newport, Va., and Gary Strauss, Mamaroneck, N.Y., assignors to M. H. Segan Limited Partnership, Great Barrington, Mass.  
Filed Sep. 27, 1993, Ser. No. 127,689  
Int. Cl.<sup>6</sup> G10H 1/02; G04B 21/00  
U.S. Cl. 84—600

31 Claims



1. An ornamental musical action display comprising:

- (A) a control unit including:
  - (1) a control circuit for generating first and second control signals;
  - (2) sound generating means electrically connected to said

control circuit for generating sound in response to said first control signal, said sound generating means comprising

- (a) a speaker;
- (b) a first plurality of stored electrical signals corresponding to a first plurality of sounds in a plurality of pitches, wherein a majority of said first plurality of sounds have a first timbre;
- (c) a second plurality of stored electrical signals corresponding to a second plurality of sounds in a plurality of pitches, wherein a majority of said second plurality of sounds have a second timbre;
- (d) means for accessing said stored first and second pluralities of electrical signals for output to said speaker in a predetermined sequence for generating a melody;

(B) a first housing;

(C) a first member connected to said first housing and comprising a representation of a first character associated with said first timbre;

(D) a first moving means movable between first and second positions for at least partially blocking and unblocking an observer's view of said first member, respectively;

(E) a second housing;

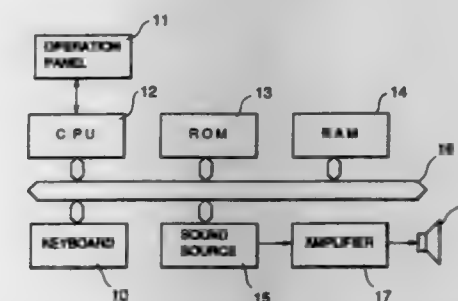
(F) a second member connected to said second housing and comprising a representation of a second character associated with said second timbre;

(G) a second moving means movable between first and second positions for at least partially blocking and unblocking the observer's view of said second member, respectively; and

(H) drive means coupled to said first and second moving means and responsive to said second control signal for driving said first and second moving means between said first and second positions, said second control signal being timed relative to said first control signal for generating said first and second pluralities of sounds in coordination with movement of said first and second moving means, respectively, between their respective first and second positions.

5,438,155  
ELECTRONIC MUSICAL INSTRUMENT WITH  
NUMERIC INPUTTING FUNCTION  
Eiji Matsuda; Toshinori Matsuda, and Tsuyoshi Koike, all of Iwata, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan  
Filed Nov. 18, 1993, Ser. No. 154,086  
Claims priority, application Japan, Nov. 20, 1992, 4-333744  
Int. Cl.<sup>6</sup> G09B 15/02; G10H 1/02, 1/18  
U.S. Cl. 84—653

5 Claims



1. An electronic musical instrument having no digital display device, comprising:

- a plurality of operation elements normally used for setting a tone or acoustic effect;
- first setting means operable in response to operation of one of said plurality of operation elements for setting the tone

or acoustic effect allocated in advance to the operated operation element;

second setting means operable in response to operation of one of said operation elements for setting a numerical value allocated in advance to the operated operation element; and

change-over means for normally rendering said first setting means operative, and selectively rendering said second setting means operative only when a predetermined operation element is operated, said first setting means and said second setting means being comprised of a single set of operation elements, whereby a numerical value can be set by use of the operation elements for setting the tone or acoustic effect without using a digital display device nor a numeric input switch.

5,438,156

# WIND TYPE TONE SYNTHESIZER ADAPTED FOR SIMULATING A CONICAL RESONANCE TUBE

Hideyuki Masuda, and Toshifumi Kunimoto, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

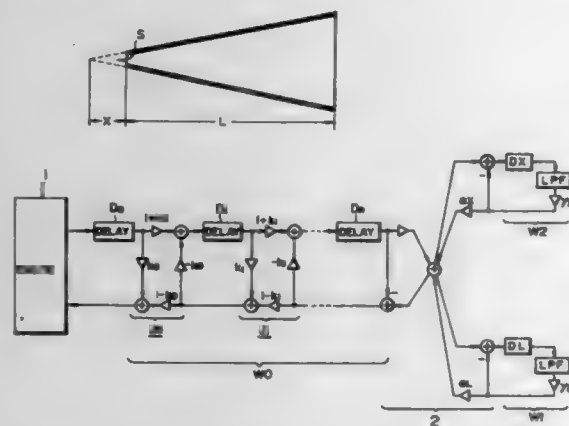
Filed May 5, 1992, Ser. No. 878,778

Claims priority, application Japan, May 9, 1991, 3-104501

Int. Cl.<sup>6</sup> G10H 5/02

U.S. Cl. 84—659

19 Claims



1. A tone signal synthesizer simulating characteristics of a conical resonance tube, comprising:

first bidirectional transmission means for receiving and reflecting a first electrical signal, having a first input, a first output, and a first delay element for producing a first delay time connected between said first input and said first output;

second bidirectional transmission means for receiving and reflecting a second electrical signal, having a second input, a second output, and a second delay element for producing a second delay time connected between said second input and said second output;

wherein the sum of said first and second delay times corresponds to the pitch of a tone to be generated;

pitch information generating means for generating pitch information which designates a tone pitch of a musical tone to be synthesized, said pitch information controlling at least one of said first and second delay elements;

exciting means for generating an exciting electrical signal, said exciting means having filter means for filtering a signal input thereto and non-linear means for imparting non-linear output characteristics to a signal input thereto, said filter means and said non-linear means being coupled in series;

control means for generating control signals in response to characteristics of the conical resonance tube to be simulated; and

junction means, coupling said first and second transmission means and said exciting means in such a manner that said first and second transmission means are connected in

parallel with respect to said exciting means, for combining signals supplied therefrom and inputting the combined signals thereto in accordance with the control signals, whereby the synthesizer generates a tone signal simulating a conical resonance tube based on said control signals.

5,438,157

# ACOUSTIC PICK-UP ASSEMBLY FOR A STRINGED MUSICAL INSTRUMENT

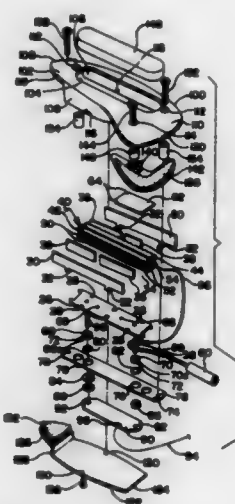
deceased Lace, Sr., late of Huntington Beach by Dorothy Lace, legal representative, and Jeffrey J. Lace, Huntington Beach, both of Calif., assignors to Actodyne General, Inc., Huntington Beach, Calif.

Filed Jan. 14, 1993, Ser. No. 4,421

Int. Cl.<sup>6</sup> G10H 3/18

U.S. Cl. 84—726

23 Claims



1. An acoustic pick-up assembly for a stringed musical instrument having a plurality of moveable strings with diameters from a large diameter to a small diameter comprising:

means for forming a longitudinal channel;

magnet means disposed in said channel for producing a magnetic field;

coil means disposed in said channel for receiving an induced voltage due to movement of the moveable strings across the magnetic field; and

means for reducing the strength of the magnetic field along said channel to balance the induced voltage from the large diameter strings relative to the small diameter strings into said coil means.

5,438,158

# PICKUP, INCLUDING MOUNTING APPARATUS THEREOF, FOR A STRINGED MUSICAL INSTRUMENT HAVING A SOUNDHOLE

John T. Riboloff, Antioch, Tenn., assignor to Gibson Guitar Corp., Nashville, Tenn.

Filed Mar. 10, 1994, Ser. No. 209,646

Int. Cl.<sup>6</sup> G10D 1/08, 3/00; G10H 3/18

U.S. Cl. 84—727

19 Claims

1. An apparatus for mounting a pickup on a stringed musical instrument having a soundhole, said apparatus comprising:

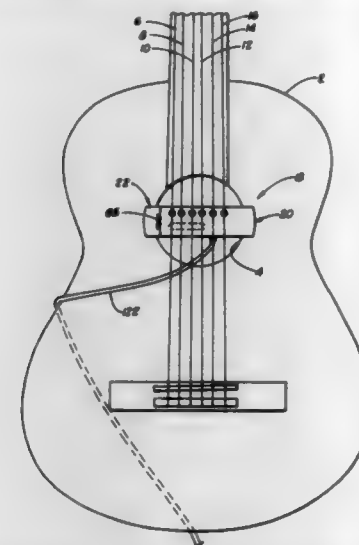
a pickup housing adapted to receive a musical instrument pickup and further adapted to be disposed in a soundhole of a stringed musical instrument;

an abutment member; and

adjustment means for connecting said abutment member with said pickup housing so that said abutment member is movable relative to said pickup housing and relative to the instrument when said pickup housing is disposed in the

soundhole of the instrument, wherein said adjustment means includes:

a threaded rod connected to said pickup housing; and an operator member mounted on said rod and said abut-



ment member so that operation of said operator member moves said abutment member along said rod into abutting engagement with the instrument in response to said pickup housing being disposed in the soundhole and said operator member being operated.

5,438,159

Patent Not Issued For This Number

5,438,160

# SEALED, SHIELDED AND FILTERED HEADER RECEPTACLE

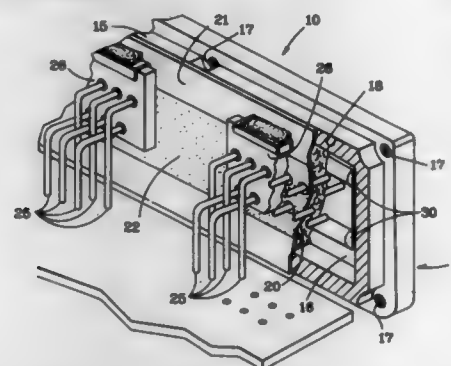
William Batty, Winston-Salem, N.C., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 22, 1992, Ser. No. 995,476

Int. Cl.<sup>6</sup> H01R 13/66

U.S. Cl. 174—52.1

10 Claims



1. In a header receptacle for mounting in an enclosure, the header receptacle being waterproof and suppressing conducted and radiated electromagnetic interferences, the improvement comprising:

a flange having a front side, a back side and a center portion, the center portion having a central opening therein;

an electrically conductive adhesive disposed on the back side of the flange;

a sealant disposed over the central opening of the center portion;

a metal shield disposed over the sealant, said shield extending over the sealant and contacting the conductive adhesive so as to adhere thereto and to make electrical contact with the flange;

an electromagnetic interference filter mounted adjacent to the metal shield and electrically connected thereto;

a plurality of spaced-apart male terminals disposed through the filter, through the metal shield, through the sealant and extending forwardly of the flange;

means for joining the respective male terminals to the filter to prevent the exit/entry of electromagnetic interferences therethrough; and

a housing mounted on the front side of the flange, the housing being sealed against the sealant through the central opening in the center portion of the flange, the male terminals being disposed within the housing.

5,438,161

# APPARATUS WITH INTERCONNECTION ARRANGEMENT

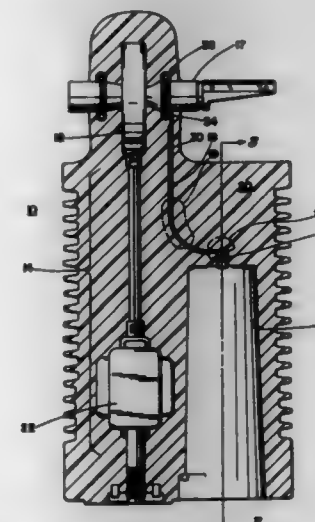
Glenn R. Borchardt, Franklin Park; Roy T. Swanson, La Grange Park, and James W. Barker, Jr., Niles, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Jun. 4, 1993, Ser. No. 72,628

Int. Cl.<sup>6</sup> H01L 23/28; H01B 5/00, 5/08; B29C 37/00

U.S. Cl. 174—52.2

8 Claims



1. Apparatus comprising:

insulating body means formed from a material that exhibits volumetric changes during and after forming; and

first means having predetermined compressibility/deformability characteristics for providing an accurately positioned, elongated electrically conductive path within said material of said insulating body means and for responding to, accommodating, and alleviating the effects of forces at the interface between said material and said first means

arising from the differences in volumetric expansion versus temperature between said material and said first means during and after the forming of said insulating body means, said first means comprising an elongated tubular conductor with a tubular wall that is deformed so as to compress said tubular conductor in response to volumetric changes in said material, said elongated tubular conductor having an oval cross-section with an overall maximum dimension d, at least a portion of said conductor along said path being a minimum distance D from the closest exterior point of said insulating body means, said distance D being at least several times greater than said dimension d, said elongated tubular conductor having a predetermined deformability characteristic with respect to the overall elongated tubular conductor so as to be rigid enough to generally maintain said path and deformable enough to effectively relieve forces at said interface between said material and said first means whereby undesir-



able stress concentrations are avoided that could result in deleterious effects to said material of said insulating body.

5,438,162

# METHOD AND APPARATUS FOR ISOLATING ELECTRONIC BOARDS FROM SHOCK AND THERMAL ENVIRONMENTS

Craig Thompson, Redmond, and Lawrence L. Eakin, Bothell, both of Wash., assignors to AlliedSignal Inc., Morris Township, N.J.

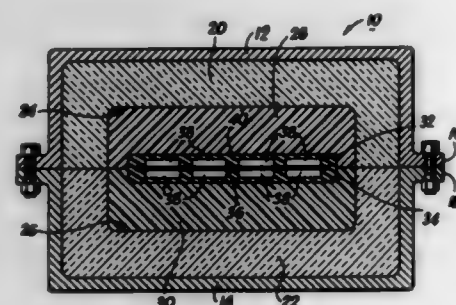
Division of Ser. No. 943,047, Sep. 10, 1992, Pat. No. 5,285,559.

This application Sep. 2, 1993, Ser. No. 115,862

Int. Cl.<sup>6</sup> H01L 23/28

U.S. Cl. 174—52.2

8 Claims



1. Apparatus for isolating an electronic device from mechanical shock and thermal environments, comprising:

- a layer of a rubber-like material surrounding said electronic device;
- a mass of preformed wax-like material having a high heat of fusion for absorbing a substantial quantity of heat before rising above a critical temperature limit in direct contact with and surrounding said rubber-like material;
- a heat insulating layer surrounding said mass of wax-like material; and
- a metal shell surrounding said heat insulating layer.

5,438,163

# BLOCKSTOP FOR LONGITUDINAL SEALING OF A CABLE AND A METHOD OF FORMING THE BLOCKSTOP

Uwe Richardt, Herdecke, Germany, assignor to RXS Schrupptechnik Garnituren GmbH, Hagen, Germany

Filed Dec. 9, 1993, Ser. No. 164,197

Claims priority, application Germany, Dec. 9, 1992, 42 41 483.0

Int. Cl.<sup>6</sup> H02G 15/04

U.S. Cl. 174—76

16 Claims



1. A method for producing a blockstop for a longitudinal sealing of a cable, said method comprising providing a curable, water-resistant kneading compound, kneading the compound tightly onto an end of the cable to be sealed and then subsequently applying a shrinkable envelope thereon.

8. A blockstop for a longitudinal sealing on an end of a cable comprising a plurality of layers of a curable, water-resistant kneading compound and said plurality of layers being covered by a shrinkable envelope.

## 5,438,164 INSULATED ELECTRICAL CONDUCTOR AND METHOD

Edward A. Green, 4419 State Rte. 82, Mantua, Ohio 44255

Filed Jan. 27, 1994, Ser. No. 187,013

Int. Cl.<sup>6</sup> H01B 7/28

U.S. Cl. 174—120 R

20 Claims



1. An insulated electrical conductor comprising an electrical conductor encompassed by at least one layer of fiberglass, an electrostatically deposited layer of fluorocarbon material disposed about the fiberglass layer, and at least one outer layer of fiberglass disposed about the layer of fluorocarbon material.

13. A method for making an insulated electrical conductor comprising:

- providing an electrical conductor of indeterminate length;
- disposing a layer of fiberglass about the conductor;
- electrostatically depositing a layer of fluorocarbon material about the fiberglass layer;
- disposing an outer layer of fiberglass about the fluorocarbon layer; and
- sintering the fluorocarbon material.

5,438,165

## INTEGRATED CIRCUIT INTERCONNECT LEADS RELEASABLY MOUNTED ON FILM

Galen F. Fritz, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

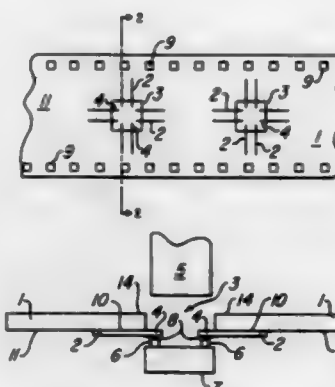
Division of Ser. No. 27,716, Mar. 19, 1987, Pat. No. 5,057,461.

This application Dec. 31, 1990, Ser. No. 636,454

Int. Cl.<sup>6</sup> H05K 1/00

U.S. Cl. 174—256

20 Claims



1. A semiconductor device fabrication system comprising:

- (a) a film;
- (b) a plurality of metallic interconnect leads removably affixed by an energy degradable adhesive to a surface of said film in a pattern to facilitate bonding of said interconnect leads to a structure;
- (c) an integrated circuit having said structure bonded to at least one of said metallic interconnect leads on said film; and
- (d) energy producing means for degrading said energy degradable adhesive and separating said bonded metallic interconnect leads from said film.

5,438,166

## CUSTOMIZABLE CIRCUITRY

David H. Carey, Austin, Tex., and Barry H. Whalen, Los Alto, Calif., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Continuation of Ser. No. 739,344, Sep. 9, 1991, Pat. No.

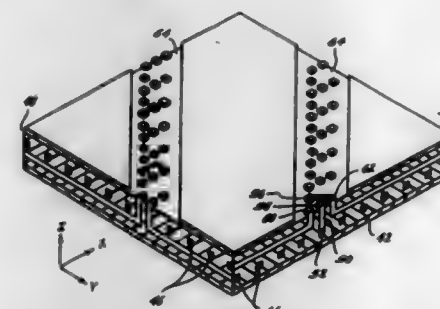
5,165,166, which is a continuation of Ser. No. 344,534, Apr. 25, 1989, Pat. No. 5,132,878, which is a continuation of Ser. No. 102,172, Sep. 29, 1987, abandoned. This application Nov. 23, 1992, Ser. No. 979,541

The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> H05K 1/02

U.S. Cl. 174—261

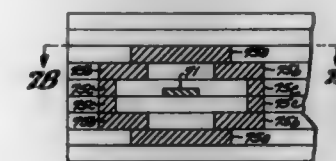
12 Claims



1. A programmable electrical interconnect for connecting electrical components comprising:

- a set of X-conductors comprising a plurality of substantially parallel electrically conductive segments of substantially uniform length arranged end-to-end;
- a set of Y-conductors comprising a plurality of substantially parallel electrically conductive segments of substantially uniform length arranged end-to-end; and
- a plurality of programmable junctions formed in a regular pattern, each programmable junction comprising segment ends of two X-conductor segments, and segment ends of two Y-conductor segments, the segment ends in each programmable junction being positioned whereby selective electrical connection can be accomplished between all combinations of segment ends forming the programmable junction, thereby permitting selective X to X, Y to Y, and X to Y connection between the segment ends forming each programmable junction, as well as combinations of X to X, Y to Y, and X to Y connections.

co-fired insulating layers and defining a region that contains ferrimagnetic material, said insulating layers and said



ferrimagnetic vias being integrally fused into a unitized multilayer circuit structure.

5,438,168

## TOUCH PANEL

Andrew Wolfe, and Gary L. Barrett, both of Austin, Tex., assignors to Gunze Limited, Kyoto, Japan and The Graphics Technology Company, Austin, Tex.

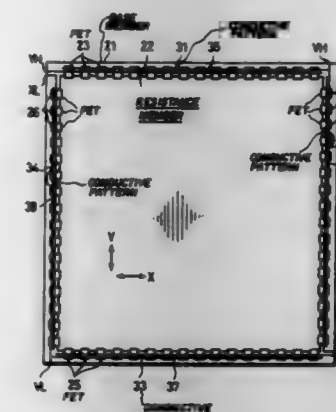
Filed Mar. 17, 1993, Ser. No. 34,836

Claims priority, application Japan, Mar. 18, 1992, 4-061908

Int. Cl.<sup>6</sup> G08C 21/00

U.S. Cl. 178—20

1 Claim



1. A touch panel, comprising:

- a substrate;
- a rectangular resistance member, constructed on the substrate, which includes a potential gradient formation area; and
- a plurality of thin film active elements constructed at a predetermined location of the substrate in accordance with a side of the potential gradient formation area, wherein each of the thin film active elements has a couple of potential gradient formation current terminals, comprised of one being connected to the side of the potential gradient formation area and the other one being connected to the gradient formation current terminal included in another thin film active element at the same side while being connected to a terminal for an external unit, and wherein a strip-like insulating member is formed at a periphery of the resistance member, and each thin film active element is formed on the insulating member.

5,438,167

## FERRIMAGNETIC VIAS WITHIN MULTI-LAYER 3-DIMENSIONAL STRUCTURES/SUBSTRATES

Robert F. McClanahan, Valencia; Robert D. Washburn, Malibu; Hal D. Smith, Rancho Palos Verdes, and Andrew Shapiro, Orange, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 951,072, Sep. 24, 1992, abandoned. This application Oct. 19, 1993, Ser. No. 141,291

Int. Cl.<sup>6</sup> H05K 1/00

U.S. Cl. 174—264

9 Claims

1. A multilayer circuit structure comprising: a plurality of planar ceramic co-fired insulating layers; and a plurality of ferrimagnetic vias formed in said ceramic

5,438,169

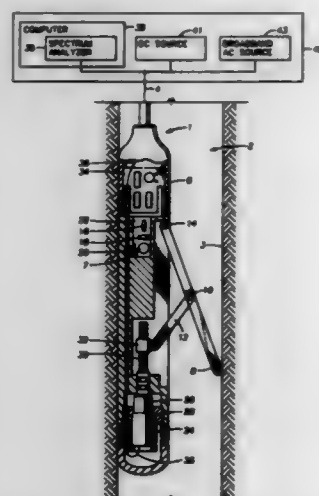
# APPARATUS AND METHOD FOR DETERMINING THE QUALITY OF CLAMPING OF A BOREHOLE SEISMIC SENSOR SYSTEM TO THE WALL OF A WELLBORE

William S. Kennedy, Menlo Park, and Kenneth J. Wolfe, Sunnyvale, both of Calif., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Aug. 30, 1994, Ser. No. 298,056  
Int. Cl.<sup>6</sup> G01V 1/20

U.S. Cl. 181-102

18 Claims



1. A method of evaluating the acoustic coupling between a borehole seismic sensor system and the wall of a wellbore, the system comprising at least one seismic sensor and a locking arm powered by a motor, the method comprising the steps of: lowering the borehole seismic sensor system into the wellbore to a depth of interest in the wellbore, the system electrically connected to equipment at the earth's surface by an electrical cable; extending the locking arm until the arm contacts the wall of the wellbore, by applying a direct current to the motor; applying a broadband alternating current to the motor, the alternating current having a substantially constant amplitude at a plurality of frequencies within a predetermined frequency range; detecting signals generated by the at least one seismic sensor; transmitting the signals to the earth's surface by the electrical cable; and processing the signals in a spectrum analyzer and generating an output representing amplitude of the signals as a function of frequency.

5,438,170

# BOREHOLE SEISMIC PULSE GENERATOR AND SYSTEM

Alf Klaveness, 12634 Taylorcrest, Houston, Tex. 77024

Filed Apr. 28, 1994, Ser. No. 234,257

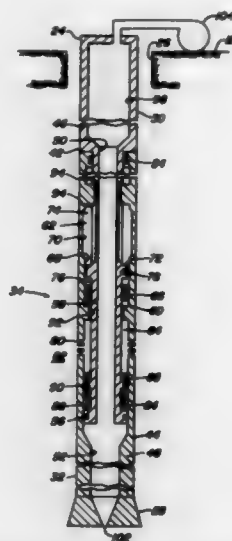
Int. Cl.<sup>6</sup> G01V 1/137, 1/40, 1/02

U.S. Cl. 181-106

26 Claims

1. An apparatus for generating a fluid pulse in a well containing a well fluid, the apparatus comprising: a tubular outer member telescopically connected to a tubular concentric inner member, each of the members having a sidewall; force means for telescopically extending the inner and outer members from a contracted position to an extended position; a port in the sidewall of the outer member adapted to be in communication with the well fluid; an annular well fluid chamber located between the sidewalls of the inner and outer members in communication with the port; delay means for controlling the rate at which the inner and

outer members move from the contracted to the extended position so that upon lifting the inner and outer members, the inner and outer members at first move slowly, thus allowing the inner and outer members to be raised substantially together a short distance while in the contracted position, the delay means subsequently allowing the force means to move the inner and outer members quickly to the extended position; and



piston means in the well fluid chamber causing the well fluid chamber to increase in volume as the inner and outer members are moved to the contracted position drawing well fluid through the port into the chamber, and causing the well fluid chamber to decrease in volume for rapidly ejecting a fluid pulse outwardly through the port in response to the movement of the inner and outer members to the extended position by the force means.

5,438,171

# COMPOSITE SOUND WALL

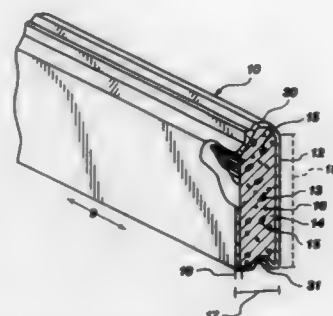
Donald W. Schmanski, Carson City, Nev., assignor to Carsonite International Corporation, Carson City, Nev.

Continuation-in-part of Ser. No. 824,108, Dec. 21, 1993, Pat. No. 5,272,284. This application Feb. 9, 1994, Ser. No. 171,899

Int. Cl.<sup>6</sup> E04H 17/00

U.S. Cl. 181-210

5 Claims



1. A sound absorbing device for use as a sound barrier, said device comprising: at least one elongated tubular member of fiber reinforced, thermosetting resin having a hollow interior of uniform cross-section able to receive sound absorbing material wherein the tubular member is formed by pultrusion and wherein the tubular member has a cross-section which is substantially rectangular having a width dimension within the range of 2 inches to 8 inches; and a sound absorbing material including particulate, recycled

polymer firmly compacted within and substantially filling the hollow interior of the tubular member.

5,438,172

# ZERO BACKLASH POSITION ENCODER

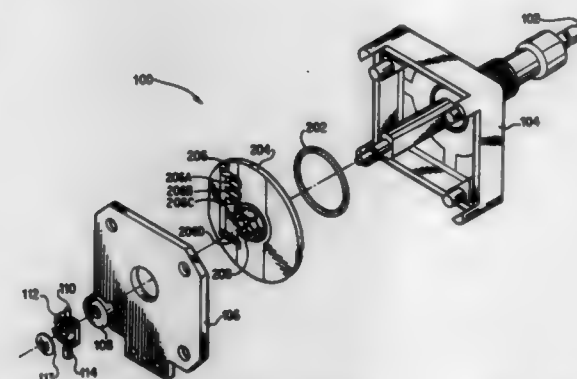
James H. Fowler, Novi, Mich., and Edward G. VanNimwegen, North Ogden, Utah, assignors to Ford Motor Company, Dearborn, Mich. and Bourns Inc., Riverside, Calif.

Filed Aug. 16, 1993, Ser. No. 106,743

Int. Cl.<sup>6</sup> H01H 19/54; F16D 3/00

U.S. Cl. 200-11 R

16 Claims



12. An electronic encoder assembly of the type having a shaft-retracted position for storage and a shaft-extended position for adjustment, comprising:

- a keyed shaft rotatable about a longitudinal axis;
  - a rotor having a keyed opening through which said shaft is passed, said opening engaging said shaft such that said rotor rotates with said shaft about said longitudinal axis while allowing said shaft to translate freely through said opening along said longitudinal axis between the shaft-retracted position and the shaft-extended position;
  - a first coupler fixedly attached to one of said rotor and said shaft, said first coupler having at least one outwardly tapering extension which extends longitudinally outward from said one of said rotor and said shaft to the other one of said rotor and said shaft substantially parallel to said longitudinal axis;
  - a second coupler fixedly attached to the other one of said rotor and said shaft, said second coupler having at least one inwardly tapering recess configured and arranged to mate with said at least one outwardly tapering extension of said first coupler; and
  - sense means for sensing the position of said rotor and allowing electrical detection thereof;
- wherein said at least one inwardly tapering recess of said second coupler engages said at least one outwardly tapering extension of said first coupler to substantially eliminate backlash between said shaft and said rotor when said shaft is in said extended position.

5,438,173

# CELL BYPASS SWITCH

Edward Rudy, Woodland Hills, and Leslie Kerek, Los Angeles, both of Calif., assignors to G & H Technology, Inc., Camarillo, Calif.

Filed Jan. 27, 1994, Ser. No. 187,016

Int. Cl.<sup>6</sup> H01H 35/00, 37/74; H01M 14/00

U.S. Cl. 200-52 R

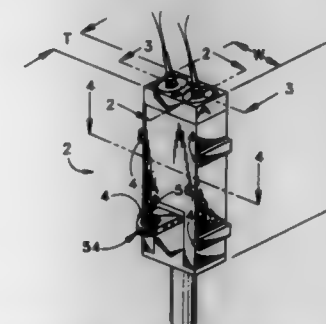
20 Claims

1. A cell bypass switch for sensing a battery cell failure and automatically providing an alternate path around the battery cell failure, the battery cell having a first external terminal and a second external terminal, the switch comprising:

- a. a housing having an upper compartment with a top end, a center compartment with a partition, and a lower compartment with a bottom end, the partition having an elongated narrow channel extending downwardly to a midsection of the center compartment;

gated narrow channel extending downwardly to a midsection of the center compartment;

- b. a first hollow socket contact and a second hollow socket contact mounted in a longitudinal direction within said lower compartment and insulated by a first insulation material away from each other, where the first and second socket contacts are located at an upper location and a lower location adjacent said bottom end of said housing respectively;
- c. an electrical pin contact having an internal threaded opening;
- d. an elongated cylindrical shaft having a flat first end and a screw threaded second end threadedly screwed into said internal threaded opening of said electrical pin contact and positioned in said lower compartment and slidably engageable with said first and second socket contacts;
- e. a collet member biased downwardly by first tension spring means and second tension spring means respectively and located at locations opposite to each other, the collet member having a base and two collapsible fingers, the base attached to said flat first end of said elongated cylindrical shaft, and the two collapsible fingers each having an enlarged top end extending upwardly through said elongated narrow channel in said partition of said center compartment;
- f. two electro-mechanical actuator assemblies insulated by a second insulation material and symmetrically mounted in said upper compartment of said housing for respectively operating a respective one of two plungers, each electro-



mechanical actuator assembly having a first spool half and a second opposite spool half bounded by a restraining wire terminated in a bridge wire and compressed inwardly for preventing the respective one of the two plungers from moving upwardly therethrough;

- g. said two plungers biased upwardly by third spring means and fourth tension spring means respectively, and inserted between said collapsible fingers of said collet member for preventing said enlarged top ends of said collapsible fingers from snapping shut, and sliding through said elongated narrow channel in said partition of said center compartment, thereby restraining said collet member from moving downwardly, which in turn prevents said electrical pin contact from sliding downwardly and making electrical connection between said first and second socket contacts, said two plungers further providing redundancy to prevent said cell bypass switch from malfunction upon transient signals;
- h. a hollow cylindrical body inserted through said bottom end of said housing and insulated by said second insulation material, the hollow cylindrical body having internal screw threads with one end connected to said second hollow socket contact and the other end extending out from said housing for threadedly engaging with said second external terminal of said battery cell; and
- i. a fastener means having a first end and a second end with a threaded opening and mounted within said lower compartment and insulated by said second insulation material away from said hollow cylindrical body, the first end



connected to said first hollow socket contact, and the second end extending outwardly away from said housing for threadedly engaging with said first external terminal of said battery cell;

- j. whereby when said battery cell fails and electrical current is passed through said bridge wires such that said bridge wires will heat up and break, this will cause said two restraining wires to unwind and separate said first and second spool halves of said two electro-mechanical actuator assemblies respectively, which allows said two plungers to move upwardly and release said enlarged top ends of said two collapsible fingers such that they can collapse and slide through said narrow channel in said partition of said center compartment, allowing said collet member to move downwardly, which in turn pushes said electrical pin contact to slide downwardly, and contacting said first and second socket contacts and making electrical connection therebetween, to provide a bypass of said failed battery cell.

5,438,174

# VACUUM INTERRUPTER WITH A RADIAL MAGNETIC FIELD

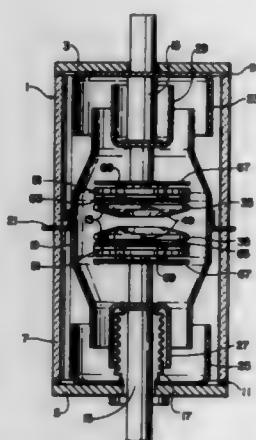
Paul G. Slade, Wilkinsburg, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 22, 1993, Ser. No. 155,355

Int. Cl.<sup>6</sup> H01H 33/66

U.S. Cl. 218—118

29 Claims



1. A vacuum interrupter, comprising:
  - a vacuum envelope;
  - a pair of coaxially aligned contact assemblies that are relatively movable between an open circuit position and a closed circuit position, each coaxially aligned contact assembly comprising:
    - a single contact located within the vacuum envelope, comprising a first side, a peripheral edge between the first side and a second side, a contacting face on the second side confronting the other contact and engageable with the other contact in the closed circuit position, and a plurality of circumferentially spaced apart contact arms defining slots therebetween;
    - a terminal for connecting the contact assembly to an a.c. circuit outside the vacuum envelope and having a terminal end electrically coupled to the contact and located inside the vacuum envelope; and
    - coil means energized by the a.c. circuit within the vacuum envelope for cooperatively producing, in conjunction with the coil means of the other contact assembly, a quadrupole magnetic field including a substantial radial component between the contacts, the coil means comprising a coil made of a first conducting material; and
    - a generally tubular, electrically conducting metal vapor shield positioned within the vacuum envelope, surrounding the contacts and electrically isolated from at least one of the contact assemblies in the open circuit position,

wherein the radial component of the quadrupole pole magnetic field enhances a probability of forming a diffuse arc between one of the contacts and the vapor shield.

5,438,175

# ELECTRIC OUTLET ELEMENT HAVING DOUBLE FLASH

Günter Herklotz; Bernd Gehlert, both of Bruchköbel, and Thomas Frey, Hanau, all of Germany, assignors to W. C. Heraeus GmbH, Hanau, Germany

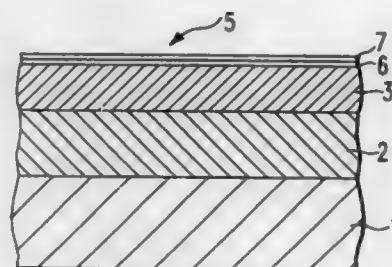
Filed Dec. 2, 1993, Ser. No. 161,332

Claims priority, application Germany, Dec. 22, 1992, 42 43 570.6

Int. Cl.<sup>6</sup> H01H 1/02

U.S. Cl. 200—269

12 Claims



1. Electric contact element comprising
  - a base,
  - a contact layer over said base, said contact layer consisting of one material selected from the group consisting of palladium, a palladium-nickel alloy, and a silver-tin alloy,
  - a support layer over said contact layer, said support layer consisting of a palladium alloy which is different from said material of said contact layer, said support layer having a thickness between 0.05  $\mu\text{m}$  and 0.5  $\mu\text{m}$ , and
  - a gold containing surface layer directly over said support layer.

5,438,176

# THREE-POSITION SWITCH ACTUATING MECHANISM

Patrick Bonnardel, Grenoble; Bernard Jacquemet, St. Simeon de Bressieux; Jean-Charles Broize, Voreppe, and André Odier, Grenoble, all of France, assignors to Merlin Gerin, France

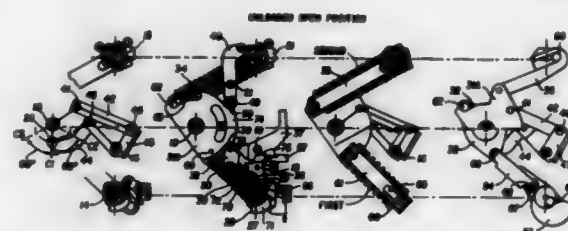
Filed Oct. 6, 1993, Ser. No. 132,349

Claims priority, application France, Oct. 13, 1992, 92 12390

Int. Cl.<sup>6</sup> H01H 5/06

U.S. Cl. 200—400

7 Claims



1. An actuating mechanism of a three-position switch, comprising:
  - a main shaft for actuating electrical contacts and adapted to be selectively rotated between three stable positions, an open position and, on each side of the open position, respectively a switch closed position and a grounded closed position;
  - a center crank which is pivotally mounted on the main shaft, said center crank being rotatable between three angular pivoting positions corresponding respectively to said three stable positions; and
  - a mechanical movement transformation system connected to

said center crank, said mechanical movement transformation system producing a kinetic ratio between the rotational movement of the center crank and the rotational movement of the main shaft which increases when the center crank rotates from the open position to the switch closed position, whereby a force transmitted to the electrical contacts increases continuously as movement takes place from the open position to the switch closed position.

5,438,177

# TWO-LAYER MEMBRANE SWITCH

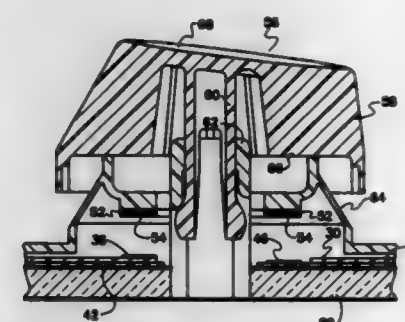
Mark W. Fagan, El Paso, Tex., assignor to Key Tronic Corporation, Spokane, Wash.

Filed May 6, 1992, Ser. No. 879,666

Int. Cl.<sup>6</sup> H01H 1/10

U.S. Cl. 200—517

12 Claims



1. An electrical switch, comprising:
  - a first conductor attached to a top surface of a first dielectric substrate and adjacent to an opening in the first dielectric substrate;
  - a second conductor attached to a top surface of a second dielectric substrate, said second conductor positioned below the first dielectric substrate such that a portion of said second conductor is located under the opening in the first dielectric substrate;
  - means for opening and closing an electrical conduction path between said first conductor and said second conductor comprising a movable conductive contact located directly above said first conductor and said second conductor, wherein said moveable conductive contact may be moved to contact said first conductor and said second conductor by extending through the opening in the first dielectric substrate, thereby acting as a conductive path between said first and second conductors; and
  - wherein said moveable electrical contact is located above said first and second conductors by attachment to a biased spring located above said conductors.

5,438,178

# METHOD OF PRECISION ELECTRIC-DISCHARGE MACHINING EMPLOYING ELECTRODES IN THE FORM OF WIRES, AND APPARATUS FOR CARRYING OUT THE METHOD

Ernst Bühler, Loosone; Livio Mazzolini, Ponte Capriasca, and Rino D'Amario, Taverne, all of Switzerland, assignors to AG für industrielle Elektronik, Loosone, Switzerland

Filed Jul. 6, 1993, Ser. No. 87,951

Claims priority, application Germany, Jul. 6, 1992, 42 22 186.2

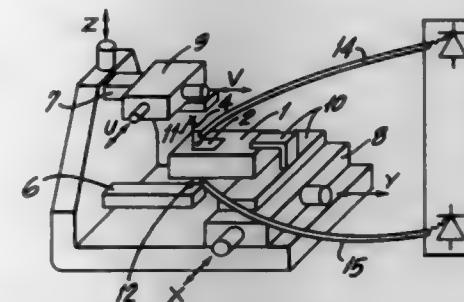
Int. Cl.<sup>6</sup> B23H 7/06

U.S. Cl. 219—69.12

31 Claims

1. Method of precision electric-discharge machining carried out in an apparatus of moderately high precision and stability with an electrode in the form of a wire comprising the steps of rough cutting a work at least once; and geometrically referenc-

ing for fine adjustments for at least one finishing cut the contour of the work that has already been rough cut, and at least



one step of finish machining to polish the rough cut contour of the work piece.

5,438,179

# METHOD AND APPARATUS FOR MANUFACTURING TEXTURE DRUMS

Wolfgang Boppel, Preetz; Gerald Sermund, and Michael Wilhelm, both of Kiel, all of Germany, assignors to Linotype-Hell AG, Eachborn, Germany

PCT No. PCT/DE91/00786, § 371 Date Mar. 24, 1993, § 102(e)

Date Mar. 24, 1993, PCT Pub. No. WO92/05911, PCT Pub.

Date Apr. 16, 1992

PCT Filed Oct. 3, 1991, Ser. No. 30,459

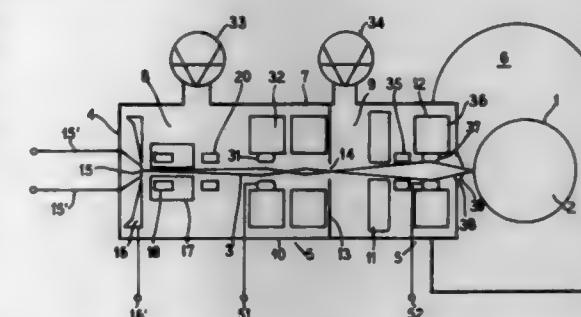
Claims priority, application Germany, Oct. 5, 1990, 40 31 547.9

The portion of the term of this patent subsequent to Jun. 28, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B23K 15/08

U.S. Cl. 219—121.19

16 Claims



1. A method for manufacturing a texture drum, comprising the steps of:
  - producing a surface structure comprising recesses in a surface region of the texture drum with an electron beam; and
  - producing each recess during at least two working intervals and providing the electron beam with a respective energy density sufficient for generating the recess during the working intervals, and, during at least one intermediate interval which separates the at least two working intervals from one another, charging the texture drum by an electron beam with a respective energy density that substantially does not alter an extent of the recess.

5,430,180

**ELECTRONIC INPUT CONTROL FOR A COOKING OVEN HAVING INDEPENDENT SELECTION OF FUNCTION AND SENTENCE PROGRAMMING**

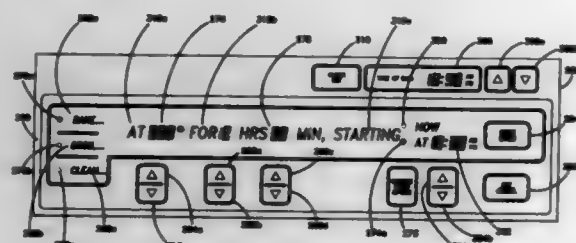
Gerald A. Eisenbrandt, Lincoln Township, Berrien County; John R. Bentley, St. Joseph; Thomas B. Bailie, Bridgman; Curtis J. Bailey, Birmingham; Sandra S. Thurlow, Benton Township, Berrien County; Judy K. Heiden, St. Joseph, all of Mich., and James R. Barger, Vandalia, Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 21, 1993, Ser. No. 6,806

Int. Cl.<sup>6</sup> H05B 1/02

U.S. Cl. 219-492

43 Claims



1. A cooking oven having means defining an oven cavity, heating means for heating said oven cavity to defined heating temperatures and a control means for receiving user input selections and for establishing a time and temperature heating profile of said oven cavity and for controlling said heating means according to said heating profile, said control means comprising:

input selection means for receiving user input selections; logic means responsive to said input means for establishing a time and temperature heating profile of said oven and for controlling said heating means according to said heating profile; and

said input selection means including heating function selection means for receiving a user selection of a heating function from among a plurality of heating functions and timing function selection means for receiving user selection of at least one timing function from among a plurality of timing functions, wherein said heating functions include a function for cooking of food in said oven cavity and a cleaning function for pyrolytic cleaning of said oven cavity, wherein said heating function selection means is substantially independent of said timing function selection means so that a user may select substantially any one of said timing functions with any one of said heating functions.

5,438,181

**APPARATUS FOR HEATING SUBSTRATE HAVING ELECTRICALLY-CONDUCTIVE AND NON-ELECTRICALLY-CONDUCTIVE PORTIONS**

Curtis L. Volkman, Brighton, and Frederick A. Buck, Milford, both of Mich., assignors to Essex Specialty Products, Inc., Clifton, N.J.

Filed Dec. 14, 1993, Ser. No. 166,430

Int. Cl.<sup>6</sup> H05B 6/10, 6/80

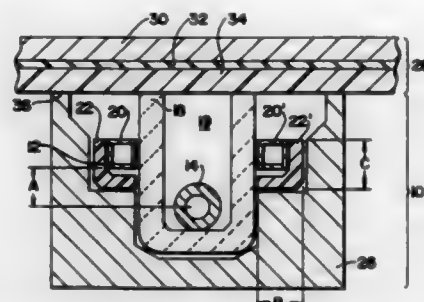
U.S. Cl. 219-601

26 Claims

1. An apparatus for heating a substrate having an electrically-conductive portion and a non-electrically-conductive portion, comprising:

- a first device capable of selectively generating heat in the electrically-conductive portion without substantially generating heat in the non-electrically-conductive portion,
- a second device capable of heating the non-electrically-conductive portion,
- an insulating shield between the first and second devices to help focus the energy generated by at least one of the devices to the substrate, and
- means for holding the first and second devices and the

insulating shield together, the apparatus having a heat-directed front side so that the substrate may be heated by



the apparatus when placed outside the apparatus at the heat-directed front side of the apparatus.

5,438,182

**CHOKE COIL APPARATUS FOR AN ELECTROMAGNETIC RANGE**

Byoung T. Choi, Kyung Sang Buk-do, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

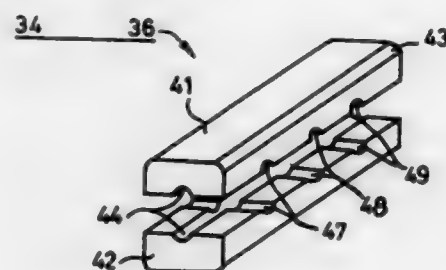
Filed Aug. 24, 1992, Ser. No. 933,681

Claims priority, application Rep. of Korea, Aug. 22, 1991, 91-14459

Int. Cl.<sup>6</sup> H05B 6/66; H01F 27/08, 27/24

U.S. Cl. 219-702

14 Claims



1. An electromagnetic range or microwave oven comprising an oscillator including a magnetron for generating an electromagnetic wave signal of high frequency and a filter circuit including a choke coil and a condenser connected between the oscillator and a power source therefor, a ferrite core inserted into said choke coil, said ferrite core having a multiangular bar shape to provide a plurality of ventilation spaces between said ferrite core and said choke coil, having its edges formed as rounding portions having a circular arc corresponding to the inner diameter of the choke coil, having at least one passing hole so as to improve its radiation efficiency, and being composed of at least two divided bodies so as to easily form said passing hole.

5,438,183

**MICROWAVE OVEN INCLUDING ANTENNA FOR RADIATING MICROWAVE**

Katsuaki Hayami; Hideo Fujii; Yoshihiro Wada; Yoshiharu Omori; Kuniyasu Kubo; Chizuko Konishi, and Yoshitsugu Takada, all of Shiga, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 24, 1994, Ser. No. 248,347

Claims priority, application Japan, Jun. 30, 1993, 5-161916; Jul. 12, 1993, 5-171567; Aug. 5, 1993, 5-194814; Aug. 27, 1993, 5-212804

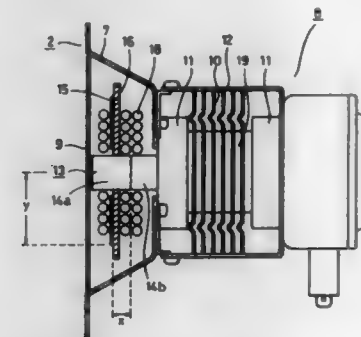
Int. Cl.<sup>6</sup> H05B 6/72

U.S. Cl. 219-748

20 Claims

1. A microwave oven comprising:  
a frame,

a cavity in said frame and in which a substance to be heated is accommodated,  
a magnetron located in a space formed between said frame and said cavity and having an output antenna for generating microwaves,  
a waveguide to which said magnetron is mounted, for supplying microwaves generated from said output antenna of said magnetron and radiating said microwaves into said cavity, wherein said waveguide has substantially a truncated cone configuration in which a cross sectional area at a cavity side of said waveguide is greater than a cross



sectional area of said waveguide at a magnetron side of said waveguide, and said output antenna of said magnetron is disposed to project from a magnetron side of said waveguide toward said cavity, and  
a radiation antenna fixed in said waveguide around said output antenna of said magnetron at maintaining distances from said waveguide and said output antenna of said magnetron wherein microwaves generated from said output antenna are propagated to said radiation antenna and radiated into said cavity from said radiation antenna for preventing generation of sparks from said antennas.

5,438,184

**METHOD AND APPARATUS FOR ELECTRONIC CASH TRANSACTIONS**

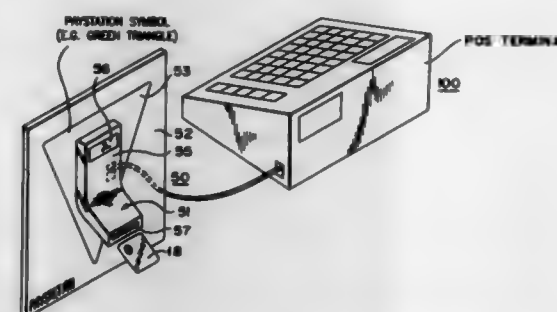
Alan B. Roberts, Palo Alto, and James S. Arakaki, Loomis, both of Calif., assignors to Verifone Inc., Redwood City, Calif.

Filed Oct. 26, 1993, Ser. No. 143,573

Int. Cl.<sup>6</sup> G06K 5/00

U.S. Cl. 235-380

10 Claims



1. A method of carrying out a transaction between a buyer and a seller using a smart card having a cash token stored therein with a current cash token value, the steps of:  
disposing on the seller's premises at a location separated from a transaction station a lookstation device having a distinctive Lookstation Symbol associated therewith, said lookstation device being adapted for insertion by a buyer of a smart card followed by automatic read and display to the buyer of the current cash token value stored therein to inform the buyer of his cash purchasing power;  
disposing on the seller's premises at said transaction station a paystation device having a distinctive Paystation Symbol associated therewith and being coupled to a transaction

terminal for participating in carrying out a transaction by means of the steps of:

- the transaction terminal communicating to said paystation device a cash transaction amount;
- the paystation device displaying said cash transaction amount;
- the buyer inserting into said paystation device a smart card having a cash token stored therein to indicate acceptance of said cash transaction;
- the paystation device reading the current cash token value in said inserted smart card;
- the paystation device calculating a new cash token value as the difference between said current cash token value and said cash transaction amount;
- the paystation device automatically writing said new cash token value into said cash token of said smart card without further action by the buyer; and
- the paystation device communicating a cash transaction completion message to said transaction terminal.

5,438,185

**IC CARD APPARATUS FOR CONNECTING A REFERENCE POTENTIAL TERMINAL OF A CARD CONNECTOR TO A MAIN FRAME WITHOUT A DATA TRANSFER CONTROL PORTION BEING CONNECTED THEREBETWEEN**

Toshiki Narukawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 718,650, Jun. 21, 1991, abandoned.

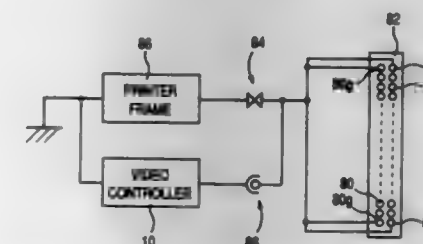
This application Sep. 30, 1993, Ser. No. 128,748

Claims priority, application Japan, Jun. 27, 1990, 2-169167; Jun. 27, 1990, 2-169168

Int. Cl.<sup>6</sup> G06K 19/00

U.S. Cl. 235-441

7 Claims



5. An electronic apparatus comprising:  
a card receptacle including a card connector to which an IC card is connectable;  
a control portion for sending data to and receiving data from said IC card through said card connector, said control portion including a central processing unit for effecting data processing operation such that, after a previous data processing operation, a next data processing operation is performed only upon receipt of an acknowledge signal;  
card-insertion signal means for generating a card-insertion signal when said IC card is connected to said card connector of said card receptacle;  
data-transfer signal means for generating a data transfer signal upon a data transfer of data between said central processing unit and said IC card;  
an acknowledge-signal generator circuit responsive to said card-insertion signal and said data-transfer signal, for supplying to said central processing unit said acknowledge signal when said data transfer between said IC card and the central processing unit is completed for said previous data processing operation, said acknowledge signal permitting said central processing unit to perform said next data processing operation;  
a frame; and  
circuit connecting means;  
wherein said card connector has a ground reference potential terminal connectable to a ground terminal of said IC



card, and a signal ground potential terminal of said control portion is connected to said frame, the signal ground potential terminal having a potential equal to a frame ground potential of said frame, said circuit connecting means electrically connecting said ground reference potential terminal of said card connector directly to said frame, the circuit connecting means bypassing the signal ground potential terminal of said control portion to electrically isolate the signal ground terminal of said control portion from the ground reference potential terminal of said card connector.

5,438,186

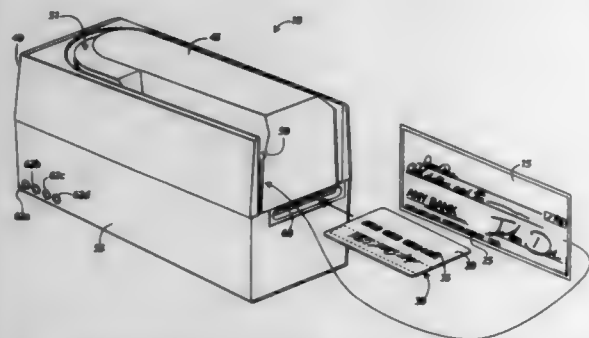
## MULTI-READER TRANSACTION TERMINAL

Parameswaran B. Nair, Acworth; John C. Evans, Atlanta; James F. Price, Alpharetta; Kumar S. Choudhuri, Kennesaw; James T. Stills, Atlanta, and Victor V. Goulding, Lawrenceville, all of Ga., assignors to MicroBilt Corporation, Atlanta, Ga. Continuation of Ser. No. 968,967, Oct. 30, 1992, abandoned. This application Jun. 17, 1994, Ser. No. 261,745

Int. Cl.<sup>6</sup> G06K 7/08

U.S. Cl. 235-449

67 Claims



1. A multireader terminal for reading financial transaction data, comprising:
  - a magnetic ink character recognition reader for reading check account data from checks;
  - a magnetic stripe reader for reading card identifying information from a magnetic stripe on a card;
  - an embossed character reader for reading card identifying information from characters embossed on said card;
  - in integrated controller in communication with said magnetic ink character recognition reader, said magnetic stripe reader, and said embossed character reader, said controller operative for receiving data signals from said magnetic ink character recognition reader, said magnetic stripe reader and said embossed character reader and for providing decoded data signals; and
  - data port means for providing check account data and card identifying information corresponding to said decoded data signals as an output.

5,438,187

## MULTIPLE FOCUS OPTICAL SYSTEM FOR DATA READING APPLICATIONS

Brad R. Reddersen, and Thomas C. Arende, both of Eugene, Oreg., assignors to Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.

Continuation-in-part of Ser. No. 786,121, Nov. 5, 1991, abandoned. This application Jun. 18, 1993, Ser. No. 80,036

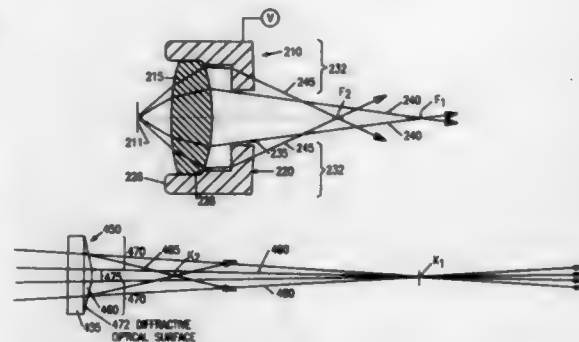
Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235-462

38 Claims

1. An optical system for data reading, comprising:
  - a single light source generating an optical beam along an outgoing optical path toward an object to be scanned;
  - a scanning mechanism for scanning the outgoing beam along at least one axis to produce at least one scan line;
  - a multifocal lens system positioned in the outgoing optical path between the single light source and the scanning

mechanism, the multifocal lens system including at least an inner lens portion having a first focal length and an outer lens portion having a second focal length, the multifocal lens system dividing the outgoing optical beam at least into a first beam section and a second beam section, the first beam section being focused by the inner lens



portion simultaneously with the second beam section being focused by the outer lens portion; a detector for detecting light reflecting off the object, the detector being positioned to receive the light reflecting from the object without the light passing through the multifocal lens system.

5,438,188

## METHOD AND APPARATUS FOR DECODING BAR CODE IMAGES USING INFORMATION FROM PREVIOUS SCAN LINES

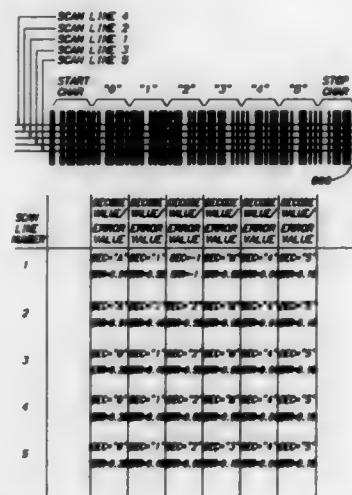
Stefan Surka, Sandy Hook, Conn., assignor to United Parcel Service of America, Inc., Atlanta, Ga.

Filed Apr. 1, 1994, Ser. No. 221,877

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235-462

10 Claims



1. A method for decoding a pixel image representative of a bar code symbol comprising a plurality of encoded characters each of which corresponds to one of a plurality of prototype bar patterns, comprising the steps of: (A) scanning said bar code along a first scan line

to determine a first set of candidate character values, each candidate character value of said first set having an error value associated therewith; (B) if said scanning along said first scan line results in an unsuccessful reading of said bar code symbol, scanning said bar code symbol along a second differing scan line to determine a second set of candidate character values, each

- candidate character value of said second set having an error value associated therewith;
- (C) comparing corresponding error values associated with said first and second sets of candidate character values;
- (D) for each corresponding pair of candidate character values from said first and second sets, selecting said candidate character value having a minimum associated error value;
- (E) forming a third set of candidate character values in accordance with said selected candidate character values; and
- (F) decoding said bar code symbol in accordance with said third set of candidate character values.

5,438,189

## RECORDING-TAPE CASSETTE W/ ANTI-JAM PERIMETER-DECLIVITY

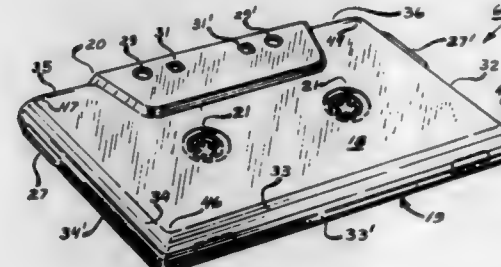
Robert W. Von Heck, 3350 Kurtz St., San Diego, Calif. 92110

Filed Mar. 1, 1993, Ser. No. 24,388

Int. Cl.<sup>6</sup> G11B 23/087

U.S. Cl. 242-347

4 Claims



1. A compact-type tape cassette comprising:
  - a housing having substantially identical substantially rectangular first and second housing portions, each housing portion having a substantially rectangular plane surface and side walls extending from the plane surface,
  - a pair of tape reels disposed radially edge to edge in said housing and having respective axes parallel to each other and perpendicular to the plane surfaces,
  - said side walls forming a side edge perimeter when said housing is assembled, one side of said perimeter having apertures adapted to accommodate entry of a capstan-roller and a head of a recording/playback apparatus,
  - said side walls outside of said one side being in the form of a curve extending from each plane surface to form an edge-less curve extending between the plane surfaces when the housing is assembled.

5,438,190

## LENS CONTROL DEVICE

Naoya Kaneda, Chigasaki; Masahide Hirasawa, Sagamihara; Kunihiko Yamada, Tanashi; Kitahiro Kaneda, and Mitsuo Niida, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 164,617, Dec. 9, 1993, abandoned, which is a continuation of Ser. No. 82,260, Jun. 24, 1993, abandoned, which is a continuation of Ser. No. 917,166, Jul. 20, 1992, abandoned. This application Aug. 9, 1994, Ser. No. 287,707

Claims priority, application Japan, Jul. 22, 1991, 3-180975; Jul. 26, 1991, 3-187658

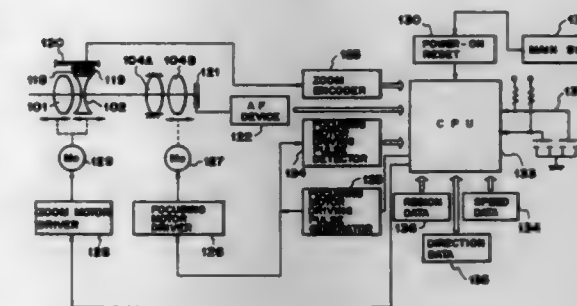
Int. Cl.<sup>6</sup> G01J 1/20

U.S. Cl. 250-201.3

69 Claims

1. A lens control device comprising:
  - a zoom lens;
  - a focus lens for correcting changes in a focus position due to movement of said zoom lens; and
  - control means for driving said focus lens, based on a speed in

which a reference speed determined by positions of zoom lens and focus lens is corrected in accordance with a depth



of field and a focus state while the zoom lens is being driven.

5,438,191

## PHOTOMULTIPLIER

Suenori Kimura; Nobuyuki Ohnagi, and Toshihiko Totsuka, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

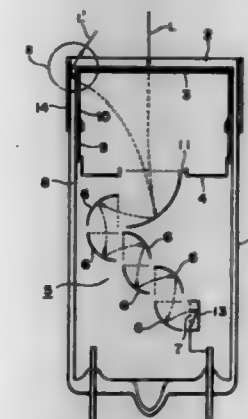
Filed Aug. 6, 1993, Ser. No. 102,808

Claims priority, application Japan, Aug. 10, 1992, 4-212723

Int. Cl.<sup>6</sup> H01J 43/18, 40/14

U.S. Cl. 250-207

13 Claims



1. A photomultiplier comprising:
  - container having first and second ends, a side wall, and internal and outer surfaces;
  - a photocathode formed on said internal surface of said first end of said container;
  - an electron multiplying unit provided in said container, said electron multiplying unit being constructed and arranged for receiving light entering said first end and for multiplying electrons emitted from said photocathode;
  - a focusing electrode having an aperture for focusing said electrons emitted from said photocathode and for guiding said electrons to said electron multiplying unit, said focusing electrode being disposed between said photocathode and said electron multiplying unit;
  - a side photocathode formed along said internal surface of said side wall of said container in a predetermined region, said predetermined region being positioned adjacent to said photocathode; and
  - a reflection film formed on said outer surface of said side wall of said container, said reflection film having a reflective surface that faces and substantially opposes said side photocathode.

5,438,192

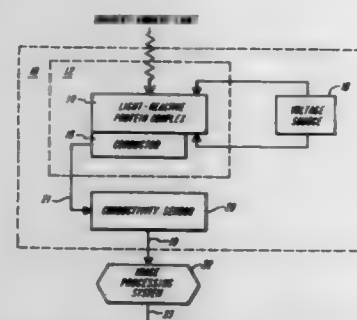
# PHOTODYNAMIC PROTEIN-BASED PHOTODETECTOR AND PHOTODETECTOR SYSTEM FOR IMAGE DETECTION AND PROCESSING

David L. Kaplan, Stow; Lynne A. Samuelson, West Newton, both of Mass.; Bonnie J. Wiley, Cambridge, Ill.; Kenneth A. Marx, Francetown, N.H.; Jayant Kumar, Lowell; Sukant K. Tripathy, Acton, both of Mass.; Sandip K. Sengupta, Nashua, and Marie J. Cazeca, Hudson, both of N.H., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 9, 1993, Ser. No. 166,398

Int. Cl.<sup>6</sup> H01J 40/14

U.S. Cl. 250—214.1



1. A dynamic adaptive camouflage system comprising: a plurality of groups of linked photodynamic protein-based photodetectors, each said group of linked photodynamic protein-based photodetectors responsive to a predetermined wavelength of incident light; each of said linked photodynamic protein-based photodetector including a configuration of at least one light-reactive protein exhibiting a change in electrical conductivity in response to a corresponding change in said incident light intensity in the presence of an applied voltage; said configuration of at least one light-reactive protein includes a multi-layered thin-film, each layer of said multi-layered thin-film being selected from the group consisting of light-reactive proteins, conductive polymers and oligomers, said multi-layered thin-film being oriented in a predetermined manner, and all the layers are specifically directed into a predetermined configuration and orientation to facilitate unidirectional energy transfer; each of said plurality of photodynamic protein-based photodetectors having a different spectral response range, said spectral response range of at least a first one of said plurality of photodynamic protein-based photodetectors overlapping with a spectral response range of at least a second one of said plurality of protein-based photodetectors, said overlapping spectral response range allowing detection of a specific wavelength of said incident light; an electrical conductor, comprising a conductive polymer, coupled to said at least one light-reactive protein, said conductive polymer being coupled to said at least one light reactive protein in a manner selected from the group consisting of covalent linkage and thin film resonance transfer; a voltage source, for providing a predetermined applied voltage across said configuration of at least one light-reactive protein; a conductivity sensor, coupled to said electrical conductor for sensing said change in electrical conductivity in said configuration of at least one light-reactive protein in response to a corresponding change in said incident light intensity and for providing an output signal; means, coupled to said conductivity sensor, for processing said output signal; and at least one output device coupled to said means for processing said output signal, and mounted to an apparatus to be camouflaged, for displaying color in response to said processed output signal from said plurality of said group

of linked photodynamic protein-based photodetectors in order to provide adaptive camouflage to said apparatus to be camouflaged, said at least one output device including a visual display device consisting of a passive reflective transducer, and said apparatus to be camouflaged comprising flexible, cloth-like material.

5,438,193

# ABSOLUTE ROTARY ENCODER WITH SLIT PATTERNS HAVING BIT-CODED TRACKS RANGING FROM HIGHER TO LOWER ORDER

Masaki Takagi, and Takumi Fukuda, both of Tokyo, Japan, assignors to Copan Company Limited, Tokyo, Japan  
PCT No. PCT/JP93/00506, § 371 Date Dec. 15, 1993, § 102(e)  
Date Dec. 15, 1993, PCT Pub. No. WO93/21499, PCT Pub. Date Oct. 28, 1993

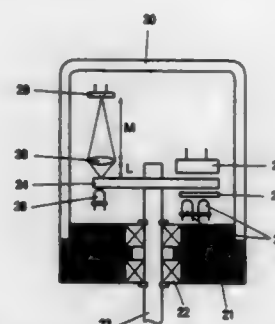
PCT Filed Apr. 20, 1993, Ser. No. 157,190

Claims priority, application Japan, Apr. 22, 1992, 4-129681; Apr. 22, 1992, 4-129682

Int. Cl.<sup>6</sup> G01D 5/34

U.S. Cl. 250—231.18

22 Claims



1. An absolute encoder comprising: a movable member formed thereon with a plurality of slit patterns to define a plurality of tracks bit-coded according to a given digital code system representative of absolute addresses, the tracks being arranged in parallel manner from a higher order to a lower order; a light source for irradiating an illuminating light onto the movable member; photodetecting means receptive of the illuminating light through the slit patterns to output detection signals associated with the respective tracks; and processing means for processing the detection signals to reproduce bit signals and for decoding the bit signals to read an absolute address of the movable member

wherein the processing means comprises logic means for combining a lower bit signal having definite leading and trailing edges with a higher order intermediate signal having indefinite leading and trailing edges to obtain a combined signal having definite leading and trailing edges, adder means for adding the combined result with another higher order detection signal by a certain proportion, and reproduction means for reproducing a synchronized higher order bit signal based on the added results such that the higher order bit signal is synchronized with either of leading and trailing edges of the lower bit signal.

5,438,194

# ULTRA-SENSITIVE MOLECULAR IDENTIFIER

Reijer Koudijs, Kootwijkerbroek; Marcel M. Mulder, Duivenrecht, both of Netherlands; Kenneth H. Purser, Lexington, Mass., and Frans W. Saris, Amsterdam, Netherlands, assignors to High Voltage Engineering Europa B.V., Amersfoort, Netherlands

Filed Jul. 30, 1993, Ser. No. 99,844

Int. Cl.<sup>6</sup> H01J 49/26

U.S. Cl. 250—288

14 Claims

1. A method for identifying and detecting molecules which have been labeled by a specific radioisotope or stable isotope, comprising the following steps: (1) separating various mole-

5,438,196

# SCANNING TUNNELING MICROSCOPE

Shinichi Kitamura, Saitama, Japan, assignor to Jeol Ltd., Tokyo, Japan

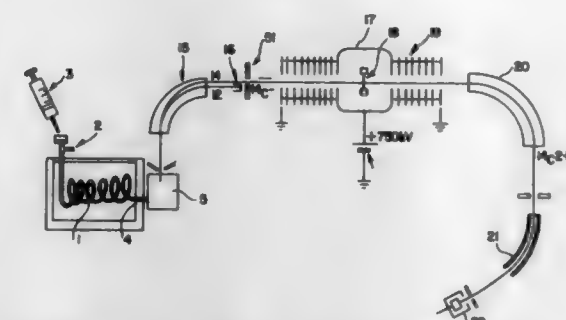
Filed Dec. 6, 1993, Ser. No. 163,339

Claims priority, application Japan, Dec. 4, 1992, 4-325212

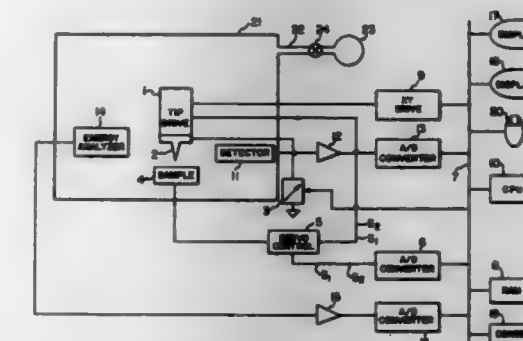
Int. Cl.<sup>6</sup> H01J 37/252

U.S. Cl. 250—306

4 Claims



dissociated and negative ions produced, (3) directing said negative ions into a tandem accelerator mass spectrometer, thereby forming positive ions having high velocity, and (4) stopping said positive ions in a particle detector.



1. A scanning tunneling microscope comprising: a conducting tip; a means for moving said tip relative to a specimen in two dimensions; a variable bias voltage source for applying a negative potential to said tip with respect to said specimen; a device for varying a distance between said tip and said specimen so that a tunneling current flowing therebetween is kept constant; a control means for controlling operation of said device; a secondary electron detector for detecting secondary electrons emitted from said specimen when absolute value of said negative potential applied to said tip from said bias voltage source is increased; and a means for displaying a scanning tunneling microscope image and for displaying a scanning secondary electron image based upon an output signal from said secondary electron detector in relation to a scanning position of said tip, whereby the scanning tunneling microscope image and the scanning secondary electron image having the same field of view and magnification are displayed.

5,438,195

# METHOD AND DEVICE FOR THE DIGITAL GENERATION OF AN ADDITIONAL ALTERNATING VOLTAGE FOR THE RESONANT EXCITATION OF IONS IN ION TRAPS

Jochen Franzen, Bremen; Gerhard Heinen, Grasberg, and Reemt-Holger Gabling, Stuhl, all of Germany, assignors to Bruker-Franzen Analytik GmbH, Germany

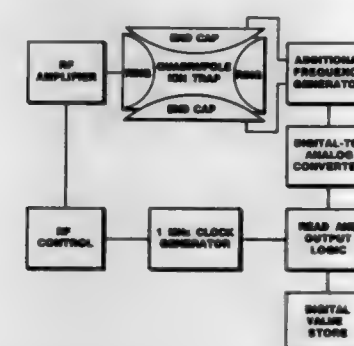
Filed May 19, 1994, Ser. No. 245,956

Claims priority, application Germany, May 19, 1993, 43 16 737.3

Int. Cl.<sup>6</sup> H01J 49/42

U.S. Cl. 250—292

19 Claims



1. A method for exciting secular oscillations of ions of selected mass-to-charge ratios in an RF quadrupole ion trap by resonances of their secular oscillations with a field of an additionally applied electrical alternating voltage generated via a digital-to-analog converter at a constant basic pulse rate from digitally stored amplitude values, said method comprising the step of:

making a frequency of the basic pulse rate of generation of the digital alternating voltage one of identical with the drive radio frequency of the ion trap and equal to an integral multiple thereof.

5,438,197

# FOCUSED ION BEAM APPARATUS

Toshiaki Fujii, and Yasuhiko Sugiyama, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

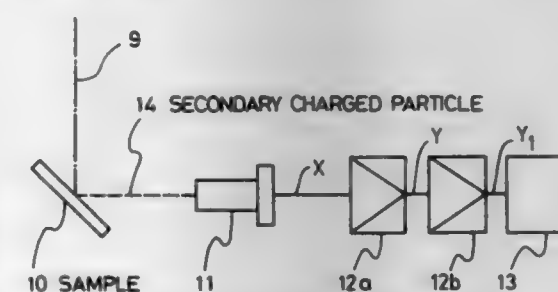
Filed Jul. 11, 1994, Ser. No. 272,545

Claims priority, application Japan, Jul. 9, 1993, 5-170612

Int. Cl.<sup>6</sup> H01J 37/28

U.S. Cl. 250—309

5 Claims



1. A focused ion-beam apparatus, comprising: an ion source which generates ions; an electronic lens system which forms a focused ion-beam from said ions; a deflecting electrode which scans said focused ion-beam; a secondary charged particle detector which detects second-



ary charged particle emitted from a sample surface and generates a detecting signal; an amplifier which amplifies said detecting signal; and an image display which displays patterns formed on the sample surface based on a flat distribution of intensity of secondary charged particle; wherein said amplifier comprises a reference voltage source; a comparator which compares output of said reference voltage source with said detecting signal; and an amplifier circuit having an adjustable operating gain according to the output signal from said comparator, and wherein said amplifier circuit provides different signal treatment in amplifying ratio based upon the value of the detecting signal.

5,438,196

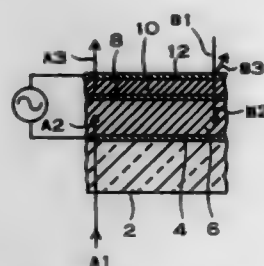
## INFRARED-TO-VISIBLE CONVERTER

Masuyuki Ebitani; Toshifumi Tominaga, both of Anan, and Akihito Kishi, Tokushima, all of Japan, assignors to Nichia Chemical Industries, Ltd., Tokushima, Japan  
Filed May 3, 1994, Ser. No. 238,020

Claims priority, application Japan, May 12, 1993, 5-110396  
Int. Cl.<sup>6</sup> H01L 31/14

U.S. Cl. 250—330

9 Claims



1. An infrared-to-visible converter which converts incident infrared rays into visible light, comprising:  
a photoconductive layer;  
an electroluminescent layer disposed along said photoconductive layer; and,  
an infrared upconversion phosphors layer optically combined with said photoconductive layer;  
wherein a wavelength of a light emission from said infrared upconversion phosphors layer which is responsive to the incident infrared rays is within a sensitive wavelength region of said photoconductive layer.

5,438,199

## THERMAL IMAGING APPARATUS WITH BIAS MODULATION

Uri Agam, Cote St. Luc, and Gary Nicholson, Montreal, both of Canada, assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed Sep. 6, 1994, Ser. No. 301,282

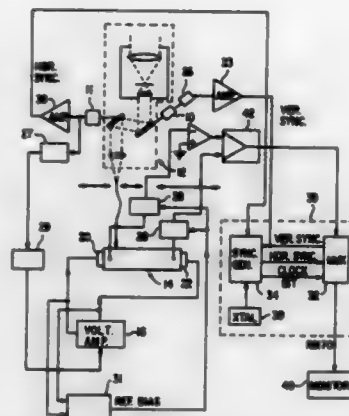
Int. Cl.<sup>6</sup> H01L 31/00

U.S. Cl. 250—334

8 Claims

1. A thermal scanning apparatus comprising:  
a non-linear optomechanical scanner receiving radiation from a scene and directing it onto an image plane, said scanner defining a non-linear scan velocity in said image plane;  
a SPRITE detector disposed in said image plane and including first and second spaced contacts and means for applying a bias voltage across said contacts;  
means for sensing the velocity of said scanner in real time as it scans across said image plane; and  
a first synchronizing means for synchronizing the applied bias voltage across said contacts as a function of the sensed non-linear scan velocity, thereby to compensate for the non-linearity of the optomechanical scanner and to further

compensate for phase lag due to said detector and associated electronic circuitry;  
a second synchronizing means for phase synchronizing an output with the signal output of the SPRITE, said output of the second synchronizing means being referred to as the reference bias;



means for adjusting the amplitude of said reference bias; and  
filtering means for comparing said reference bias with said SPRITE output signal and filtering said applied bias voltage from said SPRITE output.

5,438,200

## COMPOSITE PHOTODETECTOR SUBSTRATE AND METHOD OF FORMING THE SAME

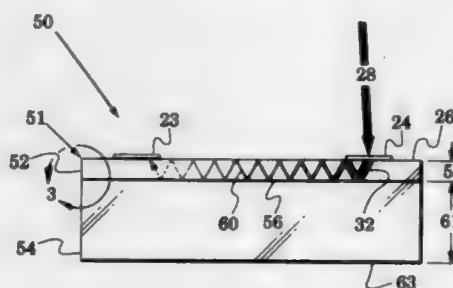
Donald D. Thornton, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Aug. 23, 1994, Ser. No. 294,704

Int. Cl.<sup>6</sup> G01N 21/27

U.S. Cl. 250—338.4

22 Claims



1. A detector array, comprising:  
a composite substrate that includes:  
a) a carrier; and  
b) a semiconductor substrate having first and second opposed surfaces, said substrate carried along said second surface by said carrier; and  
a plurality of semiconductor photodetectors spaced apart on said semiconductor substrate first surface.

5,438,201

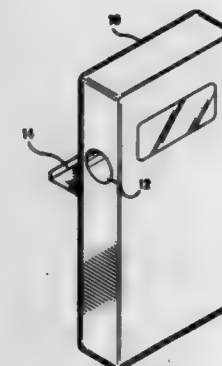
## METHOD AND APPARATUS FOR RESTRAINING FINGER MOTION IN BLOOD ANALYTE OPTICAL MEASUREMENT

Robert D. Rosenthal, Gaithersburg, Md., and Ryoichi Yabe, Tokyo, Japan, assignors to Fatrex, Inc., Gaithersburg, Md.  
Continuation-in-part of Ser. No. 103,758, Aug. 10, 1993, Pat. No. 5,362,966, which is a continuation-in-part of Ser. No. 813,739, Dec. 30, 1991, Pat. No. 5,237,178, which is a continuation-in-part of Ser. No. 565,302, Aug. 10, 1990, Pat. No. 5,077,476, which is a continuation-in-part of Ser. No. 544,580, Jun. 27, 1990, Pat. No. 5,086,229. This application Feb. 15, 1994, Ser. No. 195,654

Int. Cl.<sup>6</sup> G01N 21/35

U.S. Cl. 250—341.1

9 Claims



1. In an optical quantitative measurement apparatus having an aperture for insertion of the index finger of a subject, wherein quantitative measurement of blood analytes is performed by irradiating said index finger with radiation in a predetermined bandwidth, a method of restraining index finger rotational motion comprising the step of:

causing the middle finger of the subject to be aligned with said index finger after said index finger has been inserted into said aperture by providing means for aligning the middle finger of said subject in a horizontal plane at least as high as a horizontal plane of said index finger; whereby said index finger is prevented from rotating within said aperture to enable said apparatus to provide accurate repeatable quantitative measurements.

5,438,202

## STABILIZED SCATTER FREE GAMMA CAMERA IMAGES

Alex Matanzon; Gideon Berlad; Dov Maoz; Yigal Shrem, and Adrian Sott, all of Haifa, Israel, assignors to Elcint Ltd., Haifa, Israel

Continuation-in-part of Ser. No. 889,406, May 28, 1992. This application Jun. 6, 1994, Ser. No. 254,571

Int. Cl.<sup>6</sup> G01T 1/161

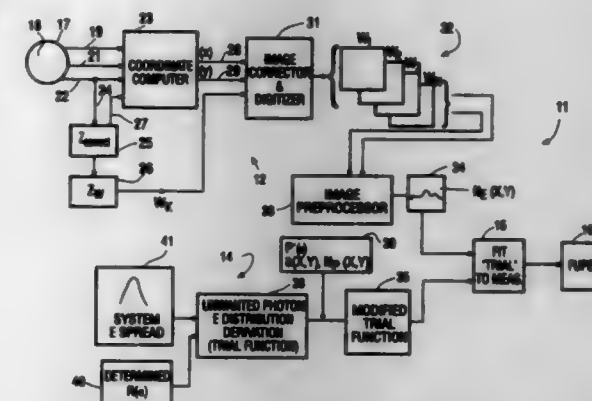
U.S. Cl. 250—363.07

50 Claims

1. A method of improving images from a gamma camera system by considering isotopes have  $k$  photopeaks where  $k \geq 1$  and by reducing the contribution of unwanted photons on an image produced by a gamma ray imaging system, said method including the steps of:

detecting photons impinging on a gamma ray detector in an X,Y coordinate location according to the location of the impingement on the detector,  
determining the energy of each detected photon,  
grouping each detected photon according to the determined energy in the X, Y coordinate location,  
accumulating counts of said grouped photons according to the determined energy level of the photons at each X, Y coordinate location,  
constructing an energy spectrum of each X, Y location using the accumulated counts,

determining a system dependent energy distribution of different components of unwanted photons,  
determining the energy spread function of the gamma camera system for the known energies of the wanted photons,  
constructing a trial function comprising the system energy spread function multiplied by a first unknown coefficient of wanted photons plus the system dependent energy distributions of the components of unwanted photons multiplied by their unknown coefficients



modifying the trial function by including in the trial function the first  $n$  derivatives of the system energy spread function of each of the  $k$  photopeaks multiplied by unknown coefficients,

locally fitting the modified trial function to the constructed energy spectrum to obtain the count of the wanted photons.

using the count of the wanted photons to produce an image practically free of unwanted photons.

5,438,203

## SYSTEM AND METHOD FOR UNIPOLAR MAGNETIC SCANNING OF HEAVY ION BEAMS

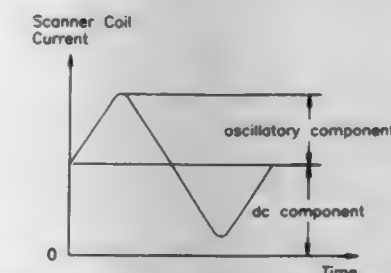
Hilton F. Glavish, Incline Village, Nev.; Michael A. Guerra, late of Exeter, N.H. by Sarah B. Cutler, executor; Tadaaki Kawai, Kyoto, Japan; Masao Naito, Kyoto, Japan, and Nobuo Nagai, Kyoto, Japan, assignors to Nissin Electric Company, Kyoto, Japan

Filed Jun. 10, 1994, Ser. No. 257,989

Int. Cl.<sup>6</sup> H01J 37/141

U.S. Cl. 250—396 ML

22 Claims



1. A magnetic deflection system for producing a strong magnetic field modulated at a fundamental frequency of at least 20 Hz for scanning an ion beam over a selected surface comprising:

a magnetic scanning structure having poles with respective pole faces that define therebetween a gap through which the ion beam passes, said magnetic scanning structure comprising, at least in part, laminations of high magnetic permeability material each having thickness in the range between about 0.2 and 1 millimeter, said laminations being separated by relatively thin electrically insulating layers, said laminations providing a low reluctance magnetically permeable path for said fundamental frequency and higher

order harmonic components of said strong magnetic field, the laminations serving to confine induced eddy currents to limited values in local paths in respective laminations; and

scanning coils associated with said magnetic scanning structure and energized by a scanning current source, said scanning current source being selected to apply to said scanning coils an excitation current to generate in said gap a substantially unipolar scanning magnetic field that varies in magnitude, above a preselected minimum value, as a function of time to cause scanning of the ion beam at a rate of at least 20 Hz, said minimum value being sufficiently greater than zero to prevent the transverse cross-section of the ion beam from substantially fluctuating in size while the ion beam is being scanned across the selected surface.

5,438,204

# **TWIN-MASK, AND METHOD AND SYSTEM FOR USING SAME TO PATTERN MICROELECTRONIC SUBSTRATES**

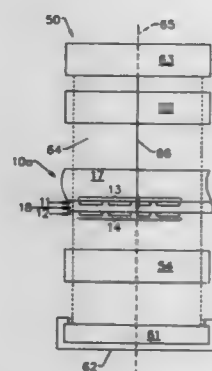
Rudolf M. von Bunau, Mountain View, and Roger F. W. Pease, Stanford, both of Calif., assignors to The Board of Trustees of the Leland Stanford, Jr. University, Stanford, Calif.

Filed Dec. 30, 1993, Ser. No. 175,977

Int. Cl.<sup>6</sup> H01J 1/52

U.S. Cl. 250—492.2

30 Claims



1. A mask for use in patterning microelectronic substrates, said mask comprising:

- a first mask layer including a first copy of a microelectronic substrate mask pattern therein;
- a second mask layer including a second copy of said microelectronic substrate mask pattern therein; and
- means for fixedly supporting said first and second copies of said microelectronic substrate mask pattern in spaced apart relation to one another, and aligned relative to one another.

5,438,205

# **ION SOURCE GASEOUS DISCHARGE INITIATION IMPULSE VALVE**

James B. Schroeder, Madison, Wis., assignor to National Electrostatics Corp., Middleton, Wis.

Filed Apr. 8, 1994, Ser. No. 225,952

Int. Cl.<sup>6</sup> H01J 37/00

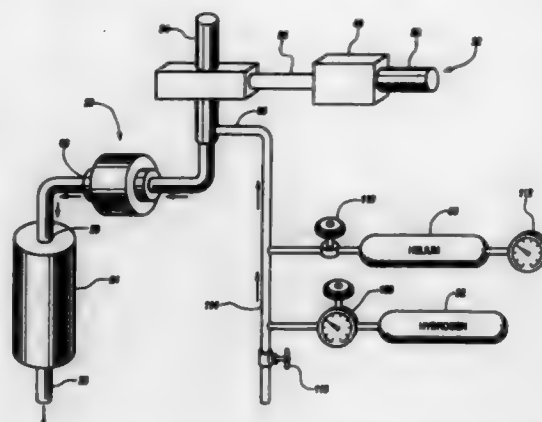
U.S. Cl. 250—423 R

14 Claims

1. An ion source comprising:

- a) an ion source chamber for supplying ions to an accelerator, wherein the chamber has a gas inlet, an ion outlet, and a first selected volume;
- b) a gas supply which contains gas to be ionized;
- c) a metering valve which receives gas from the gas supply, wherein the metering valve controls the rate of flow of gas from the gas supply;
- d) a reservoir into which gas is discharged from the metering valve, wherein the reservoir accepts a second selected volume of gas; and
- e) a valve having at least two positions, wherein the valve is

connected between the reservoir and the gas inlet of the ion source chamber, and wherein the valve in a first position closes off the reservoir, and wherein the valve in a second position connects the reservoir to the ion source chamber to release gas contained within the reservoir into



the ion source chamber, and wherein the selected pressure, the first selected volume and the second selected volume are chosen in such ratios that the gas released from the reservoir fills the ion source chamber at a pressure of between about one and about one thousandth of a Torr.

5,438,206

# **POSITIONING DEVICE**

Kazuo Yokoyama, and Motoshi Shibata, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

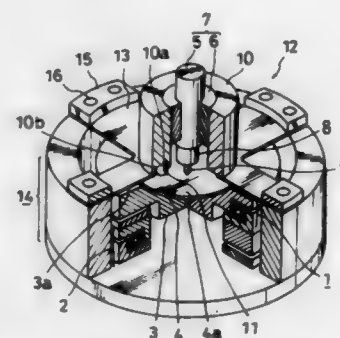
Filed Jun. 2, 1993, Ser. No. 70,682

The portion of the term of this patent subsequent to Feb. 15, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> H01J 37/20

U.S. Cl. 250—424.11

32 Claims



1. A positioning device comprising:

- a sample table having a table face on which a sample is to be fixed;
- an X-Y positioning mechanism, holding said sample table and capable of positioning said sample table in two dimensions;
- a housing including three point contact legs provided on a bottom face of said housing and sliding directly on a surface of said sample;
- a fixed base;
- a thin plate spring, coupled to said fixed base and substantially parallel to the surface of said sample, said thin plate spring holding said housing; and
- a probe head having a probe, coupled to said housing.

5,438,207

# **ELECTRON BEAM DIRECT WRITING SYSTEM FOR ULSI LITHOGRAPHY WITH FACILITATED ROTATION AND GAIN CORRECTIONS OF SHOT PATTERNS AND ELECTRON BEAM DIRECT WRITING METHOD FOR SAME**

Katsuyuki Itoh, and Hiroshi Yamashita, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

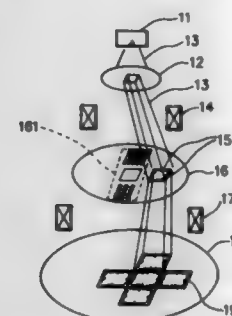
Filed Nov. 4, 1994, Ser. No. 334,225

Claims priority, application Japan, Nov. 17, 1993, 5-287897

Int. Cl.<sup>6</sup> H01J 37/304

U.S. Cl. 250—492.23

7 Claims



1. An electron beam direct writing system, comprising:

- an electron gun for supplying an electron beam;
- a first and a second aperture member vertically aligned for obtaining a desired rectangular pattern;
- a deflector as an electro-optical shaping lens interposed between the first and the second aperture member for creating a rectangular pattern of a desired size;
- an objective for having the electron beam, as it has passed through the second aperture member, focused on a surface of a semiconductor substrate as an object of a mapping operation;

the second aperture member including a shot aperture corresponding to a first, a second and a third shot as exposure operations of the electron beam for respectively mapping on the semiconductor substrate a first shot pattern of a rectangular figure having a predetermined size, a second shot pattern adjacent to the first shot pattern in a first direction and a third shot pattern adjacent to the first shot pattern in a second direction perpendicular to the first direction, and an evaluation aperture corresponding to evaluation patterns formed by mapping a first line/interval pattern in peripheral portions of the first shot pattern and second line/interval patterns in peripheral portions respectively of the second and the third shot pattern;

the first line/interval pattern including short lines each having a predetermined width arranged at first pitches in the first and the second direction in the peripheral portions of the first shot pattern; and

the second line/interval patterns including the short lines arranged in the first and the second directions in the peripheral portions respectively of the second and the third shot pattern at second pitches slightly different from the first pitches.

5,438,208

# **MIRROR COUPLED MONOLITHIC LASER DIODE AND PHOTODETECTOR**

Akira Takemoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1993, Ser. No. 140,502

Claims priority, application Japan, Jan. 27, 1993, 5-011586

Int. Cl.<sup>6</sup> G02B 27/00

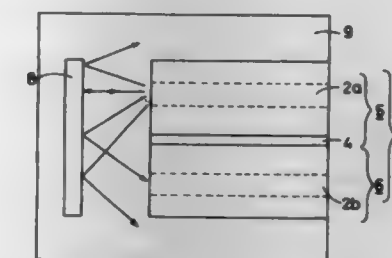
U.S. Cl. 250—551

13 Claims

1. An optical integrated circuit comprising:

- a semiconductor substrate including a laser diode having an optical axis along which laser light is emitted and a photodiode having an optical axis along which incident light is detected, said laser diode and said photodiode being sepa-

rated by a groove in said semiconductor substrate, the optical axes of said laser diode and said photodiode being parallel but not collinear;



a supporting plate on which said semiconductor substrate is mounted; and  
a mirror optically coupling said laser diode with said photodiode and disposed on said supporting plate.

5,438,209

# **APPARATUS FOR DETECTING POSITION OF A NOTCH IN A SEMICONDUCTOR WAFER**

Satoshi Yamamoto, and Kenji Kamel, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Inc., Kyoto, Japan

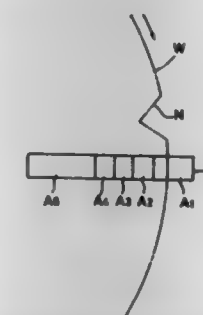
Filed Feb. 2, 1993, Ser. No. 12,346

Claims priority, application Japan, Feb. 3, 1992, 4-048090

Int. Cl.<sup>6</sup> G01N 21/86

U.S. Cl. 250—559.29

12 Claims



1. A notch position detecting apparatus for detecting a notch formed peripherally in a semiconductor wafer, comprising:

- rotating means for rotating said wafer;
- image pickup means for detecting outline positions of said wafer;
- control means for controlling and selectively driving said rotating means in stepwise rotation at a predetermined relatively broad pitch and in stepwise rotation at a predetermined relatively fine pitch;
- detecting means responsive to the image pickup means for generating outer peripheral positional data of the wafer during rotation thereof, and for determining the presence or the absence of said notch;
- switch means for causing said control means to rotate said rotating means at the fine pitch after said detecting means detects said notch;
- storage means for storing the outer peripheral positional data generated by said detecting means;
- timing means for periodically causing the outer peripheral positional data from said detecting means to be inputted into said storage means when said control means drives said rotating means at the fine pitch; and
- computing means for computing a notch position from the outer peripheral positional data stored in said storage means.

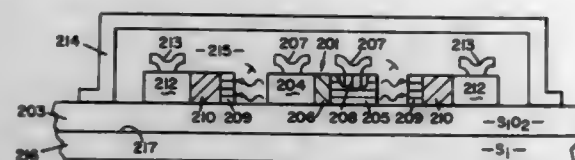


5,438,210

OPTICAL ISOLATION CONNECTIONS USING  
INTEGRATED CIRCUIT TECHNIQUESEugene R. Worley, 11 Bowditch, Irvine, Calif. 92720  
Filed Oct. 22, 1993, Ser. No. 139,818Int. Cl.<sup>6</sup> H01L 31/12, 31/16

U.S. Cl. 257-82

27 Claims



1. A monolithic SOI optical coupler comprising, a silicon LED comprising a first region which is relatively heavily doped P+, a second region which is relatively heavily doped N+ and a third region of relatively lightly doped either N- or P- intermediate said first and second regions, and light detector means comprising a first region doped N+, a second region doped P+ and a third region doped N+P+ intermediate said first and second regions, a common support means, said light detector means constructed adjacent to said LED on the same surface of said common support means, said common support means includes an insulator layer.

5,438,211

CHARGE-TRANSFER DEVICE HAVING AN IMPROVED  
CHARGE-SENSING SECTION

Nobuo Nakamura, Sagami-hara; Yoshiyuki Matsunaga, Kama-kura; Yoshihito Koya, Kawasaki, and Yukio Endo, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

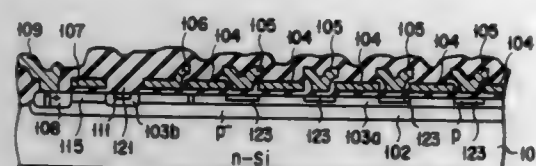
Filed Mar. 31, 1994, Ser. No. 220,708

Claims priority, application Japan, Mar. 31, 1993, 5-074838

Int. Cl.<sup>6</sup> H01L 29/78

U.S. Cl. 257-239

20 Claims



1. A charge-transfer device comprising: a semiconductor substrate of a first conductivity type having a surface; a high-resistance well layer of a second conductivity type formed in said surface of said substrate; a charge-transfer channel layer of the first conductivity type formed in a surface of said well layer; a charge storage channel layer of the first conductivity type formed in said surface of said substrate so as to connect with said transfer channel layer; a charge release channel layer of the first conductivity type formed in said surface of said substrate so as to connect with said storage channel layer; a charge release drain layer of the first conductivity type formed in said surface of said substrate so as to connect with said release channel layer; an output gate electrode provided above the junction of said transfer channel layer and said storage channel layer, with an insulating film interposed between said output gate electrode and said junction; a covering insulating film formed on said substrate and corresponding to said storage channel layer;

- a reset gate electrode provided above said release channel layer, with an insulating film interposed therebetween; a charge-sensing channel layer of the second conductivity type of a charge-sensing transistor, formed in said substrate such that said sensing channel layer and said storage channel layer contact with each other; and a source and drain layers of the second conductivity type of said charge-sensing transistor, formed in said surface of said substrate so as to face each other with said sensing channel layer interposed therebetween; wherein said storage channel layer contains a first surface portion which adjoin said transfer channel layer and is in contact with said covering insulating film, and a second surface portion which adjoins said release channel layer and is in contact with said covering insulating film.

5,438,212

SEMICONDUCTOR DEVICE WITH HEAT DISSIPATION  
STRUCTURE

Kazuhiko Okaniwa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

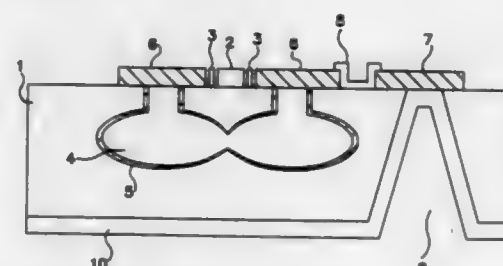
Filed Feb. 24, 1994, Ser. No. 201,224

Claims priority, application Japan, Feb. 25, 1993, 5-035916; Aug. 23, 1993, 5-207425

Int. Cl.<sup>6</sup> H01L 29/40, 29/58, 29/784

U.S. Cl. 257-275

9 Claims



1. A semiconductor device comprising: a semiconductor substrate having opposed front and rear surfaces; a heat generating element disposed on the front surface of the substrate; and a cavity in the semiconductor including a chamber contained entirely within and surrounded by the semiconductor substrate and disposed opposite the heat generating element and an opening in the semiconductor substrate connecting the chamber to the front surface, the chamber having an area in a plane substantially parallel to the front and rear surfaces larger than an area of the opening in a plane substantially parallel to the front and rear surfaces.

5,438,213

GENERAL PROTECTION OF AN INTEGRATED  
CIRCUIT AGAINST PERMANENT OVERLOADS AND  
ELECTROSTATIC DISCHARGES

Francois Tailliet, Epinay sur Seine, France, assignor to SGS-Thomson Microelectronics, S.A., Gentilly, France

Filed Dec. 29, 1992, Ser. No. 999,527

Claims priority, application France, Dec. 31, 1991, 91 16411

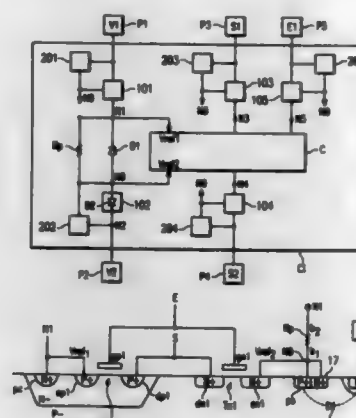
Int. Cl.<sup>6</sup> H01L 29/06, 29/78

U.S. Cl. 257-360

37 Claims

1. An integrated circuit, comprising: a plurality of contact pads, including first and second contact pads for connection to first and second power supply voltages; a plurality of active devices, formed in a common extended body of semiconductor material having a first conductivity type, and providing multiple circuit nodes which are operatively connected to respective ones of said contact pads; a respective overvoltage protection circuit connected in

- series between each said contact pad and the respective corresponding node, one of said overvoltage protection circuits comprising a diode connected between said second power supply voltage and said extended body; a biasing resistance connected, in series with said diode, to



- maintain said diode in forward bias at normal values of said power supply voltages; and a plurality of electrostatic-discharge-protection devices, each providing electrostatic discharge protection from a respective one of said contact pads to said common extended body.

5,438,214

METAL OXIDE SEMICONDUCTOR DEVICE HAVING A  
COMMON GATE ELECTRODE FOR N AND P CHANNEL  
MOS TRANSISTORS

Yuichi Egawa, and Yasuo Sato, both of Sagami-hara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 993,772, Dec. 21, 1992, abandoned.

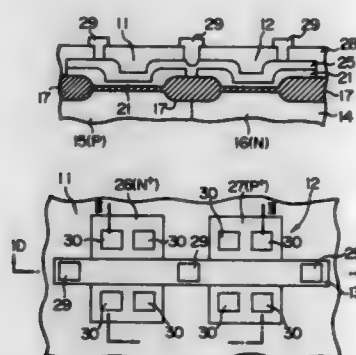
This application May 31, 1994, Ser. No. 258,351

Claims priority, application Japan, Dec. 20, 1991, 3-355793

Int. Cl.<sup>6</sup> H01L 23/54

U.S. Cl. 257-388

10 Claims



1. A Metal Oxide Semiconductor device comprising: a semiconductor substrate having a region of a first conductivity type and a region of a second opposite conductivity type; an element-isolation insulating film formed at a boundary region between said first and second conductivity type regions in a surface of said semiconductor substrate; a gate insulating film formed on the surface of said semiconductor substrate contiguous to said element-isolation insulating film; a semiconductor film having first and second semiconductor regions formed above said first and second conductivity type regions of said semiconductor substrate, respectively, and a separation region by which said first and second semiconductor regions are separated from each other, said separation region having a predetermined width and dis-

- posed above said element-isolation insulating film for reducing diffusion of N and P impurities into said first and second semiconductor regions, said first and second semiconductor regions being contiguous to said gate insulating film; and

- a continuous metallic film formed on said semiconductor film and having substantially the same pattern as that of said semiconductor film, said metallic film being formed directly on said first and second semiconductor regions of said semiconductor film so that said metallic film is electrically connected to said first and second semiconductor regions.

5,438,215

## POWER MOSFET

Jenoe Tihanyi, München, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

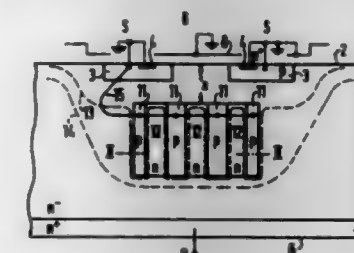
Filed Mar. 25, 1994, Ser. No. 218,372

Claims priority, application Germany, Mar. 25, 1993, 43 09 764.2

Int. Cl.<sup>6</sup> H01L 29/78, 29/784, 29/94

U.S. Cl. 257-401

9 Claims



1. A power MOSFET, comprising a semiconductor body having: first and second surfaces; an inner zone of a first conduction type and a given dopant concentration; at least one base zone of a second conduction type being adjacent said inner zone and said first surface; at least one source zone being embedded in said at least one base zone; at least one drain zone adjacent one of said surfaces; additional zones of the second conduction type being disposed in said inner zone inside a space charge zone developing when a blocking voltage is present; and at least one additional zone of the first conduction type being disposed between said additional zones of the second conduction type and being doped higher than said inner zone; said additional zones having a dopant level and said additional zones of the second conduction type being mutually spaced apart, for depleting charge carriers when a blocking voltage is applied.

5,438,216

## LIGHT ERASABLE MULTICHIP MODULE

Frank J. Juskey, Anthony B. Suppala, and Dale W. Dorinski, all of Coral Springs, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1992, Ser. No. 937,017

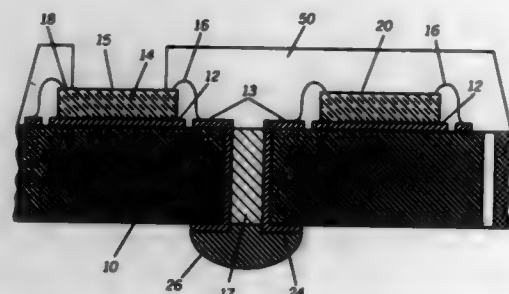
Int. Cl.<sup>6</sup> H01L 77/14, 31/00, 23/02, 23/12

U.S. Cl. 257-434

23 Claims

1. A multichip integrated circuit package, comprising: an insulating substrate having at least two die mounting portions and a conductive circuit pattern thereon, the conductive pattern electrically connected to solder pads on an opposite side of the substrate by means of conductive vias; a first integrated circuit die having an upper surface includ-

ing a perimeter portion and a central portion comprising light erasable active circuitry;  
said first integrated circuit die mechanically mounted on one of said die mounting portions and electrically connected to said conductive circuit pattern by thin wires;  
a second integrated circuit die mechanically mounted on said other die mounting portion and electrically connected to said conductive circuit pattern by thin wires;



plastic molding material formed to encapsulate the entire second integrated circuit die and associated thin wires, said first integrated circuit perimeter portion and associated thin wires, at least a portion of said conductive circuit pattern, and portions of said insulating substrate; and an opening formed in said plastic molding material to reveal said first integrated circuit die active circuitry.

5,438,217

# PLANAR AVALANCHE PHOTODIODE ARRAY WITH SIDEWALL SEGMENT

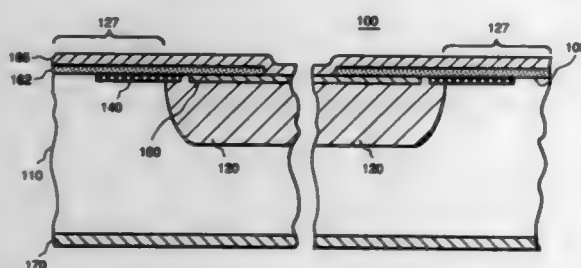
Ahmad N. Ishaque, Albany, and Donald E. Castleberry, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 29, 1994, Ser. No. 235,052

Int. Cl.<sup>6</sup> H01L 27/14, 31/00

U.S. Cl. 257—438

17 Claims



1. A deep diffused monolithic planar avalanche photodiode (APD) array for detecting incident light photons in which isolation is obtained on a p type material surface of the array, said array comprising:

a silicon block having a first surface and a second surface, said second surface being disposed opposite to said first surface;

said silicon block comprising at least one p type material well extending inward from said first surface, each of said at least one wells comprising diffused p type doped silicon having a doping gradient corresponding to diffusion of the well p type dopant from said first surface; said silicon block further comprising an n type material foundation comprising silicon having a uniform n type doping concentration, the n type doped silicon being disposed around each of said p type wells so as to form respective well p-n junctions therebetween, said n type material foundation comprising said second surface of said block and portions of said first surface extending around respective ones of said wells, each of said wells and respective foundation material comprising respective APD pixels in said APD array;

each of said respective well p-n junctions comprising a

parallel segment disposed substantially parallel to said second surface of said APD array and at a depth of between 20  $\mu$ m and 80  $\mu$ m from said first surface; each of said well p-n junctions further comprising a well sidewall segment disposed between said parallel segment of said well p-n junction and said first surface, the respective bulk electric field of each APD pixel being disposed across the respective parallel segment of said well p-n junction, and the respective surface electric field of each APD pixel being disposed across said well p-n junction at said first surface, and the respective peripheral electric field being disposed across said well sidewall segment; and means for controlling said surface electric field and peripheral electric field such that the peak surface electric field of each of respective well is less than about 70% of the bulk electric field of said well.

5,438,218

# SEMICONDUCTOR DEVICE WITH SHOTTKY JUNCTION

Yoshio Nakamura, Shin Kikuchi, and Shigeru Nishimura, all of c/o Canon Kabushiki Kaisha 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan

Continuation of Ser. No. 722,216, Jun. 27, 1991, abandoned.

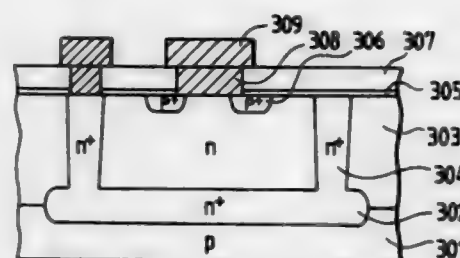
This application Apr. 30, 1993, Ser. No. 54,831

Claims priority, application Japan, Jun. 29, 1990, 2-170065; Sep. 10, 1990, 2-240493

Int. Cl.<sup>6</sup> H01L 29/48

U.S. Cl. 257—452

1 Claim



1. A semiconductor device, comprising:  
a first semiconductor region comprising an n-type semiconductor;  
a second semiconductor region comprising an n-type semiconductor having a higher resistivity than said first semiconductor region;  
an insulation film provided adjacent to said second semiconductor region having an aperture therein;  
an electrode region provided in said aperture; and  
a third semiconductor region comprising a p-type semiconductor provided at a junction between said insulation film and said electrode region,  
wherein said electrode region consists essentially of monocrystalline aluminum and constitutes a Schottky junction with said second semiconductor region.

5,438,219

# DOUBLE-SIDED OSCILLATOR PACKAGE AND METHOD OF COUPLING COMPONENTS THERETO

Mark E. Kotzan, Arlington Heights, and Thomas A. Knecht, Algonquin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 30, 1993, Ser. No. 160,008

Int. Cl.<sup>6</sup> H01L 25/16, 23/52, 23/04

U.S. Cl. 257—469

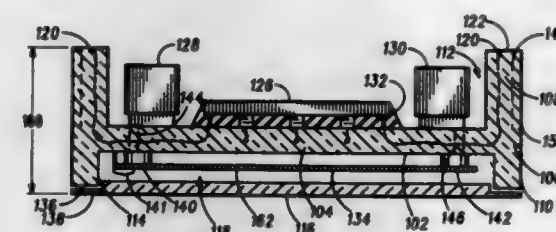
12 Claims

1. A double-sided temperature compensated oscillator package, comprising:

a platform including a central portion and an outer portion; sidewalls extending substantially upwardly and substantially

downwardly from the outer portion of the platform, the upwardly extending sidewalls terminate at a surface mountable end portion, the surface mountable end portion includes a plurality of contacts for connection to an electrical device;

the upwardly extending sidewalls and the platform forming an open-top receptacle adapted to receive electronic components and the downwardly extending sidewalls and the platform forming an open-bottom receptacle adapted to receive at least one piezoelectric component;



a cover coupled with the open-bottom receptacle defining a hermetic environment;

the open-top receptacle includes electronic components comprising at least one flip chip integrated circuit and a capacitor; and

the open-bottom receptacle includes a piezoelectric component, whereby a surface mountable temperature compensated package is defined.

5,438,220

# HIGH BREAKDOWN VOLTAGE SEMICONDUCTOR DEVICE

Akio Nakagawa, Hiratsuka; Norio Yasuhara, Yokohama; Tomoko Matsudai, Tokyo; Yoshihiro Yamaguchi, Urawa; Ichiro Omura, Yokohama, and Hideyuki Funaki, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 829,214, Jan. 31, 1992, Pat. No. 5,343,067, which is a continuation-in-part of Ser. No. 642,565, Jan. 18, 1991, Pat. No. 5,241,210, which is a continuation-in-part of Ser. No. 236,746, Aug. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 161,102, Feb. 26, 1988, abandoned. This application Jul. 2, 1993, Ser. No. 85,056

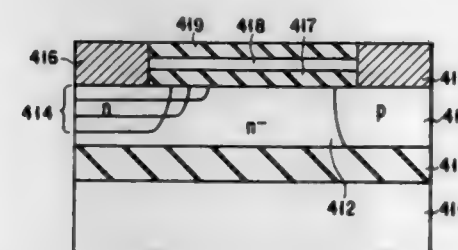
Claims priority, application Japan, Feb. 26, 1987, 62-43564; Jul. 29, 1987, 62-189420; Jul. 4, 1988, 63-166403; Jan. 31, 1991, 3-31720; Mar. 28, 1991, 3-90068; Apr. 16, 1991, 3-109605; Sep. 20, 1991, 3-268970; Jul. 2, 1992, 4-175777; Mar. 11, 1993, 5-050534

The portion of the term of this patent subsequent to Aug. 31, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> H01L 29/74

U.S. Cl. 257—487

22 Claims



1. A high breakdown voltage semiconductor device comprising:

a semiconductor substrate;  
an insulating layer formed on said semiconductor substrate;  
an active layer formed on said insulating layer and made of a high resistance semiconductor of a first conductivity type;

a first impurity region of the first conductivity type formed in said active layer;

a second impurity region of a second conductivity type formed in said active layer and spaced apart from said first impurity region by a predetermined distance,

wherein said first impurity region comprises a plurality of diffusion layers which are superimposed one upon another and which differ in diffusion depth or diffusion window width, or both, and said second impurity region reaches a bottom of said active layer.

5,438,221

# METHOD AND DEVICE IN WHICH BOTTOMING OF A WELL IN A DIELECTRICALLY ISOLATED ISLAND IS ASSURED

James D. Beason, Melbourne Village, Fla., assignor to Harris Corporation, Melbourne, Fla.

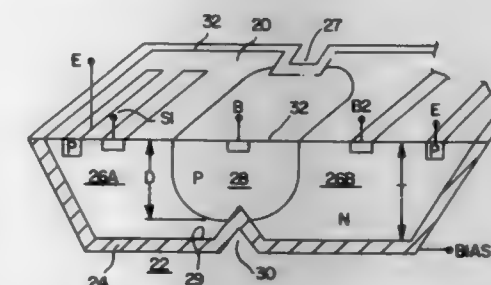
Division of Ser. No. 840,548, Feb. 25, 1992, Pat. No. 5,270,569, which is a continuation-in-part of Ser. No. 651,327, Feb. 5, 1991, Pat. No. 5,306,944, which is a continuation of Ser. No. 470,197, Jan. 24, 1990, abandoned. This application Jul. 13, 1993, Ser. No. 91,819

The portion of the term of this patent subsequent to Dec. 14, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> H01L 27/12

U.S. Cl. 257—520

10 Claims



1. A dielectrically isolated semiconductor island of a first conductivity type having two regions electrically isolated from each other, each of the two regions being connected to a switch contact comprising:

(a) a dielectric support for the island having an inwardly extending projection;  
(b) a semiconductor island of a first conductivity type supported by said support; and  
(c) a well adapted to receive a bias voltage that controls the flow of current between said switch contacts, said well being of a second conductivity type semiconductor in said island extending sufficiently to contact said projection and thereby electrically separate the island into two regions.

5,438,222

# ELECTRONIC DEVICE WITH PLURAL PAD CONNECTION OF SEMICONDUCTOR CHIP TO LEADS

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 571,264, Aug. 23, 1990, abandoned.

This application Mar. 8, 1993, Ser. No. 28,606

Claims priority, application Japan, Aug. 28, 1989, 1-221212; Aug. 28, 1989, 1-221213

Int. Cl.<sup>6</sup> H01L 23/48, 29/44

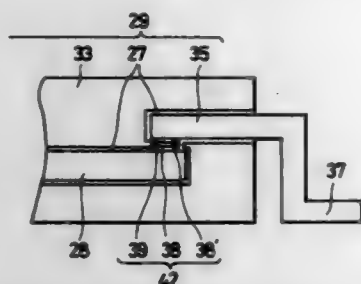
U.S. Cl. 257—673

14 Claims

1. An electronic device comprising:  
a semiconductor chip having at least one pad provided thereon;  
at least one lead having a pad provided on a stem portion thereof, said stem portion extending over a corresponding pad of said at least one pad provided on the semiconductor chip;



an organic resin covering at least said semiconductor chip and said stem portion of the lead; and  
a protective insulating film underlying said organic resin and covering said semiconductor chip, said at least one lead and a surface of said pad and said corresponding pad;



wherein said pad is provided on said stem portion of the lead by a separate pad element being connected thereto and wherein said pad is directly connected to the corresponding pad provided on said semiconductor chip by a conductive layer.

5,438,223

# ANISOTROPIC ELECTRICALLY CONDUCTIVE ADHESIVE FILM AND CONNECTION STRUCTURE USING THE SAME

Kazumi Higashi, Amase Mochizaki, and Masako Maeda, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Mar. 12, 1993, Ser. No. 30,865

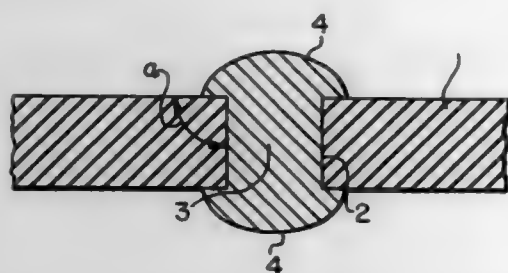
Claims priority, application Japan, Mar. 13, 1992, 4-090044; Mar. 13, 1992, 4-090045

The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> H01L 23/48, 29/40, 29/44; A01L 29/52

U.S. Cl. 257-774

16 Claims



1. An anisotropic electrically conductive adhesive film having fine through holes whereby each through hole electroconductively passes through a front surface and a back surface of an insulating film in the thickness direction, and at least one end portion of each through hole on the front and back surfaces of said insulating film is blocked with a bump-form metal projection having a base area at each end, said base area having a larger area than the plane area of the opening portion located at an end portion of the through hole, wherein the insulating film comprises a thermoplastic polyimide resin having a melt viscosity at 400° C. of not higher than  $1 \times 10^8$  poise.

## 5,438,224 INTEGRATED CIRCUIT PACKAGE HAVING A FACE-TO-FACE IC CHIP ARRANGEMENT

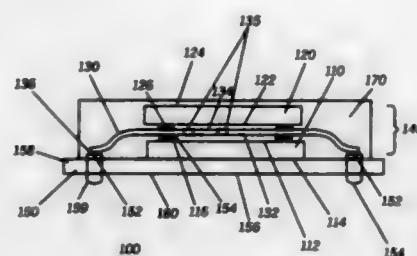
Marc V. Papageorge, Bruce J. Freyman, both of Boca Raton; Frank J. Juskey, Coral Spring, all of Fla., and John R. Thome, Palatine, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 1, 1993, Ser. No. 159,910

Int. Cl.<sup>6</sup> H01L 23/02, 23/12, 23/44, 29/44

U.S. Cl. 257-777

3 Claims



1. An integrated circuit chip carrier assembly, comprising:  
a stacked integrated chip arrangement including:  
a first integrated circuit chip having a first array of terminals positioned on a first major surface;  
a second integrated circuit chip having a second array of terminals positioned on a second major surface;  
a flexible interposed substrate having a major top surface and a major bottom surface is positioned between the first integrated circuit chip and the second integrated circuit chip, wherein the first integrated circuit chip is placed on the major bottom surface and the second integrated circuit chip is placed on the major top surface such that the first major surface and the second major surface are positioned in front of each other, the flexible interposed substrate having:

an array of interposed substrate contacts corresponding to the first array of terminals;  
a second array of interposed substrate contacts corresponding to the second array of terminals;  
at least one through hole containing an electrically conductive member that interconnects the first array of interposed substrate contacts to the second array of interposed substrate contacts; and  
an array of interposed substrate terminals for allowing electrical coupling to external circuitry;  
a circuit substrate for positioning the stacked integrated circuit arrangement thereon, including an array of circuit substrate contacts corresponding to the array of interposed substrate terminals on a first major side, and an array of solder bumps on an opposing second major side; interconnection means for correspondingly interconnecting the array of interposed substrate terminals to the array of circuit substrate contacts; and  
the stacked integrated circuit arrangement encapsulated in an epoxy resin to form an encapsulated chip carrier.

5,438,225

## SOLAR POWERED ANNUNCIATOR

Walter R. Berger, Houston, Tex., assignor to Murphy Management Inc., Tulsa, Okla.

Continuation of Ser. No. 832,122, Feb. 6, 1992, abandoned. This application Jul. 29, 1993, Ser. No. 98,257

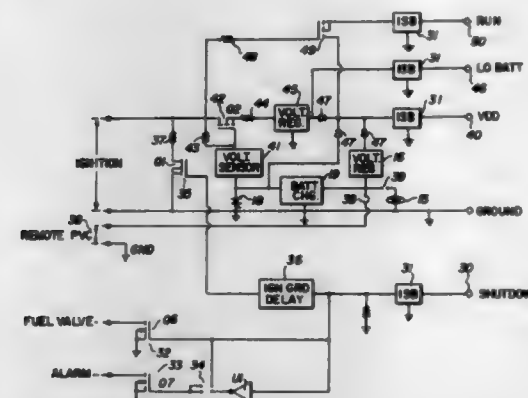
Int. Cl.<sup>6</sup> H02J 7/34

U.S. Cl. 307-66

21 Claims

1. An actuator and annunciator comprising:  
a fault detection unit responsive to a plurality of fault condition sensor inputs;  
a fault condition identification storage element connected to said fault detection unit;  
a display connected to said fault condition identification storage element;

a photoelectric power supply connected to said fault condition identification storage element;  
a backup power supply source connected to said photoelectric power supply wherein said backup power supply includes a battery and a battery charger connected to said battery and to said photoelectric power supply;  
a voltage sensor connected to said backup power supply source;  
an auxiliary power supply connected to said fault condition identification storage element;  
a switch, controlled by said voltage sensor, connected between said auxiliary power supply and said fault condition



identification storage element, wherein said switch and said voltage sensor are configured to disconnect said auxiliary power supply from said fault condition identification storage element when a voltage of said backup power supply exceeds a pre-determined level and to connect said auxiliary power supply when said voltage falls below said pre-determined level; and  
means for isolating said auxiliary power supply from said photoelectric power supply and said backup power supply to allow the photoelectric power supply to charge the battery and preventing the auxiliary power supply from charging the battery.

5,438,226

## APPARATUS FOR REDUNDANT COOLING OF ELECTRONIC DEVICES

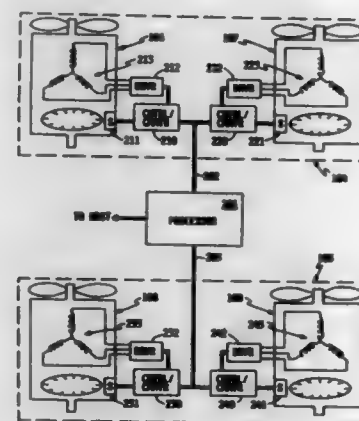
Douglas A. Kuchta, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 16, 1992, Ser. No. 945,549

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 307-125

16 Claims



1. A forced-air cooling system for an electronic device, comprising:  
an enclosure substantially surrounding one or more heat generating components of said electronic device, said

enclosure having an inlet for admitting cooling air into said enclosure and an outlet for exhausting cooling air from said enclosure, said enclosure defining a path for an airflow of said cooling air;  
a first powered air mover mounted in said airflow path for moving said cooling air in the direction of said airflow from said inlet to said outlet, wherein substantially all of said airflow passes through said first powered air mover;  
a second powered air mover mounted in said airflow path for moving said cooling air in the direction of said airflow from said inlet to said outlet, wherein substantially all of said airflow passes through said second powered air mover; and  
switching means for switching at least one of said first and second powered air movers from a non-operating mode to an operating mode to adequately provide cooling for said heat generating components.

5,438,227

## LINEAR PULSE MOTOR

Hirobumi Satomi, Kashiwa, Japan, assignor to Oriental Motor Co., Ltd., Tokyo, Japan

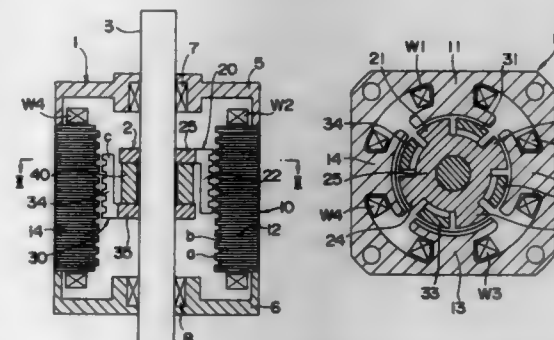
Filed Dec. 21, 1993, Ser. No. 170,739

Claims priority, application Japan, Dec. 21, 1992, 4-340280

Int. Cl.<sup>6</sup> H02K 41/02

U.S. Cl. 310-14

15 Claims



1. A linear pulse motor comprising a stator including a stator core having a plurality of salient poles disposed radially on the inner side and having a plurality of teeth disposed axially on the inner peripheral surface of said salient poles and a stator winding wound around each of said salient poles; and a mover which is supported in said stator so as to move in the axial direction, wherein

said mover has a plurality of teeth in the axial direction on the outer peripheral surface opposing to the inner peripheral surface of said stator and includes a mover core having a plurality of magnetic pole blocks disposed in the peripheral direction and a permanent magnet for magnetizing said magnetic pole blocks to a predetermined magnetic polarity.

two of said magnetic pole blocks are disposed in an opposing relationship with respect to each of said stator salient poles with an air-gap in the peripheral direction, respective two magnetic pole blocks described above are magnetized to different polarity from each other by said permanent magnet disposed in said mover core and when the tooth tops of one of said two magnetic pole blocks are opposed to the tooth tops of one salient pole of said stator, the tooth tops of the other magnetic pole block are opposed to the tooth bottoms of the salient pole of said stator.

5,438,228

**ELECTRICALLY MOTORIZED WHEEL ASSEMBLY**

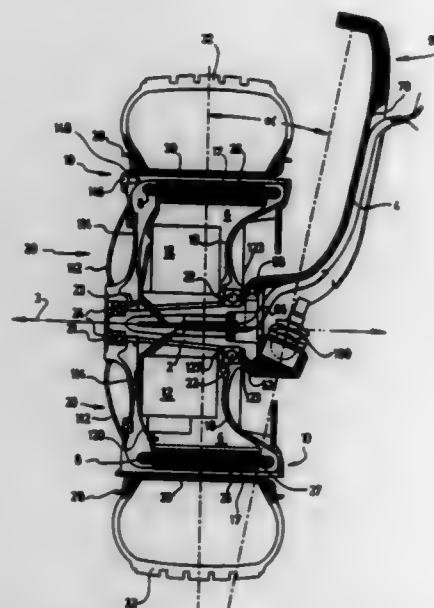
Pierre Couture, Boucherville; Bruno Francoeur, Loretteville; Julien Simard, Brossard; Francois-Xavier Bourgeois, St-Léonard, and Germain Harbec, Ste-Julie, all of Canada, assignors to Hydro-Quebec, Montreal, Canada

Continuation of Ser. No. 77,646, Jul. 23, 1993, Pat. No. 5,353,039, which is a continuation of Ser. No. 913,021, Jul. 14, 1992. This application Nov. 12, 1993, Ser. No. 151,192. The portion of the term of this patent subsequent to Jul. 5, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> H02K 11/00, 7/14, 7/10

U.S. Cl. 310—67 R

20 Claims



1. An electrically motorized wheel assembly comprising:
  - a hollow shaft having a first opening at one end thereof and a second opening, said first opening receiving conductors from outside of said assembly;
  - a stator coaxial with and fixedly attached to said shaft, said stator being provided with coils, said stator comprising a central portion attached to said shaft, a support provided with openings and extending radially from said central portion, and a peripheral circular pole piece wound with said coils, said pole piece being fixed onto peripheral ends of said support;
  - a rotor coaxial with said stator and mounted for rotation about said stator, said rotor comprising a housing having a cylindrical wall having an inner surface provided with a magnetic means surrounding said stator and separated therefrom by an air-gap, said housing comprising an inner wall, on a side of said cylindrical wall, and an outer wall, on the other side of said cylindrical wall, said shaft extending through said inner wall and centrally thereof, said outer wall of said housing comprising convex and concave sections that alternate along circumference direction thereof, in such a manner that, when said rotor is rotating, an air circulation is produced inside said housing by means of said convex sections, and an air circulation is produced along outside portions of said concave sections, whereby an efficient heat exchange can be obtained through said outer wall; and

converting means for converting an input electrical current to a variable AC electrical current, said converting means including power electronics, input terminals for receiving said input electrical current and output terminals for delivering said variable AC electrical current to said coils of said stator.

5,438,229  
**ULTRASONIC MOTOR AND ULTRASONIC MOTOR CONTROL METHOD**

Tetsuro Ohtsuchi, Osaka; Masanori Sumihara, Higashi Osaka; Osamu Kawasaki, Tsuzuki; Takahiro Nishikura, Ikoma; Katsu Takeda, Osaka; Takashi Nojima, Katano, and Katsumi Imada, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

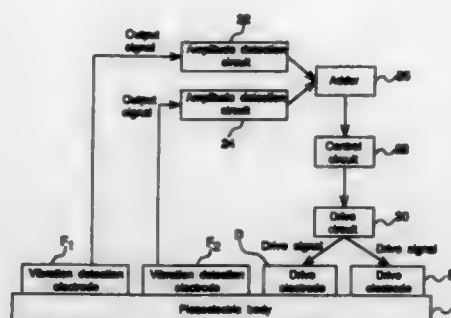
Filed Feb. 8, 1994, Ser. No. 194,334

Claims priority, application Japan, Feb. 8, 1993, 5-019806; May 28, 1993, 5-126922

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310—316

21 Claims



1. An ultrasonic motor comprising:
  - a vibrating body comprising an elastic body and a piezoelectric body adhered to said elastic body, said piezoelectric body being electrically polarized in a direction of the thickness thereof to have a predetermined polarization pattern in a circumferential direction thereof;
  - a moving body press-contacted against said vibrating body by a biasing means via a friction element;
  - plural drive electrodes arranged on one principal plane of said piezoelectric body;
  - a drive circuit for generating drive signals applied to said plural drive electrodes to generate two standing waves having an identical angular frequency and a phase difference equivalent to  $\pi/2$  or  $3\pi/2$ , said two standing waves inducing an elastic travelling wave in said vibrating body which causes rotation of said moving body;
  - first and second vibration detection electrodes arranged at respective positions on said one principal plane of said piezoelectric body for detecting vibrations at said respective positions of said vibrating body;
  - first and second vibration amplitude detection means for detecting vibration amplitudes at said respective positions of said vibrating body using output signals from said first and second vibration detection electrodes;
  - an adder for summing said first and second vibration amplitudes detected by said first and second vibration amplitude detection means; and
  - a control circuit for controlling said drive circuit to control rotation of said vibrating body using a value output from said adder as an index of control according to a predetermined relationship between a sum of said first and second vibration amplitudes and the rotation of said vibrating body.

5,438,230

**PIEZOELECTRIC MATERIAL DETECTOR**

Dale G. Hall, Cedar Crest, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 203,238, Feb. 28, 1994, abandoned.

This application Dec. 6, 1994, Ser. No. 350,248

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310—316

12 Claims

1. An improved piezoelectric material detector, comprising:
  - (a) a transducer structure including a probe for providing a predetermined vibration activity;
  - (b) a reset circuit for minimizing false readings coupled to

5,438,232

**PIEZOELECTRIC LAMINATION ACTUATOR**

Jiro Inoue, Jun Tabata, Shiro Makino, Atsushi Morikawa, and Takeshi Eimori, all of Nagakakyō, Japan, assignors to Murata Manufacturing Co., Ltd., Nagakakyō, Japan

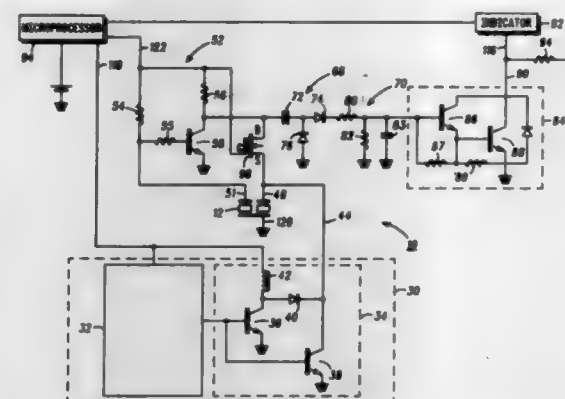
Continuation-in-part of Ser. No. 37,696, Mar. 25, 1993, abandoned, which is a continuation of Ser. No. 823,363, Jan. 21, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 202,875

Claims priority, application Japan, Jan. 25, 1991, 3-007250 U; Jan. 25, 1991, 3-007251 U; Jan. 25, 1991, 3-007252 U; Jan. 25, 1991, 3-007253 U; Jan. 25, 1991, 3-007254 U

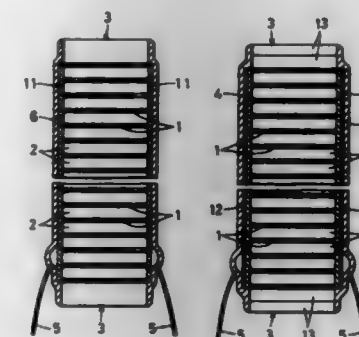
Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310—328

12 Claims



- (d) a switching device for actuating the reset circuit and the driving and detecting means for a predetermined time, defining (i) a reset mode whereby the probe is vibrated vigorously to substantially clear caked or undesirable material in proximity of the probe, thereby minimizing the possibility of false or inaccurate detection of the presence of a material in proximity thereto, and (ii) a detecting mode whereby the presence or absence of the material is detected, respectively.



1. A lamination type piezoelectric actuator comprising a plurality of elongated actuator units attached successively together along the direction of their lengths, wherein each of said actuator units comprises:
  - a plurality of internal electrodes;
  - a plurality of ceramic piezoelectric layers, each of which is sandwiched between a pair of said internal electrodes, said piezoelectric layers being laminated together by glue to form a piezoelectric body;
  - dielectric layers mounted on opposing ends of said piezoelectric body by glue;
  - first and second sputtered thin-film external electrodes formed on opposing first and second sides of said piezoelectric body, respectively, said first and second thin-film external electrodes being formed of a Cu—Ni alloy containing 50% or more Ni;

wherein every other one of said internal electrodes extends from said first sputtered thin-film external electrode and only partially toward said second sputtered thin-film external electrode, and the remaining ones of said internal electrodes extend from said second sputtered thin-film external electrode and only partially toward said first sputtered thin-film external electrode; and

wherein metal straps are attached by glue on exterior sides of said first and second sputtered thin-film external electrodes and connect said plurality of actuator units in succession, such that said metal straps constitute means for structurally connecting said actuator units in succession and electrically connecting said first sputtered thin-film external electrodes in succession and said second sputtered thin-film external electrodes in succession.

5,438,231

**THIN FILM MICROMECHANICAL RESONATOR GYRO**

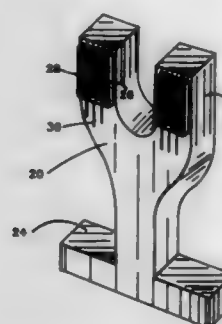
Mohsen Khoshnevisan; Manouchehr E. Motamedi, both of Newbury Park, and Ratnakar R. Neurgaonkar, Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Aug. 23, 1993, Ser. No. 110,524

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310—321

10 Claims



1. A thin film micromechanical resonator, comprising:
  - (a) a non-piezoelectric tuning fork having two tines;
  - (b) a piezoelectric thin film disposed on each tine of the fork; and
  - (c) at least three electrodes connected to each thin film, a first electrode being connected to a first side of each piezoelectric thin film and second and third electrodes being connected to a second side of each thin film; such that the application of an alternating voltage to the electrodes causes the fork to resonate.

5,438,233

**FILAMENT LAMP INFRARED SOURCE**

Steven H. Boland, Glendora, and James F. Weaver, Monrovia, both of Calif., assignors to BHK, Inc., Pomona, Calif.

Continuation of Ser. No. 799,036, Nov. 27, 1991, abandoned.

This application Jun. 10, 1993, Ser. No. 74,995

Int. Cl.<sup>6</sup> H01K 1/26

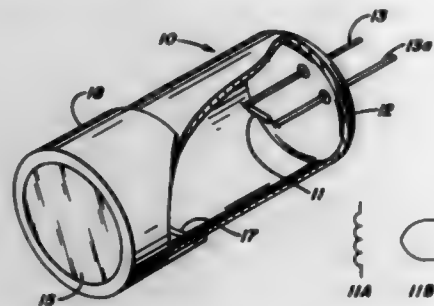
U.S. Cl. 313—110

37 Claims

1. An infrared lamp of broad spectral band output, comprising:



a hollow body having an open end and a closed end, a filament means including filament pins, extending through the body, said filament emitting broad band infrared radiation when an electrical current is passed therethrough, an optical element window disposed on said hollow body and defining an aperture for transmission of radiation from said filament,



an indium alloy junction comprising indium between said window and said body to seal said window to said body, a pliable coating overlaying said indium alloy junction and at least part of said body, and a gas contained in said hollow body in contact with said filament to control temperature and to prevent deterioration of said filament.

5,438,234

## FLUORESCENT LAMP

Shigeo Fujino, Odawara, Japan, assignor to Kasei Optonix, Ltd., Tokyo, Japan

Filed Aug. 7, 1992, Ser. No. 925,667

Claims priority, application Japan, Aug. 13, 1991, 3-202765

Int. Cl.<sup>6</sup> C09K 11/02; H01J 61/46

U.S. Cl. 313-489

7 Claims

1. A fluorescent lamp having a non-fluorescent substance layer and a phosphor layer, coated on the inner wall of a glass bulb, wherein the non-fluorescent substance is an oxide comprising:

- at least one rare earth element selected from the group consisting of yttrium, gadolinium and lanthanum; and
- at least one element selected from the group consisting of an alkaline earth metal and boron, wherein the content of said at least one element is at most 5,000 ppm.

5,438,235

## ELECTROSTATIC SHIELD TO REDUCE WALL DAMAGE IN AN ELECTRODELESS HIGH INTENSITY DISCHARGE LAMP

Timothy J. Sommerer, Ballston Spa; Hsueh-Rong Chang, Scotia; Arthur Klein, III, Rotterdam Junction; Victor D. Roberts; Harold L. Witting, both of Burnt Hills, and George A. Farrell, Rexford, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 5, 1993, Ser. No. 131,544

Int. Cl.<sup>6</sup> H01J 61/00, 61/35

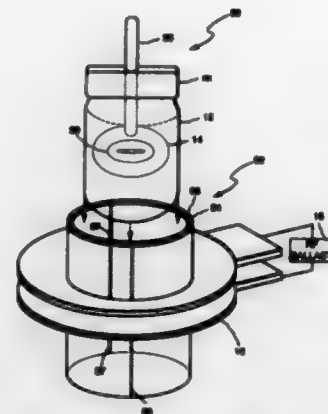
U.S. Cl. 313-489

14 Claims

1. An electrodeless high intensity discharge lamp, comprising:

- a light-transmissive arc tube for containing a fill;
- an induction coil situated about said arc tube for exciting a plasma arc discharge in said fill; and

an electrostatic shield situated between said arc discharge and said induction coil for minimizing an electric field



between said arc discharge and said induction coil during lamp operation.

5,438,236

## GAS DISCHARGE DISPLAY HAVING PRINTED CIRCUIT BOARD MEMBERS AND METHOD OF MAKING SAME

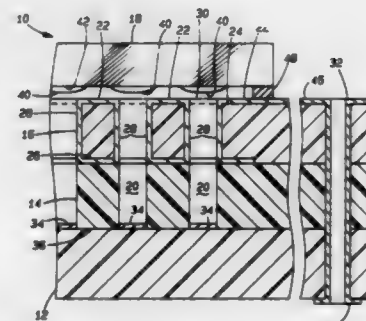
Curtis W. Evans, Overland Park, Kans., assignor to AlliedSignal Inc., Morris Township, N.J.

Filed Aug. 3, 1994, Ser. No. 285,325

Int. Cl.<sup>6</sup> H01J 17/49

U.S. Cl. 313-582

9 Claims



1. A gas discharge display comprising:

- a spacer member having a first matrix of holes provided therethrough along equally spaced rows and columns;
- a base member fused to said spacer member to form a vacuum tight seal therebetween, said base member having a plurality of parallel electrodes provided on a surface thereof adjacent to said spacer member, each electrode of said parallel electrodes aligned with a selected one of said columns;
- an electrode member fused to said spacer member to form a vacuum tight seal therebetween, said electrode member having a second matrix of holes provided therethrough each hole of said second matrix of holes being axially aligned with a respective one hole of said first matrix of holes;
- a conductive cylindrical electrode provided on the internal surface of each hole provided through said electrode member;
- a plurality of parallel electrical connectors provided on a surface of said electrode member orthogonal to said parallel electrodes, each of said parallel electrical connectors electrically connecting said cylindrical electrodes along a respective one of said rows;
- a window having a photoluminescent phosphor disposed thereon, said window spaced a predetermined distance

from a surface of said electrode member, said photoluminescent phosphor facing said electrode member; means for sealing said window to said electrode member; and an ionizable gas disposed inside said first and second matrix of holes and between said window and said electrode member.

5,438,237

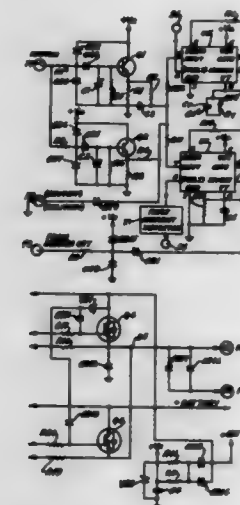
AUTOMATIC DAYTIME RUNNING LIGHT SYSTEM  
Patrick S. Mullins; Victor C. Cordiano, and Charles E. Benedict, all of Tallahassee, Fla., assignors to Autosmart Light Switches, Inc., Tallahassee, Fla.

Filed Dec. 6, 1993, Ser. No. 161,479

Int. Cl.<sup>6</sup> B60Q 1/02

U.S. Cl. 315-82

24 Claims



1. An automatic daytime running light system for a vehicle having an engine, an electric power source, a starter motor circuit for the engine, external running lights including headlights and parking lights, an ignition switch, the system being responsive to the ignition switch and starter motor circuit to automatically control the operation of the external running lights, the system comprising in combination:

- a first digital logic timer means having an input and outputs, circuit means connecting said input of said first digital logic timer means to the ignition switch for automatically controlling the operation of the external running lights to activate such lights in response to the ignition switch being ON; and
- a first MOSFET output switching means, said circuit means connecting said switching means to the external running lights and to said digital logic timer means; whereby said digital logic timer means and said MOSFET output switching provide a high level of reliability and safety to control the operation of the external running lights.

5,438,238

## MULTIPLE FILAMENT ENHANCED ION SOURCE

Stephen W. Toy, Alta, and David V. Alexander, Elk Grove, both of Calif., assignors to NEC Electronics Inc., Mountain View, Calif.

Division of Ser. No. 595,077, Oct. 10, 1990, Pat. No. 5,256,947.

This application Mar. 19, 1993, Ser. No. 35,337

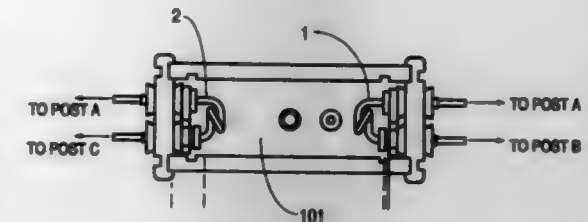
Int. Cl.<sup>6</sup> H01J 7/24

U.S. Cl. 315-94

2 Claims

- 1. An ion source powered by a current source comprising: an elongated arc chamber having first and second opposing longitudinal ends; and a plurality of electron-generating filaments mounted in said chamber, a first one of said plurality of electron-generating filaments being mounted at said first longitudinal end

and a second one of said plurality of electron-generating filaments being mounted at said second longitudinal end; and



means for coupling at least said first and second ones of said plurality of electron-generating filaments in series to said current source such that ions generated by said first and second ones of said plurality of electron-generating filaments form an electron cloud within said arc chamber.

5,438,239

## FLUORESCENT LAMP BALLAST WITH LIGHT OUTPUT CONTROL

Ole K. Nilssen, 408 Caesar Dr., Barrington, Ill. 60010

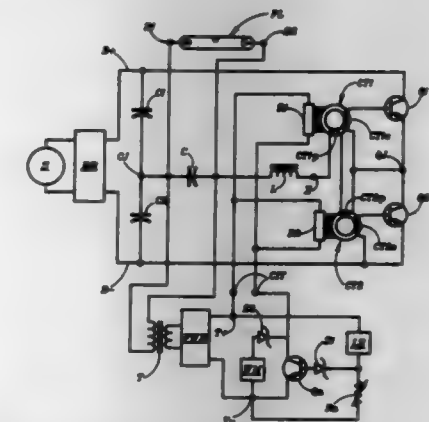
Continuation of Ser. No. 440,423, Jan. 30, 1990, abandoned, which is a continuation of Ser. No. 782,016, Sep. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 262,542, May 11, 1981, Pat. No. 4,677,345, which is a division of Ser. No. 178,107, Aug. 14, 1980, abandoned. This application Oct. 19, 1993, Ser. No. 137,885

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.<sup>6</sup> H05B 41/29, 41/39

U.S. Cl. 315-151

10 Claims



1. An arrangement comprising:

- a lighting fixture including a gas discharge lamp having a pair of lamp terminals; the lamp having a luminous efficacy which may change over time; the lighting fixture being further characterized (i) by being of a type suitable for providing general illumination in a room, and (ii) by not including a light-emitting diode;
- a ballast mounted in the lighting fixture; the ballast having a pair of power input terminals connected with the AC power line voltage of an ordinary electric utility power line, and a pair of output terminals connected with the lamp terminals; the ballast being operative to provide an alternating ballast output current from its output terminals, thereby to cause an alternating lamp current to flow through the gas discharge lamp; the alternating ballast output current having a fundamental frequency substantially higher than that of the AC power line voltage; the ballast being further characterized by: (i) not including a light-emitting diode; and (ii) including a control sub-cir-

cuit having a pair of control input terminals and being operative, in response to changes in a control signal provided thereto, to control the magnitude of the ballast output current; the control input terminals being electrically isolated from the ballast input terminals; and a light sensor disposed within the lighting fixture and arranged so as to be responsive to the light emitted from said gas discharge lamp, yet to be substantially non-responsive to light from any source external of the lighting fixture; the light sensor being connected with the control input terminals and operative to provide said control signal thereto in response to the intensity of the light emitted by the gas discharge lamp; the light sensor being further characterized by not including a light-emitting diode; such that, for a given level of the lamp's luminous efficacy, if the magnitude of the AC power line voltage were to increase, the control signal would change in such manner as to cause the intensity of the light emitted from the gas discharge lamp to tend to be maintained at a substantially constant level.

5,438,240

# FIELD EMISSION STRUCTURES PRODUCED ON MACRO-GRAIN POLYSILICON SUBSTRATES

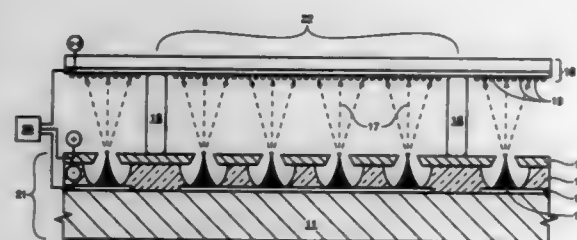
David A. Cathey; J. Brett Rolfsen; Tyler A. Lowrey, and Trung T. Doan, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 883,629, May 13, 1992, Pat. No. 5,329,207. This application Apr. 22, 1994, Ser. No. 232,792. The portion of the term of this patent subsequent to Jul. 12, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> H01J 1/30

U.S. Cl. 315—169.1

20 Claims



1. A flat panel display comprising:
  - a faceplate, said faceplate having a viewer side and a second side; and
  - a baseplate disposed in a plane parallel to said second side of said faceplate, said baseplate and said faceplate being spatially separated, said baseplate being a relatively thick macro-grain substrate.

5,438,241

# SINGLE CRYSTAL SILICON ARRAYED DEVICES FOR DISPLAY PANELS

Paul M. Zavracky, Norwood; John C. C. Fan, Chestnut Hill; Robert McClelland, Norwell, all of Mass.; Jeffrey Jacobsen, Hollister, Calif.; Brenda Dingle, Norton, and Mark B. Spitzer, Sharon, both of Mass., assignors to Kopin Corporation, Taunton, Mass.

Division of Ser. No. 815,684, Dec. 31, 1991, Pat. No. 5,317,326, which is a continuation-in-part of Ser. No. 636,602, Dec. 31, 1990, Pat. No. 5,206,749. This application Nov. 1, 1993, Ser. No. 146,589.

The portion of the term of this patent subsequent to Apr. 27, 2010, has been disclaimed.

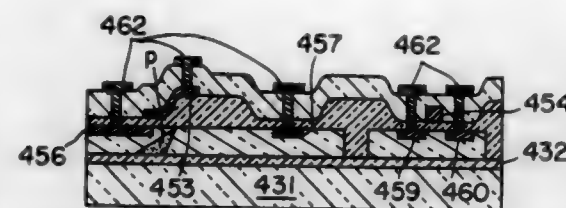
Int. Cl.<sup>6</sup> H01J 9/00

U.S. Cl. 315—169.3

25 Claims

1. An active matrix electroluminescent display comprising:
  - a circuit panel of pixels comprising an array of transistors and an array of pixel electrodes, each pixel electrode being electrically connected to at least one transistor, each tran-

sistor comprising source, drain and channel regions formed with a thin film of a single crystal silicon region; an adhesive layer to bond the circuit panel with an underlying substrate;



an electroluminescent material positioned over each pixel such that an electric field or signal generated by a transistor within each pixel causes light emission by the material; and a driver circuit electrically connected to the circuit panel for actuating the pixels.

5,438,242

# APPARATUS FOR CONTROLLING THE BRIGHTNESS OF A MAGNETRON-EXCITED LAMP

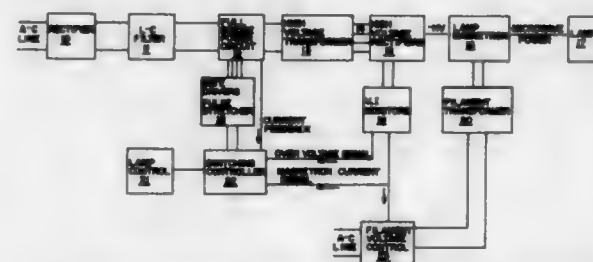
James E. Simpson, Gaithersburg, Md., assignor to Fusion Systems Corporation, Rockville, Md.

Filed Jun. 24, 1993, Ser. No. 80,839

Int. Cl.<sup>6</sup> H05B 37/00

U.S. Cl. 315—219

4 Claims



1. A switched inverter circuit for providing an alternating current to the primary winding of a high voltage transformer for setting an operating current in a secondary winding of said transformer comprising:

- a source of DC voltage;
- a first pair of switching devices connecting first and second ends of said primary winding to first and second terminals of said source of DC voltage, and a second pair of switching devices connecting said second and first terminals to said first and second ends of said primary windings; and
- means for alternately enabling said pairs of switching devices, one of said devices being enabled for a fixed period of time, and the other of said devices being enabled for a variable length of time comprising:
  - a first feedback means connected to sense said operating current;
  - comparator means for comparing said sensed operating current with a selected operating reference current to derive said variable length of time;
  - pulse generator means connected to said comparator means deriving first and second alternate pulses having a duration equal to said variable length of time;
  - second feedback means for sensing a current in said primary winding, said second feedback means providing a signal to said comparator for shortening said variable length of time, thereby controlling the duration of said alternate pulses.

5,438,243

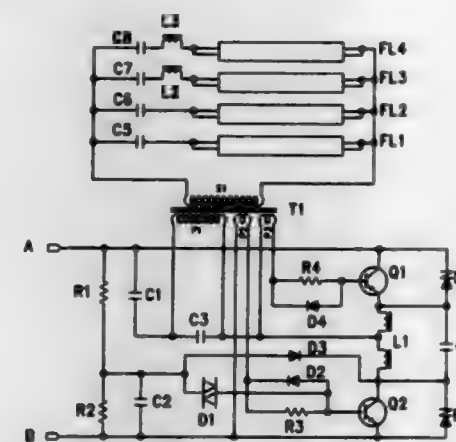
# ELECTRONIC BALLAST FOR INSTANT START GAS DISCHARGE LAMPS

Oin Kong, 13928 Mustang Hill La., North Potomac, Md. 20878  
Filed Dec. 13, 1993, Ser. No. 165,644

Int. Cl.<sup>6</sup> H05B 37/02

U.S. Cl. 315—219

19 Claims



1. A ballast for starting at least one gas discharge lamp, the ballast comprising:

- a DC voltage input terminal means for receiving DC power from an external power supply;
- an inverter means, coupled to said input terminal means, for generating and outputting an alternating output voltage based on the DC power from said input terminal means;
- a transformer means, coupled to said inverter means, for transferring the alternating output voltage output by said inverter means to the at least one gas discharge lamp; and
- a ballasting means, coupled to said transformer means and the at least one gas discharge lamp, for limiting imaginary lamp current that is passed back to said transformer means from the at least one gas discharge lamp, said ballasting means including a secondary voltage source coupled to said input terminal means for providing a source voltage, a first resonating section for receiving output from said secondary voltage source and providing an output voltage based on a first resonating frequency, a switching means for receiving the output voltage from said first resonating section and alternating the polarity of the output voltage for output to said transformer means, and an oscillating enabling circuit, coupled to said switching means, for enabling oscillation of said first resonating section.

5,438,244

# USE OF SILVER AND NICKEL SILICIDE TO CONTROL IODINE LEVEL IN ELECTRODELESS HIGH INTENSITY DISCHARGE LAMPS

Hsueh-Rong Chang, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 2, 1994, Ser. No. 298,966

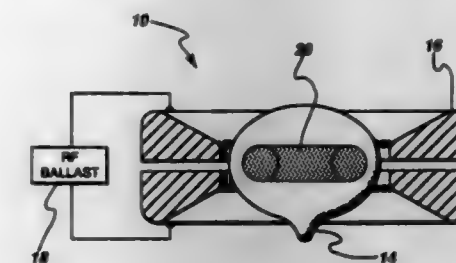
Int. Cl.<sup>6</sup> H05B 41/16

U.S. Cl. 315—248

6 Claims

1. An electrodeless high intensity discharge lamp, comprising:
  - a light-transmissive arc tube for containing a plasma arc discharge;
  - a fill disposed in said arc tube, said fill including at least one metal iodide;
  - an excitation coil situated about said arc tube for exciting said arc discharge in said fill; and
  - silver metal and nickel silicide added to said fill in predeter-

mined quantities for controlling the iodine vapor level during lamp operation to promote arc stability, said silver



metal comprising an iodine getter and said nickel silicide comprising an oxygen getter.

5,438,245

# HIGH-VOLTAGE GENERATING CIRCUIT

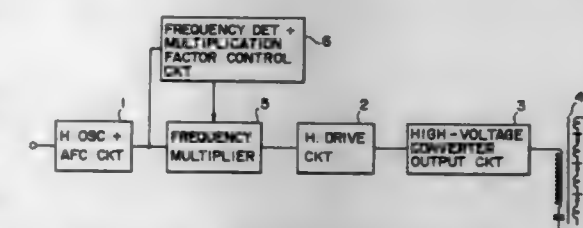
Kazuo Kii; Manabu Suzuki, and Shigeru Takasu, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan  
Filed May 12, 1993, Ser. No. 59,994

Claims priority, application Japan, May 27, 1992, 4-158975

Int. Cl.<sup>6</sup> G09G 1/04; H03B 19/00; H03K 4/08, 21/00

U.S. Cl. 315—408

17 Claims



1. A high-voltage generating circuit comprising:
  - a horizontal drive circuit supplied with a horizontal frequency signal synchronous with a horizontal synchronizing signal in an input signal for producing a switching signal;
  - a high-voltage converter output circuit switched by said switching signal from said horizontal drive circuit for producing a high-voltage switched signal;
  - a flyback transformer connected to an output of said high-voltage converter output circuit for producing high-voltage flyback pulses; and
  - frequency multiplier means connected between said horizontal drive circuit and an input terminal for multiplying a frequency of a horizontal frequency signal input at said input terminal by a multiplication factor and supplying a signal therefrom as said horizontal frequency signal to said horizontal drive circuit, wherein said multiplication factor is variable depending on said frequency of said horizontal frequency signal at said input terminal.

5,438,246

# METHOD FOR THE ADJUSTMENT OF A DISK CAM

Ralph Baeuerle, Berlin, Germany, and Dietmar Kottwitz, Singapore, Singapore, assignors to Siemens Nixdorf Informations-systeme AG, Paderborn, Germany

Filed Sep. 13, 1993, Ser. No. 120,592

Claims priority, application European Pat. Off., Sep. 14, 1992, 92115688

Int. Cl.<sup>6</sup> B26D 5/06, 5/16

U.S. Cl. 318—638

19 Claims

1. A method for the adjustment of a disk cam, whereby an electric motor turns the disk cam out of a prescribed initial position by a prescribed rotational angle, comprising the steps of:
  - providing a disk cam having two time markings in a pre-



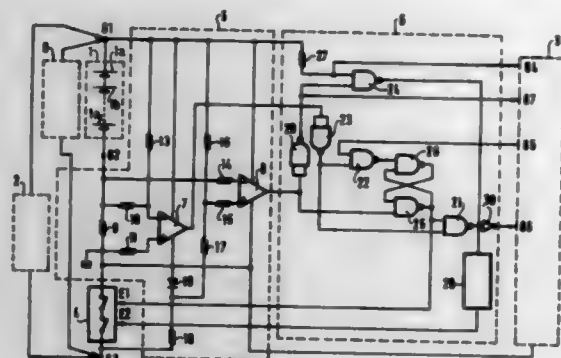


a first operational amplifier means (7) which is connected as a comparator so as to have low consumption, and which functions as a detector of current flowing through said shunt resistor so as to supply a first control current to said power supply control system (3) only when a battery-in-use current flowing through the shunt resistor is higher than said first predetermined value, respective inputs (+, -) of said first operational amplifier means (7) being connected to said terminals of said shunt resistor;

a diode (19) having terminals;

a calibration resistor 18; and

a second operational amplifier means (8) which is connected as a comparator so as to have low consumption, and which functions as a current detector, said second



operational amplifier means (8) having respective inputs (+, -) connected to the terminals of the shunt resistor, and, via the shunt resistor, to said terminals of said diode (19), said diode being connected in series with said calibration resistor (18) in a branch that is parallel to said switch circuit (4), the second operational amplifier means (8) supplying to said power supply control system (3) a second control current only when either there flows through the shunt resistor and through the switch circuit a fast battery-charge current that is higher than said second predetermined value, or else there appears across the terminals of the diode a voltage that corresponds to a trickle charge current which flows through the diode and which is higher than said third predetermined value which is in turn much lower than the second predetermined value.

5,438,253

### STATIC VAR GENERATOR USING SELF-COMMUTATED INVERTER

Tomohiko Aritsuka, and Michihiro Furuta, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1993, Ser. No. 162,301

Claims priority, application Japan, Dec. 7, 1992, 4-326468

Int. Cl.<sup>6</sup> G05F 1/70

U.S. Cl. 323-207

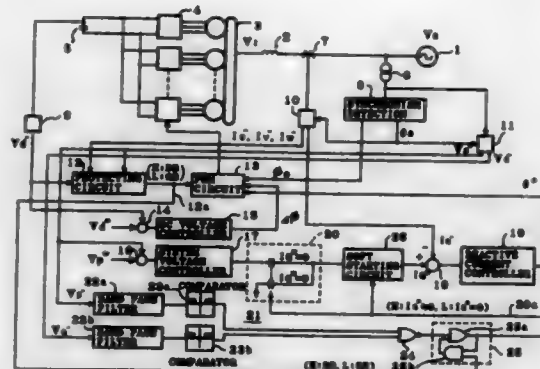
4 Claims

1. In a static var generator using self-commutated inverter having an inverter apparatus converting a d.c. power source voltage to an a.c. voltage and supplying the a.c. voltage to an alternating current system through a reactor, a voltage-detecting means detecting each phase voltage of said alternating current system and converting them to active voltages and reactive voltages, a current-detecting means detecting each phase current of said reactor and operating a reactive current, a system voltage controller operating a reactive current reference from said system active voltages and a system voltage reference, a reactive current controller operating conduction signals of switching devices of said inverter apparatus from said reactive current and said reactive current reference from said system voltage controller, and a protection controlling means detecting an occurrence of an accident in said alternat-

ing current system and making said reactive current reference to be inputted to said reactive current controller zero for a prescribed period of time from the occurrence point of time of the accident;

said protection controlling means comprising:

an accident-detecting circuit detecting the accident from the occurrence to the disappearance of it in said alternating system,



a reactive current reference zero controlling circuit controlling said reactive current reference to be zero according to detected outputs of said accident-detecting circuit, said reactive current reference zero controlling circuit inserted between said system voltage controller and said reactive current controller, and

a soft starting circuit restricting returning speeds of said reactive current reference within a prescribed value at the time of the release of said reactive current reference zero control.

5,438,254

### PHASE DIFFERENCE MEASURING DEVICE

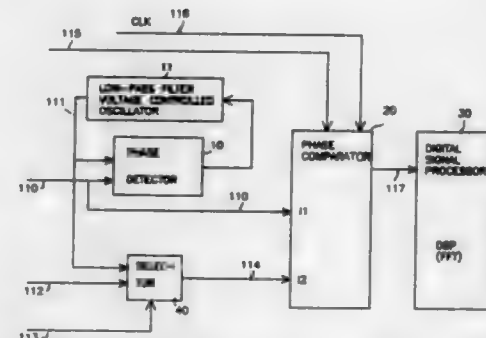
Edmond Y. Ho; Fu-chin Yang, and Jung-lung Lin, all of 3F1, No. 48, Park Ave. II, Science-Based Industrial Park, Hsinchu, Taiwan

Filed Jul. 29, 1994, Ser. No. 282,180

Int. Cl.<sup>6</sup> G01R 23/02

U.S. Cl. 324-76.82

2 Claims



1. A phase difference measuring device comprising a phase detector, a low-pass filter/voltage controlled oscillator, a reference signal selector for selecting either an internal reference signal or an external reference signal, a phase comparator for comparing an undertest signal with the selected reference signal and obtaining a phase difference between the two compared signals;

wherein the phase detector together with the low-pass filter/voltage controlled oscillator constitute a phase lock loop for detecting the phase of the undertest signal; the internal reference signal outputted from the low-pass filter/voltage controlled oscillator and the external reference signal are sent to the reference signal selector, and the internal reference signal is selected when the undertest

signal is a jittering signal, and the external reference signal is selected when the undertest signal is a wandering signal; the undertest signal and the selected reference signal are sent to the phase comparator for obtaining a phase difference therebetween; an initialization signal for initializing the phase comparator and a relatively high frequency clock signal for counting the phase difference are sent to the phase comparator; a phase difference between the undertest signal and the selected reference signal is counted in the phase comparator and a digital signal representing the phase difference outputted from the phase comparator.

5,438,255

### HIGH VOLTAGE PHASING DETECTOR

Alexander J. Binnie, Scotland, United Kingdom, assignor to Edgcombe Instruments Limited, West Sussex, England

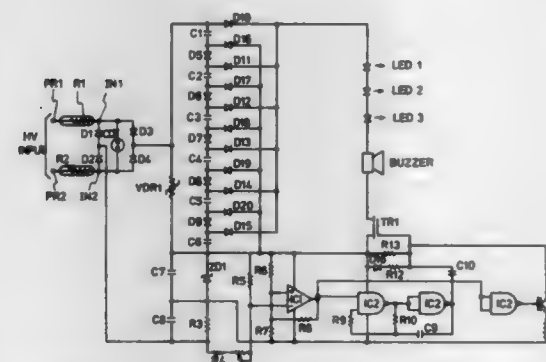
Filed Apr. 14, 1994, Ser. No. 227,656

Claims priority, application United Kingdom, Apr. 17, 1993, 9307973

U.S. Cl. 324-87

Int. Cl.<sup>6</sup> G01R 27/28

13 Claims



1. A detector having two inputs for connection to respective probes for contacting a pair of conductors to be tested, a rectifier circuit to which said inputs are connected, a plurality of capacitors arranged to be charged in series from the output of said rectifier circuit, threshold means for providing an output signal when the output voltage of said rectifier circuit exceeds a predetermined value, an indicator means for indicating whether the voltages on said conductors are in phase, and means for discharging said capacitors in parallel through said indicator means when said output signal is provided.

5,438,256

### APPARATUS AND METHOD FOR MEASUREMENT FROM THE GROUND FOR HIGH VOLTAGE OVERHEAD LINES

Edmond Thuries, Meyzieu, and Michel Collet, Villeurbanne, both of France, assignors to GEC Alsthom T & D SA, Paris, France

Filed Jul. 6, 1993, Ser. No. 86,393

Claims priority, application France, Jul. 6, 1992, 92 08311

Int. Cl.<sup>6</sup> G01R 33/00

U.S. Cl. 324-117 R

4 Claims

1. An apparatus for measuring current in a plurality of high voltage overhead electrical lines which form a group of n high voltage electrical lines above ground level, said apparatus comprising:

detecting means including a plurality p of devices (2) for detecting and measuring magnetic fields induced in the lines, said devices being at the ground level and in proximity to corresponding ones of said lines, wherein p is greater than n;

wherein the current is calculated by matrix calculation; wherein a voltage is filtered at terminals of each of said devices (2);

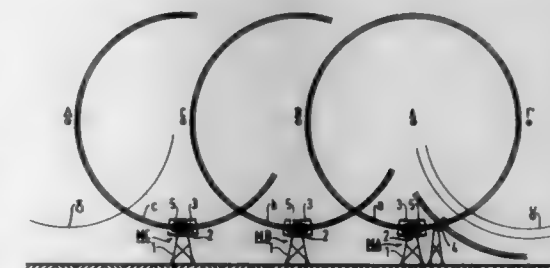
wherein a formula,  $Em_i = A_{ij}I_j$ , where

$Em_i$  is the electromotive force measured in device  $N^{\circ}i$ , i lying in the range of 1 to p,

$I_j$  is the current in line No. j, j lying in the range 1 to n, and

$A_{ij}$  is a matrix of proportionality coefficients  $a_{ij}$  relating the electromotive force to a current intensity,

is applied for each of a plurality of non-zero harmonic frequencies  $f_k$  so as to obtain the relationships linking complex components of the current  $I_k(f_k)$  to the complex components of the electromotive voltage, the sum of harmonic currents being calculated so as to obtain an instantaneous current  $i_k(t)$ ; and



wherein the calculation of the instantaneous current  $i_k(t)$  in line No. d is performed according to the formula,  $i_k(t) = \text{sum of real parts of } Id(f_k) \exp(2\pi f_k t j)$ , where

t represents time,

j is the imaginary number whose square equals -1,

$f_k$  is the k-th harmonic of 10 Hz,

$Id(f_k)$  is the complex alternating component at frequency

$f_k$  of the instantaneous current in line No. d, and

d lies in the range 1 to n.

5,438,257

### REDUCED MAGNETIC FLUX CURRENT SENSOR

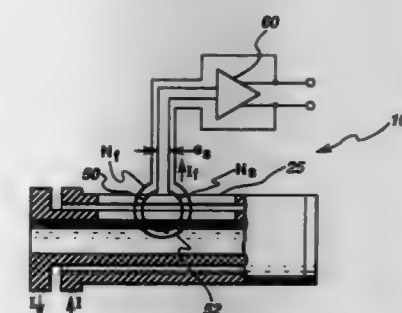
Ertugrul Berkcan, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 9, 1993, Ser. No. 119,267

Int. Cl.<sup>6</sup> G01R 33/00

U.S. Cl. 324-117 R

28 Claims



1. A current sensor for measuring a primary electrical current inducing a magnetic flux density at least defined over a known region comprising:

a first sensor for measuring the magnetic flux density due to the primary current over a first predetermined area within the known region; and

a second sensor for measuring the magnetic flux density due to the primary current over a second predetermined area within the known region, the magnetic flux density due to the primary current measured by said second sensor being a predetermined calibrated amount different from the magnetic flux density due to the primary current measured by said first sensor.



5,438,258

# POWER MULTIPLICATION CIRCUIT WHICH REDUCES AN OFFSET VOLTAGE OF A HALL ELEMENT TO ZERO

Ryoji Maruyama, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

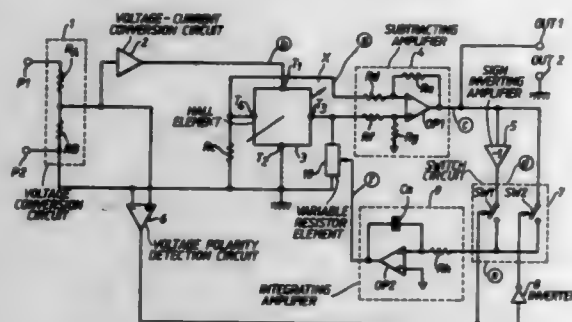
Filed Jul. 30, 1993, Ser. No. 99,535

Claims priority, application Japan, Dec. 11, 1992, 4-330844

Int. Cl.<sup>6</sup> G01R 21/00

U.S. Cl. 324-142

11 Claims



## 1. A power multiplication circuit, comprising:

- a Hall element member, disposed in a magnetic field having a strength which is proportional to an amount of current being used by a system under measurement and having an input for inputting a signal which is proportional to a voltage being used by the system under measurement, for generating a first voltage between voltage output terminals thereof, said first voltage corresponding to an amount of power being used by the system under measurement;
- voltage polarity detection means for detecting a polarity of a power source voltage of said system under measurement and having an output for outputting said polarity of the power source voltage;
- operating means, connected to said first voltage and said output of said voltage polarity detection means, for amplifying said first voltage and having an output for outputting one of an amplified first voltage and said amplified first voltage with an inverted polarity as a second voltage on an output of the operating means, in accordance with said polarity of the power source voltage output by said voltage polarity detection means;
- integrating amplifier means, connected to the output of the operating means, for integrating said second output voltage and generating an integrated signal; and
- a variable resistance member, connected between one of said voltage output terminals of said Hall element member and ground and connected to said integrated signal, for changing a resistance thereof in accordance with said integrated signal.

5,438,259

# DIGITAL CIRCUITRY APPARATUS

Ritsuro Orihashi; Kosuke Kendo, both of Yokohama, and Yoshihiko Hayashi, Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 70,113, Jun. 1, 1993. This application Oct. 18, 1994, Ser. No. 324,924

Claims priority, application Japan, Jun. 5, 1992, 4-145701

Int. Cl.<sup>6</sup> G04F 10/00

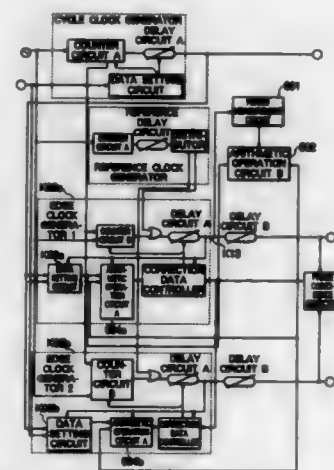
U.S. Cl. 324-158.1

3 Claims

2. An automatic test equipment comprising means for generating a first clock signal with a desired cycle by individually variably delaying a common system clock signal of a constant period generated by a system clock oscillator by using a counter circuit and a first delay vernier in order to generate a clock signal for a test stimulus supplied to a device under test (DUT) and a clock signal for fetching a response signal from said DUT to make a comparative judgment as to whether said DUT is good or not, means for generating a plurality of second clock signals having desired prorogated delay quantities or

cycles so as to be used as said clock signal for said test stimulus and said clock signal for said comparative judgment, and second delay verniers for adjusting the phase or timing between said clock signal for said test stimulus and said clock signal for said comparative judgment, said automatic test equipment further comprising:

- a period measurement circuit for measuring a period of from a point of time of appearance of a second clock signal from said first delay vernier in a certain test cycle limited by said first clock signal to a point of time of appearance of said second clock signal from said first delay vernier in a test cycle shifted by a predetermined number of test cycles from said certain test cycle;



- a first arithmetic operation circuit for calculating the rate of variation in propagation delay in said first delay vernier on the basis of the read clock period obtained by said period measurement circuit and programmed input data set to said first delay vernier in said test cycle shifted by a predetermined number of test cycles from said certain test cycle; and

- a second arithmetic operation circuit provided so as to correspond to said first delay vernier and for re-establishing programmed input data after correcting said programmed input data on said first delay vernier to suppress variations in the propagation delay on the basis of the rate in variation of the propagation delay calculated by said first arithmetic operation circuit.

5,438,260

# REMOVABLE DEVICE FOR SENSING THE ROTATION SPEED OF A BEARING, AND A VEHICLE WHEEL HUB ASSEMBLY EQUIPPED WITH SAME

Christian Rigaux, Artannes sur Indre; Christophe Houdayer; Christophe Bonnin, both of Tours, and Claude Caillaud, Saint Roch, all of France, assignors to SKF France, Clamart Cedex, France

Filed Jun. 30, 1993, Ser. No. 83,761

Claims priority, application France, Jul. 3, 1992, 92 08274

Int. Cl.<sup>6</sup> G01P 3/48, 3/54

U.S. Cl. 324-166

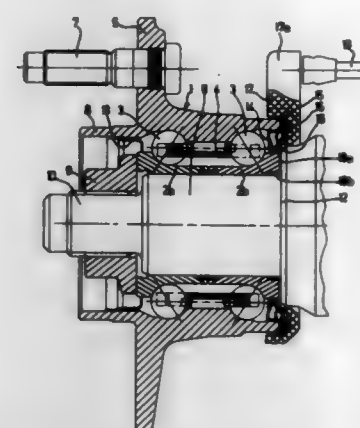
12 Claims

1. A device for sensing the rotation speed between a rotating part and a non-rotating part of a bearing, said non-rotating part having a radial surface, said device comprising an encoder element fastened to said rotating part and a sensor assembly fastened to said non-rotating part, said sensor assembly comprising a sensor facing said encoder element for measuring the rotation speed of said encoder element, a plastics material sensor support housing said sensor, and an annular metal support which includes:

- an outer peripheral portion overmolded by said plastics material sensor support,

- a substantially axial centering portion adapted to cooperate removably with a bearing surface specially provided on said non-rotating part, and
- a washer-like plane radial portion adjacent said centering

the housing in response to the frequency of the position signal.



- portion and bearing against said radial surface of said non-rotating part, said radial portion adapted to be clamped between said radial surface of said non-rotating part and a radial surface of a non-rotating member to which said non-rotating part is fastened.

5,438,261

# INDUCTIVE SENSING APPARATUS FOR A HYDRAULIC CYLINDER

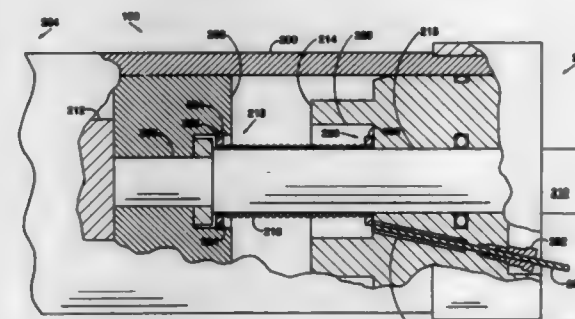
George Codina, North Hollywood, Calif.; Thomas M. Baker, Peoria, Ill.; Lisa A. Creger, Metamora, and J. Thomas Vachon, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Feb. 16, 1994, Ser. No. 197,624

Int. Cl.<sup>6</sup> G01B 7/14; G01P 3/50; F01B 25/04; H01F 21/00

U.S. Cl. 324-207.16

7 Claims



1. An apparatus for determining an extended length of a hydraulic cylinder, comprising:

- a cylindrical housing having opposing ends;
- a piston having reciprocating movement within the cylindrical housing;
- a rod being attached to and moveable with the piston;
- a coil wound about the rod having one end attached to the piston, the coil extending and retracting with the reciprocating movement of the piston;
- a cylinder head disposed at an end of the cylindrical housing, the coil having the other end attached to the cylinder head, the cylinder head defining a longitudinal bore for reception of the rod and a counter bore coaxial to the longitudinal bore to house the coil;
- an oscillator circuit coupled to the coil, the oscillator circuit producing a position signal in response to the inductance of the coil;
- means for receiving the position signal, and determining the incremental linear position of the piston or rod relative to

5,438,262

# METHOD AND APPARATUS FOR THE NONDESTRUCTIVE DETERMINATION OF TORSIONAL BREAKAGE TORQUE OF TUBULAR CARBON FIBER REINFORCED COMPOSITE MATERIALS

Atsushi Nanjyo, and Akiyoshi Kojima, both of Yokohama, Japan, assignors to Nippon Oil Co. Limited, Tokyo, Japan

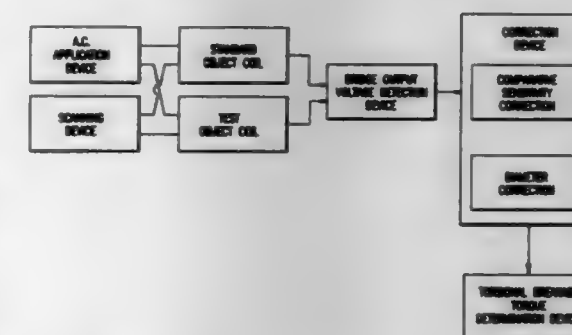
Filed Jul. 9, 1993, Ser. No. 88,526

Claims priority, application Japan, Jul. 10, 1992, 4-184169

Int. Cl.<sup>6</sup> G01N 27/90; G01R 33/12

U.S. Cl. 324-238

13 Claims



2. An apparatus for the nondestructive determination of torsional breakage torque of tubular carbon fiber reinforced composite materials (CFRC) comprising:

- a single standard object coil or a double standard object coil for accommodating a standard object which has the same external diametric dimensions as a tubular CFRC material test object and which has a previously verified degree of flaws;
- a single test object coil or a double test object coil for accommodating said test object;
- an alternating current application means for passing an alternating current through each of said single standard object and test object coils or one coil of each of said double standard object and test object coils;
- a scanning means for moving said coils, said standard object, and said test object relative to each other in an axial direction;
- a bridge circuit including each of said standard object and single test object coils or the other coil of each of said double standard object and test object coils;
- a bridge output voltage detection means for detecting fluctuation of eddy currents generated in said standard object and said test object by said alternating current application means due to a flaw;
- a correction means for correcting said bridge output voltage on the basis of the diametric dimension at the scanning location of said test object and said standard object which are formed from a tapered tubular carbon fiber reinforced composite material wound with carbon fiber at a predetermined angle with respect to the axial direction; and
- a determination means for quantitatively determining the torsional breakage torque of said test object on the basis of the corrected output.

5,438,263

**METHOD OF SELECTABLE RESOLUTION MAGNETIC RESONANCE IMAGING**

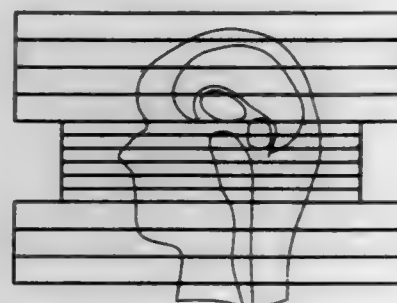
Jay S. Dworkin, Commack, and Robert B. Wolf, Medford, both of N.Y., assignors to Fomar Corporation, Melville, N.Y.  
Filed Mar. 15, 1991, Ser. No. 669,941

The portion of the term of this patent subsequent to Dec. 1, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> G01R 33/20

U.S. Cl. 324—309

16 Claims



1. A method of obtaining nuclear magnetic resonance (NMR) data for multiple slice regions within an object with different spatial resolutions during a single scan of the object, comprising:

- defining a plurality of slice regions in an object for which NMR data is to be obtained;
- exciting emission of spatially encoded NMR signals from the slice regions, wherein at least two selected slice regions are excited to emit NMR signals encoded with different spatial resolutions;
- receiving the emitted NMR signals; and
- repeating the excitation of the slice regions without interruption until NMR signals from each slice region sufficient to obtain the desired resolution have been received.

5,438,264

**MAGNETIC FIELD GENERATING APPARATUS**

Hirotsuka Takeshima, Ryugasaki; Hiroyuki Takeuchi, Kashiwa, and Chikako Nakamura, Matsudo, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

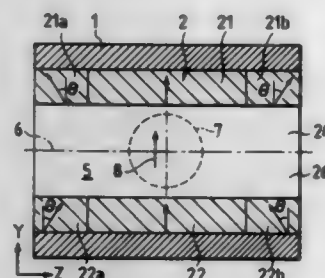
Filed Jun. 29, 1993, Ser. No. 82,977

Claims priority, application Japan, Jun. 29, 1992, 4-192709

Int. Cl.<sup>6</sup> G01V 3/00

U.S. Cl. 324—319

14 Claims



1. A magnetic field producing apparatus comprising a permanent magnet having a hole-like space portion extended in a longitudinal direction of the permanent magnet, the permanent magnet being for producing a uniform static magnetic field in a predetermined three-dimensional region of the hole-like space portion and comprising permanent magnet portions having magnetization directions tilted at an angle between, and not including, 0° and 90° in said longitudinal direction, to thereby strengthen the static magnetic field as compared with a case where the permanent magnet has magnetization direc-

tions provided uniformly along the longitudinal direction thereof.

5,438,265

**METALLIC CABLE-LOCATING APPARATUS AND METHOD HAVING AN IMAGE CAPTURING MEANS**

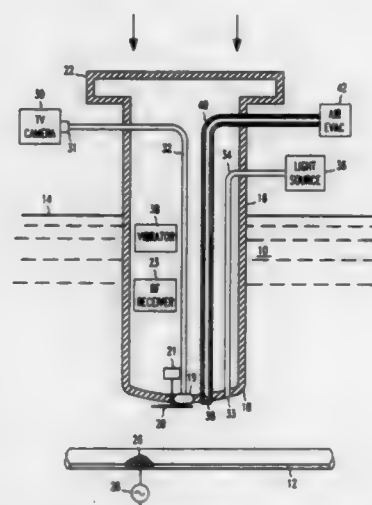
Hossein Esfahani, Bedminster, N.J., and Thomas F. Sellers, Conyers, Ga., assignors to AT&T Corp., Murray Hill, N.J.

Filed Sep. 23, 1993, Ser. No. 125,272

Int. Cl.<sup>6</sup> G01V 3/08

U.S. Cl. 324—326

11 Claims



5. A probe for locating and identifying a cable on which an RF signal is superimposed comprising:
- a generally cylindrical, at least partially hollow, cable-locating member having a closed-rounded tip at one end, for placement proximate the cable, and a head at another end;
  - a viewing window situated in the tip of the member so as to touch the cable when the member is placed proximate thereto;
  - a Radio Frequency (RF) receiver situated within the cable-locating member for sensing RF energy radiated by the cable;
  - an illumination window situated in the tip of the member;
  - a viewing means for capturing an image visible through the viewing window; and
  - a light source for directing illumination out through the illumination window to illuminate the image visible through the viewing window.

5,438,266

**INSTRUMENT TO LOCATE BURIED CONDUCTORS BY PROVIDING AN INDICATION OF PHASE REVERSAL OF THE SIGNAL UTILIZING THE ODD HARMONIC AND THE EVEN HARMONIC WHEN A VERTICAL AXIS COIL PASSES OVER ONE OF THE BURIED CONDUCTORS**

Tony H. S. Tsang, Vancouver, Canada, assignor to B.C. Hydro and Power Authority, Vancouver, Canada

Filed Dec. 7, 1993, Ser. No. 162,258

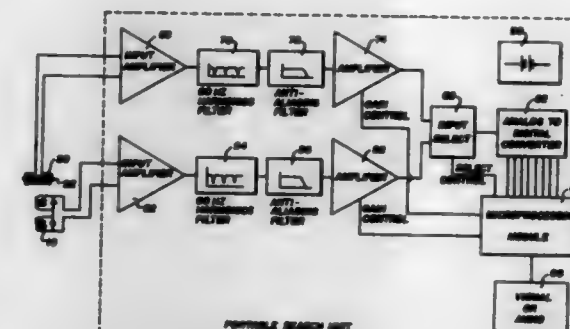
Int. Cl.<sup>6</sup> G01V 3/08

U.S. Cl. 324—326

17 Claims

1. Apparatus to locate buried conductors comprising:
- a power unit including a signal generator to produce a periodic test current, asymmetric in time, having at least one odd harmonic and one even harmonic of a fundamental frequency;
  - connection means to connect the periodic test current to pass through the buried conductors;
  - portable search unit including coil means having a substantially vertical axis coil attuned to pick up a signal includ-

ing the odd harmonic and the even harmonic of the fundamental frequency from the periodic test current; power source for the coil means, and indicator means to provide an indication of phase reversal of the signal when the vertical axis coil passes over at least one of the buried conductors, the indicator means being operable to:



determine phases of the odd harmonic and the even harmonic in the signal, calculate a function of the two phases, the function having a value that abruptly changes when a phase reversal occurs, monitor the value of the function, and indicate a phase reversal of the signal when the value of the function abruptly changes.

5,438,267

**SINGLE-SWITCHING METHOD OF ELIMINATING THE EFFECT OF ELECTROMAGNETIC COUPLING BETWEEN A PAIR OF RECEIVERS**

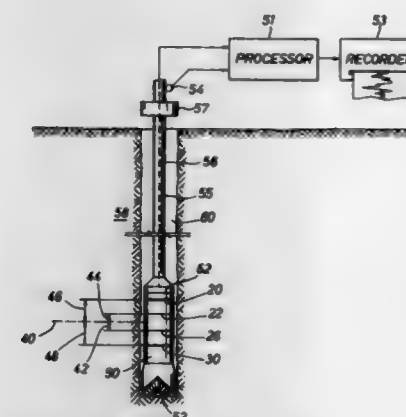
Jian-Qun Wu, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Jan. 26, 1994, Ser. No. 188,064

Int. Cl.<sup>6</sup> G01V 3/28, 3/30

U.S. Cl. 324—339

27 Claims



27. A receiver apparatus comprising:
- (a) an array of two or more receivers;
  - (b) at least one switch cooperating with each receiver in said array;
  - (c) means for operating said switches according to a predetermined switching cycle such that each said receiver is switched once between an ON status and an OFF status during said switching cycle and wherein, during said switching cycle, said receivers are simultaneously in said ON status for a length of time which is shorter than the length of time in which at least one receiver is in said ON status;
  - (d) means for measuring the responses of said receivers to

electromagnetic radiation while said receivers are in said ON status during said switching cycle; and (e) means for combining said measured responses of said receivers such that the effects of mutual coupling between said receivers are eliminated from said combination of said measured responses and wherein said combination of receiver responses is indicative of electromagnetic properties of material in the vicinity of said receivers.

5,438,268

**IGNITION SYSTEM FOR DETECTING ARC VOLTAGE OF SPARK PLUG**

Richard Schleupen, Grossingersheim; Ulrich Bestel, Wiernsheim-Iptingen; Klaus Heyke, Reutlingen-Ohmenhau, and Ulrich Nelle, Sonnenbühl, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE91/00902, § 371 Date May 7, 1993, § 102(e)

Date May 7, 1993, PCT Pub. No. WO92/10673, PCT Pub.

Date Jun. 25, 1992

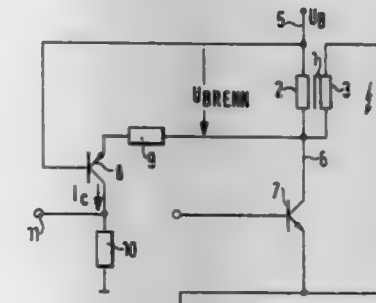
PCT Filed Nov. 16, 1991, Ser. No. 50,487

Claims priority, application Germany, Dec. 10, 1990, 40 39 356.9

Int. Cl.<sup>6</sup> F02P 17/12

U.S. Cl. 324—399

4 Claims



1. A circuit arrangement for ignition systems for detecting an arc voltage at a spark plug, the arrangement comprising an ignition coil having a primary side on which the arc voltage is transformed and also having a primary winding; an ignition switch located in series with said primary winding of said ignition coil; a pnp transistor operating as a voltage converter and having a control stage so that the arc voltage transformed on said primary side activates said control stage, said transistor being connected on an emitter side to a connection between said primary winding and said ignition switch, said pnp transistor being connected on a base side to a battery voltage; a resistor operating as an emitter follower to said pnp transistor; a measuring element which is designed as a resistor, said transistor with its collector connection feeding to said measuring element a collector current which is proportional to the arc voltage.

5,438,269

**SPARKING VOLTAGE DETECTING DEVICE HAVING AN EMBEDDED CONDUCTIVE MEMBER**

Shigeru Maruyama; Yuichi Shimazaki; Masaki Kanehiro; Takuji Ishioka; Shigeki Baba, and Takashi Hisaki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1992, Ser. No. 980,035

Claims priority, application Japan, Nov. 28, 1991, 3-339723

The portion of the term of this patent subsequent to Apr. 26,

2011, has been disclaimed.

Int. Cl.<sup>6</sup> F02P 17/00; G01R 19/165, 1/06, 15/00

U.S. Cl. 324—402

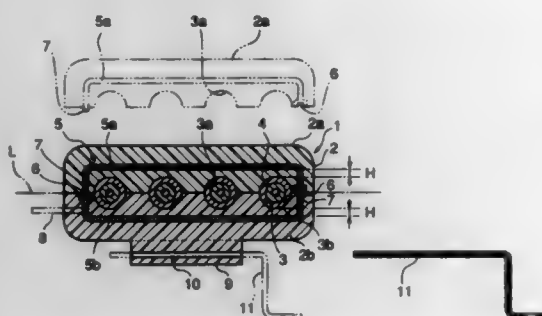
8 Claims

1. A sparking voltage detecting device for an internal combustion engine having an ignition system having at least one secondary side high-tension cord, said sparking voltage detecting device including a sensor mounted on said secondary side



high-tension cord, for detecting sparking voltage generated in said engine, said sensor comprising:

- a main body formed of an insulating material and having at least one through hole formed therein, said high-tension cord being fitted through said through hole in a liquid-tight manner, said main body including a pair of halves fabricated separately at least in part from each other and abutting each other along a line extending through a center of said main body;



- at least one conductive member entirely embedded in said main body at a location radially outward of said through hole and spaced from said high-tension cord by a predetermined distance, said of at least one conductive member molded together with said main body; and
- at least one shielding member embedded in said main body at a location outward of said conductive member radially of said through hole.

5,438,270

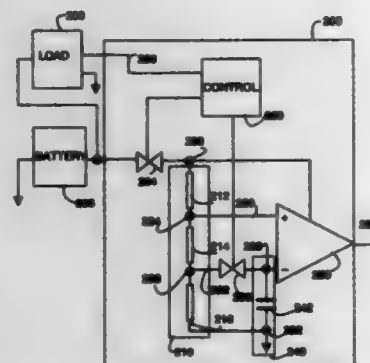
#### LOW BATTERY TESTER COMPARING LOAD AND NO-LOAD BATTERY VOLTAGE

Jonathan P. Harper, and Hubert Utz, both of Munich, Germany, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 24, 1994, Ser. No. 265,531  
Int. Cl.<sup>6</sup> G01N 27/416; H02J 7/04

U.S. Cl. 324-429

16 Claims



1. An apparatus for testing a battery, the battery being unloaded at a first time and under load at a second time, the apparatus comprising:

- a potential divider coupled to the battery and having a first tap and a second tap;
- a potential sampler having a switch coupled to the second tap and a storage element coupled to the switch;
- a comparator having a first input coupled to the storage element and a second input coupled to the first tap and having an output; and
- a controller coupled to the switch to control the switch at the first time to store a first ratiometric portion of the unloaded battery voltage on the storage element and to control the switch at the second time to apply the first ratiometric portion of the unloaded battery voltage to the

comparator first input, a second ratiometric portion of the loaded battery voltage being applied to the comparator second input so that the comparator output designates a battery test result.

5,438,271

#### BIOSENSING METER WHICH DETECTS PROPER ELECTRODE ENGAGEMENT AND DISTINGUISHES SAMPLE AND CHECK STRIPS

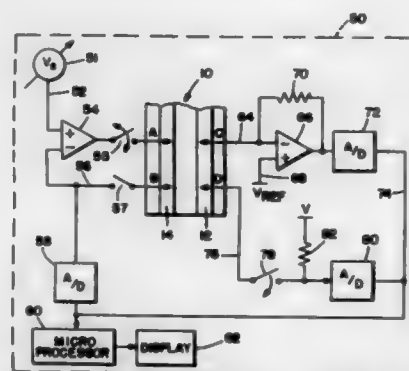
Bradley E. White, Indianapolis; Robert A. Parks, Springport, and Paul G. Ritchie, Indianapolis, all of Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Continuation of Ser. No. 73,178, Jun. 8, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 343,363

Int. Cl.<sup>6</sup> G01R 27/02

U.S. Cl. 324-444

10 Claims



1. A biosensing meter for receiving a sample strip that includes electrically isolated excitation and sense electrodes that are bridged by an analyte reactant, said biosensing meter comprising:

- a first contact and a second contact positioned to be electrically connected by said sense electrode when said sample strip is inserted into said biosensing meter;
- operational amplifier means having one input connected to said first contact, a second input connected to a reference potential, an output, and a resistor directly connecting said output to said one input, whereby said one input is enabled to manifest said reference potential; and
- processor means coupled to said second contact and responsive to a presence of said reference potential at said second contact as an indication that said sense electrode connects said first and second contacts.

5,438,272

#### VOLTAGE-STRESSING AND TESTING OF NETWORKS USING MOVING PROBES

Jeffrey A. Craig, Raleigh, N.C., and Ka-Chiu Woo, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 9, 1994, Ser. No. 240,056

Int. Cl.<sup>6</sup> G01R 31/08, 27/02

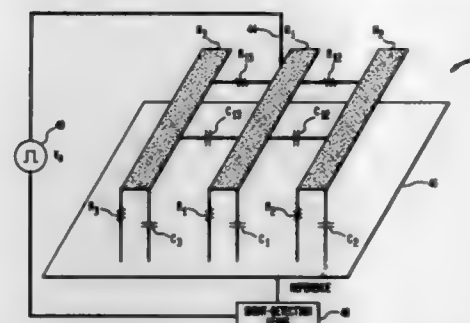
U.S. Cl. 324-537

10 Claims

1. A method for testing a network-under-test of a device, relative to other networks of the device, comprising the steps of:

- (a) probing said network-under-test with a probe;
- (b) generating a voltage;
- (c) applying said voltage across said network-under-test via said probe for developing a transient voltage between said network-under-test and said other networks of said device for stressing leakage resistance between said network-under-test and said other networks; and
- (d) applying a current to said network-under-test, measuring rise-time of said voltage applied across said network-

under-test, and comparing the measured rise-time to a reference rise-time for determining integrity of said net-



work-under-test relative to said other networks of said device.

5,438,273

#### SYSTEM FOR TESTING THE VOICE COIL ELEMENT OF A DISK DRIVE ROTARY ACTUATOR

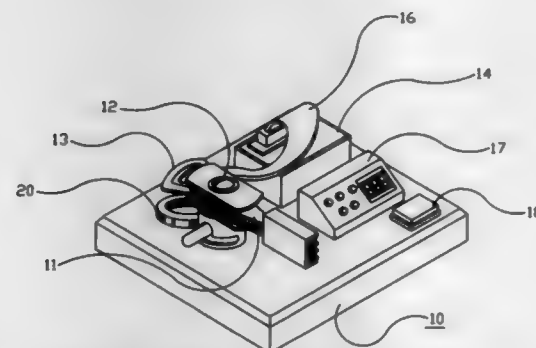
Oleg A. Gergel, Mountain View; Mostafa Mahmoudian, San Carlos; Jagdeep S. Buttar, Union City, and Neil Motiaka, Danville, all of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.

Filed Sep. 1, 1994, Ser. No. 299,524

Int. Cl.<sup>6</sup> G01R 31/06

U.S. Cl. 324-546

12 Claims



1. A system for testing electrical characteristics of a voice coil member of a rotary actuator associated with a head stack assembly (HSA) of a disk drive comprising:

- a head stack assembly including a rotary actuator, said actuator comprising a voice coil member;
- a base plate having top and bottom surfaces and means for removably mounting said HSA with the axis of rotation of said head stack assembly normal to the top surface of said plate;
- a flat reference coil disposed in a fixed position parallel to said top surface of said base plate for providing an inductively coupled relationship between said reference coil and said voice coil member under test;
- means for coupling said voice coil member to said reference coil;
- a polarity test circuit for determining the polarity of said voice coil connections including said reference coil;
- a signal generator for supplying a test signal to said voice coil member;
- connection means for selectively connecting said polarity test circuit to said voice coil member including a pair of terminals for attaching said voice coil member;
- means for determining whether a test signal supplied to said voice coil member from said signal generator produces a signal in said reference coil which is in phase with said supplied test signal, whereby a polarity check determines if the ends of said coil are connected correctly, in which the accuracy of said check is not dependent on

the precise positioning of the head stack assembly relative to said polarity checking means.

5,438,274

#### LINEAR POSITION SENSOR USING A COAXIAL RESONANT CAVITY

Ali A. Bitar, Peoria, Ill.; Denny E. Morgan, San Diego, and Charles W. Bowman, Escondido, both of Calif., assignors to Caterpillar, Peoria, Ill.

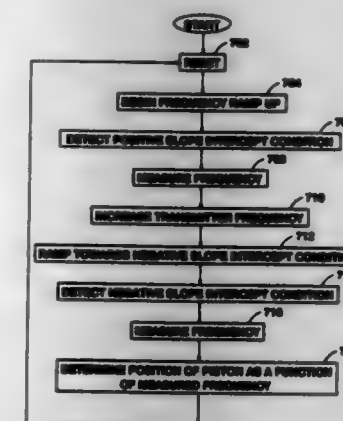
PCT No. PCT/US91/09559, § 371 Date Dec. 23, 1991, § 102(e) Date Dec. 23, 1991, PCT Pub. No. WO93/13388, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 23, 1991, Ser. No. 108,552

Int. Cl.<sup>6</sup> G01R 27/04

U.S. Cl. 324-636

24 Claims



1. An apparatus (102) for detecting a linear position of a piston (104) and a piston rod (106) being movable within a housing (110) of a hydraulic cylinder (100), comprising:

- means (114) for producing an electromagnetic signal and delivering said electromagnetic signal into said hydraulic cylinder (100), said electromagnetic signal having a frequency varying between predetermined minimum and maximum values;
- means (116) for sensing an electromagnetic wave signal within said hydraulic cylinder (100), for detecting a first positive slope intercept condition of said electromagnetic wave signal and producing a first frequency signal in response to the frequency of said electromagnetic signal corresponding to said first positive slope condition, and for detecting a first negative slope intercept condition of said electromagnetic wave signal and producing a second frequency signal in response to the frequency of said electromagnetic signal corresponding to said first negative slope condition; and
- means (118) for receiving said first and second frequency signals and responsively determining the position of said piston and piston rod (104,106).

5,438,275

#### DIGITIZING STYLUS HAVING CAPACITIVE PRESSURE AND CONTACT SENSING CAPABILITIES

Francis Fado, Highland Beach; Tin-Lup Wong; Guy F. Verrier, both of Boca Raton, all of Fla.; Robert L. Donaldson, Annapolis, and Paul D. Kowalewski, Severna Park, both of Md., assignors to International Business Machines Inc., Armonk, N.Y.

Filed Jan. 3, 1994, Ser. No. 177,106

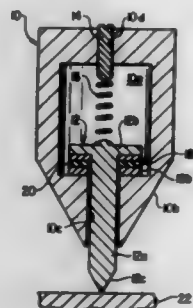
Int. Cl.<sup>6</sup> G01R 27/26

U.S. Cl. 324-662

7 Claims

1. An assembly for sensing pressure applied to a contact surface, said assembly comprising:
- a housing;

a stylus mounted in said housing for movement relative thereto;  
an electrical circuit associated with at least one of said housing and said stylus for detecting and quantifying pressure exerted on said stylus as a result of said stylus engaging said contact surface, said electrical circuit comprising a capacitor having one plate mounted on said stylus and another plate mounted on said housing so that movement of said stylus as a result of said stylus engaging said contact surface varies a capacitance of said capacitor;



spring means normally applying a predetermined pressure against said one capacitor plate to urge said one capacitor plate in a direction towards said other capacitor plate and opposite the direction of said pressure exerted on said stylus by said contact surface; and  
means for varying said predetermined pressure on said spring to vary an initial contact threshold and an operating range of said electrical circuit.

5,438,276

# APPARATUS FOR MEASURING THE LIFE TIME OF MINORITY CARRIERS OF A SEMICONDUCTOR WAFER

Yutaka Kawata; Takuya Kusaka, both of Kobe; Hidehisa Hashizume, Miki, and Futoshi Ojima, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe and Leo Corporation, Tokyo, both of Japan

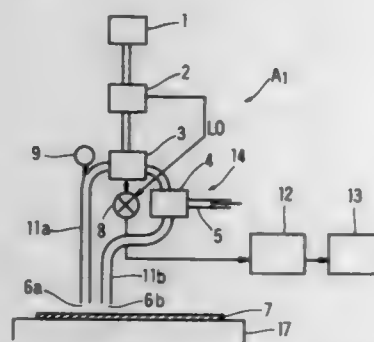
Filed May 12, 1993, Ser. No. 59,764

Claims priority, application Japan, May 14, 1992, 4-121838; Nov. 27, 1992, 4-318575

Int. Cl.<sup>6</sup> G01R 31/26

U.S. Cl. 324-765

13 Claims



1. An apparatus for measuring the life time of minority carriers of a semiconductor wafer, comprising:  
irradiating means for irradiating excitation light on a first region of a semiconductor wafer;  
microwave generator means for generating microwaves;  
transmission line means, coupled to the microwave generator means, for propagating the generated microwaves and splitting the propagating generated microwaves into first and second microwave signals that propagate along first and second paths that are spatially separate from one another, respectively;  
wherein the transmission line means radiates the first micro-

wave signal at said first region of said semiconductor wafer and radiates the second microwave signal at a second region of said semiconductor wafer that is spatially distinct from said first region of said semiconductor wafer; wherein first and second reflected microwave signals are formed by portions of said first and second microwave signals, respectively, that are reflected from said first and second regions of said semiconductor wafer, respectively; detecting means for detecting intensity of said first and second reflected microwave signals; and  
calculating means for calculating the lifetime of minority carriers of said semiconductor wafer from the detected intensity of said first and second reflected microwave signals.

5,438,277

# GROUND BOUNCE ISOLATED OUTPUT BUFFER

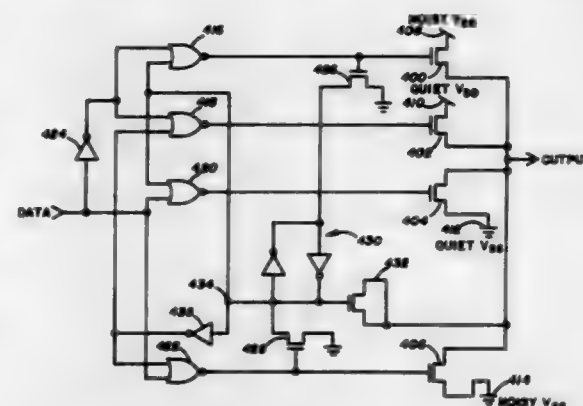
Bradley A. Sharpe-Geisler, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 19, 1993, Ser. No. 34,549

Int. Cl.<sup>6</sup> H03K 17/16

U.S. Cl. 326-27

52 Claims



1. A buffer having a buffer output and a pull down circuit, the buffer receiving a data signal including a pull down circuit turn on signal, the pull down circuit comprising:  
a noisy pull down transistor having a source to drain path coupling the buffer output to a low power supply node, and having a gate;  
a quiet pull down transistor having a source to drain path coupling the buffer output to a low power supply node, and having a gate;  
a time delay means for receiving the pull down circuit turn on signal and for providing a time delay signal in response to the pull down circuit turn on signal after a predetermined time delay without requiring the buffer output to substantially change states; and  
a switching means coupled to the gates of the noisy pull down transistor and the quiet pull down transistor, the switching means receiving the pull down circuit turn on signal and the time delay signal, the switching means for turning on the noisy pull down transistor in response to the pull down circuit turn on signal, turning on the quiet pull down transistor in response to the time delay signal, and turning off the noisy pull down transistor in response to the time delay signal.

5,438,278

# HIGH SPEED CMOS OUTPUT BUFFER CIRCUIT MINIMIZES PROPAGATION DELAY AND CROWBAR CURRENT

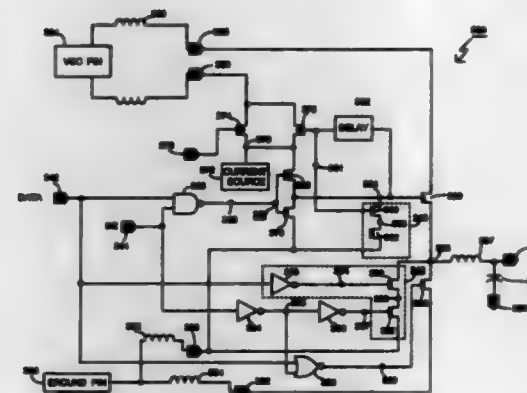
Jack T. Wong, Fremont; Fabiano Fontana, Santa Clara, and Henry Law, Cupertino, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 28, 1993, Ser. No. 128,628

Int. Cl.<sup>6</sup> H03K 17/16, 19/0175

U.S. Cl. 326-27

22 Claims



1. An output buffer circuit for receiving a data input signal and for providing an output signal, the data input signal changing level from a first level to a second level and from a second level to a first level, the output signal changing level from a first level to a second level and from a second level to a first level, the output buffer circuit having minimal propagation delay, the output buffer circuit comprising:

- a pull-up transistor coupled to an output terminal of the output buffer circuit and responsive to the data input signal to provide a first drive potential to an external element;
- a first pull-down transistor responsive to the data input signal and coupled to the output terminal and to a first ground voltage to provide a second drive potential to the external element; and
- a speed improvement circuit coupled to the first pull-down transistor, the speed improvement circuit comprising:  
a second pull-down transistor coupled to the first pull-down transistor and to a second ground voltage, the second pull-down transistor being smaller than the first pull-down transistor, the second pull-down transistor being responsive to the change of the data input signal level from the second level to the first level so as to speed up the rate of fall of the output signal for a portion of the time when the output signal is making a corresponding transition from the second level to the first level for minimizing propagation delay, and  
a fast logic gate, the logic gate being coupled to the second pull-down transistor, the logic gate receiving the data input signal and propagating the data input signal to the second pull-down transistor.

5,438,279

# OPTION SETTING CIRCUIT FOR INTERFACE CIRCUIT

Hiroaki Masumoto, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Dec. 9, 1993, Ser. No. 163,538

Claims priority, application Japan, Dec. 10, 1992, 4-330366

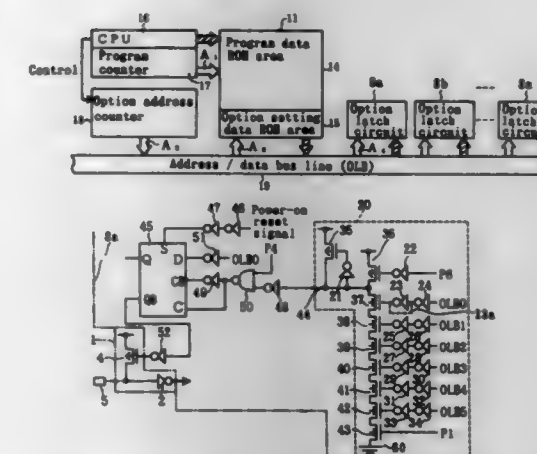
Int. Cl.<sup>6</sup> H03K 19/173, 19/0175

U.S. Cl. 326-38

5 Claims

1. An option setting circuit comprising:  
an option data memory which takes out an option data from an address and outputs the option data, said address being specified by an option address data;  
a latch circuit which latches the option data output from said

option data memory based on the option address data, said latch circuit being reset when power is turned on; a circuit being set to a predetermined circuit state in accordance with an output of said latch circuit; and



an option address circuit which causes the option address data to be repeatedly generated in a predetermined cycle during a program running period after a) the turning on of the power and b) a resetting period.

5,438,280

# INPUT CIRCUIT RECEIVING INPUT SIGNAL OF TTL LEVEL

Mitsutoshi Sugawara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

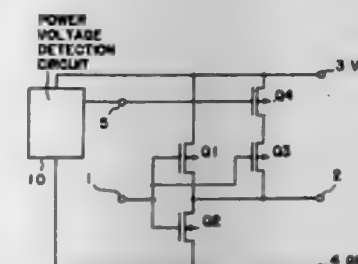
Filed Nov. 30, 1993, Ser. No. 159,512

Claims priority, application Japan, Dec. 1, 1992, 4-321743

Int. Cl.<sup>6</sup> H03K 19/0175

U.S. Cl. 326-71

8 Claims



7. An input circuit comprising a first transistor of one channel type connected between a first power terminal and an output terminal and having a gate connected to an input terminal, a second transistor of an opposite channel type connected between a second power terminal and said output terminal and having a gate connected to said input terminal, a third and a fourth transistors of said one channel type connected in series between said first power terminal and said output terminal, said third transistor being rendered conductive when a power voltage between said first and second power terminals takes a first level and nonconductive when said power voltage takes a second level different from said first level.



5,438,281

# SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND DATA PROCESSING SYSTEM HAVING AN INTERFACE WITH REDUCED PARASITIC CAPACITANCE

Tohshiro Takahashi, Ohme, and Kazuo Koide, Iruma, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

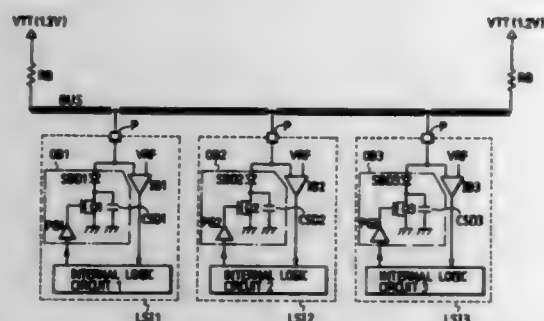
Filed Oct. 18, 1993, Ser. No. 136,946

Claims priority, application Japan, Oct. 26, 1992, 4-310902

Int. Cl.<sup>6</sup> H03K 19/094, 17/16

U.S. Cl. 326—86

37 Claims



1. A semiconductor integrated circuit device formed on a semiconductor region, comprising:
  - an external terminal;
  - first output switching means including a first output region on the semiconductor region, for providing output data in accordance with a signal from an internal logic circuit having a predetermined logic function, to the first output region thereof;
  - first Schottky diode means connected between the external terminal and the first output region of the first output switching means, for removing a parasitic capacitance of the first output region from the external terminal when the first output switching means is turned-off; and
  - input means connected to the external terminal, for receiving input data transmitted through the external terminal.

5,438,282

# CMOS BTL COMPATIBLE BUS AND TRANSMISSION LINE DRIVER

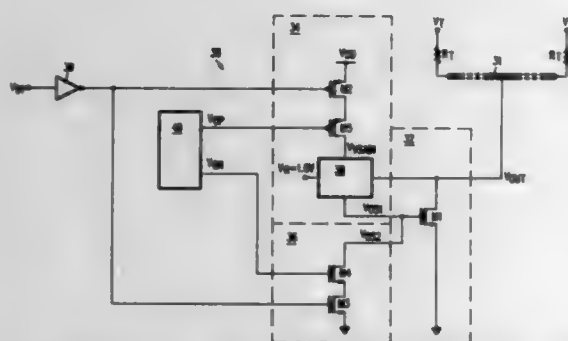
James R. Kuo, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 73,534, Jun. 8, 1993, abandoned. This application Dec. 12, 1994, Ser. No. 356,784

Int. Cl.<sup>6</sup> H03K 17/16, 19/0175

U.S. Cl. 326—86

18 Claims



1. A driver for providing binary signals from a data system to a transmission line, the driver comprising:
  - a first field-effect transistor (FET) coupled between an output node and ground for conducting current from the output node to ground, the output node being connectable to the transmission line;
  - a first input stage for conducting current from a first voltage supply to the gate of the first FET, the first input stage

including a voltage sensing amplifier for comparing a reference voltage to the voltage potential of the output node and for controlling the amount of current conducted to the gate of the first FET in response to the comparison; and

a second input stage for conducting current from the gate of the first FET to ground.

5,438,283

# FAST STATIC CASCODE LOGIC GATE

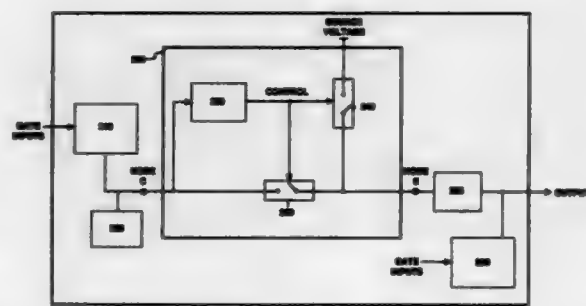
Lavi A. Lev, San Jose, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Aug. 11, 1994, Ser. No. 288,918

Int. Cl.<sup>6</sup> H03K 19/096

U.S. Cl. 326—108

18 Claims



1. A circuit comprising:
  - a pullup logic network coupled to a plurality of inputs and to a first node for implementing a logic function by generating a first voltage level at said first node to represent a first state, said first voltage level being less than a source voltage for said circuit;
  - a leakier circuit coupled to said first node for generating a second voltage level at said first node in response to a second state of said logic function;
  - a driver circuit coupled to a second node for generating an output;
  - a pulldown logic network coupled to receive said inputs for implementing said logic function by generating a second voltage level for said output to represent said second state; and
  - a switch circuit for coupling said first node to said second node when said logic function generates said second state, and for coupling a source voltage to said second node when said logic function generates said first state such that said driver circuit receives said source voltage representing said first state.

5,438,284

# BASIC LOGIC CIRCUIT HAVING MULTI-EMITTER TRANSISTOR

Motomu Takatsu, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 4, 1994, Ser. No. 317,738

Claims priority, application Japan, May 10, 1993, 5-249606

Int. Cl.<sup>6</sup> H03K 19/20

U.S. Cl. 326—124

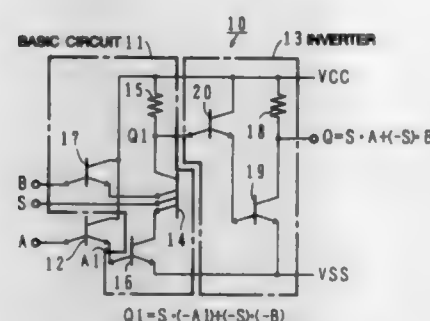
19 Claims

1. A basic logic circuit having a control input, a first data input end, a second data input end and a data output end, said circuit comprising:

a first transistor having a collector, a first emitter, a second emitter, a third emitter, a base between a collector and each of said three emitters, said base having no electrode, said second emitter being said control input end, said collector being said data output end, a carrier in one of said three emitters being able to move through said base to said collector when a potential difference for said carrier between said one emitter and another emitter of said three emitters is more than a threshold voltage;

a first load resistor means connected between said collector and a first power supply line;

carrier-source control means, having a first end being connected to said first emitter and having a second end being said first data input end, for admitting/prohibiting to push a carrier in said first emitter to said base by controlling a potential level of said first emitter in response to a potential level of said second end of said carrier-source control means; and



carrier-sink control means, having a first end being connected to said third emitter and having a second end being said third data input end, for admitting/prohibiting to pull a carrier in said base to said third emitter by controlling a potential level of said third emitter in response to a potential level of said second end of said carrier-sink control means.

5,438,285

# PHASE/FREQUENCY COMPARATOR

Pascal Debatty, Domene, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

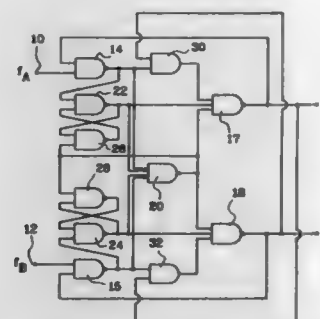
Filed Mar. 17, 1993, Ser. No. 32,510

Claims priority, application France, Mar. 17, 1992, 92 03547

Int. Cl.<sup>6</sup> H03K 5/26

U.S. Cl. 327—3

25 Claims



1. A phase/frequency comparator comprising:
  - first and second input terminals respectively receiving first and second logic signals;
  - a first logic gate, having at least first and second inputs, coupled to the first and second input terminals, providing an output being at an active state during a time duration substantially equal to a time during which the first logic signal precedes the second logic signal in phase;
  - a second logic gate, having at least first and second inputs, coupled to the first and second input terminals, providing an output being at an active state during a time duration substantially equal to a time during which the second logic signal precedes the first logic signal in phase;
  - a first latching circuit, having an input coupled to the first logic signal and providing an output coupled to the first input of the first logic gate;
  - a second latching circuit, having an input coupled to the second logic signal and providing an output coupled to the first input of the second logic gate;
  - first means for switching, receiving an input from the output

of the second logic gate and providing an output to the second input of the first logic gate, controlled by the second logic gate such that during the active state of the second logic gate, the first switching means prevents transmission to the first logic gate of a signal which would cause the first logic gate to go to its active state; and

second means for switching, receiving an input from the output of the first logic gate and providing an output to the second input of the second logic gate, controlled by the first logic gate such that during the active state of the first logic gate, the second switching means prevents transmission to the second logic gate of a signal which would cause the second logic gate to go to its active state.

5,438,286

# CIRCUIT FOR DETECTING AND OPEN LOAD

Antoine Pavlin, Puyricard, and Jean-Louis Sinaudeau, Belcodene, both of France, assignors to SGS-Thomson Microelectronics S.A., Gentilly, France

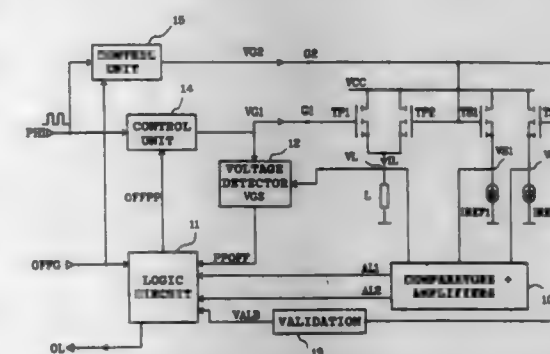
Filed Oct. 19, 1993, Ser. No. 138,849

Claims priority, application France, Oct. 21, 1992, 92 12903

Int. Cl.<sup>6</sup> G05F 1/573; H02H 3/087

U.S. Cl. 327—50

19 Claims



1. A circuit for detecting an open load for a power MOS transistor designed to operate in a switching mode, wherein said MOS transistor includes first and second transistors disposed in parallel between a high voltage supply and a low voltage supply and in series with a load, the second transistor having a resistance in a conductive state higher than a resistance of the first transistor in a conductive state, the circuit comprising:

means, coupled to the first and second transistors, for enabling conduction of only the second transistor when a current, drawn by the load, through the MOS transistor is below a first threshold value; and

means, coupled to the means for enabling, for detecting an open load when only the second transistor is operating within a conductive state.

5,438,287

# HIGH SPEED DIFFERENTIAL CURRENT SENSE AMPLIFIER WITH POSITIVE FEEDBACK

Jon A. Faue, Colorado Springs, Colo., assignor to United Memories Inc., Colorado Springs, Colo. and Nippon Steel Semiconductor Corp., Chiba, Japan

Filed Jun. 1, 1994, Ser. No. 252,269

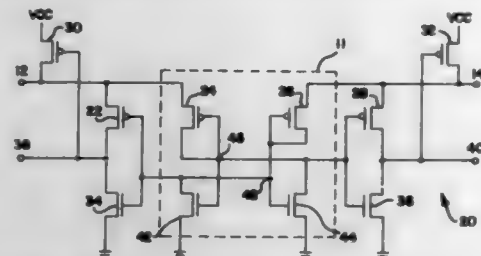
Int. Cl.<sup>6</sup> H03K 5/08

U.S. Cl. 327—54

13 Claims

11. A method for sensing a state of a memory cell comprising the steps of:
  - developing different currents at two inputs of an amplifier based upon impedances related to the state of said memory cell;
  - developing voltage transitions in said amplifier in accordance with said pair of different currents;
  - accelerating said voltage transitions in said amplifiers by positive feedback therein;

wherein said positive feedback responds to said different currents developed at said two inputs; controlling voltages at said inputs by negative feedback; and



developing differential voltages at two outputs of said amplifier based on said pair of different currents.

5,438,288

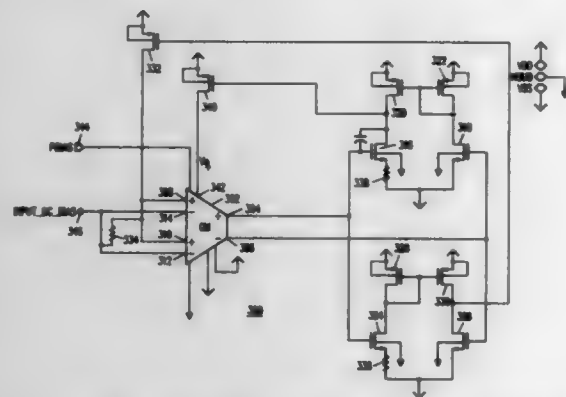
**HIGH DIFFERENTIAL OUTPUT IMPEDANCE SETTER**  
Cary L. Delano, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 70,710, May 28, 1993, abandoned. This application Aug. 2, 1994, Ser. No. 285,752

Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 327-65

4 Claims



1. An output impedance setting circuit for adjusting the output impedance of a differential input transconductance cell, the differential input transconductance cell having at least one positive polarity input, at least one negative polarity input and differential outputs, the circuit comprising:

control means for sensing a change in the potential across the differential outputs and in response thereto adjusting the level of negative impedance generated within the differential input transconductance cell to counteract said change; and

offsetting means coupled to the differential outputs and connected to a resistance connected between at least one positive polarity input of the differential amplifier and at least one negative polarity input of the differential amplifier for generating an offset potential between the positive polarity input and the negative polarity input commencing upon initial charging of at least one parasitic capacitance from at least one of the differential outputs to ground and ending prior to the full charging of the parasitic capacitance.

5,438,289

**COMPARATOR CIRCUIT**

Rikiya Kan, and Yasuo Shimomura, both of Tsurugashima, Japan, assignors to Toko, Inc., Tokyo, Japan

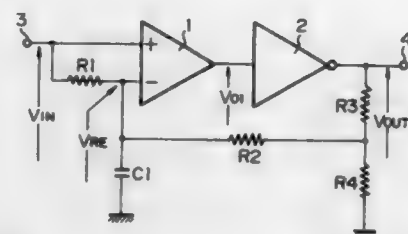
Filed Nov. 24, 1993, Ser. No. 157,701

Claims priority, application Japan, Nov. 27, 1992, 4-339508

Int. Cl.<sup>6</sup> H03K 5/153

U.S. Cl. 327-97

2 Claims



2. A comparator circuit comprising: a comparator arranged such that input signal and reference voltage are applied to separate input terminals respectively; an inverter for inverting output of said comparator; a first and a second integrating circuit; and a capacitor shared by first and second integrating circuits, wherein the reference voltage applied to the comparator is provided by adding output of the first integrating circuit to which said input signal is applied and output of the second integrating circuit to which output of said inverter is applied after having being divided, and the output of said inverter or the output of said comparator is used as output signal.

5,438,290

**LOW POWER DRIVER CIRCUIT FOR AN AC PLASMA DISPLAY PANEL**

Akio Tanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

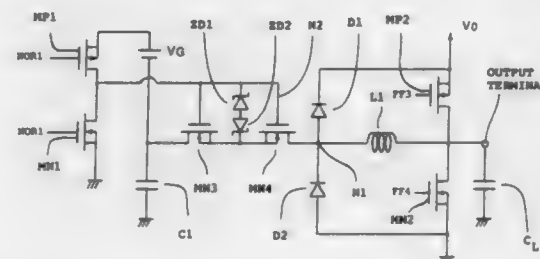
Filed Jun. 9, 1993, Ser. No. 74,081

Claims priority, application Japan, Jun. 9, 1992, 4-149083

Int. Cl.<sup>6</sup> H03K 1/00, 17/16; G09G 3/10

U.S. Cl. 327-108

12 Claims



1. A driver circuit for driving an AC plasma display device comprising:

an output terminal connected to an external load capacitance in said plasma display device for delivering an output of said driver circuit to said load capacitance;

a voltage sustaining means connected to said output terminal for sustaining voltages appearing at said output terminal; an inductor means comprising first and second terminals, said first terminal being connected in series to said output terminal for recovering most of energies normally lost in charging and discharging said load capacitor;

a two-way switching means comprising only first and second MOS transistors connected in series to each other, said first MOS transistor being connected to said second terminal of said inductor means, said two-way switching means controlling switching operations in charging and discharging said load capacitance;

an AC power supply means connected to said second MOS transistor of said two-way switching means for supplying

an alternating current for charging and discharging said load capacitance; and  
a control circuit means connected to said two-way switching means for controlling said switching operations of said two-way switching means.

5,438,291

**CONTROLLED DELAY DIGITAL CLOCK SIGNAL GENERATOR**

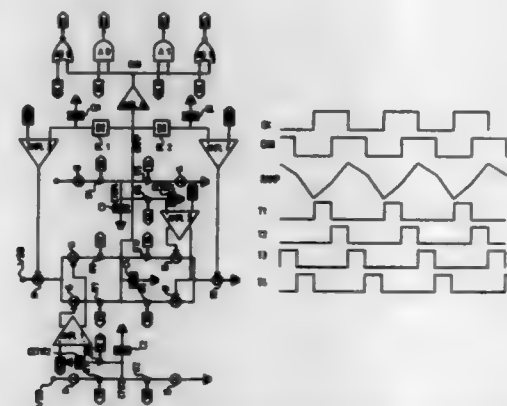
Pierre Carbou, Vence, and Pascal Guignon, Callian Fayence, both of France, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 16, 1993, Ser. No. 168,707

Int. Cl.<sup>6</sup> H03K 5/12

U.S. Cl. 327-170

8 Claims



1. A controlled delay digital clock signal generator circuit comprising:

a. first circuitry to generate, from a clock signal and its clock signal, a single ramp signal comprising at least two segments of different positive slopes and at least two segments of different negative slopes wherein said slopes of each of said segments of said ramp signal are separately controlled;

b. second circuitry for conversion of said ramp signal into a delayed square clock signal;

c. third circuitry to provide logic combinations of said delayed square clock signal with said clock signal and with said complementary clock signal, to obtain as many delayed digital clock signals as said ramp signal has segments of different slopes.

5,438,292

**SCHMITT TRIGGER CIRCUIT WITH CMOS INVERTERS AND FILTERING MEANS**

Kenji Tadokoro, Miyazaki, Japan, assignor to Oki Electric Industry, Co., Ltd., Tokyo, Japan

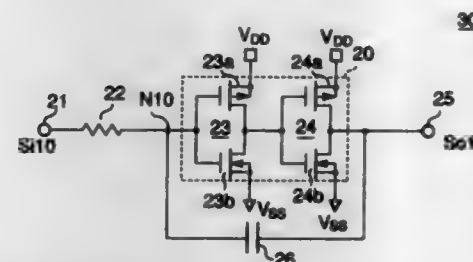
Filed Apr. 2, 1993, Ser. No. 42,406

Claims priority, application Japan, Apr. 7, 1992, 4-084288

Int. Cl.<sup>6</sup> H03K 3/3565

U.S. Cl. 327-206

6 Claims



1. A Schmitt trigger circuit, comprising:  
an input terminal;

an output terminal;  
an input node;  
an inverter circuit having an even number of MOS inverters, said MOS inverters connected to each other in series between said input node and said output terminal;  
an input resistor circuit, connected between said input terminal and said input node; and  
a feedback capacitor circuit, connected in parallel with said MOS inverters, between said input node and said output terminal.

5,438,293

**LOW POWER ANALOG ABSOLUTE DIFFERENCING CIRCUIT AND ARCHITECTURE**

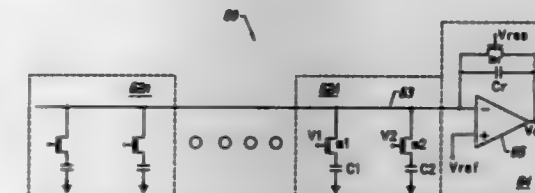
Roberto Guerrieri, Bologna, Italy, and Alan Kramer, Berkeley, Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Oct. 4, 1993, Ser. No. 132,447

Int. Cl.<sup>6</sup> H03K 19/00

U.S. Cl. 327-355

11 Claims



1. An analog vector absolute differencing circuit comprising:

a linear array of comparison circuits, each of said comparison circuits of said linear array including means for comparing a first analog signal value to a second analog signal value to produce an absolute difference signal, said linear array thereby producing a plurality of absolute difference signals;

a common integration line coupled to said linear array of comparison circuits, said common integration line receiving said plurality of absolute difference signals;

means, coupled to said integration line, for summing said absolute difference signals to yield a difference sum; wherein said comparing means includes

a first transistor, the source of said first transistor being coupled to a first capacitor, the drain of said first transistor being coupled to said common integration line, and the gate of said first transistor being coupled to a first analog signal input node,

a second transistor, the source of said second transistor being coupled to a second capacitor, the drain of said second transistor being coupled to said common integration line, and the gate of said second transistor being coupled to a second analog signal input node,

wherein a first analog signal is stored on said first capacitor corresponding to said first analog signal value and a second analog signal is stored on said second capacitor corresponding to said second analog signal value during a precharge step, and

wherein said first analog signal value is applied to said second analog signal input node and said second analog signal value is applied to said first analog signal input node during a compute step to generate said absolute difference signal.



5,438,294

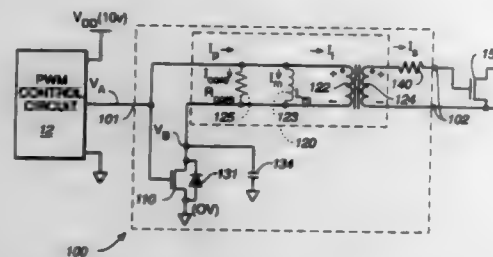
## GATE DRIVE CIRCUIT

David A. Smith, Kowloon, Hong Kong, assignor to Astec International, Ltd., Hong Kong  
 Filed Mar. 17, 1993, Ser. No. 32,791  
 Claims priority, application United Kingdom, Mar. 19, 1992, 9206012

Int. Cl.<sup>6</sup> H03K 17/16

U.S. Cl. 327—384

20 Claims



1. A drive circuit for controlling the operation of a switching device, the switching device including a control port for receiving a signal from said drive circuit for controlling its conductance state, said drive circuit being responsive to an input control signal having a first state for directing the switching device to enter a first conduction state and a second state for directing the switching device to enter a second conduction state, the input control signal alternating between its first and second states during normal operation and being caused to remain in its second state when operation of the switching device is to be terminated, said drive circuit comprising:

an output port for coupling to the control port of the switching device;

a transformer having a primary winding and a secondary winding, said secondary winding being coupled to said output port, said primary winding having a first terminal and a second terminal;

coupling means responsive to said input control signal for coupling power to said primary winding when the input control signal is in its first state, said coupling causing a voltage of a first polarity to be applied across said primary winding, a portion of said power being coupled to the control port of the switching device by said secondary winding and causing the switching device to enter its first conduction state, said transformer storing energy in response to the coupling of said power, said coupling means further for uncoupling said power from said primary winding and substantially removing said power from said primary winding when the input control signal enters its respective second state, said portion of said power thereafter being uncoupled from the switching device such that said switching device is caused to enter its second conduction state; and

discharge means coupled to said transformer and responsive to the uncoupling of said power from said primary winding for discharging the energy stored in said transformer during the second state of said control signal such that sufficient power is prevented from being coupled to the switching device to cause it to enter its first conduction state during the time the input control signal is in its second state, said discharge means comprising a reversal means for applying a voltage having a second polarity opposite to said first polarity across said primary winding in a time interval during the second state of said input control signal, said second polarity voltage discharging the energy stored in said transformer, said reversal means comprising a means for applying a first reference voltage to the first terminal of said primary winding and a first capacitance coupled to said second terminal of said primary winding, the energy stored in said transformer being directed into said first capacitance during said second state of said input control signal such that a reversing voltage is generated thereon and a voltage of said second polarity is applied to said primary winding, said discharge means

further comprising a second reference voltage and a rectifier coupled between the second terminal of said primary winding and said second reference voltage, said rectifier conducting current to limit the magnitude of voltage across said primary winding having said second polarity to less than a predetermined value during the time said input control signal is in its second state.

5,438,295

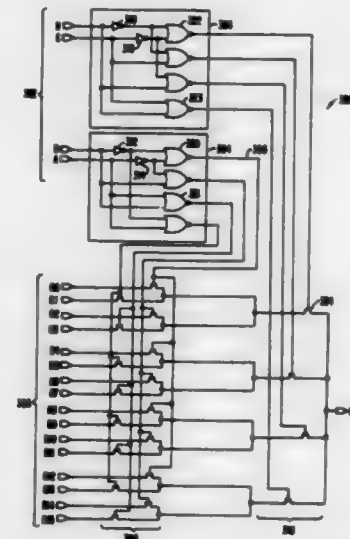
## LOOK-UP TABLE USING MULTI-LEVEL DECODE

Srinivas T. Reddy, Santa Clara, and Anil Gupta, San Jose, both of Calif., assignors to Altera Corporation, San Jose, Calif.  
 Filed Jun. 11, 1993, Ser. No. 76,712

Int. Cl.<sup>6</sup> H03K 17/62, 17/693

U.S. Cl. 327—408

2 Claims



1. A look-up table circuit, the circuit including a plurality of signal inputs, a circuit output and a plurality of select lines, wherein one of the signal inputs is passed to the circuit output in response to voltages placed on the select lines, the circuit comprising:

a first pass transistor coupled to a first signal input for selectively passing a first signal input to a first node;

a second pass transistor coupled to a second signal input for selectively passing a second signal input to the first node;

a select line coupled to gates of the first and second pass transistors so that when one of the transistors is on the other transistor is off;

combinational means, coupled to two or more of the select lines, for outputting an enable signal in response to the voltages on the two or more select lines;

pass means coupled between the circuit output and the first node for selectively passing a signal at the first node, the pass means coupled to the enable signal, the pass means enabled by the enable signal to allow the signal at the first node to pass to the circuit output when the enable signal is at a predetermined voltage level; wherein the combinational means includes

first inversion means having an input coupled to a first select line;

second inversion means having an input coupled to a second select line;

a first NOR gate coupled to outputs of the first and second inversion means;

a second NOR gate coupled to an output of the second inversion means and coupled to the first select line;

a third NOR gate coupled to an output of the first inversion means and coupled to the second select line;

a fourth NOR gate coupled to the first and second select lines;

wherein the pass means includes

a first transistor coupled between a first signal input and the circuit output, the first transistor enabled by an output of the first NOR gate;

a second transistor coupled between a second signal input and the circuit output, the second transistor enabled by an output of the second NOR gate;

a third transistor coupled between a third signal input and the circuit output, the third transistor enabled by an output of the third NOR gate; and

a fourth transistor coupled between a fourth signal input and the circuit output, the fourth transistor enabled by an output of the fourth NOR gate.

5,438,296

## MULTIPLIER AND SQUARING CIRCUIT TO BE USED FOR THE SAME

Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 851,192, Mar. 13, 1992, abandoned.

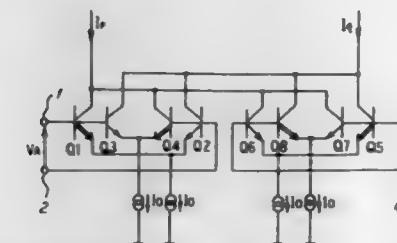
This application Jul. 22, 1994, Ser. No. 277,302

Claims priority, application Japan, Mar. 13, 1991, 3-73977; May 16, 1991, 3-141005; May 23, 1991, 3-147770

Int. Cl.<sup>6</sup> G06G 7/12; G06F 7/44

U.S. Cl. 327—560

28 Claims



1. A multiplier comprising:

a first squaring circuit having a first differential input end pair and a first output end;

a second squaring circuit having a second differential input end pair and a second output end, said second output end being connected in common to said first output end so as to be opposite

said first differential input end pair being applied with the difference of a first input signal voltage and a second input signal voltage;

said second differential input end pair being applied with the sum of said first input signal voltage and said second input signal voltage; and

an output signal showing a result of multiplication of said first input signal and said second input signal being derived from said first and said second output ends common-connected; wherein

said first squaring circuit includes a first differential pair of first and second transistors whose emitter sizes are different from each other, and a second differential pair of third and fourth transistors whose emitter sizes are different from each other;

said first and second transistors have emitters connected in common to a first constant current source, and bases between which said difference of said first input signal voltage and said second input signal voltage is applied; said third and fourth transistors have emitters connected in common to a second constant current source, and bases between which said sum of said first input signal voltage and said second input signal voltage is applied;

collectors of said first and fourth transistors are connected in common, and collectors of said second and third transistors are connected in common;

said second squaring circuit includes a third differential pair of fifth and sixth transistors whose emitter sizes are different from each other, and a fourth differential pair

of seventh and eighth transistors whose emitter sizes are different from each other;

said fifth and sixth transistors have emitters connected in common to a third constant current source, and bases between which said sum of said first input signal voltage and said second input signal voltage is applied;

said seventh and eighth transistors have emitters connected in common to a fourth constant current source, and bases between which said sum of said first input signal voltage and said second input signal voltage is applied;

collectors of said fifth and eighth transistors are connected in common, and collectors of said sixth and seventh transistors are connected in common; and

said common-connected collectors of said first and fourth transistors and sixth and seventh transistors are connected in common to form said first output end, and said common-connected collectors of said second, third, fifth and eighth transistors are connected in common to form said second output end.

5,438,297

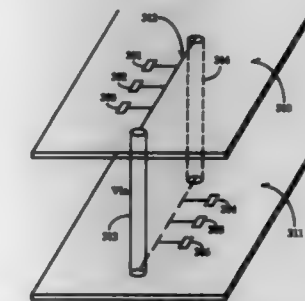
## ELECTRICAL TRACE HAVING A CLOSED LOOP CONFIGURATION

Tawfik Rahal-Arabi, Hillsboro; Real Pomerleau, Aloha; Martin Rauch, Manning, and Tim Schreyer, Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.  
 Filed Dec. 30, 1992, Ser. No. 998,937

Int. Cl.<sup>6</sup> H01L 25/00

U.S. Cl. 327—565

7 Claims



1. A printed circuit board having a plurality of semiconductor devices for processing digital data, a plurality of transmission lines coupled to said semiconductor devices for supplying power and ground to said semiconductor devices, and a trace coupled to said semiconductor devices, wherein a digital signal transmitted onto said trace by one of said semiconductor devices propagates through said trace and is received by another semiconductor coupled to said trace, said trace comprising a continuous closed periphery topology having no endpoints, wherein a digital signal driven onto said trace simultaneously propagates in both a clockwise direction and a counter-clockwise direction and wherein said closed periphery topology is used to couple a semiconductor mounted on a first signal layer of said printed circuit board to another semiconductor residing on a different signal layer of said printed circuit board.

5,438,298

## AMPLIFIER HAVING OVERSHOOT PREVENTING CIRCUIT

Hidetoshi Hori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 12, 1994, Ser. No. 180,842

Claims priority, application Japan, Jan. 14, 1993, 5-004466

Int. Cl.<sup>6</sup> H03G 9/12

U.S. Cl. 330—289

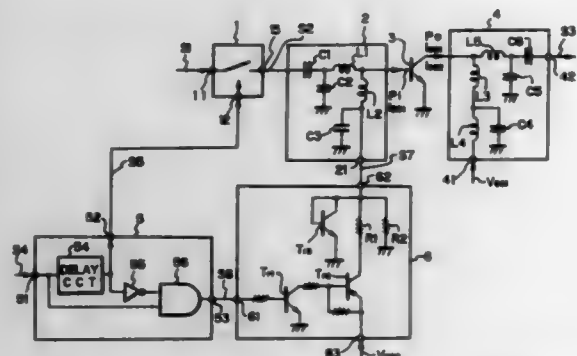
5 Claims

1. An amplifier comprising:

a first transistor for amplifying an AC signal;

a bias voltage applying circuit for applying, just before the AC signal is applied to said first transistor, a DC current to said first transistor, whereby when said AC signal is applied to said first transistor, a junction temperature of said first transistor is elevated to a temperature substantially equal to an operating junction temperature of said first transistor;

a switch controlled by a carrier application control signal for selectively turning on or turning off the AC signal to be applied to said first transistor; and



a control signal generator for generating, in response to a carrier control signal indicative of a beginning and an end of a duration of amplification of said first transistor, a preheat control signal continuing for a predetermined preheating period from said beginning of said carrier control signal, and said carrier application control signal continuing for said duration of amplification from an end of said preheat control signal;

said first transistor amplifying the AC signal by class "C" amplification.

5,438,299

## PHASE-LOCKED LOOP CIRCUIT

Toshizi Shimada; Yasunori Kanai, both of Nagano, and Yoshio Watanabe, Kawasaki, all of Japan, assignors to Shinko Electric Industries, Co., Ltd., Nagano and Fujitsu Limited, Kawasaki, both of Japan

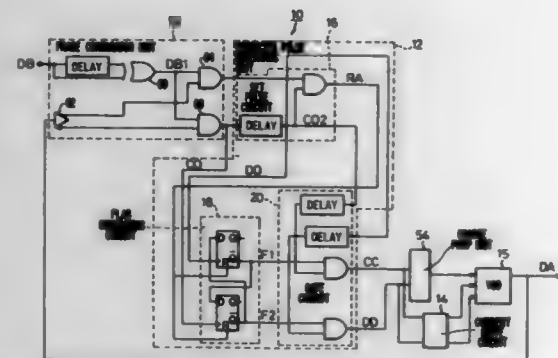
Filed Mar. 30, 1994, Ser. No. 220,057

Claims priority, application Japan, Mar. 31, 1993, 5-073834

Int. Cl.<sup>6</sup> H03L 7/08, 7/085, 7/089, 7/099

U.S. Cl. 331-1 A

14 Claims



1. A phase-locked loop (PLL) circuit which so controls the phase of a corrected reference signal that the leading edge of a reference signal is located at an intermediate position of a differentiation signal, comprising:

a phase comparator unit which accepts an external signal and a reference signal, forms, based on said external signal, a differentiation signal having a predetermined time width in synchronism with both edges thereof, outputs an early pulse only during a period in which said differentiation

signal overlaps a period from the leading edge to the trailing edge of said reference signal, and outputs a late pulse only during a period in which said differentiation signal overlaps a period from the trailing edge to the leading edge of said reference signal;

a charge pump unit which accepts said early pulse and said late pulse, calculates and compares the amounts of integration of the pulses, lowers or raises the output voltage to become smaller than the present output voltage when the amount of integration of the late pulse is larger than the amount of integration of the early pulse, and raises or lowers the output voltage to become larger than the present output voltage when the amount of integration of the late pulse is smaller than the amount of integration of the early pulse; and

a voltage controlled oscillator (VCO) which receives an output voltage from said charge pump unit, outputs a corrected reference signal of the frequency which is lowered to become smaller than the present frequency when the amount of integration of the late pulse is larger than the amount of integration of the early pulse and when said output voltage is raised or lowered, and outputs a corrected reference signal of the frequency which is raised to become greater than the present frequency when the amount of integration of the late pulse is smaller than the amount of integration of the early pulse and when said output voltage is lowered or raised,

wherein provision is made of a corrected pulse generating unit between said phase comparator unit and said charge pump unit, said corrected pulse generating unit correcting said late pulse and said early pulse according to a phase relationship between said external signal and said reference signal, and sending a corrected late pulse and a corrected early pulse to said charge pump unit.

5,438,300

## DIGITAL FREQUENCY MULTIPLIER UTILIZING DIGITAL CONTROLLED OSCILLATOR

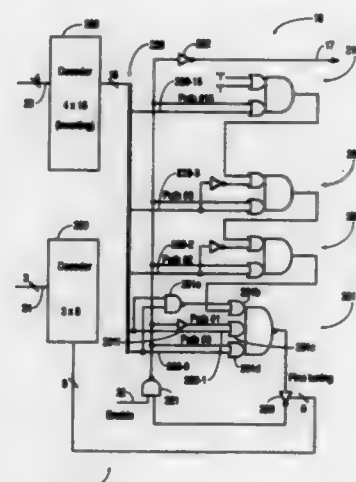
Rami Saban, Holon; Avner Efendovich, Jerusalem, and Varda Karpati, Netanya, all of Israel, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 1, 1994, Ser. No. 221,736

Int. Cl.<sup>6</sup> H03L 7/099, 7/18; H03B 5/24

U.S. Cl. 331-16

17 Claims



1. A frequency multiplier comprising:

a control logic unit comprising a divide-by-K unit, a divide-by-N unit and a frequency comparator, respective outputs of said divide-by-K unit and said divide-by-N unit being connected to inputs of said frequency comparator; and a ring oscillator having an output connected to an input of said divide-by-N unit, said ring oscillator comprising a

plurality of coarse delay units connected into a plurality of rings, a different number of said coarse delay units being connected in different ones of said plurality of rings, and a variable delay unit connected in all of said rings, a delay introduced by said variable delay unit being adjustable independently of said coarse delay units.

5,438,301

## MODEM HAVING A PHASE CORRECTOR AND A VOLTAGE CONTROLLED OSCILLATOR IMPLEMENTED USING A MULTI-STAGE RING OSCILLATOR

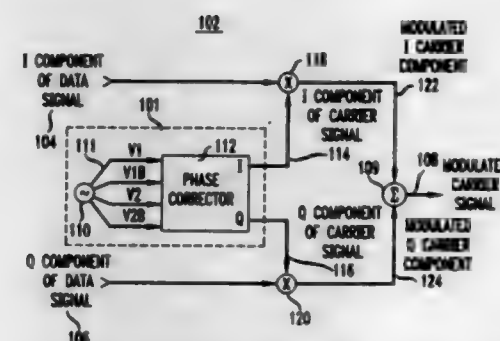
Joseph H. Havens, Tokyo, Japan, and Robert K. Montgomery, Neshanic Station, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jul. 25, 1994, Ser. No. 280,638

Int. Cl.<sup>6</sup> H03B 5/24, 27/00

U.S. Cl. 331-45

20 Claims



1. A carrier generator circuit for use in a modem employed in a wireless communication system, comprising:

a voltage controlled oscillator comprising an N-stage ring oscillator to generate N balanced vectors of equal magnitude and arbitrary phase difference; and a phase corrector to add two of said balanced vectors to generate a sum vector and to subtract said two of said balanced vectors to generate a difference vector, said sum vector and difference vector having a phase difference of 90 degrees, said sum vector representing an I (in-phase) carrier signal component and said difference vector representing a Q (quadrature-phase) carrier signal component.

5,438,302

## ELECTROSURGICAL RADIOFREQUENCY GENERATOR HAVING REGULATED VOLTAGE ACROSS SWITCHING DEVICE

Colin C. O. Goble, Penarth, Scotland, assignor to Gyrus Medical Limited, St. Mellons, Wales

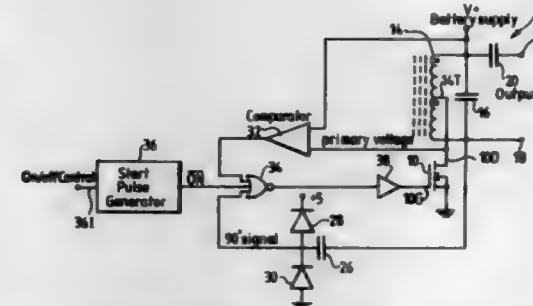
Filed Jul. 11, 1994, Ser. No. 273,496

Claims priority, application United Kingdom, Jul. 12, 1993, 9314391

Int. Cl.<sup>6</sup> H03B 5/12; A61B 17/36

U.S. Cl. 331-167

21 Claims



1. An electrosurgical generator having a radio frequency

oscillator comprising at least one switching device, a resonant output network coupled in series with the switching device in a path between power supply rails of opposite polarities, and an oscillator feedback circuit operable to feed to the switching device a switching control pulse signal as an oscillation feedback signal such that the switching device is cyclically switched to its "on" state whilst the voltage across the switching device is decreasing, the phase of the "on" point being dynamically variable such that the "on"-time of the switching device is adjusted to regulate the amplitude of the voltage across the switching device.

5,438,303

## PULSE WITH MODULATION APPARATUS WITH PLURAL INDEPENDABLY CONTROLLABLE VARIABLE DELAY DEVICES

Daisuke Murakami; Hideki Yoshida, and Takao Terno, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

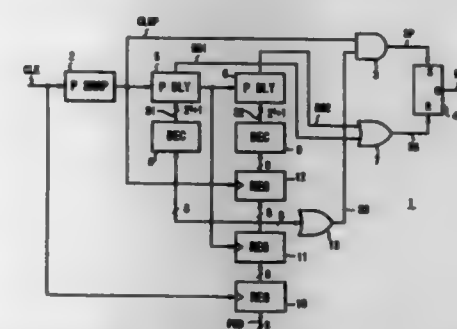
Filed Jul. 12, 1993, Ser. No. 89,566

Claims priority, application Japan, Jul. 14, 1992, 4-210819; Dec. 29, 1992, 4-360286; Dec. 29, 1992, 4-361516; Dec. 29, 1992, 4-361546; Dec. 30, 1992, 4-360616

Int. Cl.<sup>6</sup> H03K 7/08

U.S. Cl. 332-109

27 Claims



1. A pulse width modulation apparatus comprising latch means, a delay means for delaying a control pulse fed at intervals of a predetermined period by an arbitrary period of time, said delayed control pulse controlling a setting or resetting of said latch means so as to modulate a pulse width of an output pulse to be delivered, wherein:

said delay means comprises delay output means having plural stages for producing plural delayed control pulses dividing said intervals into plural durations; and a rising or falling of said latch means is controlled based on said delayed control pulses.

5,438,304

## AUTOMATICALLY TUNED NOTCH FILTER FOR PROVIDING BANDPASS AND BAND REJECT SIGNALS

Peter R. Jennings, P.O. Box 336, Ben Lomond, Calif. 95005-0336

Continuation of Ser. No. 630,303, Dec. 19, 1990, abandoned.

This application Sep. 25, 1992, Ser. No. 952,480

Int. Cl.<sup>6</sup> H03H 11/4

U.S. Cl. 333-17.1

10 Claims

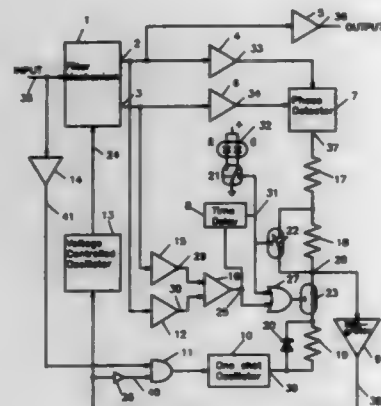
1. An automatically tuned notch filter having at least one characteristic operating frequency for rejecting at least one narrow band interference signal comprising:

a voltage controlled oscillator for providing a clock input signal having a frequency dependent upon a control voltage applied thereto,

a filter mechanism, operatively coupled to the voltage controlled oscillator for receiving said control signal, having an input terminal coupled to receive an input signal with a frequency and having first and second output terminals for providing, respectively, band rejection and bandpass signals at a frequency controlled by the clock input signal,



said band rejection and bandpass signals each having a corresponding amplitude,  
said filter mechanism having a phase relationship between the band rejection and bandpass signals such that a phase difference occurs between said band rejection and bandpass signals which is a function of the difference between the input signal frequency and the characteristic operating frequency of the filter, said characteristic operating frequency is determined by a signal characteristic of said clock input signal, and



means responsive to the band rejection and bandpass signals for generating a first control signal representative of the relative phase between the band rejection and bandpass signals, and  
means responsive to the band rejection and bandpass signals for generating a second control signal representative of the relative amplitudes of the band rejection and bandpass signals, and  
means operatively connected to the control signal means for coupling the first and second control signals as the control voltage to the voltage controlled oscillator.

5,438,305

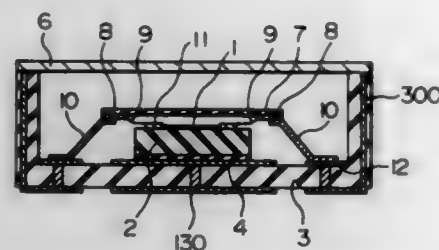
#### HIGH FREQUENCY MODULE INCLUDING A FLEXIBLE SUBSTRATE

Mitsutaka Hikita, Hachioji; Atsushi Sumioka; Takatoshi Akagi, both of Kokubunji; Toyoji Tabuchi, Kanagawa, and Nobuhiko Shibasaki, Hachioji, all of Japan, assignors to Hitachi, Ltd.; Hitachi Denahi Kabushiki Kaisha, both of Tokyo and Hitachi Video & Information System, Inc., Kanagawa, all of Japan  
Filed Aug. 3, 1992, Ser. No. 924,091

Claims priority, application Japan, Aug. 12, 1991, 3-201658  
Int. Cl.<sup>6</sup> H05K 7/02; H03H 9/64, 11/28

U.S. Cl. 333-32

21 Claims



20. A radio communication device comprising:  
a package comprising a first package portion having first terminals and a second package portion;  
a high frequency device having second terminals; and,  
a flexible substrate having wiring conductor patterns thereon including at least one of a distributed constant circuit and a lumped constant circuit;

said first package portion having said high frequency device disposed therein;  
said flexible substrate with said at least one of said distributed constant circuit and lumped constant circuit being disposed above said high frequency device;  
said second package portion being disposed above said flexible substrate with said at least one of said distributed constant circuit and lumped constant circuit; and,  
said flexible substrate being of a bent shape such that said wiring conductor patterns contact said first terminals of said first package portion and said second terminals of said high frequency device and said wiring conductor patterns on said flexible substrate being electrically connected such that said at least one of said distributed constant circuit and said lumped constant circuit performs impedance matching or transformation for said high frequency device.

5,435,306

#### SURFACE ACOUSTIC WAVE FILTER DEVICE WITH SYMMETRICAL ELECTRODE ARRANGEMENT

Kazuhiko Yamanouchi, Sendai; Mitsuhiro Tanaka, Chita, and Yasufumi Horio, Nagoya, all of Japan, assignors to Kazuhiko Yamanouchi and NGK Insulators, Ltd., Japan

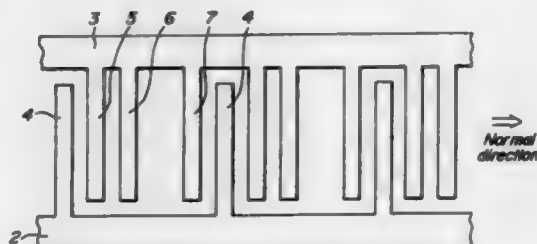
Filed Jul. 1, 1993, Ser. No. 85,121

Claims priority, application Japan, Jul. 2, 1992, 4-215370; Dec. 22, 1992, 4-361917; Mar. 5, 1993, 5-045362

Int. Cl.<sup>6</sup> H03H 9/64

U.S. Cl. 333-195

10 Claims



1. A surface acoustic wave filter device comprising:  
a substrate comprising a piezoelectric material and having a surface;  
an interdigital-type input side unidirectional transducer applied on said surface of said substrate and including an input side positive electrode having a plurality of electrode fingers, and an input side negative electrode having a plurality of electrode fingers each arranged between successive electrode fingers of said input side positive electrode; and  
an interdigital-type output side unidirectional transducer applied on said surface of said substrate and including an output side positive electrode having a plurality of electrode fingers, and an output side negative electrode having a plurality of electrode fingers each arranged between successive electrode fingers of said output side positive electrode, said output side transducer having a symmetrical electrode arrangement to said input side transducer; wherein each of said input side and output side transducers includes at least one group of electrode fingers which are successively arranged in a propagation direction of the surface acoustic wave, said group comprising first and second electrode fingers of the positive electrode and first, second and third electrode fingers of the negative electrode, said first, second and third electrode fingers of the negative electrode being arranged between said first and second electrode fingers of the positive electrode, said electrode fingers of said positive and negative electrodes of each of said input side and output side transducers being arranged so as to transduce a harmonic wave of a selected order which is higher relative to a fundamental surface acoustic wave.

5,438,307

#### SINGLE-POLE MAGNETIC REED RELAY

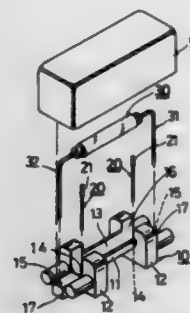
Tien-Ming Chou, Taichung, Taiwan, assignor to Pen-Lin Liao, Taichung, Taiwan

Filed Aug. 3, 1994, Ser. No. 283,186

Int. Cl.<sup>6</sup> H01H 1/66

U.S. Cl. 335-151

2 Claims



1. A single-pole magnetic reed relay comprising:  
a coil reel including an axially extending reel portion, two opposite stop ends, a reed receiving groove extending axially in said reel portion and said stop ends, a reed entrance extending axially in said reel portion and said stop ends and communicated with said reed receiving groove in a radial direction, two extension portions formed outwardly of said stop ends, two first holes formed respectively and radially through said stop ends, and two second holes formed respectively and radially through said extension portions, said first and second holes being aligned axially with one another;  
two coil terminals extending respectively through said first holes and having head portions positioned within said first holes;  
a reed contact unit received in said reed receiving groove and having two conducting end portions which extend respectively through said second holes;  
a coil wound around said reel portion and said reed contact unit and having two distal ends connected respectively and directly to said coil terminals;  
a case for containing said coil reel, said coil terminals, said reed contact unit and said coil therein; and  
a resin provided in said case to encapsulate said coil reel, said coil terminals, said reed contact unit and said coil in said case.

5,438,308

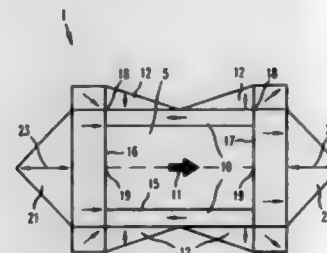
Yokeless Permanent Magnet Solenoids  
Herbert A. Leupold, Eatontown, and Ernest Potenziani, II, Ocean, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 8, 1994, Ser. No. 336,363

Int. Cl.<sup>6</sup> H01F 7/00

U.S. Cl. 335-306

5 Claims



1. A yokeless magnetic circuit producing an internal magnetic field, comprising:  
a permanent magnet shell having a solenoidal cavity within which the internal magnetic field is produced, said perma-

nent magnet shell having at least a first and a second end, each said first and second end having a radial periphery and an axial centerpoint;  
a first conical end magnet adjacent said first end of said permanent magnet shell; and  
a second conical end magnet adjacent said second end of said permanent magnet shell, said first and second end magnets having a predetermined coercivity, each said first and second conical end magnets providing an equipotential surface at said first and second ends of said permanent magnet shell between said radial periphery and said axial centerpoint.

5,438,309

#### OVER-CURRENT/OVER-TEMPERATURE PROTECTION DEVICE

John F. Krumme, 4124 Verbier Rd., Tahoe City, Calif. 96145

PCT No. PCT/US92/01185, § 371 Date Oct. 19, 1993, § 102(e)

Date Oct. 19, 1993, PCT Pub. No. WO92/19002, PCT Pub.

Date Oct. 29, 1992

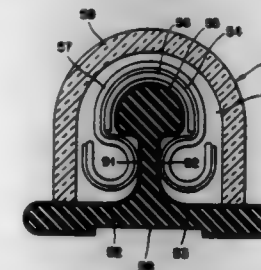
Continuation-in-part of Ser. No. 687,792, Apr. 19, 1991, Pat. No.

5,105,178. This PCT application Feb. 19, 1992, Ser. No. 133,187

Int. Cl.<sup>6</sup> H01H 61/06

U.S. Cl. 337-140

19 Claims



1. An over-current/over-temperature protection device, comprising:  
first and second electrical contacts;  
a separable resistance electrical current path forming an electrical connection between the contacts, the separable path having a resistance to flow of electrical current there-through, the separable path comprising an electrically conductive layer on a polymer film;  
breaker means for preventing flow of electrical current between the contacts through the separable path when current above a threshold value flows through the separable path and/or the over-current/over-temperature protection device reaches a threshold temperature, the means comprising a member of a shape memory alloy which undergoes a metallurgical phase change when heated from a first temperature T<sub>1</sub> to a second temperature T<sub>2</sub>, the member when unrestrained being capable of changing from a first configuration into a second configuration when heated from the first temperature T<sub>1</sub> to the second temperature T<sub>2</sub>, the separable path being separated from at least one of the contacts when the member is heated to the second temperature T<sub>2</sub>;  
heater means for heating the member from the first temperature T<sub>1</sub> to the second temperature T<sub>2</sub>, the heater means comprising the separable path; and  
resettable means for reconnecting the electrical connection between the separable path and at least one contact after the breaker means causes the electrical connection between the separable path and the contacts to be broken.

# 5,438,310 FUSE BOX

Akira Ikari, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

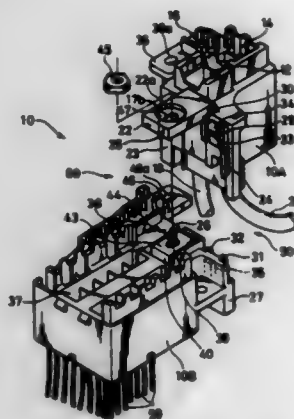
Filed Sep. 2, 1993, Ser. No. 115,329

Claims priority, application Japan, Sep. 4, 1992, 4-237134

Int. Cl.<sup>6</sup> H01H 85/22

U.S. Cl. 337-208

9 Claims



1. A fuse box for distributing current derived from a battery through a plurality of fuses, comprising:  
a main power source box to be connected to the battery;  
a sub-power source box adapted to be mechanically and electrically integrated with said main power source box;  
means for mechanically coupling said main power source box with said sub-power source box such that electrical connection therebetween is prevented by a space therebetween; and  
threaded fastener means for overcoming said space to ensure electrically coupling said main power source box with said sub-power source box.

# 5,438,311

## ANTI-CARJACKING DEVICE TRIGGERED BY A SWITCH IN THE SEAT BELT LATCH

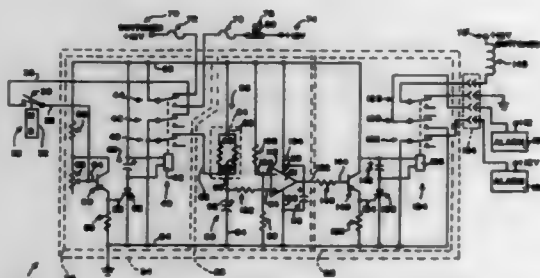
Donald W. Lane, Sr., 338 Joe Joyner Rd., Atoka, Tenn. 38004

Filed Feb. 5, 1993, Ser. No. 14,133

Int. Cl.<sup>6</sup> B60R 25/00

U.S. Cl. 340-426

5 Claims



1. An anti-carjacking circuit for disabling a motor vehicle's motor after the driver of the motor vehicle has been unwillingly forced to exit the motor vehicle, said motor vehicle including a driver's seat belt latch, said circuit being responsive to electrical power being applied to the motor vehicle's motor through normal operation of said motor vehicle and said circuit not requiring separate actuation of any alarm-enabling switch, said circuit comprising:

- (a) sensing means for sensing the exit of the driver from the motor vehicle, said sensing means comprising a seat belt switch means for sensing the opening of the seat belt latch;
- (b) latching memory means, responsive to said sensing

means, for recording the exit of the driver from the motor vehicle while the motor of the motor vehicle is powered;  
(c) delay means, responsive to said latching memory means and startable thereby, for indicating the passage of a predetermined period of time after the starting thereof; and  
(d) disabling means, responsive to the indication by the delay means of the passage of said predetermined period of time, for disabling the motor of the motor vehicle.

# 5,438,312

## ANTI-LOCKOUT SYSTEM

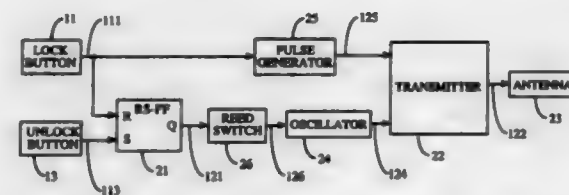
James Lewis, 615 W. Chilton St., Chandler, Ariz. 85224

Filed Apr. 19, 1994, Ser. No. 229,750

Int. Cl.<sup>6</sup> B60Q 1/00

U.S. Cl. 340-457

13 Claims



1. A method for preventing keys from being locked in a vehicle comprising:  
transmitting a first lock signal;  
transmitting a first oscillating unlock signal;  
receiving the first lock signal and outputting a second lock signal;  
locking at least one door of a vehicle when the second lock signal is received;  
receiving the first oscillating unlock signal and outputting a second oscillating unlock signal;  
inhibiting the second oscillating unlock signal when a driver's seat belt is buckled;  
inhibiting the second oscillating unlock signal when at least one door of the vehicle is open;  
sounding an audible warning when the second oscillating unlock signal is output;  
unlocking at least one door of the vehicle when the second oscillating unlock signal is output;  
whereby at least one door of a vehicle is unlocked and the audible warning is sounded when the seat belt is unbuckled and at least one door of the vehicle is closed.

# 5,438,313

## MOTORCYCLE SIGNALLER

Steven Henderson, 4071 Madison Ave., Montreal, Quebec, Canada H4B 2T8, and David Kernaghan, 2360 Beaconsfield, Montreal, Quebec, Canada H4A 2G8

Continuation-in-part of Ser. No. 863,686, Apr. 1, 1992, Pat. No. 5,264,826. This application Mar. 28, 1994, Ser. No. 219,292

Int. Cl.<sup>6</sup> B60Q 1/52

U.S. Cl. 340-471

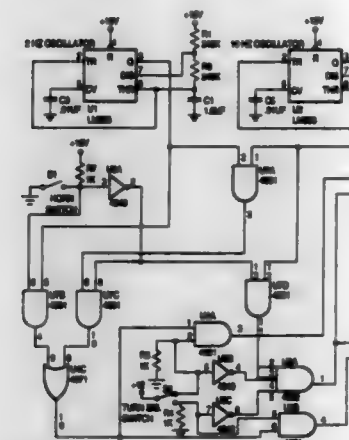
11 Claims

1. An emergency flasher circuit for use with a motorized vehicle having a horn switch and left and right turn indicator lights selectable by means of a turn indicator switch, said emergency flasher circuit comprising:

- a) means for generating a first signal having a frequency of approximately 2 Hz and a second signal having a frequency of approximately 10 Hz; and
- b) logic means connected to said horn switch, said turn signal switch and said means for generating, for operating said left and right turn indicator lights in accordance with the condition of said horn switch and said turn signal switch, wherein:  
i) in the event said horn switch is closed and neither of said turn indicator lights are selected then said second signal is applied to said left and right turn indicator lights for

causing said lights to flash at said frequency of approximately 10 Hz;

- ii) in the event said horn switch is open and one of said turn indicator lights is selected then said first signal is applied to said selected one of said left and right turn indicator lights for causing said selected one of said lights to flash at said frequency of approximately 2 Hz;



- iii) in the event said horn switch is closed and one of said turn indicator lights is selected then said first signal and said second signal are combined and applied to said selected one of said left and right turn indicator lights for causing said selected one of said lights to flash at said frequency of 10 Hz within an approximately 2 Hz envelope.

# 5,438,314

## VEHICLE TURN SIGNAL

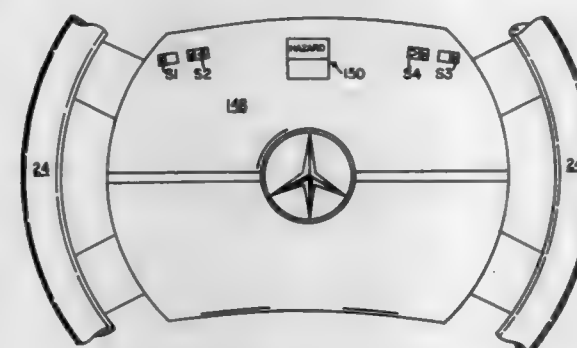
Harold A. Evans, 10 Merrymount Dr., Swampscott, Mass. 01907

Filed Mar. 31, 1993, Ser. No. 40,413

Int. Cl.<sup>6</sup> B60Q 1/40

U.S. Cl. 340-477

20 Claims



1. A directional indicator system for vehicles comprising:

- a flasher unit;
- left hand marker lamps;
- right hand marker lamps;
- a first timer interconnected between the left hand marker lamps and the flasher unit and a second timer interconnected between the right hand marker lamps and the flasher unit, each of the first timer and the second timer being individually operated by a switch and the first timer and second timer each operating for a first predetermined time when operated by the switch, the flasher unit causing one of the left hand marker lamps and the right hand marker lamps to flash when one of the first timer and the second timer, respectively, is operated; and
- a third timer and a fourth timer interconnected with each of the left hand marker lamps and the right hand marker lamps, respectively, the third timer and the fourth timer

operating for a second predetermined time that is longer than the first predetermined time.

# 5,438,315

## SECURITY ALARM SYSTEM

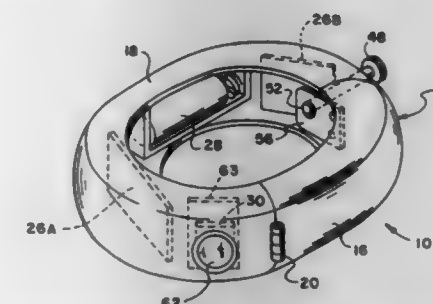
Ronald D. Nix, Rte. 1, Box 285K, Nevada, Tex. 75173

Continuation of Ser. No. 8,199, Jan. 25, 1993, abandoned. This application Sep. 23, 1994, Ser. No. 311,706

Int. Cl.<sup>6</sup> G08B 3/10

U.S. Cl. 340-539

1 Claim



1. A security alarm system comprising, in combination:

a bangle-type bracelet divided into first and second segments each having respective proximate end portions and means pivotally interconnecting the proximate end portions for permitting opening and closing of the bracelet segments, the bracelet segments having respective distal end portions, the bracelet further including security latching means having a threaded member movably coupled to the first bracelet segment, and means within the distal end portion of the second bracelet segment for receiving the threaded member along an axis extending transversely of the second bracelet segment;

the latching means including a fastening member having a threaded shaft and first receptacle means mounted in the distal end portion of one of the bracelet segments for threadably receiving the fastening member shaft, the latching means further comprising second receptacle means mounted in the distal end portion of the other bracelet segment, for receiving the threaded shaft of the fastening member;

a transmitting assembly enclosed within one of said segments, the transmitting assembly having a power supply, a transmitter, and switching means electrically connected between the power supply and the transmitter, the switching means having an actuating member spaced from the latching means;

the first bracelet segment being intersected by an access opening and the switch actuating member including a push button mounted within the first bracelet segment adjacent the switching means, the push button being recessed inwardly relative to the outer surface of the first bracelet segment and being aligned with the access opening;

a resilient mounting member disposed between the switch actuating member and the first bracelet segment for yieldably maintaining the push button flush against the first bracelet segment in an open circuit switch position so that it may be depressed through the access opening to a closed circuit switch position, thus making the push button inconspicuous and further enhancing the illusion that the bracelet is merely an ornamental item rather than a security device; and,

an alarm unit having an alarm device and a receiving system, responsive to signals emitted by the transmitting system for actuating the alarm device, and power supply means for powering the receiving system and the alarm device.



5,438,316

## FENCE ALARM SYSTEM WITH SWIVELING POSTS

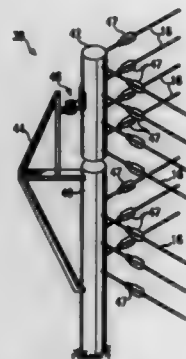
James V. Motzinger, Round Rock, and Michael P. Coppo, Austin, both of Tex., assignors to Detek Security Systems, Inc., Vestal, N.Y.

Filed Nov. 4, 1991, Ser. No. 787,046

Int. Cl.<sup>6</sup> G08B 13/00

U.S. Cl. 340—541

16 Claims



1. A fence alarm system comprising:  
a plurality of wires;  
force detection circuitry responsive to the application of a force to one or more of said wires; and  
a plurality of posts coupled to said wires, at least one of said posts having an associated rotating member for rotating in a plurality of planes coupled to at least two wires such that said rotating member is maintained in a predetermined position by said wires in the absence of an external force and is offset from said predetermined position in at least one of said plurality of planes responsive to an external force applied to the rotating member.

5,438,317

## GLASS BREAK DETECTION WITH NOISE RIDING FEATURE

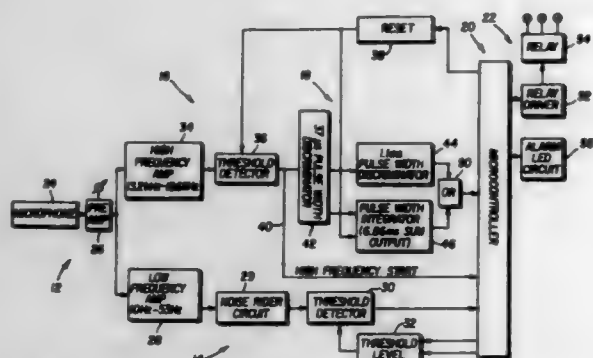
Richard L. McMaster, Rochester, N.Y., assignor to Detection Systems, Inc., Fairport, N.Y.

Filed Apr. 8, 1994, Ser. No. 225,117

Int. Cl.<sup>6</sup> G08B 13/04

U.S. Cl. 340—550

26 Claims



23. Apparatus for detecting glass breaking from an impact; said apparatus comprising:

- a wide-band transducer for converting sound and pressure waves, characteristic of glass flexing and shattering, into electrical signals;
- a low-frequency channel including a low frequency band-pass filter, a noise filter for nulling symmetrical low frequency signals from the band-pass filter, and a threshold detector for detecting signals from the noise filter characteristic of the glass flexing from the impact;
- a high-frequency channel including a high frequency band-pass filter and a threshold detector for detecting signals

from the transducer characteristic of a) sound from the impact and b) the glass breaking;

- a timing-signal generator monitoring said low and high frequency channels and responsive to the detection of said low and high frequency signals for determining first and second time intervals, said first time interval beginning with detection of the sound of the impact and continuing through the flexing and the shattering of the glass, the second time interval beginning after the flexing of the glass and continuing through the shattering of the glass;
- means for analyzing the detected high frequency signals based on a sum of pulse widths over said first time interval and individual pulse widths over said second time interval; and
- means for issuing an alarm signal only when said sum of pulse widths is less than a predetermined value indicative of the sound of the impact followed by the glass shattering, and the individual pulse widths, respectively, are less than a predetermined value indicative of the glass shattering.

5,438,318

## MOVEMENT DETECTOR FOR DETECTING MOVEMENT WITHIN A PREDETERMINED SPACE

Jack Latorre, Prades-le-Lez, and Gerald Espinadel, Nîmes, both of France, assignors to Electro-Univers-Diffusion, Saint Martin de Londres, France

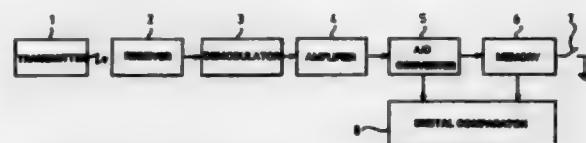
Continuation of Ser. No. 829,000, Jan. 31, 1992, abandoned. This application Apr. 21, 1994, Ser. No. 232,442

Claims priority, application France, Jun. 1, 1990, 90/07055

Int. Cl.<sup>6</sup> G08B 13/18, 29/20

U.S. Cl. 340—554

14 Claims



1. A device for detecting movement in an area, comprising:  
a transmitter which is operable for transmitting a signal into the area;

a receiver which is operable for receiving a signal from the area, said receiver being responsive to said transmitted signal, said receiver supplying an output signal in response to the received signal, said output signal being a function of movement within the area;

memory means including a memory for storing information representing a reference level of the receiver output signal indicative of a threshold level of detected motion in the area;

said memory means including a switch connected to said memory for being closed momentarily to cause said memory to store said reference level of the received signal and for being opened to cause said memory means to continuously supply said stored reference level as an output of said memory means; and

means for comparing the receiver output signal to the stored reference level and generating an output signal when the received signal exceeds the reference level;

wherein said switch is disposed for being operable by a user who is located in the area where movement is being detected, so as to permit the user to simultaneously make a threshold-level movement in the area and operate said switch, and thereby cause said reference level to be stored in said memory.

5,438,319

## GOLF CART CONTROL AND MONITORING APPARATUS

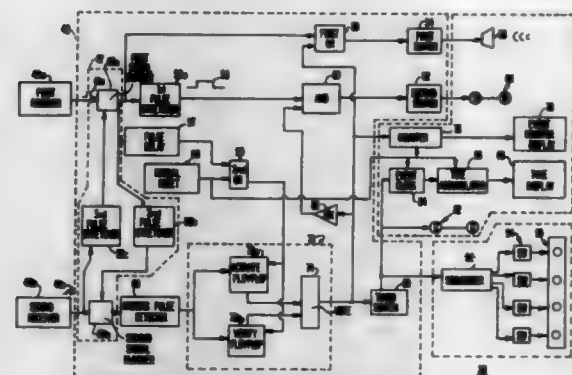
Douglas Zeytoonjian, Boston, Mass.; Frederick Zeytoonjian, Sr., Somers, Conn.; Harold Kramer, Pittsfield, and Paul Allen, North Adams, both of Mass., assignors to Cart Watch, Inc., Enfield, Conn.

Filed Jun. 24, 1993, Ser. No. 82,030

Int. Cl.<sup>6</sup> G08B 13/14

U.S. Cl. 340—571

79 Claims



1. A golf cart control and monitoring apparatus, comprising:  
first and second antennas spaced from each other, said first and second antennas each being disposed about at least one restricted area of a golf course, where said first antenna is disposed outside of said second antenna;

transmitter means for transmitting both a first electromagnetic signal from said first antenna and a second electromagnetic signal from said second antenna;

receiver means for both receiving said first and second electromagnetic signals and providing first and second outputs representative thereof;

first alarm means, responsive to said first output from said receiver means, for generating a first alarm indicating that a golf cart is approaching any one of the at least one restricted area;

second alarm means, responsive to said second output from said receiver means, for generating a second alarm indicating that the golf cart has entered any one of the at least one restricted area;

event log means, responsive to both said first and second outputs, for generating a cumulative historical log of how many times and for how long the golf cart has been located within any of the at least one restricted area, wherein said event log means, said receiver means, said first alarm means and said second alarm means are disposed on the golf cart.

5,438,320

## PERSONAL ALARM SYSTEM

William R. Taylor, Williamsburg, N.Y., assignor to Figgie International Inc., Willoughby, Ohio

Filed Apr. 9, 1993, Ser. No. 45,376

Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 340—573

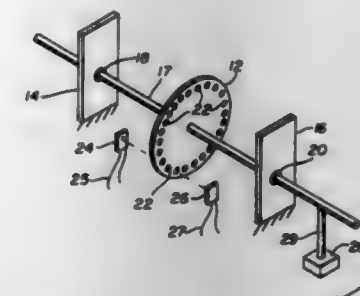
29 Claims

- 1. A motion sensor to be worn by a user and comprising:  
a housing having a hollow chamber therein;  
a rotatable disk mounted for free rotation in the hollow chamber about an axis;  
a plurality of spaced arcuately arranged orifices in the rotatable disk;

a weight within the housing coupled to the freely rotatable disk such that movement of the housing causes the weight to rotate the disk about said axis; and

a light source on one side of the disk in alignment with the arcuate path formed by the orifices in the disk and a light detector on the other side of the disk such that the light

from the light source to the light detector through an orifice is interrupted by rotation of the disk when the



housing is moved thereby causing the light detector to generate an output electrical signal.

5,438,321

## LOCATION SYSTEM

Hermanus A. Bernard, 734 Wiedrich Street; Francois D. Joubert, 489 Amy Street, both of Moreletapark, Pretoria Transvaal, and Robert D. Crook, 30 Francolin Street, Flamingo Park, Welkom Orange Free State, all of South Africa

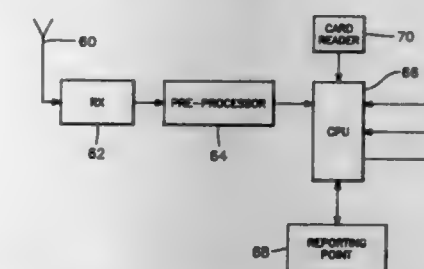
Filed Aug. 10, 1993, Ser. No. 103,774

Claims priority, application South Africa, Oct. 11, 1991, 91/8124; Oct. 12, 1992, 91/7827

Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 340—573

16 Claims



1. A location system comprising a plurality of portable identification modules, a plurality of identification stations, and a control station, each identification module comprising:

a transmitter; and

first processor means arranged to store an identification code and to enable the transmitter periodically to transmit an output signal including the identification code, with an interval between the transmission of successive output signals which varies from one transmission to the next;

each identification station comprising:

a receiver for receiving the transmitted identification code from each of the identification modules;

at least one second processor means adapted to identify valid identification codes received by the receiver and to output the identified codes; and

a communications interface arranged to transmit the identified codes to the control station together with an identification station code corresponding to the respective identification station;

the control station comprising:

third processor means for receiving codes from identification stations and generating a display signal according to the identification modules detected by respective identification stations; and

display means for providing a display indicating the positions of the identification modules,

wherein at least one of said plurality of identification stations serves as a reporting point and includes a battery charging circuit for charging an identification module and token reading means for reading data from a token identifying a





and then transfer the replaced valid capcode or capcodes to said decoder;  
said decoder comparing said demodulated address data with all of the transferred capcodes transferred by said controller to said decoder and generating a coincidence signal when said demodulated address data matches one of said transferred capcodes; and  
an executing circuit to receive said coincidence signal from said decoder to execute one of a plurality of services corresponding to said one of said transferred capcodes matched with said demodulated address data.

5,436,325

# CIRCUIT FOR MEASURING PULSE WIDTH OF REMOTE CONTROL SIGNAL

Sun-don Kwon, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

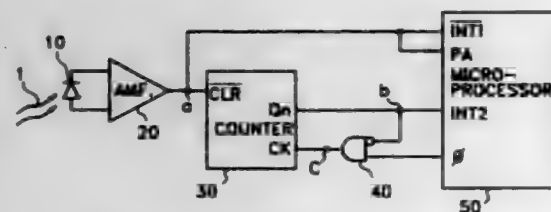
Filed Jul. 22, 1991, Ser. No. 335,930

Claims priority, application Rep. of Korea, Oct. 16, 1990, 90-16418

Int. Cl. G08C 19/00

U.S. Cl. 340-825.63

27 Claims



12. A method for measuring a waveform width of remote control signals, comprising the steps of:  
receiving remote control signals exhibiting at least one pulse having a period;  
generating clock pulses in response to provision of said remote control signals;  
making a first count of said clock pulses starting at a falling edge of each pulse of said remote control signals and generating an output when said first count reaches a first predetermined value corresponding to the sum of a pulse period and a selected delay value;  
making a second count of said clock pulses starting at said falling edge of a first pulse of said remote control signals and storing said second count in response to said output when said first count reaches said first predetermined value; and  
measuring a waveform width of said remote control signals upon termination of said first count of clock pulses by subtracting a second predetermined value corresponding to said selected delay value from said second count.

16. A method for measuring a pulse width of a signal, comprising the steps of:  
receiving a signal exhibiting at least a pulse having a period; providing a plurality of clock pulses;  
simultaneously making a first count and a second count of said clock pulses starting at a falling edge of said pulse of said signal;  
providing an output when a value of said first count reaches a first predetermined value, wherein said first predetermined value is set slightly longer than a pulse period of said signal by a selected delay value;  
making a determination of a value of said second count in response to said output when the value of said first count reaches said first predetermined value; and  
measuring the pulse width of said signal upon termination of said first count of said clock pulses by subtracting a second predetermined value from the value of said second count, wherein said second predetermined value corresponds to said selected delay value.

5,438,329

# DUPLEX BI-DIRECTIONAL MULTI-MODE REMOTE INSTRUMENT READING AND TELEMETRY SYSTEM

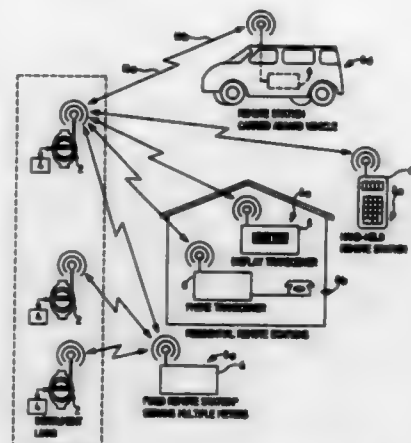
C. S. Gastounotis, Santa Barbara; Nuno Bandeira, Goleta, both of Calif.; Bruce E. Gray, Murrysville, and Scott H. Seehoffer, Unifontown, both of Pa., assignors to M & FC Holding Company, Inc., Wilmington, Del.

Filed Jun. 4, 1993, Ser. No. 72,241

Int. Cl. G08C 17/02

U.S. Cl. 340-870.02

22 Claims



1. A data collection system, comprising an interrogation apparatus and at least one instrument link, interconnected to a data gathering device located remote from said interrogation apparatus, said interrogation apparatus further including:  
an interrogation transmitter means for transmitting a radio frequency (RF) signal at a predetermined frequency to said at least one instrument link;  
an interrogation receiver means for receiving an informational message from said instrument link, said interrogation receiver means being tunable to any of a number of center frequencies which lie in a prespecified bandpass;  
frequency determining means, using said interrogation receiver means, for determining what center frequency, in the prespecified bandpass that an informational message from said instrument link should be transmitted on;  
interrogation signal determining means, responsive to said frequency determining means, for determining content of an interrogation message, said message to be transmitted by said interrogation transmitter means, wherein the interrogation message provides at least the center frequency for transmitting the informational message;  
tuning means for tuning said interrogation receiver means to the center frequency determined by said frequency determining means so that informational messages from said instrument link can be received; and  
informational message signal processing means, responsive to said interrogation receiver, for both processing the informational message received and providing an output representative of transmitted information; and  
wherein each said instrument link further includes:  
an instrument link receiver tuned to the predetermined frequency of the interrogation transmitter, said instrument link receiver providing an output representative of a transmitted interrogation message;  
interrogation signal processing means, responsive to said instrument link receiver, for processing the receiver output to determine at least what information is to be transmitted by each said instrument link and at what center frequency to transmit the informational message;  
instrument link transmission means for transmitting the informational message at the center frequency determined by said interrogation signal processing means, where said instrument link transmission means is tunable to any of the

center frequencies that lie in the prespecified bandpass; and  
informational message generating means, responsive to said interrogation signal processing means, for generating the informational message for transmission by said instrument link transmission means, wherein the informational message generated provides the information requested in the interrogation message.

5,438,330

# ABSOLUTE ENCODER

Yuji Yamazaki, Yokohama, and Koh Ohno, Zama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan  
Continuation of Ser. No. 965,430, Oct. 23, 1992, abandoned.

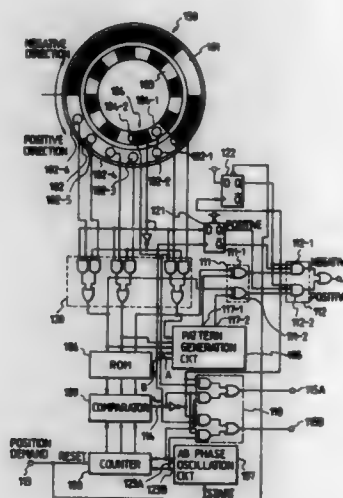
This application Nov. 23, 1994, Ser. No. 347,227

Claims priority, application Japan, Oct. 28, 1991, 3-280142; Oct. 28, 1991, 3-280143

Int. Cl. H03M 1/30

U.S. Cl. 341-11

13 Claims



1. An absolute encoder comprising:  
a code plate formed with an absolute pattern and an incremental pattern;  
first signal output means for detecting the absolute pattern by sequentially selecting the absolute pattern bit by bit, and outputting an absolute signal as serial data;  
second signal output means for detecting the incremental pattern, and outputting two signals having a 90°-phase difference therebetween;  
a pattern generation circuit for generating an electrical signal pattern equivalent to the absolute pattern;  
input means for inputting the absolute signal, obtained when a power supply is turned on or when a demand signal is input, to said pattern generation circuit as initial data; and  
instruction means for operating said pattern generation circuit in synchronism with the outputs from said second signal output means after the initial data is input to said pattern generation circuit.

5,438,331

# COMPUTER KEYBOARD WITH DIAL FOR ENTERING REPETITIVE DATA AND COMMANDS

Federico G. Gilligan, and Fernando D. Falcon, both of Laval 682, 1047 Buenos Aires, Argentina

Filed Jun. 11, 1993, Ser. No. 75,770

Claims priority, application Argentina, Aug. 21, 1992, 323028

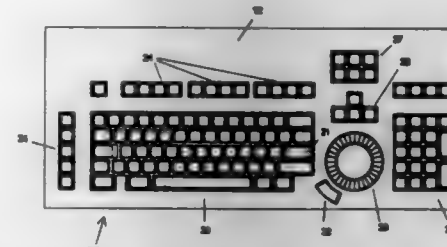
Int. Cl. H03M 11/08

U.S. Cl. 341-35

9 Claims

1. In a computer system comprising a keyboard including a plurality of keys mounted in a supporting frame, scanning means for sensing activation of said keys, processing means for generating commands and data units from status changes of

said keys as detected by said scanning means and communication means for transmitting said commands and said data units from said processing means; the improvement comprising a rotatable dial manually operable for production of sequences of repeated commands and data units, said dial being rotatably mounted in said supporting frame, having a center, a rotation axis passing through said center and an exposed operating surface and said dial being rotatable by contact of at least one



finger of an operator with said operating surface at a plurality of radial positions spaced from said center; rotational transducer means for generating an output signal according to an angular rotation speed of said dial in predetermined incremental angular units; means for generating said sequences of repeated commands and data units from said output signal and means for modifying said sequences of repeated commands and data units by activation of said keys when said dial is rotated by said operator.

5,438,332

# METHOD OF HARDENING TRANSMISSIONS, IN PARTICULAR BETWEEN A CONTROL STATION AND A TRANSPONDER, AND A DEVICE IMPLEMENTING THE METHOD

Daniel Adam, Vitry S/Seine; André Bech, Vernouillet; Alain Desmoucelles, Savigny Sur Orge, and Denis Vallier, Verrieres Le Buisson, all of France, assignors to Thomson-CSF, Puteaux, France

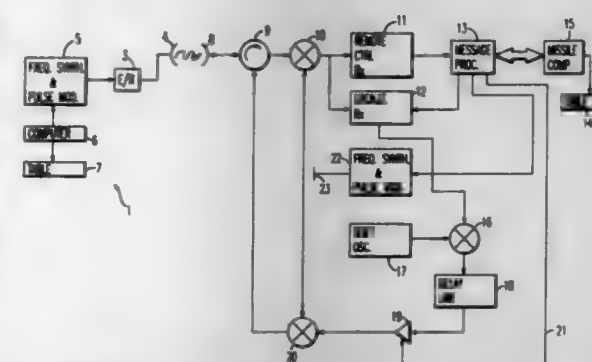
Continuation of Ser. No. 22,269, Feb. 25, 1993, abandoned. This application Jun. 28, 1994, Ser. No. 266,788

Claims priority, application Japan, Feb. 28, 1992, 4-02362

Int. Cl. G01S 13/79

U.S. Cl. 342-45

44 Claims



1. A method for frequency hopping communication, comprising the steps of:  
transmitting, a frequency hopping first signal which includes pulses, from a first station to a second station;  
transmitting a frequency hopping second signal from the first station to the second station, at a predetermined period of time after the transmission of the first signal, the second signal having at least one of the following communication parameters including a number of pulses, a pulse width, and a timing of pulses, which is different from the first signal, wherein said at least one of the communication parameters is changed using a table in the first station, and

a changing of the communication parameters is performed in response to a jamming of said first signal; receiving the second signal by the second station using a second table in the second station which indicates how said at least one of the communication parameters has been changed.

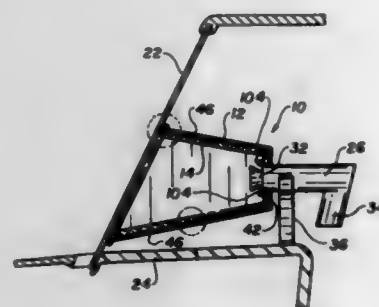
5,438,333

## ELECTROMAGNETIC RADIATION ABSORBING SHROUD

Robert W. Perkins, Amesbury, Mass., and Todd J. Durant, Kingston, N.H., assignors to ARC Technologies, Inc., Amesbury, Mass.

Filed Jul. 28, 1994, Ser. No. 282,532  
Int. Cl.<sup>6</sup> H01Q 17/00

U.S. Cl. 342-4



4. A radar absorbing apparatus for absorbing radiation emitted from an electromagnetic radiation generating device mounted within an automotive vehicle, said apparatus comprising: a rigid housing having a closed end and an open end defining an inner cavity and an inner surface of said housing, said open end formed to have a peripheral edge dimensioned to mate to an interior surface of the vehicle's window, said housing having electromagnetically reflective properties; an electromagnetically absorbing layer disposed on the inner surface of said housing; and, an aperture through said closed end of said housing communicating with said cavity, said aperture dimensioned to receive an operative end of said electromagnetic radiation generating device.

5,438,334

## RAINFALL DETECTION

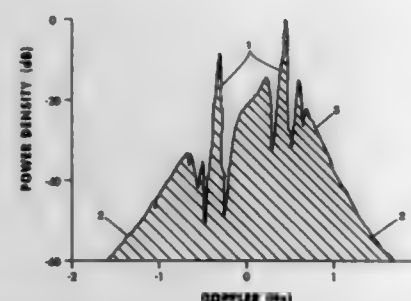
Stuart J. Anderson, Adelaide, Australia, assignor to The Commonwealth of Australia, Canberra, Australia  
PCT No. PCT/AU92/00357, § 371 Date Jan. 5, 1994, § 102(e) Date Jan. 5, 1994, PCT Pub. No. WO93/02370, PCT Pub. Date Feb. 4, 1993

PCT Filed Jul. 17, 1992, Ser. No. 175,344

Claims priority, application Austria, Jul. 18, 1991, PK 7275  
Int. Cl.<sup>6</sup> G01S 13/95

U.S. Cl. 342-26

13 Claims



1. A method of remotely detecting the presence of rainfall at a remote location from high frequency radar spectral information including the steps of:

transmitting a plurality of signals to the remote location; recording signals scattered from the remote location; generating a family of Doppler clutter spectra from the recorded scattered signals; and analyzing the Doppler clutter spectra in terms of at least one model to detect the presence of rainfall at the remote location.

5,438,335

## RESPONDER UNIT FOR TRANSPONDER ARRANGEMENT

Josef H. Schuermann, Oberhummel; Guenter Heinecke, Langenbach, and Rudolf Kremer, Wartenberg, all of Germany, assignors to Texas Instruments Deutschland, GmbH, Germany

Division of Ser. No. 964,574, Oct. 21, 1992, abandoned, which is a continuation of Ser. No. 742,134, Aug. 8, 1991, abandoned, which is a division of Ser. No. 655,182, Feb. 13, 1991, Pat. No. 5,053,774, which is a continuation of Ser. No. 216,756, Jul. 8, 1988, abandoned. This application Jun. 21, 1994, Ser. No. 263,300

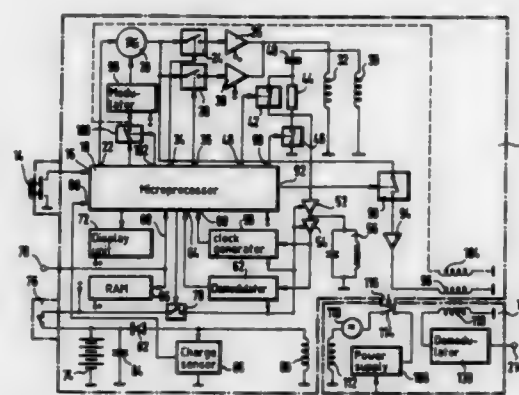
Claims priority, application European Pat. Off., Jul. 31, 1987, 87111110

The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> G01S 13/75

U.S. Cl. 342-51

9 Claims



1. A responder unit for communicating with an interrogator unit which sends an RF interrogation pulse thereto, said responder unit comprising:

- a) an energy accumulator which stores the energy contained in said RF interrogation pulse;
- b) a responder unit memory for storing read data;
- c) a RF threshold detector for detecting termination of said RF interrogation pulse;
- d) a responder unit RF carrier wave generator under control of said RF threshold detector and operable to activate upon said detection of said termination of said RF interrogation pulse; and
- e) a responder unit modulator to modulate the RF carrier with said read data from said responder unit memory.

5,438,336

## FOCAL PLANE IMAGING ARRAY WITH INTERNAL CALIBRATION SOURCE

Paul S. C. Lee, La Palma; Pei-Ming D. Chow, Los Angeles; John J. Berenz, San Pedro; Jay S. Pearlman, Rancho Palos Verdes, and Wayne W. Lam, Manhattan Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 12, 1993, Ser. No. 151,713

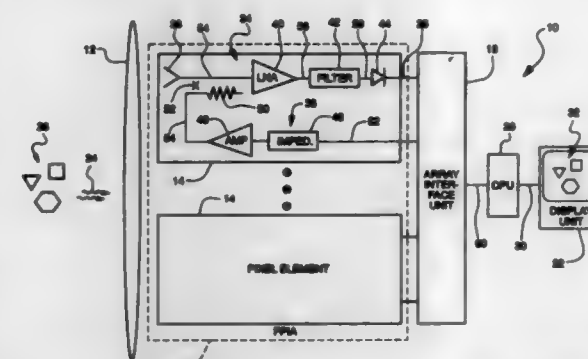
Int. Cl.<sup>6</sup> G01S 7/40

U.S. Cl. 342-174

16 Claims

1. An energy detecting pixel element for use in a focal plane imaging array for a direct detection imaging device, said pixel element comprising a detection circuit for receiving and de-

tecting radiant electromagnetic energy at microwave and millimeter-wave frequencies, a calibration circuit for calibrating said pixel element, said calibration circuit being electronically coupled to said detection circuit by a directional coupler, said directional coupler being operable to enable a known



portion of a calibration signal to be introduced into said detection circuit from said calibration circuit, and wherein said detection circuit, said calibration circuit and said directional coupler are monolithically integrated onto a single computer chip.

5,438,337

## NAVIGATION SYSTEM USING RE-TRANSMITTED GPS

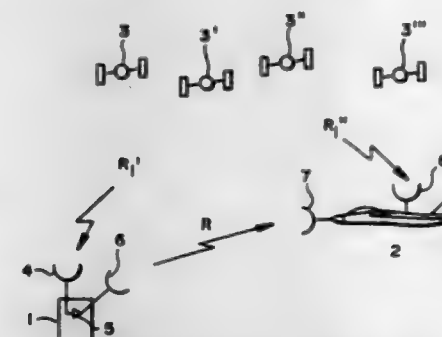
Morton M. Aguado, New York, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Sep. 24, 1993, Ser. No. 127,039

Int. Cl.<sup>6</sup> G81S 5/02; H04B 7/185

U.S. Cl. 342-357

45 Claims



25. In a method of determining positions of a first unit relative to a second unit of the type which includes the step of receiving signals from a plurality of satellites deployed at spaced intervals within one or more geostationary orbits, the improvement comprising the steps of retransmitting the signals in their entirety, without delay, from said satellites to the second unit; receiving at the second unit directly from said satellites and simultaneously receiving the signals retransmitted from the first unit; and performing a real time sample-by-sample comparison of the directly received and retransmitted signals in order to extract information, without input of additional position data, concerning the relative positions of the first and second units.

5,438,338

## GLASS MOUNTED ANTENNA

Kevin Thill, 7403 Fifth Ave., Kenosha, Wis. 53143

Filed Jul. 29, 1994, Ser. No. 283,086

Int. Cl.<sup>6</sup> H01Q 1/38, 1/32

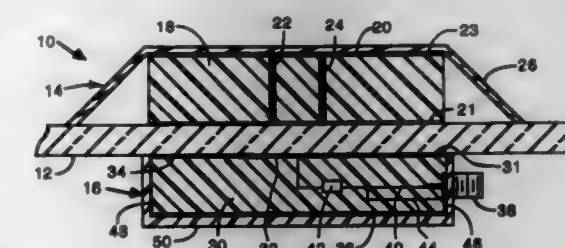
U.S. Cl. 343-700 MS

10 Claims

1. An antenna for mounting on a piece of glass, said antenna comprising:

a first element for attaching to one side of the piece of glass

and including a first substrate of a dielectric material having two major surfaces, a first conductive layer on one major surface of said first substrate, a second conductive layer on another major surface of said first substrate, and a plurality of tuning posts extending through said first substrate with each tuning post electrically connected to said first and second conductive layers; and a second element for attaching to another side of the piece of glass and opposite to said first element, said second element including a second substrate of a dielectric material



having two major surfaces with an edge surface therebetween which edge surface defines a perimeter of the second substrate, a first electrode centrally located on one major surface of said second substrate, a second electrode having an annular shape and located on the one major surface of said second substrate extending around said first electrode, a third electrode on another major surface of said second substrate, a shunt connected between the second and third electrodes, and a coupling to apply an excitation signal between said first electrode and said third electrode.

5,438,339

## ANTENNA FOR A RADIO COMMUNICATION APPARATUS

Ryoh Itoh, Yukio Yokoyama, and Takao Ono, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

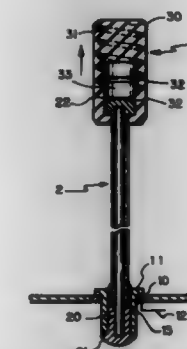
Filed Feb. 24, 1994, Ser. No. 201,338

Claims priority, application Japan, Feb. 26, 1993, 5-037689

Int. Cl.<sup>6</sup> H01Q 1/24

U.S. Cl. 343-702

10 Claims



1. An antenna for a radio communication apparatus, comprising:

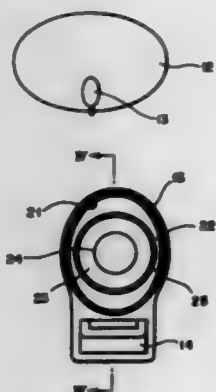
a first whip antenna having a first portion retractable into a casing of said apparatus and a second portion constantly positioned externally of said casing; and a second whip antenna having a coil element in the form of a loading coil having a predetermined number of turns, said second whip antenna being coaxially provided on an upper end of said first whip antenna and slidable relative to and in an axial direction of said first whip antenna such that said second portion of said first whip antenna is movable between a position where one end of said coil element is disengaged from one end of said second portion and a position where one end of said coil element is engaged with one end of said second portion.



position where said one end of said coil element is engaged with said one end of said second portion.

5,438,340

**ELLIPTICAL FEEDHORN AND PARABOLIC REFLECTOR WITH PERPENDICULAR MAJOR AXES**  
Keiji Fukazawa, Chiba, and Yoshikazu Yoshida, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
Continuation of Ser. No. 897,473, Jun. 12, 1992, abandoned.  
This application Jun. 2, 1994, Ser. No. 252,976  
Int. Cl.<sup>6</sup> H01Q 13/02, 19/13  
U.S. Cl. 343—781 R 8 Claims



1. A parabolic-reflector antenna comprising:
  - a support column;
  - a parabolic reflector mounted on said support column and having an elliptical shape with a horizontal major axis;
  - a polarization converter mounted on said support column including a primary horn mounted in an opposing relationship with respect to said parabolic reflector for receiving radio waves reflected by said parabolic reflector, said primary horn comprising a first hollow portion having:
    - an elliptical cross section with a vertical major axis perpendicular to the horizontal major axis of said parabolic reflector at a first end of said first hollow portion for discriminating between cross polarized waves;
    - a circular cross section of a first diameter at an opposite second end of said first hollow portion; and
    - a first inner surface which is progressively tapered from said first end of said first hollow portion to said opposite second end of said first hollow portion;
  - converting means mounted coaxially with respect to said first hollow portion of said primary horn for converting a circularly polarized radio wave into a linearly polarized radio wave; and
  - a waveguide connected to said converting means for guiding said linearly polarized radio wave converted by said converting means to a selected location.

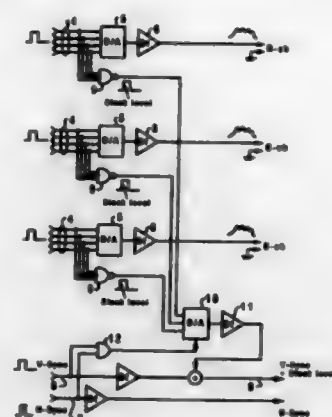
5,438,341

# MONITOR INTERFACE ARCHITECTURE FOR BLACK LEVEL TRANSFER

Masaki Kobayashi, Yamazaki, Rieko Kataoka, and Masahiro Naitoh, both of Kanagawa, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Jul. 28, 1994, Ser. No. 281,900  
Claims priority, application Japan, Jul. 30, 1993, 5-189682  
Int. Cl.<sup>6</sup> G09G 1/14, 5/10  
U.S. Cl. 345—20 6 Claims

1. A display device controller connected to a display device with RGB color signal lines, horizontal and vertical synchronous signal lines, comprising:
  - a means for taking out a black level signal from at least one of said RGB color signal lines, each said color signal

consisting of an N bit digital signal, said black level signal being defined as a predetermined N bit pattern; and



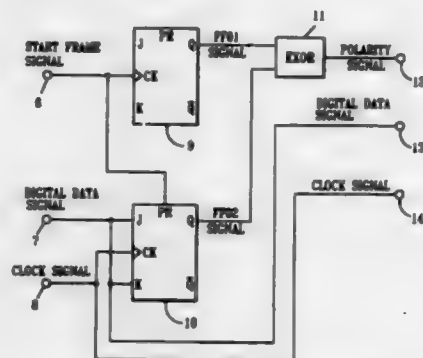
a means for adding said black level signal being taken out to at least one of said horizontal and vertical synchronous signal lines.

5,438,342

# LIQUID CRYSTAL DISPLAY APPARATUS AND METHOD AND APPARATUS FOR DRIVING SAME

Hidefumi Yamaguchi, Fujisawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed May 15, 1992, Ser. No. 883,090  
Claims priority, application Japan, May 15, 1991, 3-138666  
Int. Cl.<sup>6</sup> G09G 3/30 19 Claims

U.S. Cl. 345—58



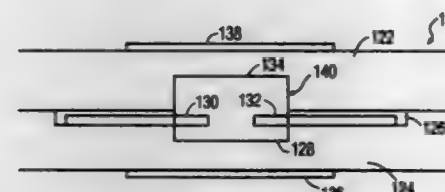
8. A liquid crystal display apparatus comprising:
    - a plurality of scan lines;
    - a plurality of data lines;
    - a plurality of pixels arranged in a matrix at intersections of said scan lines and said data lines;
    - a data driver for receiving a digital data signal representing successive pixel states each by a predetermined number of bits and for outputting a data signal to said data lines to drive said pixels, said data driver providing data signals of alternating polarity to said data lines in accordance with a polarity signal, said polarity signal having a polarity value representing one of two different polarity states for each of said successive pixel states; and
    - means for creating said polarity signal so as to change said polarity value each time a predetermined one of said number of bits representing a successive pixel state has a predetermined value,
- whereby the polarity of the data signals outputted to said data lines is inverted for each occurrence of a pixel state in which said predetermined one of said number of bits representing said pixel state has said predetermined value.

5,438,343

# GAS DISCHARGE DISPLAYS AND METHODOLOGY FOR FABRICATING SAME BY MICROMACHINING TECHNOLOGY

Babar A. Khan, Ossining, David A. Cammack, Scarborough; Ronald D. Pinker, Peekskill, and Jerry M. Kramer, Yorktown Heights, all of N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.  
Continuation-in-part of Ser. No. 922,707, Jul. 28, 1992, abandoned. This application Dec. 30, 1993, Ser. No. 177,089  
Int. Cl.<sup>6</sup> H01J 61/33 12 Claims

U.S. Cl. 313—493



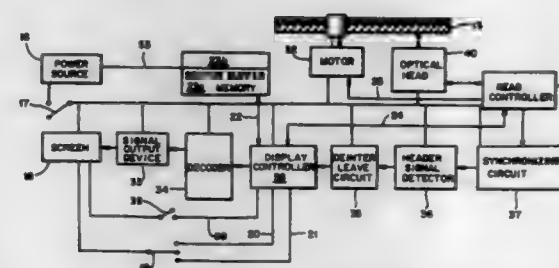
1. A gas discharge display having first and second substrates of material capable of withstanding heat and pressure; a plurality of cavities disposed in at least one of said first and second substrates; a series of first electrodes disposed on at least one of said first and second substrates, at least one of said first electrodes having a portion extending into one or more of said cavities, a series of second electrodes disposed on at least one of said first and second substrates, at least one of said second electrodes having a portion extending into one or more of said cavities, each of said cavities having a first and a second electrodes disposed therein; luminescent gas discharge material disposed in said cavity; said first and second substrates being wafer bonded together such that said substrates are joined together at all points of contact.

5,438,344

# PORTABLE VIDEO BOOK

Anthony Oliva, 56-16 108th St., Corona, N.Y. 11368  
Continuation-in-part of Ser. No. 64,734, May 19, 1993, abandoned, which is a continuation of Ser. No. 610,365, Nov. 5, 1990, abandoned. This application Apr. 19, 1994, Ser. No. 229,580  
Int. Cl.<sup>6</sup> G09G 3/02 1 Claim

U.S. Cl. 345—185



1. A portable video book for displaying information stored on a CD ROM disc carried within said portable video book, the CD ROM disc being stored within a cartridge comprising:
  - (a) a housing having an interior space, an exterior and recessed access door for inserting the cartridge and the CD ROM disc contained therein, into said housing surface;
  - (b) first circuit means disposed within said interior space, including:
    - (i) an optical head for optically reading a signal from said disc;
    - (ii) a read controller for demodulating said signal; and
    - (iii) a deinterleave circuit for deinterleaving said signal into an information component and an address component;
  - (c) second circuit means connected to said first circuit means

including a display controller and a sector buffer memory for storing said components said sector buffer memory comprising temporary sector buffer memory and permanent sector buffer memory;

- (d) third circuit means connected to second circuit means, for error-detecting and correcting said information component;
- (e) a liquid crystal video screen connected to said third circuit means, placed on said exterior surface of said housing, which displays said information component; and
- (f) a mechanical page advance rocker switch mounted on said exterior surface of said housing adjacent to said video screen and directly connected to said display controller for displaying another screen by directly signaling said display controller for an additional screen, said display controller selectively
  - (i) displaying an additional screen from said temporary sector buffer memory, thus saving energy required to operate said first circuit means, to optically read a signal from said disc, demodulate said signal and deinterleave said signal; and
  - (ii) directing said read controller to read a new signal from said disc, demodulate said signal, deinterleave said signal into an information component and an address component and store said information component comprising several screens in said temporary sector buffer memory for transmitting to said video screen; and
- (g) a momentary reference control switch mounted on said exterior surface of said housing adjacent said mechanical page advance rocker switch and connected to said display controller to direct said display controller to permanently store reference data from the CD disc in said permanent sector buffer memory until the CD ROM disc is removed from the portable video book, said momentary reference control switch thereafter directing said display controller to display the permanently stored reference data from said permanent sector buffer memory on said video screen.

5,438,345

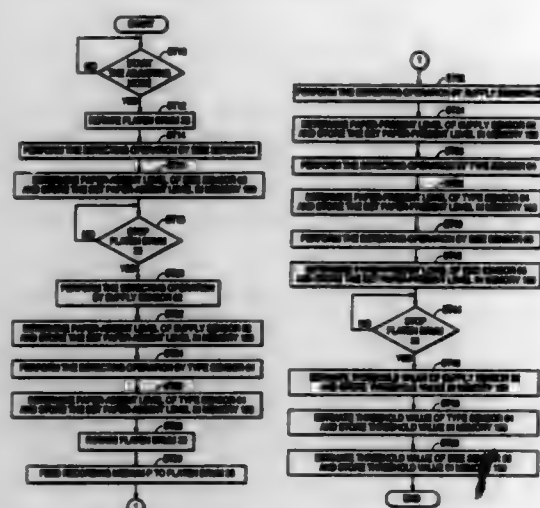
# IMAGE FORMING APPARATUS FOR FORMING AN IMAGE ON A RECORDING MEDIUM WHICH CAN AUTOMATICALLY ADJUST OUTPUT LEVELS FROM A RECORDING MEDIUM SENSOR

Kawano Hisaki, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Filed Jul. 7, 1992, Ser. No. 909,661  
Claims priority, application Japan, Jul. 9, 1991, 3-168248  
Int. Cl.<sup>6</sup> B41J 2/325 14 Claims

U.S. Cl. 347—218

7. An image forming apparatus for forming an image on a recording medium, comprising:
  - means for feeding the recording medium;
  - means for forming an image on the recording medium fed by said feeding means;
  - means for detecting the recording medium fed by said feeding means;
  - control means for controlling said detecting means, said control means including first means for operating said detecting means so as to detect a first output level of said detecting means when the recording medium is not fed and second means for operating said detecting means so as

to detect a second output level of said detecting means when the recording medium is fed; and



means for automatically determining a threshold value of said detecting means in accordance with detected first and second output levels.

5,438,346

# COMPATIBLE THERMAL HEAD HAVING STROBE SIGNAL CONVERTING MEMBER

Hisayoshi Fujimoto, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

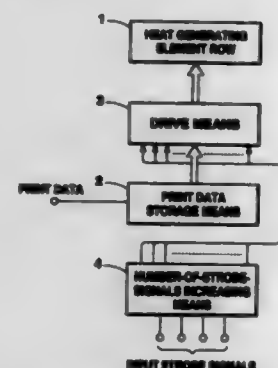
Filed Mar. 3, 1993, Ser. No. 25,647

Claims priority, application Japan, Mar. 4, 1992, 4-047145

Int. Cl.<sup>6</sup> B61J 2/35, 2/355

U.S. Cl. 347-211

7 Claims



1. A compatible thermal head comprising:
  - a plurality of heat generating elements arranged in a row on a substrate;
  - a plurality of drive means, selectively coupled to said plurality of heat generating elements, for driving a corresponding at least one of said plurality of heat generating elements, a quantity of said plurality of drive means being less than a quantity of said plurality of heat generating elements;
  - strobe signal input means for receiving as input a plurality of external strobe signals; and
  - number-of-strobe-signals converting means, integral to said thermal head and coupled to said strobe signal input means, for converting the plurality of external strobe signals received by said strobe signal input means into a plurality of internal strobe signals, a quantity of the internal strobe signals being greater than a quantity of the external strobe signals, and
  - wherein said number-of-strobe-signals converting means supplies the plurality of internal strobe signals to corre-

sponding ones of said plurality of drive means to cause said plurality of drive means to drive said corresponding at least one heat generating element in accordance with the internal strobe signal.

5,438,347

# MASTER MAKING DEVICE FOR A STENCIL PRINTER

Kamichika Shishido, and Hidetoshi Aizawa, both of Shibata, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

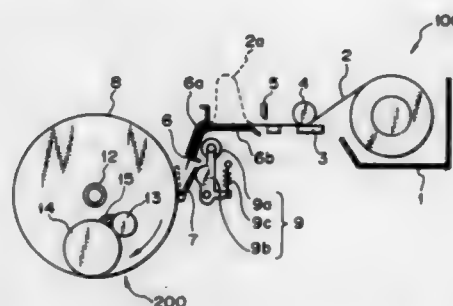
Filed May 19, 1993, Ser. No. 63,609

Claims priority, application Japan, May 19, 1992, 4-126318; May 19, 1992, 4-126320; Feb. 16, 1993, 5-026949

Int. Cl.<sup>6</sup> B41J 2/325

U.S. Cl. 347-218

6 Claims



1. A master making device for a stencil printer which is capable of transporting a web toward a master clasper openably provided on a print drum, said device comprising:
  - a receptacle for accommodating the web in the form of a roll;
  - a thermal head for cutting the web paid out from said receptacle to thereby form a document image in said web;
  - a platen roller rotatable while pressing the web against a surface of said thermal head, and transporting said web toward the print drum while pulling said web out of said receptacle;
  - a cutter for cutting the web pulled out of said receptacle by said platen roller at a predetermined length;
  - a guide plate defining a passageway for transporting a leading edge of the web transported by said platen roller toward the master clasper; and
  - a tension member for unblocking said passageway when the master clasper is opened while facing a clamp position for clamping the leading edge of the web, or blocking said passageway in contact with said web when said master clasper is closed to clamp said leading edge of said web and the print drum is rotated for wrapping said web around said print drum, said tension member applying, when blocking said passageway, a tension to said web while causing said web to form a slack at a position downstream of said platen roller;

wherein said tension member is operated by opening and closing movements of the master clasper to block or unblock said passageway.

5,438,348

# THERMAL TRANSFER PRINTING METHOD AND INTERMEDIATE SHEETS THEREFOR

Akihiro Imai, Ikoma; Yasuo Fukui, Kadoma, and Nobuyoshi Taguchi, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 725,669, Jul. 3, 1991, Pat. No. 5,332,459.

This application May 4, 1994, Ser. No. 237,877

Claims priority, application Japan, Jul. 4, 1990, 2-176720; Oct. 30, 1990, 2-293839

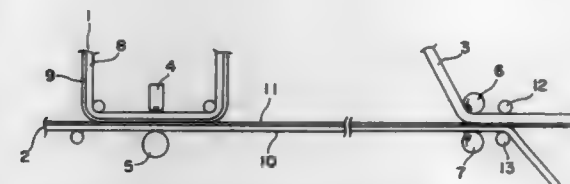
Int. Cl.<sup>6</sup> B41J 2/235; B41M 5/26

U.S. Cl. 346-135.1

25 Claims

1. An intermediate sheet for a thermal transfer printing process comprising heating a thermal ink film with a printing

head to print dye transferring images onto an intermediate sheet which comprises a substrate and a printing layer thereon, heaping an image receive sheet on said printing layer, and transferring said printing layer onto said image receive sheet



by pressure or heat; wherein said intermediate sheet comprises a substrate and a printing layer of polyvinyl acetal having an acetalization degree of 50 mol % or more formed on said substrate.

5,438,349

# THERMAL PRINTER LABEL GAP SENSOR AND METHOD FOR CONTROLLING SAME

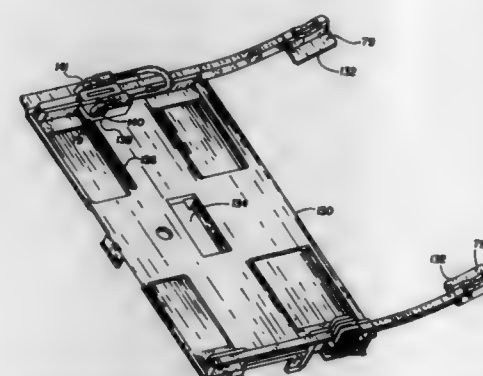
Duane M. Fox, Snohomish, and Joel A. Schoen, Redmond, both of Wash., assignors to Intermec Corporation, Everett, Wash.

Filed May 22, 1992, Ser. No. 888,044

Int. Cl.<sup>6</sup> B41J 15/04, 15/06

U.S. Cl. 346-136

46 Claims



26. A thermal printer which detects an edge of a print media carried by a continuous length of light transmissive backing material in longitudinally spaced-apart positions along the continuous length of the backing material as the backing material travels along a print path, the edge extending generally transverse to the print path, the apparatus comprising:
  - a printer housing having a print head and the print path therein;
  - a light source positioned along the print path producing a light on one side of the backing material which illuminates the backing material as it travels by the light source, the light source producing light of sufficient intensity to pass through the backing material and the print media carried by the backing material;
  - a light sensor positioned along the print path to a side of the backing material opposite the light source at a position to receive light from the light source passing through the backing material, the light sensor detecting variations in the received light as the backing material carries the print media along the print path and the edge of the print media past the light sensor, based upon whether the received light has passed through only the backing material or has passed through both the backing material and the print media carried by the backing material, the light sensor generating an analog indicator signal indicating passage of the edge by the light sensor; and
  - a converter with a controllable gain, the converter converting the analog indicator signal to a digital signal.

5,438,350

# METHOD OF OPERATING MULTI-CHANNEL ARRAY DROPLET DEPOSITION APPARATUS

Nicholas J. Kerry, Cambridge, Great Britain, assignor to XAAR Limited, Cambridge, United Kingdom

PCT No. PCT/GB91/01784, § 371 Date Jun. 10, 1993, § 102(e)

Date Jun. 10, 1993, PCT Pub. No. WO92/06848, PCT Pub.

Date Apr. 30, 1992

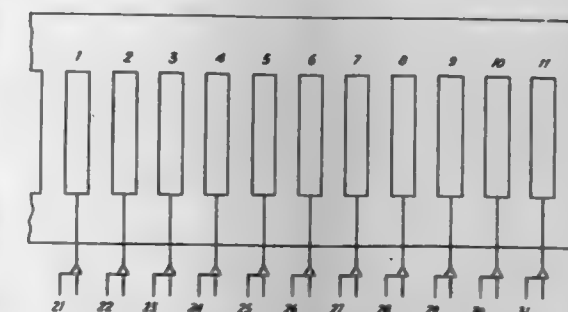
PCT Filed Oct. 14, 1991, Ser. No. 39,365

Claims priority, application United Kingdom, Oct. 18, 1990, 9022662

Int. Cl.<sup>6</sup> B41J 2/045

U.S. Cl. 347-12

33 Claims



1. A method of operating a multi-channel array pulsed droplet deposition apparatus comprising an array of parallel channels, channel walls each separating one channel of the array from an adjacent channel in the array, the channel walls having a wall compliance, respective nozzles communicating with said channels for ejection of droplets of liquid from the channels, droplet liquid supply means connected with the channels for the supply to the channels of droplet liquid having a liquid compliance, and electrically actuatable means located in relation to said channels for imparting energy pulses to droplet liquid in the channels so that droplets are ejected from the nozzles of selected ones of the channels, the method comprising the steps of applying through said electrically actuatable means energy pulses of a first amplitude to the droplet liquid in selected ones of the channels of the array and applying through said electrically actuatable means energy pulse of a second amplitude to the liquid in at least some others of the channels in the array, said first amplitude and said second amplitude being dependant upon a ratio of said wall compliance and said liquid compliance, to produce a pressure distribution in the channels of the array which effects droplet ejection from only said selected channels and is substantially free from pressure crosstalk between said selected channels or between said selected channels and other channels of the array.

5,438,351

# VACUUM PRIMING DIAGNOSTIC CARTRIDGE

Thomas J. Trenchard, Macedon; Lonnie J. Pollocks, Jr., and Donald P. Curran, Jr., both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 27, 1993, Ser. No. 67,921

Int. Cl.<sup>6</sup> G01d 21/00; B41J 2/01

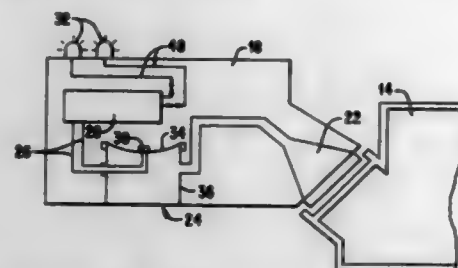
U.S. Cl. 347-19

12 Claims

6. A method for diagnosing vacuum level in a maintenance station of an ink jet printer, comprising the steps of:
  - (a) removing a standard ink jet printhead cartridge from a mounting fixture of the printer;
  - (b) installing a diagnostic cartridge in the printer mounting fixture in place of the ink jet printhead cartridge, said diagnostic cartridge comprising a manifold communicable with a source of vacuum within the maintenance station, a detector responsive to vacuum levels present in the manifold, a driver circuit responsive to the detector for outputting an output signal, and an indicator responsive to the output signal for indicating detected vacuum level;



- (c) activating a priming operation of the maintenance station;  
 (d) detecting a vacuum level value of the maintenance station by the detector within the cartridge; and  
 (e) outputting a signal to the indicator which indicates detected vacuum level.



**5,438,351**  
**METHOD OF AND APPARATUS FOR RECORDING AN IMAGE IN A FIRST DIRECTION WHILE THE RECORDING MEANS IS BEING RELATIVELY MOVED AND THE IMAGES BEING DISPERSED IN A SECOND DIRECTION WHICH IS SUBSTANTIALLY PARALLEL TO THE FIRST DIRECTION**

Toshitaka Agano, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

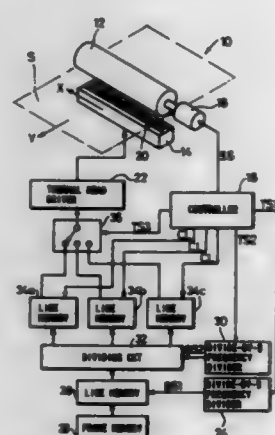
Filed Aug. 2, 1994, Ser. No. 285,034

Claims priority, application Japan, Aug. 2, 1993, 5-191317

Int. Cl.<sup>6</sup> B41J 2/35

U.S. Cl. 347-183

14 Claims



7. An image recording apparatus comprising:  
 image recording means for recording an image in a first one-dimensional direction on a recording medium;  
 moving means for moving either said recording medium or said image recording means in a second direction substantially perpendicular to said first one-dimensional direction;  
 image data dividing means for dividing image data of pixels of the image into a plurality of substantially equal sets of image data;  
 divided image data memory means for storing the divided sets of image data;  
 image data selecting means for selecting image data stored in said divided image data memory means depending on a recording position in said second direction; and  
 means for supplying the image data selected by said image data selecting means to said image recording means to record the image on the recording medium.

**5,438,353**  
**CLOCK SIGNAL GENERATOR FOR ELECTROPHOTOGRAPHIC PRINTERS**

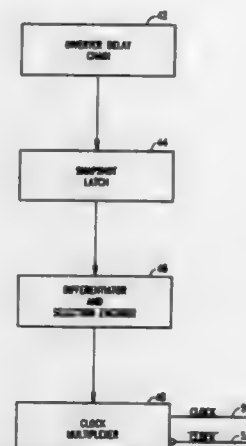
Robert D. Morrison, Star, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 2, 1992, Ser. No. 969,913

Int. Cl.<sup>6</sup> G01D 9/42

U.S. Cl. 347-250

5 Claims



2. A clock generator for producing CLOCK and CLOCK bi-phase output timing signals for use in controlling video data in an electrophotographic printer including, in combination:  
 a. a chain of serially connected inverters for receiving an input clock signal and generating a plurality of variably delayed clock signals,  
 b. a snapshot latch stage having a plurality of bistable flip flops therein, each of which are connected to receive a beam detect signal and a different variably delayed clock signal from one of said inverters,  
 c. a differentiator stage connected to said flip flops in said snapshot latch stage and operative to generate output signals indicative of the phase of said beam detect signal, and  
 d. an output multiplexer stage connected to said differentiator stage and operative for comparing said output signals with a selected one of said variably delayed clock signals in said chain of serially connected inverters and generating said bi-phase clock signals, whereby said selected one clock signal is closest in phase to the phase of said beam detect signal.

**5,438,354**  
**START-OF-SCAN AND END-OF-SCAN OPTICAL ELEMENT FOR A RASTER OUTPUT SCANNER IN AN ELECTROPHOTOGRAPHIC PRINTER**

Frank C. Genovese, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

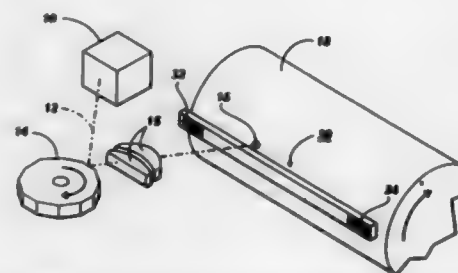
Continuation of Ser. No. 850,737, Mar. 13, 1992, abandoned.

This application Apr. 12, 1994, Ser. No. 226,426

Int. Cl.<sup>6</sup> B41J 2/435

U.S. Cl. 347-256

13 Claims



1. An optical element for the selective transmission there-

through of a light beam movable along a scan path generally transverse to the direction of the beam, the scan path having two endpoints, comprising:

- a member elongated along the scan path; and  
 a plurality of optical patterns defined along portions of the member in areas including each endpoint of the scan path, each optical pattern including at least one surface for the non-transmission of light therethrough, each optical pattern adapted to create a predetermined optical effect in response to a light beam moving along the scan path through the optical pattern,  
 the member allowing complete transmission of the light beam therethrough along the scan path between the optical patterns, the portion of the member allowing complete transmission of the light beam being longer along the scan path than one of the optical patterns.

**5,438,355**  
**INTERACTIVE SYSTEM FOR PROCESSING VIEWER RESPONSES TO TELEVISION PROGRAMMING**

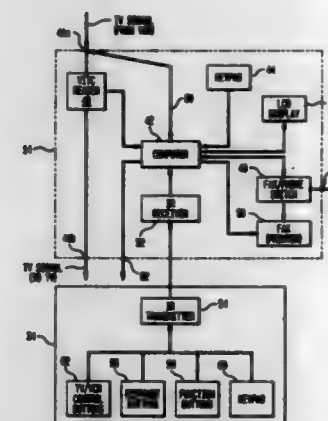
Shelton L. Palmer, 19 W. 36th St., 11th Floor, New York, N.Y. 10018-7909

Filed Apr. 16, 1993, Ser. No. 47,445

Int. Cl.<sup>6</sup> H04N 7/173

U.S. Cl. 348-1

12 Claims



1. An interactive system for processing viewer responses to television programming, said system comprising:  
 a central exchange including:  
 a database containing a plurality of first codes uniquely identifying various television programs, a plurality of second codes, unique program data associated with each first code, and unique console data associated with each second code, and  
 a processor; and  
 a plurality of consoles, each said console connected in a path of TV signals derived from the television programming to a television receiver and including:  
 a code reader for reading the first codes included with TV signals of programs as displayed by the television receiver,  
 a register storing the second code uniquely identifying said console,  
 a controller, and  
 an actuator activated by a viewer in response to a program being displayed by the television receiver to signal said controller to transmit to said processor over a communications link the second code from said register and the first code currently being read by said code reader, whereby, said processor, in response to the received first and second codes, searches the databases to locate the first and second codes corresponding to the received first and second codes and sends the stored program data associated with the received first code to the viewer at a location of said console indicated by the

stored console data associated with the received second code.

**5,438,356**  
**ACCOUNTING SYSTEM FOR MULTIMEDIA COMMUNICATIONS SYSTEM**

Kazumasa Ushiki, Mitsunori Fukazawa, and Masashi Wakamoto, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

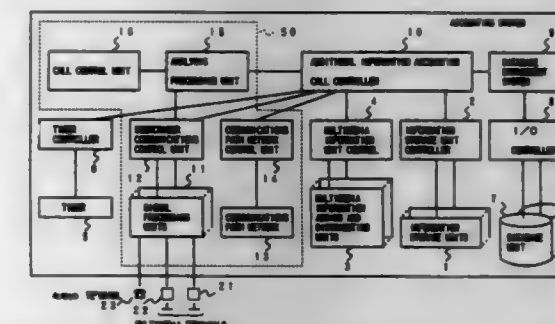
Filed May 19, 1993, Ser. No. 63,916

Claims priority, application Japan, May 18, 1992, 4-149896

Int. Cl.<sup>6</sup> H04N 7/14

U.S. Cl. 348-12

33 Claims



1. An accounting system for a multimedia communications system comprising:  
 additional information storage means for storing advertising image information to be supplied to subscriber terminals in the multimedia communications system by one or a plurality of additional information suppliers;  
 additional information adding means provided in an exchange system of the multimedia communications system, for adding at least the advertising image information to communication image information transmitted between subscriber terminals communicating with each other;  
 measurement means for measuring a degree of supply of the advertising image information supplied to at least one of the subscriber terminals communicating with each other;  
 database means for storing accounting information used to calculate a fee for a communication between the subscriber terminals communicating with each other; and  
 control means for calculating the fee for said communication between the subscriber terminals communicating with each other on the basis of the accounting information and the degree of supply of the advertising image information measured by the measurement means.

**5,438,357**  
**IMAGE MANIPULATING TELECONFERENCING SYSTEM**

Steve H. McNeley, 29677 Woodlake Ct., San Juan Capistrano, Calif. 92675

Filed Nov. 23, 1993, Ser. No. 156,009

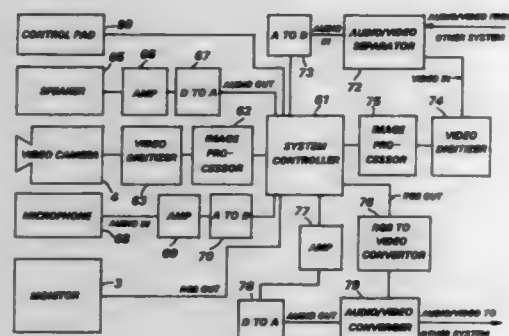
Int. Cl.<sup>6</sup> H04M 11/00; H04N 7/14

U.S. Cl. 348-15

29 Claims

1. A teleconferencing system which enables a conferee at a local terminal to enjoy the appearance of eye contact during a teleconference with a second conferee at a connected remote terminal, the system comprising:  
 a terminal which comprises:  
 image display means for displaying an image;  
 image pickup means for producing a video signal representative of the image of the first conferee, the image pickup means being placed beyond the outside perimeter of the image on the image display means so as not to interfere with the viewing of the image display;  
 audio pickup means to produce an audio signal representa-

tive of speech and other sounds produced by the first conferee; and  
 audio reproduction means for audibly reproducing an audio signal from the remote terminal, the audio signal representative of speech and other sounds produced by the second conferee such that the first conferee and the second conferee can carry out a conversation;  
 digitizing means for creating a digital representation of the video signal from the image pickup means;  
 signal transmission means for processing audio and video signals from the local terminal and transmitting them to the remote terminal, and receiving audio and video signals from the remote terminal and processing them for use by



the local terminal so that the local terminal is connected to the remote terminal;  
 orientation means for deriving data representing a spatial orientation of elements of the image of one of the first conferee, the second conferee, and both conferees from a digital representation of the video signal from their respective terminals so as to determine elements of one of the first conferee's gaze, the second conferee's gaze and both conferees' gazes, respectively;  
 image manipulation means for using the spatial orientation data to manipulate the digital image representation to create the appearance of eye contact between the first and second conferees to facilitate natural conversation.

5,438,358

## IMAGE SIGNAL CONVERSION SYSTEM

Shouji Kosuge, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 858,592, Mar. 27, 1992, abandoned.

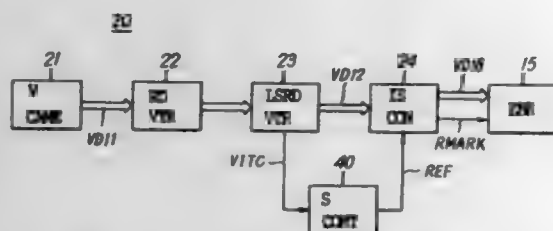
This application Mar. 4, 1994, Ser. No. 206,895

Claims priority, application Japan, Mar. 31, 1991, 3-093688

Int. Cl.<sup>6</sup> H04N 9/11

U.S. Cl. 348-96

7 Claims



1. Apparatus for recording on film images derived from video image signals obtained from a plurality of video frames, said apparatus comprising:

means receiving the video image signals at a first rate for supplying reproduced image signals at a second rate so as to obtain low speed image signals with a timed relationship between the low speed image signals of each of said frames and for producing timing information relating to said timed relationship between said low speed image

signals for supply therefrom, wherein the low speed image signals are formed by repeating the video image signals of each of said frames 30 times, in which a first 15 repeated video image signals of each of said frames represent an odd field therein, while a second 15 repeated video image signals of each of said frames represent an even field therein;

means for generating a first reference signal on the basis of said timing information;

means receiving said low speed image signals and said first reference signal and being controlled by said first reference signal for converting said low speed image signals to film record signals and for generating a second reference signal on the basis of said first reference signal; and

film recording means controlled by said second reference signal for receiving said film record signals and for recording the images relating thereto on said film.

5,438,359

## ELECTRONIC CAMERA SYSTEM USING IC MEMORY CARD

Harumi Aoki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

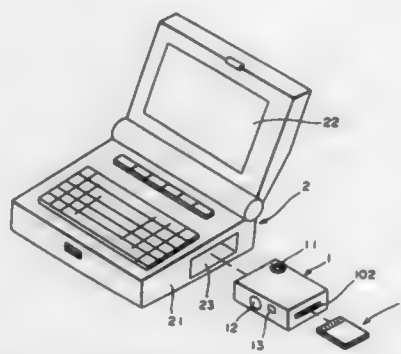
Filed Sep. 15, 1993, Ser. No. 122,234

Claims priority, application Japan, Sep. 16, 1992, 4-270723

Int. Cl.<sup>6</sup> H04N 5/30

U.S. Cl. 348-207

11 Claims



1. An electronic camera system comprising:

a camera utilizing an IC memory card in which image data of an object to be photographed can be stored, said camera comprising: means for receiving said IC memory card and to electrically connect therewith, a data writing/reading circuit which writes and reads data onto and from said IC memory card connected to said IC memory card receiving means, a computer interface circuit connected to said data writing/reading circuit, and a means connected to said interface circuit for electrically connecting said camera to an associated computer; and,

a computer including a recess defined therein into which said camera may be completely inserted, said computer recess having a means for electrical connection to said electrically connecting means of said camera when said camera is inserted into said computer recess whereby when said camera is inserted into said recess, said computer is electrically connected to said IC memory card through said data writing/reading circuit and said interface circuit when said connecting means of said camera is connected to said connecting means of said computer.

5,438,360

## MACHINE VISION CAMERA AND VIDEO REPROCESSING SYSTEM

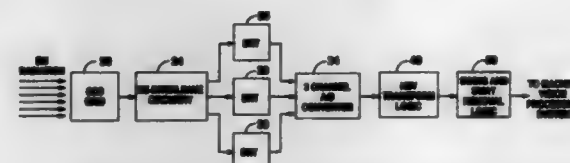
Michael K. Edwards, Houston, Tex., assignor to Paul Howard Mayeux, Houston, Tex.

Continuation of Ser. No. 942,203, Sep. 8, 1992, abandoned. This application Jul. 28, 1994, Ser. No. 282,169

Int. Cl.<sup>6</sup> H04N 5/232

U.S. Cl. 348-208

15 Claims



1. A video preprocessing system for removing effects of camera motion, comprising:

a video source for providing incoming signals representing an image; and

a motion compensator coupled to said video source receiving said incoming image for adjusting said incoming image to compensate for camera motion caused by environmental influence on the camera,

said motion compensator comprising:

a background frame buffer for storing an accumulated background image of said image; and

a comparator coupled to said background frame buffer which compares values of a plurality of incoming pixels with values of selected background pixels, wherein each of said background pixels that are compared with said incoming pixels are displaced in position from said incoming pixels by one of a plurality of predetermined relative displacements, wherein said incoming image comprises a plurality of blocks each comprising a first number of pixels, and a different predetermined relative displacement is used for each pixel comprising one of said blocks wherein said comparison of said incoming pixels with said background pixels generates error values;

an error matrix store for storing said error values; and determining means coupled to said error matrix store for determining a total displacement that can be made to said incoming image to compensate for said camera motion, wherein said determining means uses said error values in said error matrix store in determining said total displacement;

wherein said incoming image is adjusted according to said total displacement to compensate for said camera motion.

5,438,361

## ELECTRONIC GIMBAL SYSTEM FOR ELECTRONICALLY ALIGNING VIDEO FRAMES FROM A VIDEO SENSOR SUBJECT TO DISTURBANCES

Guy B. Coleman, Northridge, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 13, 1992, Ser. No. 867,653

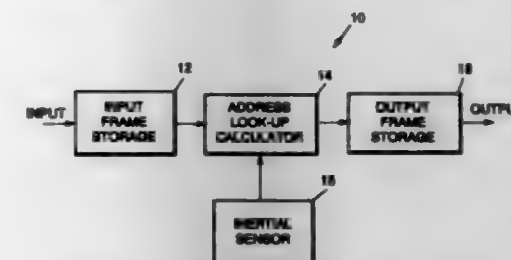
Int. Cl.<sup>6</sup> H04N 5/228

U.S. Cl. 348-208

17 Claims

1. An electronic gimbal system for stabilizing consecutive images from a sensor, said gimbal system comprising: means for providing an input signal of a desirable scene; inertial sensor means for measuring an offset of the sensor relative to an inertial coordinate system; address look-up calculator means for receiving an offset signal from the inertial sensor means and aligning the input signal to the inertial coordinate system, said address look-up calculator means assigning address locations for the input signal and adjusting the address locations in

accordance with the offset signal to correspond to the inertial coordinate system; and an input frame storage means for receiving the input signal



and storing it as a two-dimensional array of pixel locations where each pixel location has a value, said input frame storage means being operable to output the array of pixel values to the address look-up calculator means.

5,438,362

## REMOTE CONTROL SYSTEM

Junichiro Tabuchi, Tondabayashi, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

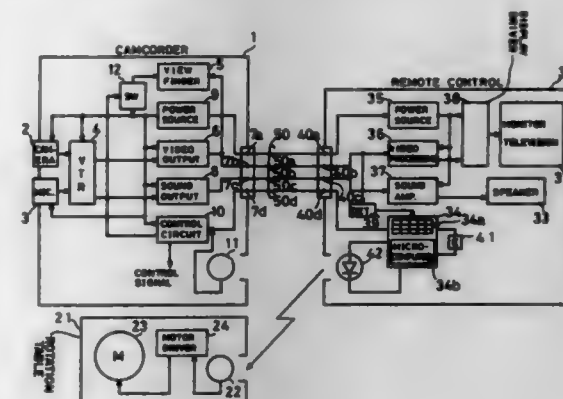
Filed Jul. 6, 1993, Ser. No. 85,958

Claims priority, application Japan, Jul. 6, 1992, 4-178224; Apr. 12, 1993, 5-084703

Int. Cl.<sup>6</sup> H04N 5/232, 5/222

U.S. Cl. 348-211

4 Claims



1. A remote control apparatus, having a television monitor capable of displaying an image according to a first video signal sent from a first piece of electronic equipment through a video signal line, said first piece of electronic equipment including video signal generating means for generating said first video signal and first operation control means for controlling an operation of said first piece of electronic equipment in response to a control signal, said remote control apparatus comprising: wire control means for applying a first control signal to said operation control means of said first electronic equipment by means utilizing an electronic signal through a control signal line; wireless control means for applying a second control signal to said operation control means of said first electronic equipment by means utilizing one of an infrared ray and an electromagnetic radio frequency wave; connection detecting means for detecting connection of said remote control apparatus and said first piece of electronic equipment through said video signal line and said control signal line; and function stopping means for inhibiting at least one of the functions of said wireless control means when said connection is detected by said connection detecting means, wherein said wireless control means applies a third control signal to a second piece of electronic equipment which includes second operation control means for controlling





5,438,368

# SYSTEM FOR THE COMPATIBLE PROCESSING OF A PROGRESSIVELY SCANNED IMAGE SIGNAL IN LINE INTERLACED FORMAT

Ingo Hütter, Celle, Germany, assignor to Deutsche Thomson-Brandt GmbH, Villengen-Schwenningen

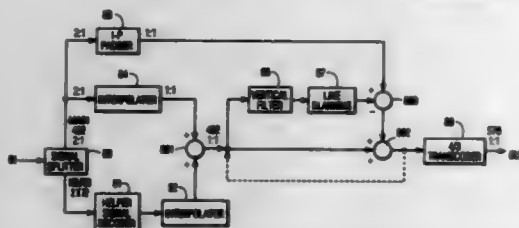
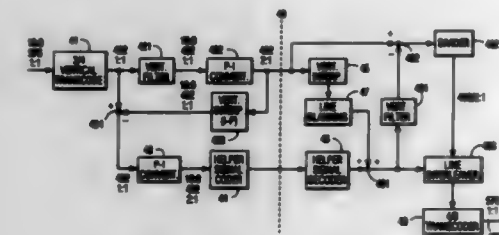
Filed Oct. 22, 1993, Ser. No. 141,806

Claims priority, application Germany, Apr. 25, 1991, 41 13 506.7; Jun. 14, 1991, 41 19 676.7

Int. Cl.<sup>6</sup> H04N 7/015

U.S. Cl. 348—434

9 Claims



1. A method for decoding an input compatible progressive picture signal exhibiting a letter-box format, and including a helper signal to help reconstruct a progressive picture signal at a decoder, said input progressive picture signal representing image lines containing picture elements (pixels) having been subjected to vertical filtering at a coder whereby pixel values from a current line and pixel values from lines located vertically above and below said current line which are not transmitted are used; said decoding method including the step of:

- vertically filtering pixel values of a progressive picture signal with a half band vertical filter exhibiting the inverse response of a picture signal half band vertical filter at a coder, whereby said inverse half band vertical filter removes low pass effects caused by vertical filtering at said coder; or the steps of:
- filtering a progressive picture signal with a vertical filter characteristic similar to that of a picture signal vertical filter at a coder;
- producing a difference picture signal representing a difference between compatible lines so vertically filtered at said coder, and corresponding lines of a reconstructed progressive picture signal filtered with said similar vertical filter characteristic; and
- adding said difference picture signal to said reconstructed progressive picture signal.

5,438,369

# DIGITAL DATA INTERLEAVING SYSTEM WITH IMPROVED ERROR CORRECTABILITY FOR VERTICALLY CORRELATED INTERFERENCE

Richard W. Citta, Oak Park, and Scott F. Halozan, Des Plaines, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 17, 1992, Ser. No. 931,177

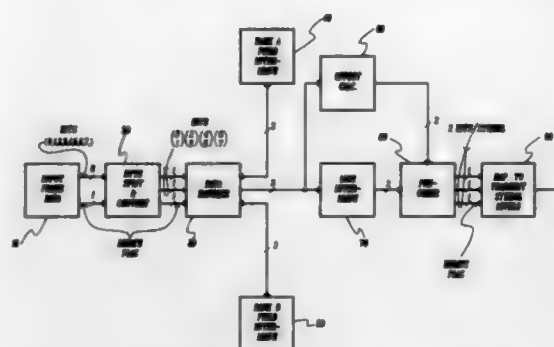
Int. Cl.<sup>6</sup> H04N 7/015, 7/64

U.S. Cl. 348—470

20 Claims

1. In a system having an input data frame comprising a plurality of successive input data segments, each said input data segment including a plurality of symbols arranged into a group of input subsegments of a given number of symbols and including an error protection code, potential interference with

signals in said system expected to have a high degree of vertical correlation;



means for formatting a transmission data frame for said signals wherein two or more symbols of an input subsegment are vertically correlated on different transmission data segments.

5,438,370

# APPARATUS AND METHODS FOR PROVIDING CLOSE CAPTIONING IN A DIGITAL PROGRAM SERVICES DELIVERY SYSTEM

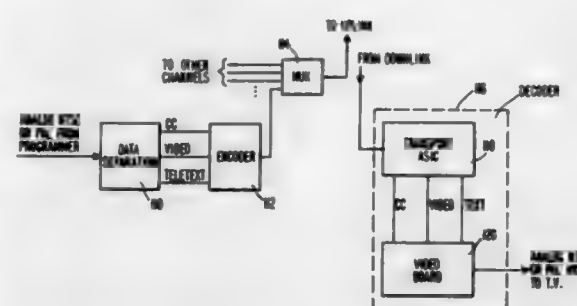
Guy A. Primiano, Cumming, and Ajith N. Nair, Lawrenceville, both of Ga., assignors to Scientific Atlanta, Atlanta, Ga.

Continuation of Ser. No. 6,476, Jan. 21, 1993, abandoned. This application Jul. 14, 1994, Ser. No. 275,332

Int. Cl.<sup>6</sup> H04N 7/087

U.S. Cl. 348—476

13 Claims



1. An apparatus for providing close captioning in a digital program services delivery system, comprising:

- a rate converter circuit receiving video codes and outputting video data;
- a video decoder circuit, coupled to said rate converter circuit, receiving said video data and outputting digital component video data;
- a digital to analog converter/analog encoder circuit, operatively coupled to said video decoder circuit, converting said component video data into an analog video signal in a prescribed format;
- a line former circuit receiving digital text data and forming a line of analog text signal; and
- a multiplexor, coupled to said digital to analog converter/analog encoder circuit and said line former circuit, inserting said line of analog text signal into said analog video signal.

5,438,371

# DATA TRANSMISSION METHOD

Rolf-Dieter Gutschmann; Siegfried Böhme; Hartmut Hackmann, and Leo Warmuth, all of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

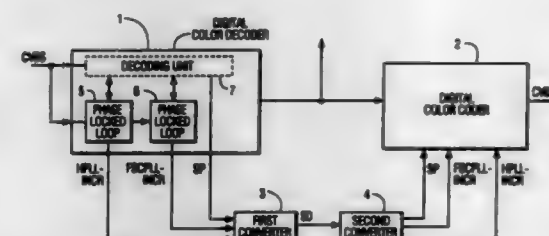
Filed Jun. 23, 1993, Ser. No. 82,071

Claims priority, application Germany, Jul. 2, 1992, 42 21 683.4

Int. Cl.<sup>6</sup> H04N 11/12

U.S. Cl. 348—492

11 Claims



1. A method of transmitting data from a digital color decoder, said digital color decoder decoding a digital color picture signal, to another signal processing unit, characterized in that said method comprises the steps:

- generating a first digital signal in said digital color decoder, said first digital signal being dependent on the instantaneous value of a clock frequency used in the digital color decoder;
- generating a second digital signal in said digital color decoder, said second digital signal being dependent on the instantaneous value of a chrominance subcarrier frequency used for color decoding and generated in the digital color decoder; and
- serially transmitting said first and second digital signals as one signal from the digital color decoder to said signal processing unit, wherein said one signal is processed at the clock frequency used in said digital color decoder.

5,438,372

# PICTURE-IN-PICTURE TELEVISION RECEIVER WITH MENU DISPLAYED IN SECOND SUB-SCREEN

Koki Tsumori, Tokyo, and Kiyoshi Ogawa, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

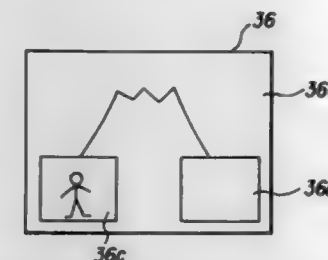
Continuation of Ser. No. 943,038, Sep. 10, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 329,133

Claims priority, application Japan, Sep. 10, 1991, 3-258580

Int. Cl.<sup>6</sup> H04N 5/45

U.S. Cl. 348—365

4 Claims



1. A television receiver including a picture-in-picture circuit for displaying a picture different than a picture being displayed on a main portion of a picture screen of the television receiver on a first sub-screen formed as a portion of the picture screen, the television receiver comprising:

- display means for displaying a menu on a second sub-screen of the main screen separate from the first sub-screen, the menu relating to selectable parameters of a picture displayed on the first sub-screen of the main screen;
- selecting means for selecting one of the selectable parameters in the menu displayed by the display means on the second sub-screen;

control means for performing controls corresponding to the parameter selected by the selecting means; and display control means for controlling the picture-in-picture circuit to cause the first sub-screen to display a picture while the menu is simultaneously displayed on the second sub-screen by the display means.

5,438,373

# SYSTEM FOR DEVELOPING CRT COLOR-INTENSITY CONTROL SIGNALS IN HIGH RESOLUTION CRT DISPLAY EQUIPMENT

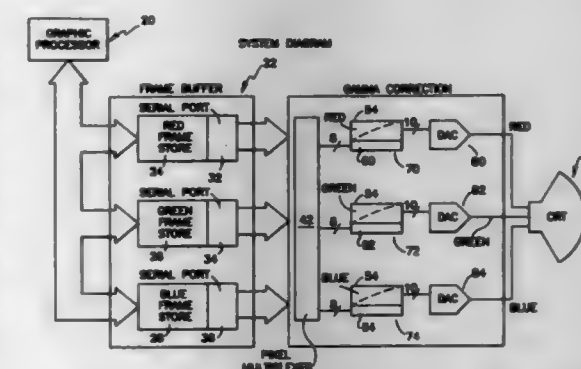
Timothy J. Cummins, Limerick, Ireland, assignor to Analog Devices, Inc., Norwood, Mass.

Continuation of Ser. No. 649,433, Feb. 1, 1991, abandoned. This application Jan. 18, 1993, Ser. No. 79,641

Int. Cl.<sup>6</sup> H04N 5/16

U.S. Cl. 348—572

8 Claims



1. In digital high-resolution CRT display equipment of the type including a frame buffer having a number of storage banks for storing digital signals identifying information regarding corresponding pixels on the CRT, said frame buffer being controlled by a graphics processor which updates the stored digital signals for successive frames of the CRT display; said frame buffer including a read-out port for transferring successive n-bit digital control signals from the buffer storage banks to a CRT control system creating analog control signals for controlling the intensities of the electron beams from the color guns of the CRT;

that improvement for effecting correction of said CRT control signals without loss of resolution and dynamic range and comprising CRT control apparatus developed on a single integrated-circuit (IC) chip formed with a large number of transistors arranged to provide:

- digital-signal control means for the color guns of the CRT, said control means including pixel multiplexer means arranged to receive at one time a plurality of said n-bit digital control signals from said frame buffer, each such control signal representing instructions for developing the color of a corresponding pixel of the CRT, said pixel multiplexer means producing an output comprising a succession of said digital control signals;
- a set of digital-signal-transformation devices each forming part of said control means and each coupled to the output of said pixel multiplexer means to receive a sequence of said digital control signals; each of said digital-signal-transformation devices being operable by each received n-bit signal serving as an address signal thereto, each of said transformation devices including means to produce for the received n-bit signal a corresponding (n+x)-bit digital signal representing the color intensity identified by the corresponding n-bit signal and additionally representing a correction factor for the color intensity identified by that n-bit signal;
- a set of digital-to-analog converters (DACs) arranged to receive said (n+x)-bit signals from said control means respectively and to convert those (n+x)-bit signals to





5,438,380

**LENS-FITTED PHOTOGRAPHIC FILM UNIT AND PHOTOFINISHING METHOD USING THE SAME**

Katsuji Muramatsu, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

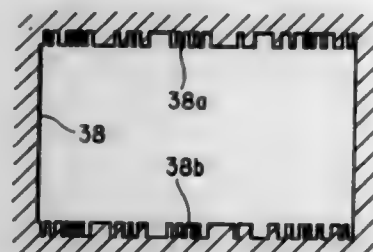
Filed Aug. 17, 1993, Ser. No. 106,960

Claims priority, application Japan, Aug. 17, 1992, 4-217889; Aug. 20, 1992, 4-221622

Int. Cl.<sup>6</sup> G03B 17/24, 17/02, 11/00

U.S. Cl. 354-105

4 Claims



1. A method of producing a photograph from photographic film exposed by use of a lens-fitted photographic film unit, said film unit having an exposure aperture for exposing said film so as to create an exposed area on said film, said method comprising the steps of:

- providing a patterned portion on at least one longer side of said exposure aperture, said patterned portion including projections that extend into said exposure aperture and that cast a patterned shadow on said film to create a patterned edge on said exposure area;
- developing said film;
- reading information conveyed by said patterned edge so as to determine an aspect ratio at which the film is to be printed;
- setting a printer in a printing mode adapted to print said film at said aspect ratio; and
- producing said photograph from said film in said adapted printing mode.

5,438,381

**DEVICE FOR DRIVING PHOTOGRAPHING LENS AND FINDER DEVICE OF CAMERA HAVING ZOOM LENS**

Makoto Mogamiya, and Taihei Morisawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 15,074, Feb. 8, 1993, abandoned, which is a continuation of Ser. No. 750,266, Aug. 27, 1991, abandoned, which is a continuation of Ser. No. 414,123, Sep. 27, 1989, Pat. No. 5,068,678. This application Mar. 25, 1994, Ser. No. 217,765

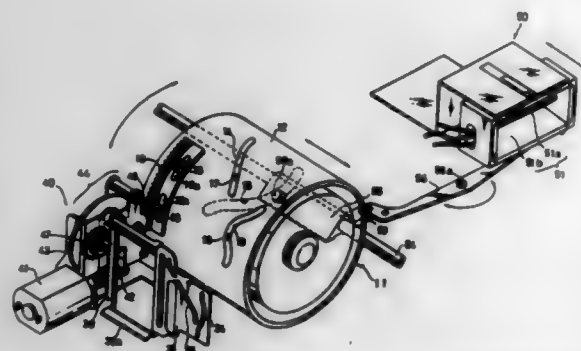
Claims priority, application Japan, Sep. 29, 1988, 63-127923

The portion of the term of this patent subsequent to Nov. 26, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> G03B 3/00, 13/10

U.S. Cl. 354-199

17 Claims



1. A zoom lens camera having a zoom-photographing lens

and a zoom finder device which are driven in association with each other so that the image plane and the finder field of view correspond to each other, comprising:

- a common first gear train including a reversible motor, for driving both the zoom-photographing lens and the zoom finder device;
  - a second gear train including a first pinion for the zoom photographing lens; and
  - a third gear train including a second pinion for the zoom finder device;
- wherein each said second and third gear trains separately engage said common first gear train and said second and third gear trains contain no common elements.

5,438,382

**PHOTOGRAPHIC PROCESSING APPARATUS**

Satoshi Morita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

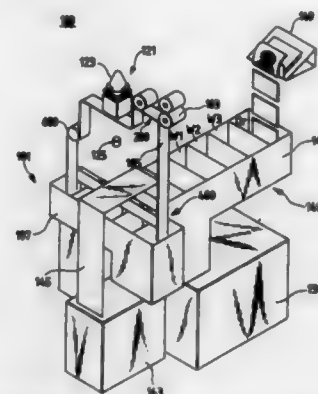
Filed Dec. 17, 1993, Ser. No. 168,363

Claims priority, application Japan, Dec. 18, 1992, 4-354918

Int. Cl.<sup>6</sup> G03D 13/00, 3/08

U.S. Cl. 354-298

8 Claims



1. A photographic processing apparatus for processing an exposed film accommodated in a film accommodating means and a photographic printing paper, comprising:

- film conveying means for drawing out said film from said film accommodating means and storing said film in said film accommodating means again, said film being subjected to the processing while said film is conveyed in a conveying passage;
- transfer means for moving said film accommodating means from a conveyance start position drawing out said film, to a conveyance end position storing again said film; and
- conveying passage changing means for changing said conveying passage of said film according to whether or not said film has been developed.

5,438,383

**AUTOMATIC DEVELOPING MACHINE FOR PHOTOSENSITIVE MATERIALS**

Yoshihiko Nakashima, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Aug. 9, 1994, Ser. No. 287,899

Claims priority, application Japan, Aug. 10, 1993, 5-198145

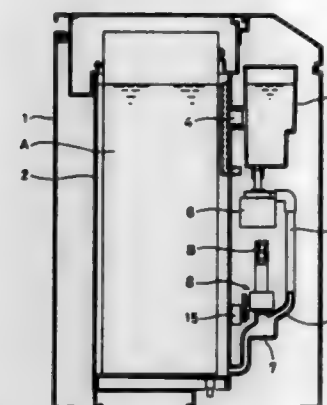
Int. Cl.<sup>6</sup> G03B 3/02

U.S. Cl. 354-324

2 Claims

1. An automatic developing machine for photosensitive materials comprising a treating tank, a sub-tank communicating with said treating tank through a return passage and a supply passage, a circulating pump provided in said supply passage to circulate a treating solution between said treating

tank and said sub-tank, and a tablet supply unit for supplying tablets containing components necessary for the treatment of



photosensitive materials, said tablet supply unit being connected to said supply passage.

5,438,384

**PHOTOGRAPHIC APPARATUS**

Anthony Earle, Harold Weald, England, assignor to Eastman Kodak Company, Rochester, N.Y.

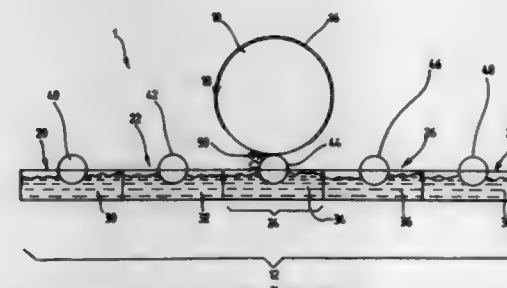
Filed Apr. 12, 1994, Ser. No. 227,210

Claims priority, application United Kingdom, Apr. 13, 1993, 9307513

Int. Cl.<sup>6</sup> G03D 3/04

U.S. Cl. 354-329

10 Claims



1. Photographic apparatus including at least a processing stage which comprises:

- a rotating drum on which material to be processed is mounted;
- a plurality of reservoirs each containing a processing solution; and
- applicator means for transferring processing solution from the plurality of reservoirs to the material being processed; characterized in that the applicator means comprises a plurality of application rollers, each application roller being associated with a respective one of the reservoirs; and in that there is relative movement between each application roller and the rotating drum to effect transfer of the processing solution to the material being processed.

5,438,385

**AUTOMATED DEVELOPMENT PROCESSOR FOR DENTAL X-RAY FILM**

Hiroyuki Tanaka, Yokohama, Japan, assignor to Nix Company Ltd., Tokyo, Japan

Filed Aug. 11, 1994, Ser. No. 288,774

Claims priority, application Japan, Aug. 17, 1993, 5-234351

Int. Cl.<sup>6</sup> G03D 13/02, 13/14

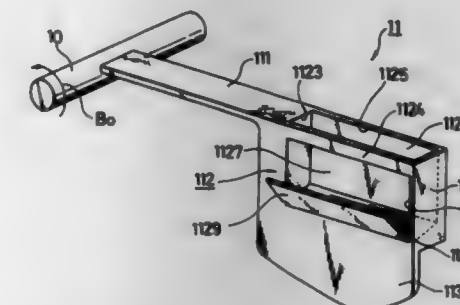
U.S. Cl. 354-337

9 Claims

1. An automated development processor for an exposed dental X-ray film, said processor having a plurality of tanks filled with processing solutions, respectively, and arranged in

parallel with one another so that development processing of the exposed dental X-ray film is conducted by successively throwing into the tanks a ring with the exposed dental X-ray film mounted thereon, comprising:

- a rotary shaft whose axis extends in the same direction as the direction of the arrangement of the individual tanks; and
  - arms fixed, in registration with said respective tanks, on said rotary shaft so that said arms are movable in the corresponding tanks;
- wherein each of said arms comprises a fixed portion secured on said rotary shaft and a ring-holding portion arranged



on a free end of said fixed portion, and said ring-holding portion defines a space for holding said ring therein and comprises a bottom wall for supporting said ring in said space, a first opening for receiving therethrough said ring, which is located in the corresponding processing solution, into said space as said corresponding arm is moving, a second opening for releasing said ring from said space into the adjacent tank or where said arm is associated with the last tank, releasing said ring out of said space, and means for preventing release of said ring through said second opening as said ring-holding portion is moving in the corresponding tank.

5,438,386

**COAXIAL MASTER-SLAVE LENS PHOTOGRAPHING APPARATUS**

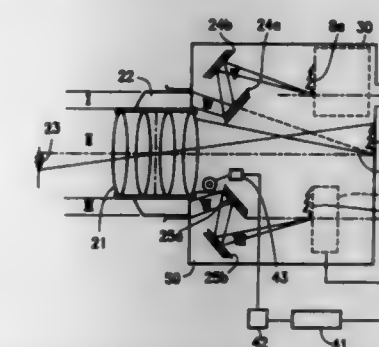
Zu-Wen Chao, Hsinchu, Taiwan, assignor to Industrial Technology Research Institut, Hsinchu, Taiwan

Filed Dec. 30, 1993, Ser. No. 175,642

Int. Cl.<sup>6</sup> G03B 13/36, 13/02

U.S. Cl. 354-402

6 Claims



1. A coaxial master-slave lens camera system, comprising:

- (a) at least a master lens having:
  - (1) a master optical axis,
  - (2) a master front lens plane,
  - (3) a master rear lens plane,
  - (4) a master front focus point, and
  - (5) a master rear focus point; (b) at least a slave lens having:
    - (1) a slave optical axis,
    - (2) a slave front lens plane,
    - (3) a slave rear lens plane,
    - (4) a slave front focus point, and



- (5) a slave rear focus point;  
said slave lens having a center hollowed portion for accommodating said master lens in such a manner that:
- (1) the slave optical axis is in coincidence with the master optical axis;
  - (2) the slave front lens plane is in coincidence with the master front lens plane;
  - (3) the slave rear lens plane is in coincidence with the master rear lens plane;
  - (4) the slave front focus point is in coincidence with the master front focus point; and
  - (5) the slave rear focus point is in coincidence with the master rear focus point;
- (c) an photographing optical system for receiving light rays passing through said master lens;
- (d) a viewfinder optical system for receiving light rays passing through said slave lens; and
- (e) a focus adjustment optical system for receiving light rays passing through said slave lens to generate focus adjustment servo signal.

5,438,387

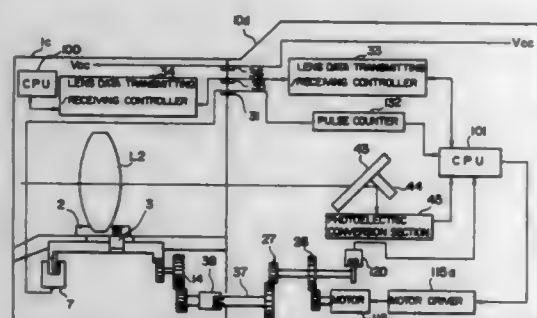
# **AUTOMATIC FOCUSING CAMERA WITH CONTROL OF FOCUSING OPTICAL SYSTEM POSITION AND DRIVING POWER SOURCE VELOCITY**

Yoshiharu Shiokawa, Chiba, and Shozo Yamano, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan  
Continuation of Ser. No. 58,307, May 10, 1993, abandoned, which is a division of Ser. No. 782,297, Oct. 24, 1991, Pat. No. 5,250,976. This application Jul. 14, 1994, Ser. No. 278,862  
Claims priority, application Japan, Oct. 30, 1990, 2-290904; Dec. 25, 1990, 2-414275

Int. Cl.<sup>6</sup> G03B 13/36

U.S. Cl. 354-402

3 Claims



1. An automatic focusing camera system provided with a lens barrel in which a focusing optical system is incorporated, and a camera body to which said lens barrel is detachably mounted, comprising:

- a focus detecting device incorporated in said camera body, said focus detecting device detecting the focusing condition of an objective image to output a focus detecting signal;
- a processor incorporated in said camera body, said processor calculating driving information of said focusing optical system on the basis of said focus detecting signal;
- a driving device incorporated in said camera body, said driving device having a driving power source and a first transmission member for transmitting the driving power of said driving power source to said focusing optical system;
- a first signal generator incorporated in said lens barrel, said first signal generator being provided at the final stage of a second transmission member coupled to said first transmission member to generate a first driving signal in response to the driving of said focusing optical system;
- a first terminal member provided in said lens barrel, said first terminal member transmitting said first driving signal to said camera body on real time;
- a second terminal member provided in said camera body,

- said second terminal member receiving said first driving signal on real time;
- a second signal generator incorporated in said camera body, said second signal generator being provided at the initial stage of said first transmission member to generate a second driving signal in response to the driving of said driving power source;
- a switching member incorporated in said camera body, said switching member switching driving signals to either one of said first driving signal or said second driving signal; and
- a driving controller incorporated in said camera body, said driving controller controlling the position of said focusing optical system and the velocity of said driving power source on the basis of said driving signal switched by said switching member and said driving information.

5,438,388

# **PHOTOGRAPHIC PROCESSING APPARATUS**

Keigo Arimoto, and Tohru Tanibata, both of Wakayama, Japan, assignors to Noritsu Koki Co., Ltd., Wakayama, Japan

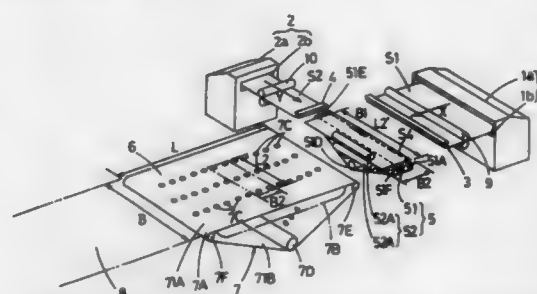
Filed May 27, 1994, Ser. No. 249,977

Claims priority, application Japan, Jun. 7, 1993, 5-136077

Int. Cl.<sup>6</sup> G03B 29/00, 27/58

U.S. Cl. 355-28

3 Claims



1. A photographic processing apparatus for separating a desired size sheet from a sensitive material roll, exposing the sheet to light on an exposing stage at an exposure station, and transferring the sheet to a development station, said apparatus comprising:

- a first magazine for feeding a first sensitive material toward the exposure station;
- a second magazine for feeding a second sensitive material in a direction at a right angle to a feeding direction of the first sensitive material;
- a first cutter for separating a first sensitive sheet from the first sensitive material;
- a second cutter for separating a second sensitive sheet from the second sensitive material;
- a conveying pass line for conveying the first and second sensitive sheets separated by respective said first and second cutters to the development station;
- the exposing stage disposed across the pass line; and
- a transfer shifting means mounted at an intersection of the feeding direction of the first sensitive material and the feeding direction of the second sensitive material for transferring the second sensitive sheet to the pass line.

5,438,389

# **PHOTOGRAPHIC PRINTING METHOD AND SYSTEM**

Eiichi Kito; Tsutomu Kimura, and Junji Sugano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1994, Ser. No. 260,218

Claims priority, application Japan, Jun. 14, 1993, 5-142241

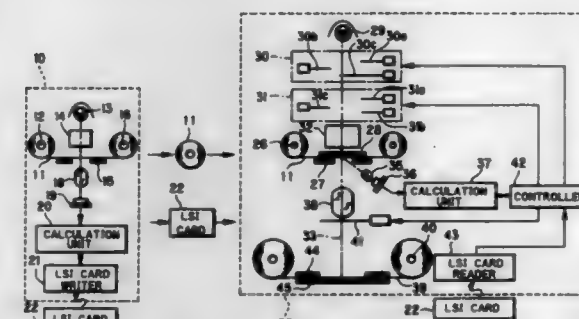
Int. Cl.<sup>6</sup> G03B 27/73

U.S. Cl. 355-38

11 Claims

1. A photographic printing method comprising the steps of:

performing a preliminary photometry operation on an original frame of a spliced long film;  
obtaining a large area transmittance density, LATD, of said original frame by said preliminary photometry operation;  
determining a required density for an ND filter to be used for printing when said original frame is a low LATD frame having an LATD lower than a reference value;  
setting said original frame to a print station following said preliminary photometry operation when said original frame corresponds to said low LATD frame;  
inserting said ND filter having said required density into a printing path immediately before said low LATD frame is set to said print station;



performing a main photometry operation on said original frame set to said print station, when said ND filter is set in said printing path, said main photometry operation being performed using said ND filter;  
determining an exposure time from an LATD obtained by said main photometry operation; and  
printing an image of said original frame onto a photographic paper by projecting said image onto said photographic paper for a period of time corresponding to said exposure time, when said original frame corresponds to said low LATD frame, said image of said low LATD frame being projected via said ND filter onto said photographic paper.

5,438,390

# **IMAGE FORMING APPARATUS HAVING MONOCOQUE HOUSING STRUCTURE INCLUDING UNITARY TONER COLLECTING VESSEL**

Masahiko Kobayashi, Nara; Masakatsu Akashi, Hyogo; Junichi Hirobe, Osaka; Tsutomu Sugaya, Osaka; Yoshihisa Tanaka, Osaka; Toshiaki Kusuda, Hyogo; Ikuro Makie, Osaka; Yukihiko Aikawa, Osaka; Satoshi Ishii, Osaka, and Yosuke Ohata, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Mar. 10, 1992, Ser. No. 848,210

Claims priority, application Japan, Mar. 12, 1991, 3-046963

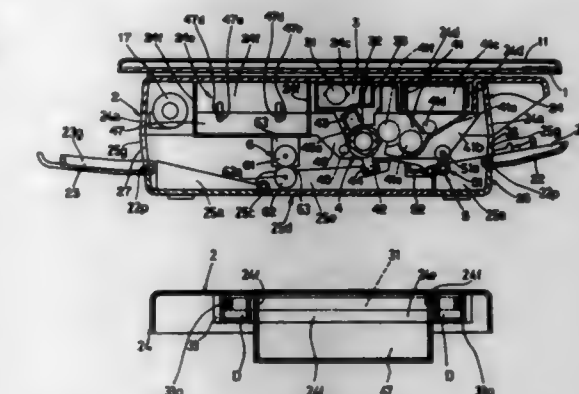
Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355-200

38 Claims

1. An image forming apparatus comprising:
- an exposing means for forming a latent electrostatic image on a photosensitive means;
  - an image forming means for developing a latent electrostatic image formed on said photosensitive means into a toner image and transferring a toner image onto a sheet; and
  - a sheet transfer means for transferring a sheet into an apparatus body and discharging said sheet through said image forming means, said sheet transfer means including a fixing means for fixing a toner image transferred on a sheet;
- said exposing means, said image forming means, and said sheet transfer means being disposed in said apparatus body, said apparatus body being resin and formed of an upper casing and a lower casing, said upper casing and said lower casing being separably coupled in a shiplap style,
- said image forming means being arranged in said upper casing which is formed of a monocoque construction

having four side walls, a ceiling serving as an exterior cover, and a projecting rib section integrally projecting to components of said image forming means,  
said image forming means including an image forming unit frame disposed in said apparatus body and a toner collecting vessel for collecting toner remaining on a surface of said photosensitive means,



said toner collecting vessel being coverable with a lid formed by a part of said ceiling of said upper casing and a downward rib section which extends downwardly from said ceiling to seal an edge of an opening of said toner collecting vessel.

5,438,391

# **CLAMSHELL-TYPE IMAGE FORMING APPARATUS**

Takashi Maekawa, Kawasaki, and Akira Takahashi, Fukushima, both of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu Isotec Limited, Inagi, both of Japan

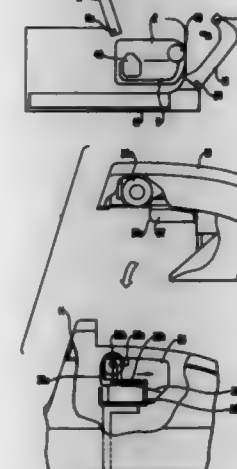
Filed Aug. 10, 1993, Ser. No. 103,787

Claims priority, application Japan, Sep. 28, 1992, 4-257921

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355-200

21 Claims



1. An image forming apparatus, comprising:
- an endless latent image carrier;
  - image forming means for forming an electrostatic latent image on the latent image carrier;
  - developing means for developing the electrostatic latent image on the latent image carrier;
  - transfer means for transferring a toner image on the latent image carrier onto a sheet;
  - fixing means for fixing the toner image on the sheet;

- a housing, sheet retaining means provided at a bottom portion of the housing for retaining the sheet;
- a process cartridge, provided detachable to the apparatus above the sheet retaining means, for holding at least the latent image carrier and the developing means;
- a stacker, provided above the process cartridge, for holding a discharge sheet on which the toner image has been fixed;
- a feeding path along which the sheet from the sheet retaining means is discharged on the stacker through the process cartridge;
- a front cover provided on the housing rotatable frontward of the apparatus;
- an upper cover provided on the housing to be rotatable upward of the apparatus, the stacker being formed in the upper cover;
- the front cover provided in such a way that a distal end of the front cover covers that of the upper cover;
- a first discharge roller provided at the distal end of the front cover, for discharging the sheet on the stacker;
- a second discharge roller provided at the distal end of the upper cover, facing the first discharge roller;
- a support block provided on the upper cover said support block having a movable sub-support block for supporting a shaft of the second discharge roller and a spring member for urging the sub-support block toward the first discharge roller; and
- a positioning member provided on the front cover and engageable with the support block, for positioning the support block.

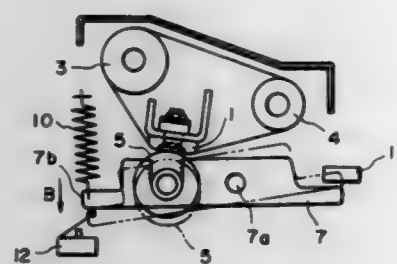
5,438,392

# IMAGE FIXING APPARATUS WITH ENERGY CUT-OFF

Tamotsu Okada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 915,865, Jul. 20, 1992, abandoned, which is a continuation of Ser. No. 602,776, Oct. 24, 1990, abandoned. This application Dec. 13, 1993, Ser. No. 165,549  
Claims priority, application Japan, Oct. 31, 1989, 1-284584  
Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355-206

8 Claims



1. An image fixing apparatus, comprising:
  - a heater;
  - a film movable together with a recording material in contact with said heater;
  - a back-up member for forming a nip with said heater, said film being interposed between said heater and said back-up member; and
  - stopping means for cutting electric power supply to said heater in response to separation between said back-up member and said film, irrespective of movement state of the said film.

5,438,393

# POWDER FLUIDITY DETECTING APPARATUS WHICH INCLUDES A PIEZOELECTRIC ELEMENT

Katsuaki Komatsu; Kazunori Yamamoto, and Shinichi Nishi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

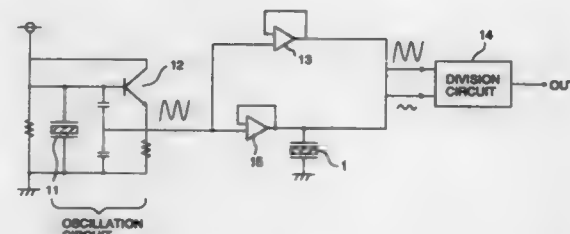
Filed Nov. 18, 1993, Ser. No. 154,749

Claims priority, application Japan, Nov. 26, 1992, 4-317128; Nov. 27, 1992, 4-318882; Nov. 27, 1992, 4-319060; Nov. 27, 1992, 4-319061

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355-246

29 Claims



1. A method for detecting a fluidity of powder, comprising said steps of:
  - (a) making said powder come into contact with a surface of a piezoelectric element being parallel with an oscillating direction of said piezoelectric element that generates transverse wave oscillations;
  - (b) detecting electrical characteristics of said piezoelectric element under a condition of resonance; and
  - (c) detecting said fluidity of said powder in accordance with a change in said electrical characteristics with respect to a reference value.

5,438,394

# IMAGE FORMING APPARATUS USABLE WITH A CARRIER HAVING MAGNETIZATION CONTROLLED IN RELATION TO RECORDING DENSITY

Hiroyuki Suzuki, Machida; Yukio Nagase, Tokyo; Kenichiro Waki, Kawasaki; Kazuhisa Kemmochi, Hachioji, and Masaru Hibino, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

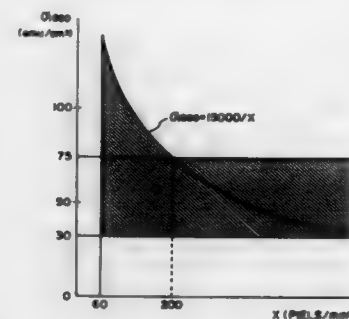
Filed Jun. 29, 1993, Ser. No. 83,899

Claims priority, application Japan, Jun. 30, 1992, 4-173253

Int. Cl.<sup>6</sup> G03G 15/09

U.S. Cl. 355-251

13 Claims



1. An image forming apparatus, comprising:
  - an image bearing member for bearing an electrostatic latent image;
  - image forming means for forming on said image bearing member a dot distribution electrostatic image with a recording density of X pixels per 1 mm<sup>2</sup>, in accordance with image signals; and
  - developing means for developing the electrostatic image formed on said image bearing member with a non-magnetic toner, said developing means comprising a developer carrying member for carrying a nonmagnetic toner

and a magnetic carrier, and magnetic field generating means located within said developer carrying member; wherein a degree  $\sigma d$  (emu/cm<sup>3</sup>) of magnetization of said magnetic carrier by a magnetic field generated by said magnetic field generating means at a peak of a perpendicular magnetic field on a surface of said developer carrying member satisfies the following:

if  $X < 200$ , then  $\sigma d \leq 15000/X$ if  $X \geq 200$ , then  $\sigma d \leq 75$ .

5,438,395

# DEVELOPMENT PROCESS

Yoshiro Koga, and Masanao Kunugi, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

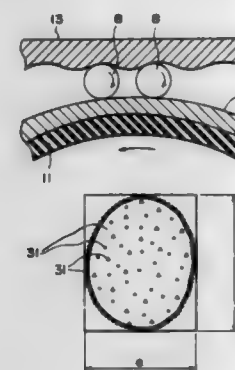
Filed Sep. 9, 1991, Ser. No. 756,997

Claims priority, application Japan, Sep. 10, 1990, 2-239262; Sep. 10, 1990, 2-239263; Sep. 10, 1990, 2-239264; Sep. 10, 1990, 2-239265; Sep. 10, 1990, 2-239266

Int. Cl.<sup>6</sup> G03G 13/08

U.S. Cl. 355-253

10 Claims



1. A development process comprising the steps of regulating spherical toner particles carried on a toner transporter by an elastic blade to pass the toner particles through a gap between the toner transporter and the elastic blade for forming a thin toner layer which is charged, wherein surface roughnesses of the elastic blade and the toner transporter are different from each other, and bringing the thin toner layer on the toner transporter into pressure contact with a latent image carrier to develop an electrostatic latent image formed on the latent image carrier by the toner, wherein the toner particles carried on the toner transporter are rotated between the elastic blade and the toner transporter and are charged electrostatically.

5,438,396

# TONER ANTI-DRIBBLE DEVICE FOR FILL EQUIPMENT HAVING VERTICAL FILL FUNNEL AND AUGER FEEDING

Frank Mawdesley, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

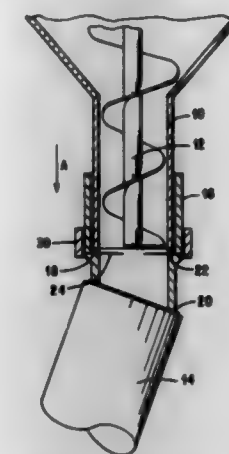
Filed Jun. 29, 1994, Ser. No. 267,739

Int. Cl.<sup>6</sup> G03G 15/06

U.S. Cl. 355-260

25 Claims

1. A toner anti-dribble device attachable to a toner fixture having a vertical fill tube and a rotatable auger for feeding



toner fixture and disposed substantially perpendicular to an insertion direction of said toner.

5,438,397

# IMAGE FORMING APPARATUS

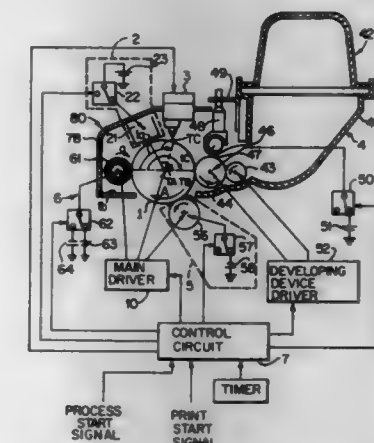
Yoshiaki Okano, and Tetsuya Nakamura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 24, 1994, Ser. No. 216,867

Int. Cl.<sup>6</sup> G03G 15/06

U.S. Cl. 355-269

15 Claims



1. An image forming apparatus comprising:
  - a photosensitive member;
  - charging means for charging the photosensitive member;
  - exposing means for exposing the charged photosensitive member to form a latent image and a non-exposed area on the photosensitive member;
  - developing means for developing the latent image with toner to form a developed toner image on the photosensitive member;
  - transferring means for transferring the developed toner image to a sheet-like material;
  - a brush member arranged along the photosensitive member and arranged between the transferring means and the charging means;
  - first voltage supply means for supplying a first voltage which is sufficient to attract residual toner remaining on the photosensitive member to the brush member during a first period when an exposed area that is to be exposed by the exposing means passes the brush member, the first period occurring before the exposed area reaches the exposing means;



second voltage supply means for supplying a second voltage which is sufficient to spit the attracted toner attracted in the brush member at the photosensitive member during at least a part of a second period when a non-exposed area that is on a different area of the photosensitive member from the exposed area passes the brush member, the second period occurring before the non-exposed area reaches the exposing means; and  
removing means for removing the spit toner on the photosensitive member by transferring the spit toner from the photosensitive member to the developing means, the removing means being operated simultaneously with the developing means.

5,438,396

# IMAGE FORMING APPARATUS WITH INTERMEDIATE TRANSFER MEMBER

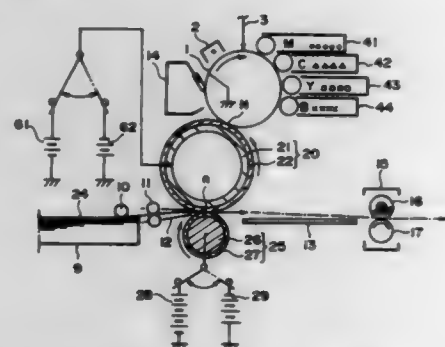
Koichi Tanigawa, Tokyo; Kimio Nakahata, Kawasaki; Akihiko Takeuchi, Yokohama; Hideo Nanstaki, and Kazuaki Ono, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 69,379, Jun. 1, 1993, abandoned. This application Mar. 22, 1994, Ser. No. 215,666

Claims priority, application Japan, May 29, 1992, 4-164226  
Int. Cl.<sup>6</sup> G03G 13/16

U.S. Cl. 355-271

43 Claims



1. An image forming apparatus, comprising:  
a first image bearing member on which a toner image can be formed;  
an intermediate transfer member onto which the toner image is transferable from said first image bearing member;  
wherein the toner image is further transferred onto a second image bearing member therefrom;  
wherein said intermediate transfer member comprises a conductive layer to which a voltage is applied, a surface layer on the conductive layer, and a volume resistivity of the surface layer is  $10^5$ - $10^{11}$  ohm.cm, wherein a voltage is set so that a current in a non-image portion during an image transfer operation from said first image bearing member to said intermediate transfer member is less than twice a current in an image portion.

5,438,399

# IMAGE FORMING APPARATUS HAVING TRANSFER VOLTAGE CONTROL

Jun Asai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 613,006, Nov. 15, 1990, abandoned. This application Jan. 18, 1994, Ser. No. 182,384

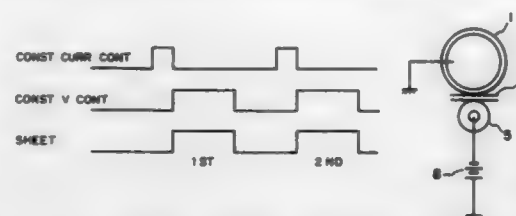
Claims priority, application Japan, Nov. 16, 1989, 1-296289  
Int. Cl.<sup>6</sup> G03G 15/14

U.S. Cl. 355-273

34 Claims

1. An image forming apparatus, comprising:  
a movable image bearing member;  
image forming means for forming an image on said image bearing member;  
a charging member contactable with a transfer material at a

transfer position to transfer the image from said image bearing member to the transfer material;  
voltage applying means for applying a voltage to said charging member, said voltage applying means applying a constant voltage between said charging member and said image bearing member when the transfer material is present



ent at the transfer position, wherein said voltage applying means applies a constant current to said charging member during a time period in which the transfer material is absent from the transfer position;  
wherein the constant voltage is a sum of a voltage provided during application of the constant current and a predetermined voltage.

5,438,400

# IMAGE FORMING APPARATUS HAVING CLEANING BLADE WITH SURFACE COATED LAYER AT A TIP END THEREOF

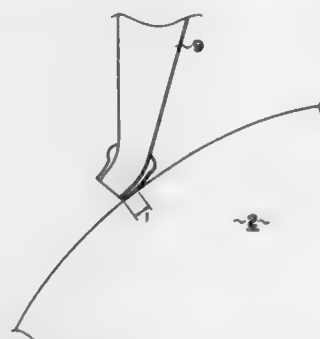
Ikuo Kuribayashi, Tokyo, and Rie Saito, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1993, Ser. No. 128,101

Claims priority, application Japan, Sep. 30, 1992, 4-283424  
Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355-299

14 Claims



1. An image forming apparatus for forming an image onto a recording medium, comprising:  
an image bearing body; and  
a cleaning blade abutting against said image bearing body for removing a toner remaining on said image bearing body, said cleaning blade having a surface coated layer at a tip end abutting against said image bearing body, said surface coated layer having a liquid drip portion at a portion remote from the tip end of said cleaning blade, wherein a width from said liquid drip portion to the tip end of said cleaning blade is larger than a width of an area where said cleaning blade contacts said image bearing body, so that said liquid drip portion does not abut against said image bearing body when said cleaning blade is abutted against said image bearing body.

5,438,401

# MULTICOLOR IMAGE FORMING METHOD AND APPARATUS THEREFOR

Hideo Murayama, Yokohama, and Hitoshi Ishibashi, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

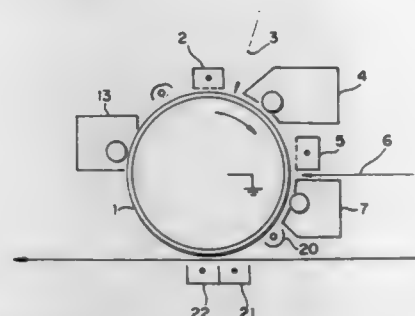
Continuation of Ser. No. 987,815, Dec. 9, 1992, abandoned. This application Sep. 23, 1994, Ser. No. 311,716

Claims priority, application Japan, Dec. 9, 1991, 3-350004; Mar. 31, 1992, 4-077354; Oct. 3, 1992, 4-289284

Int. Cl.<sup>6</sup> G03G 15/01

U.S. Cl. 355-326 R

21 Claims



7. A multicolor image forming method for forming toner images of at least two colors, comprising the steps of:  
first charging means for charging an image carrier to a predetermined potential by applying a first voltage to the image carrier;  
first forming means for forming a first image pattern with toner of a first color deposited thereon on the image carrier;  
second charging means for charging said image carrier at portions where a charge from the primary charging remains by applying a second voltage to the image carrier, the second voltage being less than the first voltage so that a potential of the image carrier at portions where the toner of the first color is deposited is lower than a potential of the image carrier at portions where the toner of the first color is absent and is lower than the predetermined potential of the first charging;  
second forming means for forming a second image pattern with toner of a second color deposited thereon on the image carrier where toner of the first color is not deposited; and  
transferring means for transforming the toner of the first and second colors from the image carrier to a recording medium for forming a multicolor image.

5,438,402

# SYSTEM AND METHOD FOR MEASURING THE INTERFACE TENSILE STRENGTH OF PLANAR INTERFACES

Vijay Gupta, Hanover, N.H., assignor to Trustees of Dartmouth College, Hanover, N.H.

Filed Mar. 5, 1993, Ser. No. 26,682

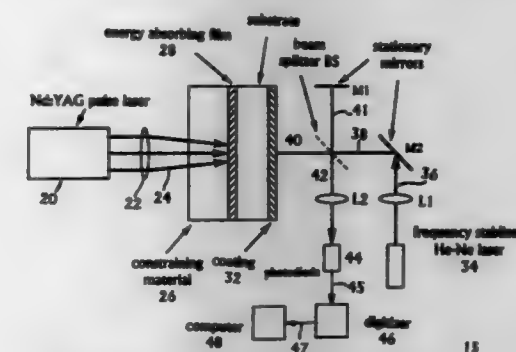
Int. Cl.<sup>6</sup> G01L 1/24; G01B 11/16

U.S. Cl. 356-35.5

30 Claims

1. A system for measuring the tensile strength of a planar interface between a substrate and a coating, said system comprising  
an energy source including means for generating an electromagnetic beam along a first axis,  
a sample assembly disposed along said first axis and positioned to receive said collimated electromagnetic beam so as to allow said beam to propagate within said assembly along said first axis, said sample assembly includes a substrate and a coating having a free surface, each said substrate and coating being axially spaced along said first axis and in intimate facing contact with each other, thereby forming a substrate/coating interface, said sample assembly further including pulse forming means, axially spaced

along said first axis and in contact with said substrate opposite said substrate/coating interface for generating a stress pulse responsive to said electromagnetic beam that propagates within said sample assembly along said first axis, said substrate and said coating being arranged to receive said generated stress pulse such that said coating free surface moves in response to said stress pulse propagating therethrough,  
said pulse forming means including means for generating said stress pulse with a selected profile having a selected



amplitude, rise portion, and decay portion, wherein said decay portion of said stress pulse attains zero amplitude in substantially less than 100 nanoseconds,  
measuring means for measuring the movement of said coating free surface in response to said generated stress pulse, and  
calculation means, coupled to said measuring means, for determining the tensile strength at said substrate/coating interface from said measured movement of said coating free surface.

5,438,403

# ARTICLE IDENTIFICATION SYSTEM

Hidekazu Hoshino, and Hidemi Haga, both of Kanagawa, Japan, assignors to NHK Spring Co., Ltd., Japan

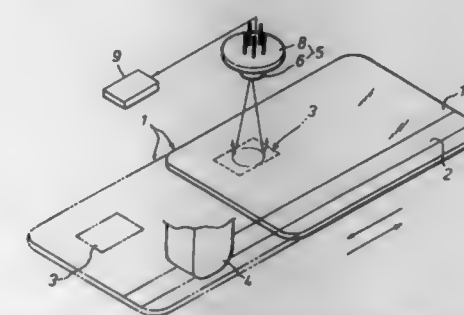
Filed Mar. 23, 1993, Ser. No. 36,019

Claims priority, application Japan, Apr. 28, 1992, 4-137786  
The portion of the term of this patent subsequent to Sep. 13, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G06K 7/10; G02B 27/38

U.S. Cl. 356-71

7 Claims



1. An article identification system for identifying the authenticity of an article, comprising:  
identification means provided on said article;  
light emitting means for impinging light emitted therefrom onto said identification means, said light having a prescribed wavelength, and linearly polarized in a prescribed direction;  
light detecting means for detecting light reflected by said identification means; and  
control means for evaluating light detected by said light

detecting means and determining the authenticity of said article associated with said identification means; wherein:

said identification means comprises at least a first layer having a reflective property adapted to be detected by said light detecting means for identification purpose, and a second layer, said second layer underlying said first layer;

said light detecting means being provided with a filter which selectively allows transmission of light having a certain polarization direction, and said second layer being provided with such a polarization plane rotating property that light which has passed through said first and second layers and reflected by a surface underlying said second layer onto said light detecting means is substantially prevented from passing through said filter.

5,438,404

# GYROSCOPIC SYSTEM FOR BORESIGHTING EQUIPMENT BY OPTICALLY ACQUIRING AND TRANSFERRING PARALLEL AND NON-PARALLEL LINES

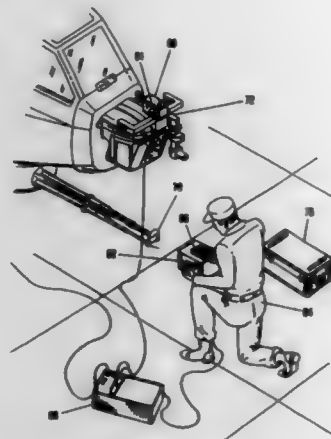
Stephen B. Hamilton, Baltimore; James J. Jaklitsch, Parkton; Christopher J. Reed, Pasadena; Charles E. Sachulz, Jarrettsville; Robert R. Schulze, Baltimore; Leslie H. Debelius, Manchester, and Niall B. McNelis, Baltimore, all of Md., assignors to AAI Corporation, Cockeysville, Md.

Filed Dec. 16, 1992, Ser. No. 990,976

Int. Cl.<sup>6</sup> G01B 11/26; G01C 1/10

U.S. Cl. 356—152.2

16 Claims



1. A gyroscopic system for translating parallel and non-parallel lines between a reference line and a device to be aligned with respect to the reference line, comprising:

a first inertial sensor configured to be substantially stationary and boresighted with respect to said reference line, said first inertial sensor comprising at least two gyroscopes and a mirror having first and second nonplanar surfaces, each of said gyroscopes being operable to generate an output signal;

a second inertial sensor configured to be portable so as to be positionable adjacent to said first inertial sensor and comprising a gimbal and a gimbal drive system, and an electromagnetic energy beam generator, at least two gyroscopes that are operable to generate an output signal, and a collimator, said collimator being operable to determine an angle between a beam projected by said beam generator and a beam reflected from said mirror and to generate an output signal indicative of said determined angle; and

a control circuit operable to process output signals generated by said collimator and said first and second inertial sensor gyroscopes and determine relative orientations of said first and second inertial sensors with respect to each other.

## 5,438,405 DEVICE AND METHOD FOR TESTING OPTICAL ELEMENTS

Moshe Lapidot, Kiryat Bialik; Samuel Liran, Haifa, and Amit Stekel, Rehovot, all of Israel, assignors to Optomic Technologies Corporation, LTD, Migdal Haemek, Israel

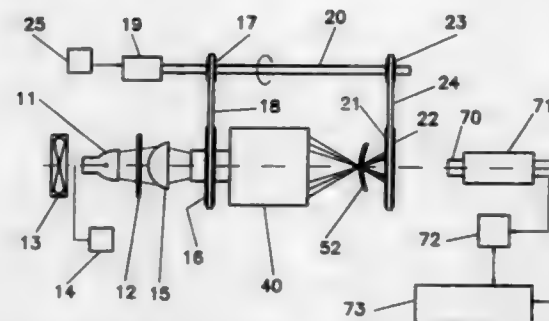
Filed Feb. 9, 1993, Ser. No. 15,006

Claims priority, application Israel, Feb. 17, 1992, 100972

Int. Cl.<sup>6</sup> G01N 21/15

U.S. Cl. 356—239

13 Claims



7. A system for lens grading and evaluation according to severity of surface and internal defects comprising:

a light source,

holding means for holding an optical lens being tested with its optical axis aligned with an optical axis of the system, means for directing a wedge-shaped light beam so as to intersect a diameter of the lens being tested at the diameter in the form of a narrow rectangular beam which intersects a surface of the lens being tested at an angle therewith,

means for rotating said wedge-shaped light beam in synchronization with a mask located after the lens and an array of photosensitive elements arranged after said mask and facing the mask so that (1) rotation of the light beam sweeps the light beam over an entire surface of the lens being tested and (2) direct light is prevented from reaching the photosensitive elements so that the photosensitive elements receive only light signals due to scattering of light caused by defects of the optical lens being tested, and means for evaluating the light signals.

5,438,406

## TUNABLE NARROWBAND SPECTROMETER WITH ACOUSTO-OPTICAL TUNABLE FILTER

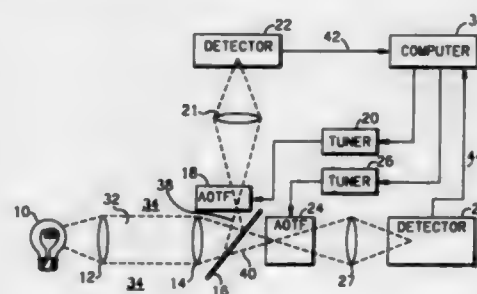
Jeffrey J. Puscell, Albuquerque, N. Mex., assignor to The Titan Corporation, San Diego, Calif.

Filed Oct. 7, 1993, Ser. No. 134,188

Int. Cl.<sup>6</sup> G01J 3/36; G01N 31/35

U.S. Cl. 356—307

6 Claims



1. A tunable narrowband spectrometer comprising a discrete broadband light source; an optical system disposed in relation to the light source for transmitting light from the light source within an optical path through a spatial region of interest and for focusing

the transmitted light on the opposite side of the region of interest from the light source;

a first narrowband acousto-optical tunable filter disposed for filtering said transmitted light;

first tuning means coupled to the first filter for tuning the first filter through a predetermined series of different wavelengths that are characteristic of an energy absorption spectrum for a first predetermined set of given substances;

a first detector disposed for detecting the energy of the transmitted light filtered by the first filter at each of said different tuned wavelengths to thereby provide a signal indicative of an energy absorption spectrum for said region of interest at wavelengths that are characteristic of said energy absorption spectrum for said first predetermined set of given substances;

wherein the first filter is disposed between the optical system and the first detector;

a second narrowband acousto-optical tunable filter disposed for filtering said transmitted light;

means disposed in relation to said optical system and the two filters for splitting the transmitted light into different light beams and for respectively directing said different light beams to the two filters;

second tuning means coupled to the second filter for tuning the second filter through a second predetermined series of different wavelengths that are characteristic of energy absorption spectra for a second predetermined different set of given substances; and

a second detector disposed for detecting the energy of said transmitted light filtered by the second filter at each of said second predetermined series of different tuned wavelengths to thereby provide a signal indicative of an energy absorption spectrum for said region of interest at wavelengths that are characteristic of said energy absorption spectra for said second predetermined set of given substances.

5,438,407

## SPECTROMETER AND APPARATUS INCLUDING THE SPECTROMETER

Yoichi Harada, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

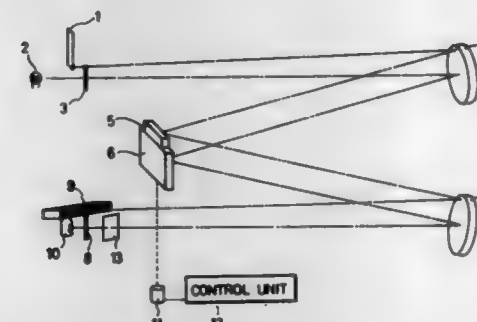
Filed Feb. 16, 1994, Ser. No. 197,485

Claims priority, application Japan, Feb. 16, 1993, 5-026585

Int. Cl.<sup>6</sup> G01J 3/28, 3/32

U.S. Cl. 356—328

11 Claims



1. A spectrometer comprising: an incident slit through which an incident light to be spectrally investigated passes; a main wavelength dispersion element for dispersing the incident light passed through the incident slit; an outlet slit for passing only a desired wavelength component of the incident light; a main detector which detects the desired wavelength of the incident light; a driving unit for driving and rotating said main wavelength dispersion element in a direction of the dispersion; a control unit connected to said driving unit for controlling operation of said driving unit; a light source which generates a standard light having a narrow wavelength bandwidth as a standard wavelength and passing through said incident slit; a sub-wavelength dispersion element which diffracts the stan-

dard light and is driven with and secured on said main wavelength dispersion element; a sub-detector having a plurality of detecting elements in line of the sub-wavelength dispersing direction for detecting the diffracted light of the standard light; and means for preventing the standard light from reaching said main detector.

5,438,408

## MEASURING DEVICE AND METHOD FOR THE DETERMINATION OF PARTICLE SIZE DISTRIBUTIONS BY SCATTERED LIGHT MEASUREMENTS

Reiner Weichert, and Wolfgang Witt, both of Clausthal-Zellerfeld, Germany, assignors to Sympatec GmbH System-Partikel-Technik, Germany

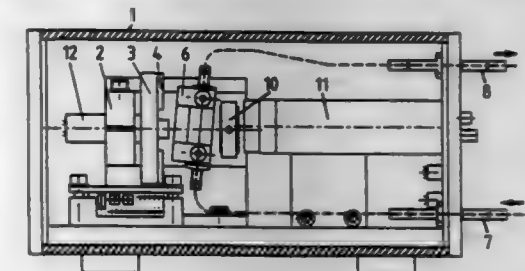
PCT No. PCT/EP92/01276, § 371 Date Feb. 5, 1993, § 102(e) Date Feb. 5, 1993, PCT Pub. No. WO92/21955, PCT Pub. Date Dec. 10, 1992

PCT Filed Jun. 5, 1992, Ser. No. 983,559

Int. Cl.<sup>6</sup> G01N 15/02

U.S. Cl. 356—336

13 Claims



1. A device for determination of fine particle size distributions, comprising:

means for illuminating a suspended assembly of fine particles with coherent laser light of a predetermined intensity;

means for directing a Fraunhofer diffraction light pattern created by the illumination light scattered at the particles onto light-sensitive detector elements of a video camera to form a diffraction light pattern image on said detector elements, digitizing means for transformation of electrical light intensity signals generated by a detector element at each pixel of said diffraction light pattern image into digital signals, with said means for directing and said means for illuminating being adjacent; and

computer means for computing from said digitized signals a point defining a center of the diffraction light pattern image and for determining therefrom an averaged radial intensity distribution of said diffraction light pattern image via solution of a Fredholm integral equation and for computing the particle size distribution of said suspended assembly.

5,438,409

## READOUT FOR A RING LASER ANGULAR RATE SENSOR

Wesley C. Sewell, Dunedin, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 8, 1985, Ser. No. 731,708

Int. Cl.<sup>6</sup> G01B 9/02; H01S 3/083

U.S. Cl. 356—350

8 Claims

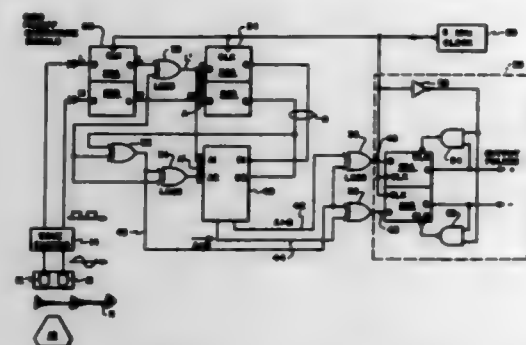
1. A readout apparatus for a laser angular rate sensor having counter-propagating laser beams which exhibit a changing phase difference between said beams in the presence of rotation, said readout apparatus comprising:

first means responsive to at least one of said laser beams for producing a first signal which has first and second signal levels as a function of said phase difference between said beams, and wherein said signal level cyclically changes level for each  $\pi$  phase change between said beams;

second means responsive to at least one of said laser beams



for producing a second signal which has first and second signal levels as a function of said phase difference between said beams, and wherein said signal level cyclically changes level for each  $\pi$  phase change between said beams, and wherein said second signal is in phase quadrature with said first signal in the presence of rotation; third means responsive to said first and second signals for providing a two-bit binary number representation of said levels of said first and second signals, said two-bit binary



number representation restricted to monotonically increasing in the presence of rotation in one direction and decreasing in the presence of rotation in the opposite direction; and signal processing means responsive to said two-bit binary number representation for providing at least one output signal having a selected signal change for each change in value of said two-bit binary number such that each output signal change represents a  $\pi/2$  phase change between said counter-propagating laser beams.

5,438,410

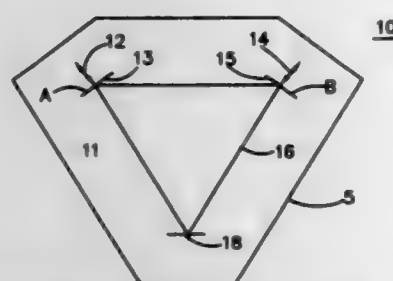
## RING LASER GYRO BIAS DRIFT IMPROVEMENT METHOD AND APPARATUS

Joseph E. Killpatrick, Minneapolis, and Dale F. Berndt, Plymouth, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 18, 1992, Ser. No. 900,403  
Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356—350

23 Claims



1. A bias drift rate improvement apparatus for a laser gyro having a laser with a path length, a first path length control mirror with a first mirror position, a second path length control mirror with a second mirror position, and a bias drift rate that varies periodically with the first mirror position and the second mirror position, wherein the bias drift rate improvement apparatus comprises:

- a first mirror positioning means coupled to the first path length control mirror for positioning the first path length control mirror;
- a second mirror positioning means coupled to the second path length control mirror for positioning the second path length control mirror; and
- a control means for controlling the first mirror positioning means and the second mirror positioning means the control means being coupled to the first and second mirror

positioning means such that the second and first mirror positions change over one period of the bias drift rate.

5,438,411

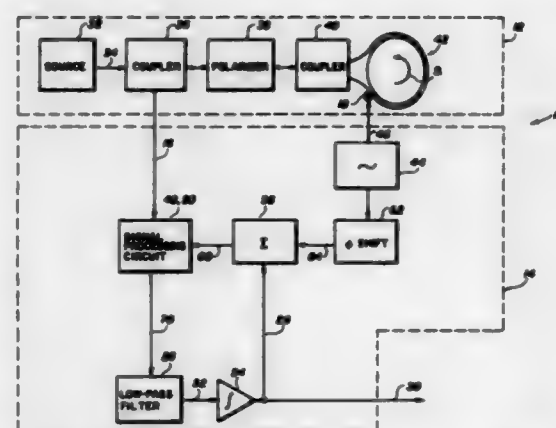
## ELECTRONIC PHASE-TRACKING OPEN-LOOP FIBER OPTIC GYROSCOPE

Alan D. Kersey, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 31, 1992, Ser. No. 937,566  
Int. Cl.<sup>6</sup> G01C 19/72

U.S. Cl. 356—350

13 Claims



1. An electronic phase-tracking open-loop fiber optic gyroscope apparatus, comprising:  
an optical gyroscope responsive to a modulation signal for developing a phase-shifted optical signal output;  
a modulator signal source for producing the modulation signal;  
phase shift means responsive to the modulation signal for producing a reference modulation signal;  
summer means responsive to the reference modulation signal and to a feedback signal for producing a reference signal;  
signal processing means responsive to the optical signal output and the reference signal for producing a composite signal;  
means for filtering the composite signal to produce an error signal; and  
an integrator responsive to the error signal for producing and applying the feedback signal to said summer means and producing an electrical system output signal related to the phase-shift of the optical signal output.

5,438,412

## PHASE CONJUGATE INTERFEROMETER FOR TESTING PARABOLOIDAL MIRROR SURFACES

Koji Tenjinbayashi, Tsukuba, Japan, assignor to Agency of Industrial Science Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 210,292

Claims priority, application Japan, Mar. 31, 1993, 5-097300  
Int. Cl.<sup>6</sup> G01B 9/02

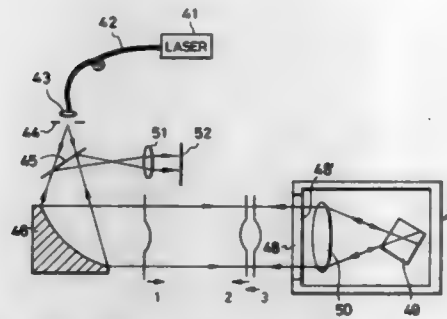
U.S. Cl. 356—359

1 Claim

1. A phase conjugate interferometer for testing paraboloidal mirror surfaces, comprising:

- a laser light source;
- an optical fiber for guiding a laser beam emitted by the laser light source;
- an objective lens through which the laser beam is diverged, said objective lens being disposed at the end of the optical fiber;
- a semi-transparent mirror disposed between the objective lens and the paraboloidal mirror surface for transmitting

the laser beam from the objective lens to the paraboloidal mirror surface;  
a light reflection portion having both a parallel plane glass plate with a reference flat surface and a non-linear optical crystal for causing a phase conjugate wave front, said light reflection portion reflecting the incident laser beam reflected by the paraboloidal mirror surface not only as a laser beam with a reflection flat surface reflected wave front imparted by the reference flat surface of the parallel



plane glass plate, but also as a laser beam with a phase conjugate wave front caused by the non-linear optical crystal;  
said semi-transparent mirror reflecting the two laser beams reflected by the light reflection portion and then by the paraboloidal mirror surface; and  
a screen for displaying an interference fringe pattern formed by the two laser beams reflected by the semi-transparent mirror.

5,438,413

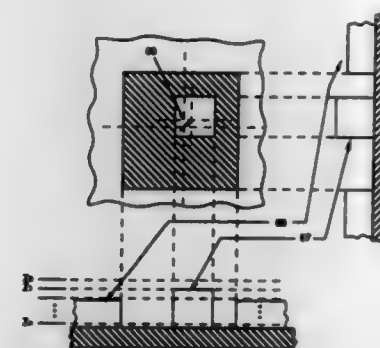
## PROCESS FOR MEASURING OVERLAY MISREGISTRATION DURING SEMICONDUCTOR WAFER FABRICATION

Isaac Mazar, Haifa; Noam Knoll, Zicron Jacob, and Yoram Uziel, Kibutz Yodfat, all of Israel, assignors to KLA Instruments Corporation, San Jose, Calif.

Filed Mar. 3, 1993, Ser. No. 25,435  
Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356—363

12 Claims



1. A method of inspecting a semiconductive wafer in process to determine the accuracy of alignment of one process layer to a subsequent process layer formed thereover, said subsequent layer having at least a second alignment attribute intended to have a predetermined registrational relationship to a corresponding first alignment attribute of said one layer, said first and second attributes each being defined by at least one edge of geometric bodies formed during fabrication of said one and said subsequent process layers, comprising the steps of:  
using an interference optical system including an object channel and a reference channel for simultaneously inspecting said wafer and a reflective reference surface, and developing a plurality of images formed by the interference between object wave energy, passing from said wafer and through said object channel to an image plane,

and reference wave energy passing from said reference surface and through said reference channel to said image plane, each said image being formed in response to a change in axial position of either said wafer along the optical axis of said object channel or said reference surface along the optical axis of said reference channel;  
detecting for each image the magnitude of the mutual coherence between the object wave energy reflected from a portion of the surface of said wafer including said second attribute, and from a portion of said wafer including at least a vestige of said first attribute, and said reference wave energy;  
using the magnitude coherence data to generate synthetic image data representative of at least one edge of said first attribute and at least one edge of said second attribute; and  
using said synthetic image data to determine the relative alignment of said second attribute of said subsequent layer to said first attribute of said one layer.

5,438,414

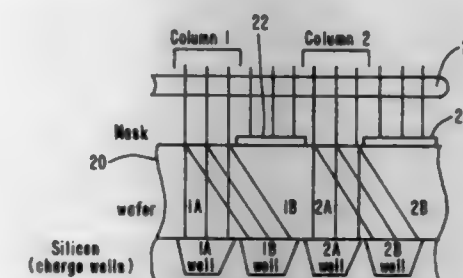
## INTEGRATED DUAL IMAGING DETECTOR

David M. Rust, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Jan. 22, 1993, Ser. No. 8,449  
Int. Cl.<sup>6</sup> G01J 4/00

U.S. Cl. 356—364

17 Claims



1. A polarization analyzer for the simultaneous collection of two polarization images on a detector array comprising:  
a charge-coupled device (CCD) comprising a detector array of columns of charge collection cells;  
a wafer of beamsplitting material bonded to the CCD on top of the array of charge collection cells; and  
an optical mask bonded to the wafer of beamsplitting material and comprising a plurality of opaque strips covering alternate columns of the charge collection cells; whereby a beam of light incident on the wafer is split by the beamsplitting material into two polarization images, the first image passing straight through the beamsplitting material and falling on the columns of charge collection cells not covered by the optical mask and the second image being refracted through the beamsplitting material to fall on the columns of charge collection cells covered by the optical mask, the optical mask preventing the two images from mixing.

5,438,415

**ELLIPSO-METER AND METHOD OF CONTROLLING COATING THICKNESS THEREWITH**

Akira Kasama; Takahiko Oshige; Yoshiro Yamada; Takeo Yamada; Takeshi Yamazaki; Takamitsu Takayama, and Shuichi Nomura, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

PCT No. PCT/JP92/00067, § 371 Date Sep. 22, 1992, § 102(e) Date Sep. 22, 1992, PCT Pub. No. WO92/14119, PCT Pub. Date Aug. 20, 1992

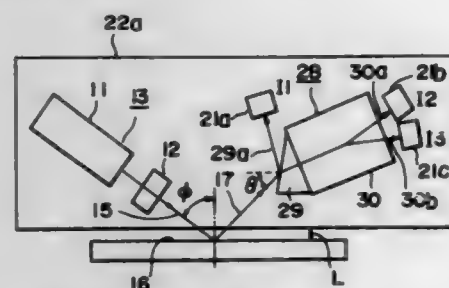
PCT Filed Jan. 27, 1992, Ser. No. 927,410

Claims priority, application Japan, Jan. 30, 1991, 3-029296; Apr. 5, 1991, 3-100405; Nov. 13, 1991, 3-296868

Int. Cl.<sup>6</sup> G01B 11/06

U.S. Cl. 356-369

8 Claims



**1. An ellipsometer comprising:**

a light source section for projecting polarized light on an object to be measured at a specified angle;

a composite polarization beam splitter for dividing reflected light from said object into a first polarized light component whose polarizing direction is set to a reference direction, and second and third polarized components having polarizing directions which are set to directions different from said reference direction;

first, second and third photodetectors for sensing the light intensities of the first, second and third polarized light components divided by the composite polarization beam splitter; and

a computing section for calculating ellipsoparameters of the elliptically polarized light of said reflected light, from the respective light intensities sensed by said first, second and third photodetectors;

said composite polarization beam splitter comprising:

an unpolarizing glass portion which has an incident angle at an incident surface thereof for the light reflected from said object set to a Brewster angle, and which divides light incident thereon at the incident surface into the reflected light component going to said first photodetector and the transmitted light going inside thereof; and

a polarization beam splitter which is optically bonded to a light emitting surface of the unpolarizing glass portion from which the transmitted light leaves, and which divides the light passed through said unpolarizing glass member into the second and third polarized light components whose polarizing directions are different from said reference direction.

5,438,416

**LASER DUAL WAVELENGTH SELECTION SYSTEM**

Charles Nater, P.O. Box 386, Saratoga, Calif. 95071

Continuation-in-part of Ser. No. 831,769, Feb. 5, 1992, abandoned, which is a continuation of Ser. No. 272,596, Nov. 17, 1988, abandoned. This application Sep. 20, 1993, Ser. No. 124,304

Int. Cl.<sup>6</sup> G01B 11/14; H01S 3/00

U.S. Cl. 356-373

24 Claims

**1. A method of selecting laser dual wavelengths comprising the steps of:**

(1) angularly moving a shaft of a galvanometric actuator by means of a drive control means providing a voltage to said

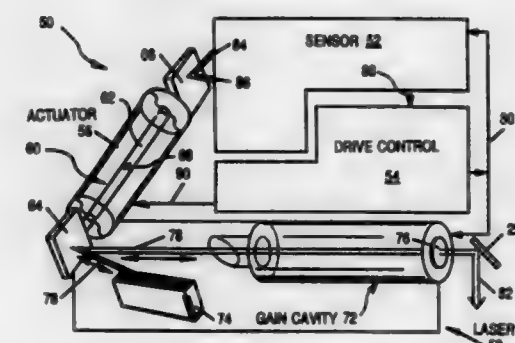
galvanometric actuator which is selected from the group consisting of pulsed and alternating voltage, where angularly moving is selected from the group consisting of sinusoidally and resonantly moving;

(2) using the drive control means in a resonant mode for moving the shaft in cycles at a fixed cyclic rate and causing the shaft to be motionless in two positions one hundred-eighty degrees of rotation apart for each cycle;

(3) sensing the movement and angular position of the shaft by means of a sensor means comprising reflecting a continuously emitted sensing light beam onto a sensor reflector which is rigidly mounted on the actuator shaft, detecting the reflected beam by means of an optical detector, and using the position of the reflected beam for determining a position signal of the sensor reflector at the time in the cycle when the shaft is motionless;

(4) controlling the drive control means for driving and positioning of the shaft by using feedback from the position signal;

(5) directing a laser beam onto an intra-cavity reflector rigidly mounted on the actuator shaft, wherein the laser



beam is created by a trigger pulse from the drive control means at the time when the intra-cavity reflector is motionless;

(6) controlling the trigger pulse by means of the drive control means;

(7) reflecting the laser beam off the intra-cavity reflector onto an optical diffraction grating;

(8) selecting a specific wavelength of light by orienting the intra-cavity reflector relative to the diffraction grating and an axis of a laser cavity;

(9) controlling the position of the intra-cavity reflector by means of the drive control means;

(10) activating a change of state in a gain medium for the laser, by means of the drive control means;

(11) controlling optimum energizing of the laser through timing information provided to the laser by feedback from the drive control means;

(12) recording sensor reflector position information and programming sequential wavelength choices for the drive control means to implement the method by means of a memory means.

5,438,417

**ELECTRO-OPTICAL SYSTEM FOR GAUGING SURFACE PROFILE DEVIATIONS**

Garland F. Busch, Milan; James G. Downward, Ann Arbor; Paul G. Gottschalk, Ann Arbor; Theodore B. Ladewski, Ann Arbor, and Charles D. Lysogorski, Dexter, all of Mich., assignors to KMS Fusion, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 770,885, Oct. 4, 1991, Pat. No. 5,289,267. This application Aug. 17, 1993, Ser. No. 108,851. The portion of the term of this patent subsequent to Feb. 22, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 356-394

19 Claims

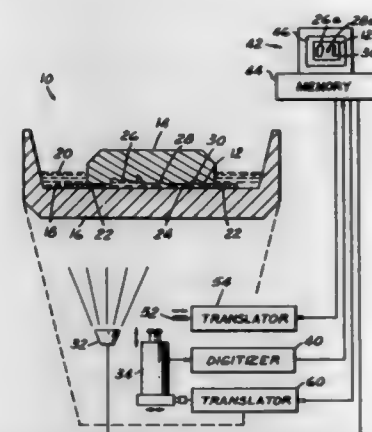
**1. A system for gauging deviations of a surface on a test**

object from a preselected nominal surface geometry using electromagnetic radiation, comprising:

a source of electromagnetic radiation for irradiating the test object surface;

an image sensor positioned to receive electromagnetic radiation reflected from the test object surface and which originates from said source;

an attenuating medium disposed between said image sensor and the test object surface such that the electromagnetic radiation reflected from the test object surface passes through said attenuating medium prior to being received by said image sensor, the intensity of the reflected radiation



tion varying across the image as a function of the deviation of the test object surface from the preselected nominal surface geometry, whereby an image of the test object surface is formed within said image sensor;

a digitizer for converting the image from said image sensor into digital signals representing the intensity of the reflected radiation across the image;

digital electronic storage means coupled to the digitizer for receiving and storing the digital signals; and

a calibration arrangement for correcting errors in the image formed by said image sensor, including means for producing a set of correction data and for altering the digital signals in accordance with the correction data.

5,438,418

**ROBOT-TEACHING CASSETTE**

Shoji Fukui; Toshiyuki Watanabe, and Masaki Suzuki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 7,777, Jan. 22, 1993, abandoned. This application Apr. 21, 1993, Ser. No. 49,496. Claims priority, application Japan, Jan. 22, 1992, 4-8909. Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 356-399

4 Claims

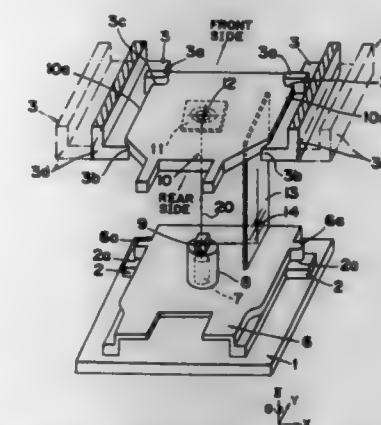
**1. A robot-teaching cassette used for teaching a robot to mount a wafer cassette or a substrate cassette on a cassette-supporting base, said robot-teaching cassette comprising:**

a fixing section capable of being detachably secured to the cassette-supporting base;

a moving section capable of being held by a robot-chucking section of the robot and being movable relative to said fixing section;

a light source provided on one of the fixing section and the moving section; said light source including a beam source and a beam splitter which splits a beam emitted by the source into a beam extending perpendicular to and a beam extending parallel to the section of the robot-teaching cassette provided with the beam source;

a first target, establishing a reference position, provided on one of the fixing section and the moving section, and



a second target, establishing a second reference position, provided on said other of the fixing section and the moving section.

5,438,419

**PRECISION WAFER DRIVING DEVICE BY UTILIZING SOLID TYPE ACTUATOR**

Jonghyun Lee; Yountae Kim, and Bowoo Kim, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Rep. of Korea

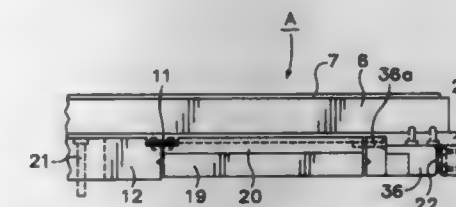
Continuation of Ser. No. 813,370, Dec. 23, 1991, abandoned.

This application Feb. 16, 1994, Ser. No. 200,577

Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 356-399

8 Claims



**1. A precision positioning device using a solid state actuator for positioning a wafer holder 6, comprising:**

(a) a support block 12;

(b) solid state actuators 19 to be expanded according to an input voltage, said solid state actuators 19 horizontally connected to said support block;

(c) hinge springs 11 connected to said support block; and

(d) displacement transformer means 20 connected to said hinge springs for transforming an axial stroke of said solid state actuators 19 into vertical movement by rotating about the hinge springs, the vertical movement being transferred to the wafer holder through rollers 22 set between the displacement transformer means and the wafer holder.

5,438,420

**MONITORING OF FLUID CONTAMINATION LEVEL WHEREIN THE LIGHT ENERGY IS FOCUSED ON THE FLUID PASSAGE MEANS**

Warren J. Harwick, Rochester, Mich.; Holger T. Sommer, Merlin, and Kenneth L. Girvin, Grants Pass, both of Oreg., assignors to Vickers, Incorporated, Maumee, Ohio and Met One, Inc., Grants Pass, Oreg.

Filed Aug. 9, 1993, Ser. No. 103,352

Int. Cl.<sup>6</sup> G01N 21/00

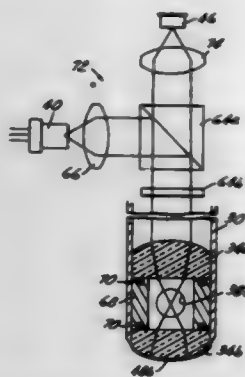
U.S. Cl. 356-440

5 Claims

**1. Apparatus for monitoring fluid contaminant level comprising:**



an elongated probe, first means adjacent to one end of said probe providing a passage for sample fluid flow through said probe in a direction orthogonal to said probe, a light source at a second end of said probe for directing collimated light energy along a light path within said probe toward said fluid passage, retroreflective means disposed at said one end of said probe on a side of said fluid passage opposite said light source, second means disposed within said probe between said light source and said fluid passage for cooperating with said retroreflective means to focus collimated light energy from said source to a point in said fluid passage and thence



onto said retroreflective means, said retroreflective means reflecting and refocusing said light energy to the same said point in said fluid passage and thence onto second means for recollimation and passage back along the same second light path in said probe toward said light source, third means in said light path between said light source and said second means for separation from said path the light energy reflected for said retroreflective means, and photosensing means at said second end of said probe for receiving light energy separated from said light path by said third means and providing an indication of level of contamination in the fluid in said passage as a function of intensity of such light energy.

5,438,421

#### ORIENTATION FILM OF LIQUID CRYSTAL HAVING BILATERALLY ASYMMETRIC RIDGES SEPARATED BY GROOVES

Kiyomi Sugawara, Sendai; Yoshihiko Ishitaka, Miyagi; Hiroshi Yamagami, Nagasaki; Masahiko Yamaguchi, Sendai; Mitsuru Kano, Furukawa, and Hiroyuki Hebiguchi, Sendai, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

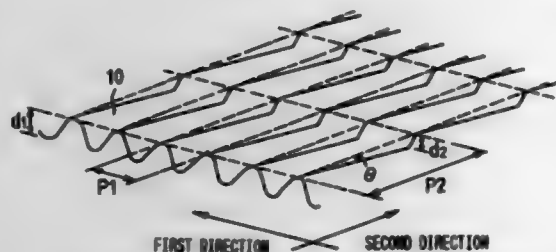
Continuation of Ser. No. 866,727, Apr. 10, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 203,849

Claims priority, application Japan, Apr. 24, 1991, 3-122330; Jul. 8, 1991, 3-167257; Sep. 13, 1991, 3-235040; Oct. 4, 1991, 3-258148

Int. Cl.<sup>6</sup> G02F 1/1337

U.S. Cl. 359-75

8 Claims



4. A orientation film of a liquid crystal, said orientation film

being formed on a planar substrate, said orientation film comprising:

a plurality of parallel, continuous convex ridges, each adjacent pair of said plurality of ridges being separated by a continuous groove; wherein each of said plurality of ridges has an irregular, asymmetric repeated form in a longitudinal direction and a width, the repeated form in the longitudinal direction being longer than the width; and wherein said orientation film is entirely defined by said plurality of ridges and associated grooves such that all surfaces of the orientation film are curved with respect to said planar substrate.

5,438,422

#### ERROR DETECTION APPARATUS AND METHOD FOR USE WITH ENGRAVERS

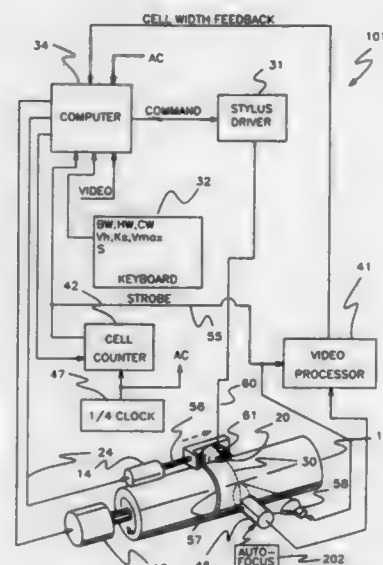
Paul L. Holowko, Spring Valley; David R. Seltz, Vandalia, and Curtis Woods, Centerville, all of Ohio, assignors to Ohio Electronic Engravers, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 22,127, Feb. 25, 1993. This application Mar. 26, 1993, Ser. No. 38,679

Int. Cl.<sup>6</sup> B41C 1/02; G06F 17/00

U.S. Cl. 358-299

53 Claims



1. A method for measuring a portion of an engraved area on a cylinder in an engraver, said method comprising the steps of: videoing said portion of said engraved area and generating a video image corresponding thereto; using said video image to locate a transition between said engraved area and a non-engraved area and generate transition data corresponding thereto; generating at least one actual dimension value using said transition data.

5,438,423

#### TIME WARPING FOR VIDEO VIEWING

Eugene F. Lynch, Portland; Guy W. Cherry, Beaverton, and Mayer D. Schwartz, Portland, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Continuation of Ser. No. 81,943, Jun. 25, 1993, abandoned. This application May 11, 1994, Ser. No. 240,942

Int. Cl.<sup>6</sup> H04N 5/76

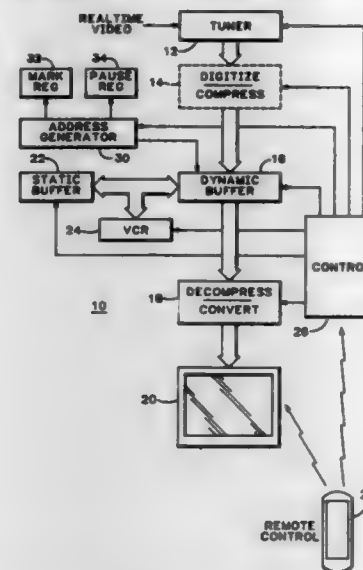
U.S. Cl. 358-335

15 Claims

1. A system of time warping for video viewing in a video receiver having a tuner for selecting a video channel and providing a time linear input video signal and a display device for displaying a video signal comprising:

a recirculating dynamic buffer coupled to the tuner for

continuously receiving the time linear input video signal provided by the tuner so that a segment of the time linear input video signal having a predetermined duration is temporarily stored in the recirculating dynamic buffer; control means responsive to a PAUSE command for marking the segment of the time linear video signal stored in the recirculating dynamic buffer with an access point; and



means for randomly accessing the segment of the time linear video signal stored in the recirculating dynamic buffer to provide an output video signal for display by the display device so that the segment of the time linear video signal can be accessed for subsequent display from the access point simultaneously with continued buffering of the time linear input video signal.

5,438,424

#### VIDEO SIGNAL PROCESSING APPARATUS WITH IMAGE QUALITY ADJUSTMENT

Yukihiko Ozaki, and Eiji Moro, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

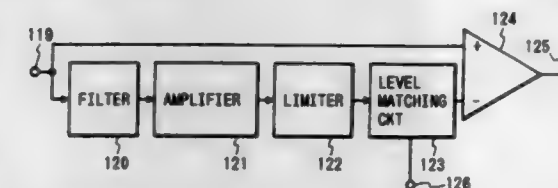
Continuation of Ser. No. 826,621, Jan. 28, 1992, abandoned. This application Jul. 8, 1993, Ser. No. 89,401

Claims priority, application Japan, Jan. 31, 1991, 3-010563; Feb. 15, 1991, 3-021805

Int. Cl.<sup>6</sup> H04N 5/94

U.S. Cl. 358-336

2 Claims



1. A video signal processor comprising: a noise canceling circuit including an amplitude limiter circuit; and, state switching means;

wherein said noise canceling circuit is constructed such that a noise component derived from a video signal after being passed through said limiter is amplified or attenuated and then subtracted from the video signal, and wherein said state switching means is operable to switch said noise canceling circuit between a first state in which an amplification or attenuation thereof is set such that an amplitude of a noise component derived after being passed through said limiter circuit substantially equals an amplitude of a noise component contained in the video signal and subtracting the noise component from the video signal under a first condition where the noise component of the video signal is small enough to not be influenced by an ampli-

tude limiting effect of said limiter circuit or in a second state in which the amplification of the noise component is increased or the attenuation of the noise component is decreased compared with the first state to compensate for an amplitude attenuation of the noise component limited by said limiter circuit under a second condition where the amplitude of the noise component of the video signal is large enough to be influenced by the amplitude limiting effect of said limiter circuit.

5,438,425

#### FREQUENCY DROP OUT DETECTOR CIRCUIT AND METHOD THEREOF

Cheon-seob Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

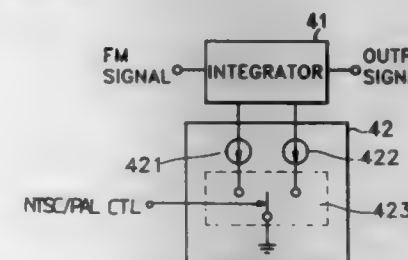
Filed Oct. 20, 1993, Ser. No. 138,183

Claims priority, application Rep. of Korea, Oct. 22, 1992, 92-19425

Int. Cl.<sup>6</sup> H04N 5/94, 5/945

U.S. Cl. 358-336

4 Claims



1. A frequency drop out detector for determining frequency drop out in both a PAL system and an NTSC system, comprising:

an integrator for integrating an FM signal applied thereto, said integrator having an input for receiving a source of integrating current; a variable source of integrating current for selectively applying first and second integrating currents to said input of said integrator for controlling the rate of integration of said integrator, said selection being based on whether said FM signal is of an NTSC or a PAL system; and means for detecting the relationship between the integrated value of said FM signal and a fixed reference to determine the existence of drop out in said FM signal irrespective of whether said FM signal is of an NTSC or a PAL system.

5,438,426

#### IMAGE INFORMATION PROCESSING APPARATUS

Michiyori Miale, and Ai Soga, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

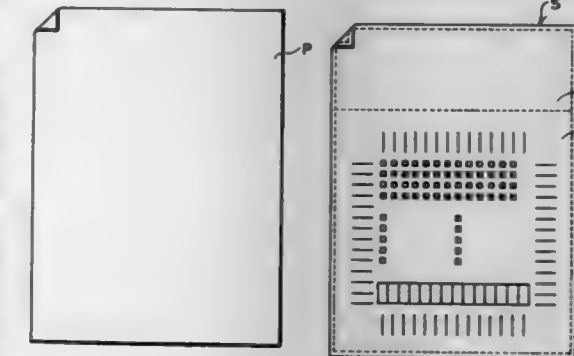
Filed Jan. 25, 1994, Ser. No. 186,371

Claims priority, application Japan, Mar. 19, 1993, 5-060563

Int. Cl.<sup>6</sup> H04N 1/00

U.S. Cl. 358-403

19 Claims

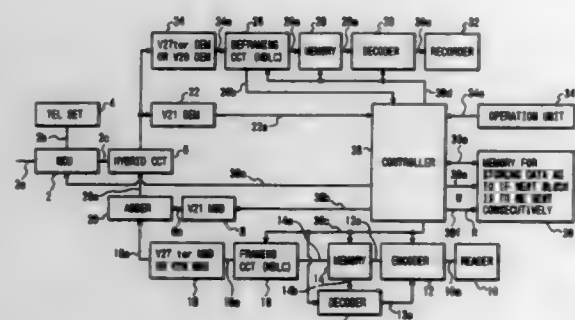


1. An image information processing apparatus comprising:

inputting means for sequentially inputting a plurality of documents as image information;  
detecting means for detecting a separating sheet with a white specified area, the separating sheet being inserted between the documents;  
separation designating means for designating a grouping of the image information according to a position of the separating sheet inserted; and  
memory means for separating the image information into groups in accordance with an output of said separation designating means and filing each of said group of the image information as a block of document data,  
wherein said detecting means carries out a logical AND between image data of said specified area of the separating sheet and data which is obtained by shifting the image data by an amount of one dot in a lateral direction, and detecting the separating sheet based on first data represented by the logical AND so as to eliminate noise from the image information.

5,438,427  
FACSIMILE APPARATUS WITH CONTROLLED IMAGE  
PAGE TRANSMISSION AFTER RETRANSMISSION  
Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki  
Kaisha, Tokyo, Japan

Continuation of Ser. No. 771,183, Oct. 4, 1991, abandoned. This application Oct. 19, 1994, Ser. No. 325,639  
Claims priority, application Japan, Oct. 11, 1990, 2-273588  
Int. Cl.<sup>6</sup> H04N 1/333, 1/41, 1/415  
U.S. Cl. 358—405 24 Claims

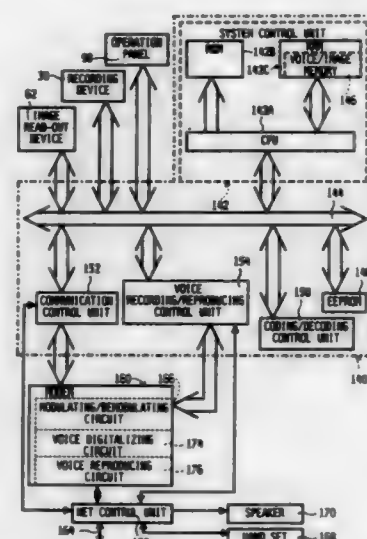


1. A facsimile apparatus for communicating image data, said apparatus having a plurality of modes for encoding image data to be transmitted and comprising:

- selection means for selecting one of a plurality of encoding modes, wherein a first one of the encoding modes is an at least two-dimensional encoding mode;
- encoding means for encoding image data by employing the selected encoding mode;
- retransmission means for retransmitting encoded image data in accordance with a request of retransmission from a receiver station; and
- control means for controlling transmission of next image data that follows first image data encoded and transmitted by said apparatus, said control means being operative, in response to the first encoding mode being selected for encoding the first image data and the encoded first image data being not correctly transmitted after retransmission of the encoded first image data a predetermined number of times, for controlling whether the next image data is to be transmitted as encoded image data encoded using the first encoding mode.

**5,438,428**  
**DATA STORAGE DEVICE WITH SELECTABLE TYPE**  
**DATA STORAGES**

**Shingo Itoh, Inazawa, Japan, assignor to Brother Kogyo Kabu-  
shiki Kiasha, Nagoya, Japan**  
**Filed Apr. 6, 1994, Ser. No. 223,963**  
**Claims priority, application Japan, Apr. 15, 1993, 5-114033**  
**Int. Cl.<sup>6</sup> H04N 1/21, 1/32; H04M 11/06**  
**U.S. Cl. 358—436** **14 Claims**



**1. A data storage device, comprising:**  
digital data storing means for storing both voice digital data of voice messages and image digital data of image messages; and  
storage mode indicating means for conducting a selective storage mode indication of at least two storage modes from multiple storage modes, the multiple storage modes including a first storage mode in which the type of digital data to be stored into the digital data storing means is limited to only voice digital data, a second storage mode in which the type of digital data to be stored into the digital data storing means is limited to only image digital data and a third storage mode in which the type of digital data to be stored into the digital data storing means is both voice digital data and image digital data.

5. An apparatus for storing data, comprising:  
a digital data storing memory for storing a selected type of digital data from a group of types of digital data consisting of voice digital data, image digital data and both voice digital data and image digital data;  
control means for controlling operation of the apparatus;  
selection means for selecting the type of digital data to which digital data stored in said digital data storing means is limited; and  
indication means for indicating the type of digital data selected for storage using said selection means.

**5,438,429**  
**DIGITAL FILTERING FOR LENTICULAR PRINTING**  
 Paul E. Haeberli, Menlo Park, and Leonard J. Flory, Sacramento, both of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Continuation of Ser. No. 751,033, Aug. 28, 1991. This application Nov. 4, 1993, Ser. No. 148,086  
Int. Cl.<sup>6</sup> H04N 1/40

U.S. Cl. 358—445 **MICROFICHE APPENDIX INCLUDED** 9 Claims  
(106 Microfiche, 2 Pages)

1. A method of producing a composite hardcopy comprising:

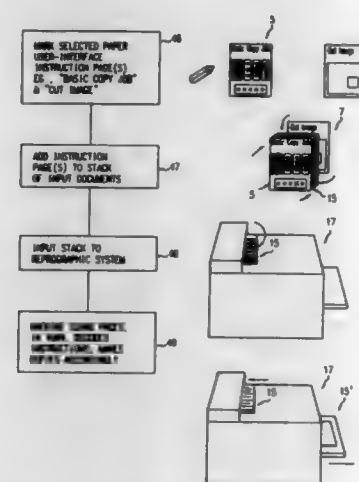
digitizing and storing a plurality of generated images captured on frames;  
determining a common point to said plurality of frames;  
creating multiple images from off-axis perspective projections using said common point;  
storing said images;  
splitting each image into a plurality of strips;  
interleaving said plurality of strips to form a composite of interleaved strips such that when viewed by a person a



three dimensional image is formed in the mind of said person;  
performing an unsharp masking technique on said composite of interleaved strips to produce a sharper image composite;  
printing said sharper image composite using a hard copy output device; and  
laminating said sharper image composite onto a lenticular surface.

**5,438,430**  
**PAPER USER INTERFACE FOR IMAGE**  
**MANIPULATIONS SUCH AS CUT AND PASTE**  
**Jock D. Mackinlay, Palo Alto, and Walter A. L. Johnson, Santa**  
**Clara, both of Calif., assignors to Xerox Corporation, Stam-**  
**ford, Conn.**

Filed Sep. 25, 1992, Ser. No. 950,564  
Int. Cl.<sup>6</sup> H04N 1/387  
U.S. Cl. 358—450



1. A method for interfacing image manipulation instructions from a user to a system reprographic device to produce an output document having an output image comprised of a cropped portion of an input image from an input document, comprising the steps of:

- providing an instruction page containing user selectable image processing commands on cropping an input image from an input document;
- operating said system reprographic device to scan said instruction page with a scanner;
- decoding the image processing commands contained in said instruction page;

scanning an input image from an input document with the scanner; and  
producing an output document having an output image in accordance with the decoded image processing commands, said output image comprising a cropped portion of the input image scanned from the input document.

**5,438,431**  
**METHOD AND APPARATUS FOR GENERATING**  
**DIGITAL HALFTONE IMAGES USING A ROTATED**  
**DISPERSED DITHER MATRIX**

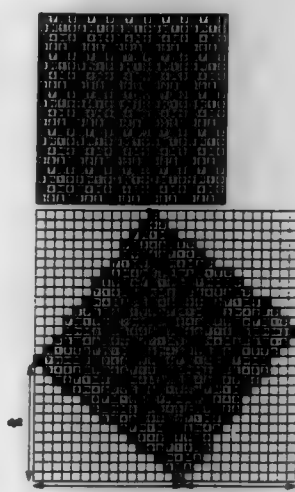
Victor B. Ostromoukhov, Rte du Pavement 10, CH-1018 Lausanne, Switzerland

Filed May 20, 1993, Ser. No. 63,984  
Claims priority, application Switzerland, May 21, 1992,  
01633920

U.S. Cl. 358—457 Int. Cl.<sup>6</sup> H04N 1/40

U.S. CL. 358-457

### 3 Claims



1. A method for producing digital halftone screens, the screens being composed of a plurality of repetitive screen patterns, all having a predetermined screen angle; said screen patterns being obtained by applying threshold comparisons between input image intensity levels and threshold values contained in a rotated threshold dither matrix; said rotated threshold dither matrix being obtained by applying a discrete one-to-one rotation to a well-dispersed non-rotated square threshold dither matrix composed of multiple well-dispersed non-rotated square threshold sub-matrices; said rotated threshold dither matrix being composed of a multiple of rotated sub-matrices of different shapes; the method being characterized by the fact that all said rotated sub-matrices contain exactly the same number of elementary cells as said non-rotated sub-matrices, that their elementary cell positions are defined by said discrete one-to-one rotation and that the threshold values associated with elementary cells of said non-rotated sub-matrices are identical to corresponding threshold values associated with elementary cells of said rotated sub-matrices, so that said rotated threshold dither matrix can be seen as a spatial reorganization of the non-rotated threshold dither matrix, without modifying the threshold values of said threshold dither matrix; the method comprising the steps of

(a) creating and storing in memory said well-dispersed non-rotated square threshold dither matrix by replicating said well-dispersed non-rotated square threshold sub-matrices each of size  $n$  by  $n$ ,  $c$  by  $c$  times vertically and horizontally, in a threshold matrix coordinate system  $(i,j)$ , where  $n$  and  $c$  are integers;

(b) creating and storing in memory said rotated threshold dither matrix in an output coordinate system  $(x,y)$ ; every elementary cell of said rotated threshold dither matrix which contains the threshold value having the coordinates



$(x_i, y_i)$  in the output coordinate system  $(x, y)$  computed according to the following formula which specifies said discrete one-to-one rotation of angle  $\alpha = \arctan(b/a)$ :

$$x_i = \text{round}((a^2(i_i - i_0) - b^2(j_i - j_0))/c) + x_0$$

$$y_i = \text{round}((b^2(i_i - i_0) - a^2(j_i - j_0))/c) + y_0$$

where  $(i_i, j_i)$  define the coordinates of an elementary cell of said non-rotated threshold dither matrix in the threshold matrix coordinate system  $(i, j)$  having the same threshold value as the elementary cell  $(i_i, j_i)$  of the rotated threshold dither matrix;  $(i_0, j_0)$  respectively  $(x_0, y_0)$  define the positions of said non-rotated threshold matrix respectively rotated threshold matrix in the coordinate systems  $(i, j)$  respectively  $(x, y)$  and wherein  $a$ ,  $b$  and  $c$  are integers, members of Pythagorean triplets  $\{a, b, c\}$  satisfying Diophantine equation  $a^2 + b^2 = c^2$  and said screen angle being  $\alpha = \arctan(b/a)$  to said output coordinate system  $(x, y)$ ;

(c) scanning the input gray-scale image pixel by pixel, finding the appropriate rectangular area of each pixel, in said output coordinate system  $(x, y)$ ; then applying, for every elementary dot inside said rectangular area, a comparison between the input gray level and the corresponding threshold value, in the rotated threshold dither matrix defined in step (b), and producing for each elementary dot inside said rectangular area an active (white) pixel respectively inactive (black) pixel, according to the result of said comparison.

5,438,432

## DATA TRANSMITTING APPARATUS

Toshiaki Kose, and Tsuchiro Matsui, both of Saitama, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan  
Filed Sep. 24, 1992, Ser. No. 950,154

Claims priority, application Japan, Sep. 25, 1991, 3-271898  
Int. Cl.<sup>6</sup> H04N 1/00

U.S. Cl. 358-467

5 Claims



1. A data transmitting apparatus capable of transmitting data in a mixed mode to a remote data receiving station, said data transmitting apparatus comprising:

- an image data block detecting means for detecting a block composed of image data out of blocks forming document data;
- a vacant space detecting means for detecting a vacant space in excess of a predetermined size in the block detected by said image data block detecting means; and
- a dividing means for dividing the block into two blocks separated by the vacant space detected by said vacant space detecting means.

5,438,433

## SYSTEM AND METHOD FOR FACSIMILE COVER PAGE STORAGE AND USE

Jeffrey B. Reifman, Seattle; Kurt D. DeBene, Bellevue; Chris E. Tobey, and Renée Marceau, both of Seattle, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Division of Ser. No. 73,511, Jan. 7, 1993. This application Mar. 31, 1994, Ser. No. 221,681

Int. Cl.<sup>6</sup> H04N 1/00

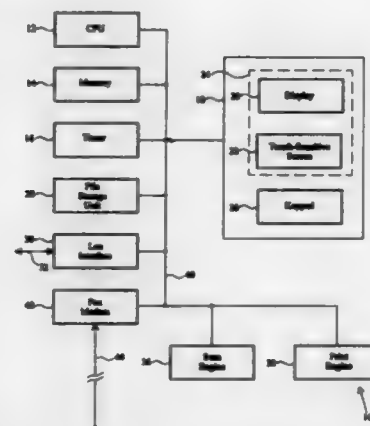
U.S. Cl. 358-468

10 Claims

1. A method in a facsimile machine having a display and a

user input device, for storage and use of a facsimile cover page, the method comprising the steps of:

- maintaining at least one facsimile cover page in a first storage location continuously accessible by any of a plurality of users of the facsimile machine;
- maintaining at least another facsimile cover page in a second storage location accessible by a selected one of said plurality of users, said selected user having a corresponding user identification;



sensing if a user inputs a user identification; and enabling access to said, second storage location only if said sensed user identification corresponds to said user identification of said selected user, said first storage area being continuously enabled for any of said plurality of users and said second storage area being enabled only when said sensed user identification corresponds to said user identification of said selected user.

5,438,434

## PORTABLE APPARATUS FOR PRINTING AN IMAGE ON FILM AND DISPLAYING THE IMAGE ON A SCREEN

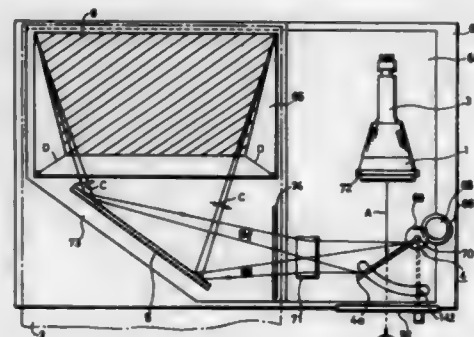
Toshihide Saitoh, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 22, 1994, Ser. No. 215,622

Claims priority, application Japan, Mar. 23, 1993, 5-064114

Int. Cl.<sup>6</sup> H04N 1/04, 1/46; G03B 13/28; G03F 3/10  
U.S. Cl. 358-487

16 Claims



1. Portable apparatus selectively operable in print and monitor modes for printing and monitoring, respectively, a color an image, comprising:

- a light-proof housing;
- means for receiving a composite color video signal for providing red, green and blue component signals therefrom;
- image generating means for generating a viewable image;
- means for receiving said red, green and blue component signals and being operative, in said prior mode, to supply said red, green and blue component signals in succession to said image generating means;
- means for receiving said red, green and blue component

Signals and being operative, in said monitor mode, to form a composite image signal therefrom and to supply said composite image signal to said image generating means; a display screen in optical communication with said image generating means to define a first optical path and to display said viewable image; means for defining a second folded optical path; reflecting means selectively movable into said first optical path to intercept the image generated by said image generating means and reflect said image over said second folded optical path; drive means coupled to said first reflecting means for driving said first reflecting means into and out of said first optical path; optically exposable film positioned to receive said image reflected over said second folded optical path; and optical filter means disposed in said housing and having red, green and blue portions selectively interposed in said second folded optical path in synchronization with the successive supplying of said red, green and blue component signals to said image-generating means in said print mode for successively passing red, green and blue color components of the image reflected over said second folded optical path to said optically exposable film.

5,438,435

## DUPLEX DOCUMENT HANDLER AND IMAGE FORMING APPARATUS

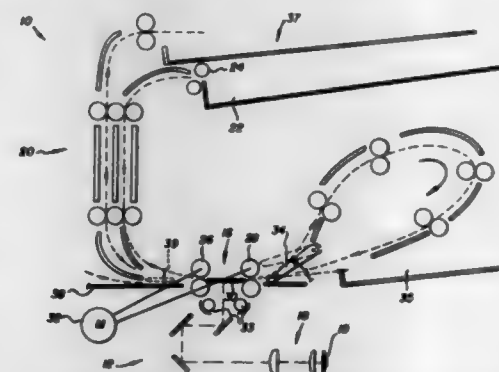
Gary P. Lawniczak, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 27, 1993, Ser. No. 98,111

Int. Cl.<sup>6</sup> H04N 1/04

U.S. Cl. 358-496

15 Claims



1. A duplex document handler for moving each side of a document sheet in an in-track direction past a stationary scanning station, comprising:

- supply means for receiving document sheets of a large size and of a smaller size;
- means for feeding a document sheet from said supply means along a supply path, through said scanning station with a first side of the document sheet facing in a scanning orientation to scan the first side of the document sheet;
- means for feeding the document sheet, leading edge first, from said scanning station, through an inverting loop, back to said scanning station and through said scanning station, leading edge first, with a second side of the document sheet opposite the first side facing in the scanning orientation to scan the second side of the document sheet, said document sheet moving through said scanning station when scanning the second side of the document sheet, in a direction opposite the movement of the document sheet when scanning the first side, wherein said loop is of a size to receive only one large size document sheet without the leading edge of said document sheet being returned to the scanning station before the trailing edge of the document sheet leaves the scanning station, but is large enough to receive two smaller size document sheets without the

leading edge of a first smaller document sheet being returned to the scanning station before the trailing edge of the second document sheet leaves the scanning station; and means for electronically scanning whichever side of the document sheet is facing in the scanning orientation as the document sheet moves through the scanning station.

5,438,436

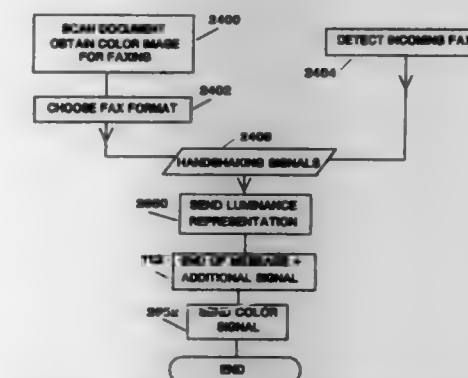
## FACSIMILE MACHINE APPARATUS

Scott C. Harris, 7988 Foxmoor Dr., Dunn Loring, Va. 22027  
Continuation-in-part of Ser. No. 346,211, May 2, 1989, Pat. No. 5,339,174. This application Sep. 27, 1993, Ser. No. 126,408

Int. Cl.<sup>6</sup> H04N 1/46

U.S. Cl. 358-500

4 Claims



1. A method of assembling and transmitting a color facsimile, comprising the steps of:  
obtaining information to be transmitted as a facsimile;  
dividing said information into luminance signals indicative of monochrome information and chrominance signals indicative of colors of the information;  
assembling a facsimile message to be transmitted which includes a luminance signal and a separate chrominance signal;  
transmitting a first portion of the facsimile message including information indicative of the luminance signal;  
transmitting an additional handshaking signal indicating that the first portion of the message is completed and querying the presence of color capabilities in a receiving facsimile machine; and  
detecting a response to said additional handshaking signal and only if the response to said additional handshaking signal indicates that color capabilities are present, transmitting the chrominance signal corresponding to the already-transmitted luminance signal.

5,438,437

## IMAGE FORMING APPARATUS WITH EXPOSURE, SIZE, AND POSITION CORRECTION FOR PIXELS

Yoshimi Mizoguchi; Hiroshi Ishii; Kiyoshi Kimura; Masakazu Fukuchi; Makoto Takeda; Hiroyuki Maruyama; Yasuhiko Yamaguchi; Kenji Taki; Masashi Akamatsu, and Takao Kurohata, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 13, 1992, Ser. No. 959,664

Claims priority, application Japan, Oct. 17, 1991, 3-269594; Jul. 24, 1992, 4-198747; Jul. 24, 1992, 4-198748; Jul. 24, 1992, 4-198749

Int. Cl.<sup>6</sup> H04N 1/23; G01D 15/06, 15/14

U.S. Cl. 358-518

7 Claims

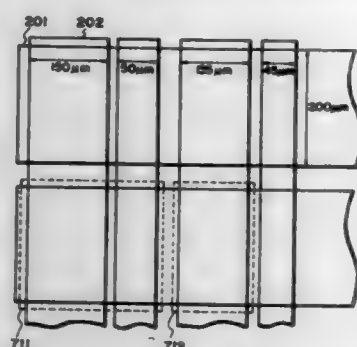
1. An electrophotographic color image forming apparatus comprising:

- (a) an imagewise dot exposure apparatus for emitting a light beam toward an image carrier;
- (b) a receiver, including said image carrier, for receiving a





arranged so that said pixel is defined by a group of plural subsidiary pixels independently controllable, so that ratios



of areas of the subsidiary pixels of adjacent pixels are different from each other.

5,438,443

## LIQUID CRYSTAL DEVICE

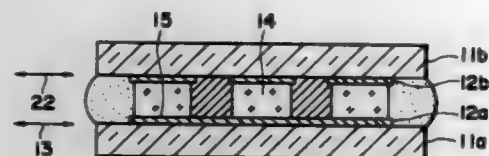
Osamu Taniguchi; Shinjiro Okada, both of Kawasaki; Yutaka Inaba, Kawaguchi; Hitoshi Shindo, and Hirofumi Shibata, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 5,406, Jan. 19, 1993, abandoned, which is a continuation of Ser. No. 652,494, Feb. 8, 1991, abandoned, which is a continuation of Ser. No. 344,446, Apr. 28, 1989, abandoned, which is a continuation of Ser. No. 919,379, Oct. 16, 1986, abandoned. This application Aug. 23, 1994, Ser. No. 294,603

Claims priority, application Japan, Oct. 18, 1985, 60-233036 Int. Cl.<sup>6</sup> G02F 1/1339

U.S. Cl. 359-81

6 Claims



1. A liquid crystal device, comprising:

a pair of substrates each having thereon a plurality of stripe-shaped transparent electrodes having a thickness of 800-3,000 Å, said electrodes intersecting each other with a space therebetween, one of the substrates being provided with a uniaxial orientation treatment parallel to the stripe-shaped transparent electrodes thereon, and the other substrate being free from a uniaxial orientation treatment; and

a chiral smectic liquid crystal disposed in the space between said transparent electrodes;

said liquid crystal further comprising means for providing prior to display driving an AC-voltage sufficient to increase display contrast.

5,438,444

## OPTICAL ROUTING SYSTEM

Takashi Tayanaka, Hachioji; Shinji Tsuji, Hidaka, and Ryoji Takeyari, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1993, Ser. No. 118,365

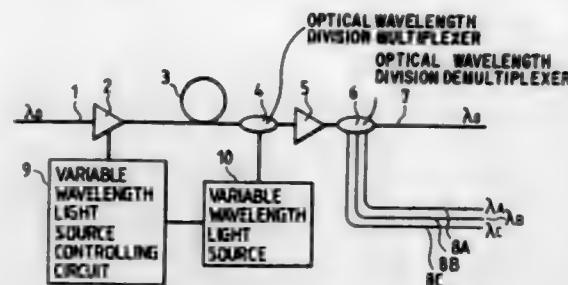
Claims priority, application Japan, Sep. 9, 1992, 4-240335 Int. Cl.<sup>6</sup> H04J 4/00, 14/00

U.S. Cl. 359-123

10 Claims

1. An optical routing system installed on a transmission path of a time-division multiplexing optical signal train, comprising: a variable wavelength light source emitting a local oscillator

light in correspondence with the time-division multiplexing optical signal train; an optical wavelength division multiplexer multiplexing the local oscillator light with the time-division multiplexing optical signal train;



a semiconductor optical amplifier coupled to the optical wavelength division multiplexer, modulating the multiplexed local oscillator light into an inverted signal; and an optical wavelength division demultiplexer coupled to the semiconductor optical amplifier, demultiplexing the inverted signal from the time-division multiplexing optical signal train.

5,438,445

## OPTICAL WAVELENGTH MULTIPLEXING COMMUNICATION SYSTEM

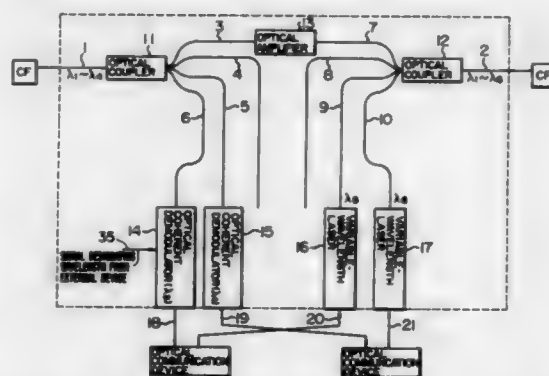
Yukio Nakano, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 29, 1991, Ser. No. 783,778

Int. Cl.<sup>6</sup> H04J 14/02

U.S. Cl. 359-124

15 Claims



1. An optical wavelength multiplexing add/drop apparatus for separating an optical signal from, and multiplexing a new optical signal with, an optical wavelength multiplex signal including a respective circuit signal allotted for a plurality of wavelengths, comprising:

first means for selectively extracting a first optical signal, having a wavelength selected in response to a signal designating a particular wavelength, from received optical wavelength multiplex signals; and

second means for converting said circuit signal to be transmitted into second optical signal by use of a wavelength different from the wavelengths included in said received optical wavelength multiplex signals and transmitting said second optical signal after wavelength-multiplexing thereof with said received optical wavelength multiplex signals.

5,438,446

## UNIFORM REFLECTANCE OPTICAL MIRROR

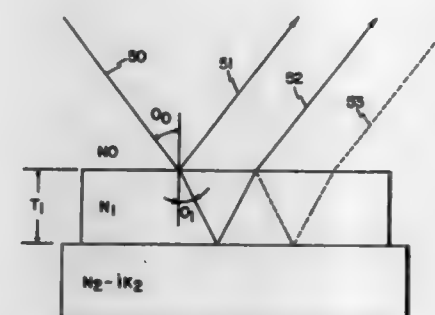
Michael B. Brandt, Walworth, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 819,033, Jan. 10, 1992, abandoned. This application Feb. 23, 1993, Ser. No. 21,739

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359-196

2 Claims



1. A mirror for optically scanning an incident light beam consisting of P-polarized light having a single plane of polarization and a single wavelength presented in a range of varying angles of incidence thereto defining a scanning plane oriented at 0° to the single plane of polarization of the polarized light beam through a corresponding range of reflected light beam scanning angles comprising a reflective mirror surface coated with a protective layer of a dielectric coating to protect the mirror surface from oxidation while being substantially transmissive to the incident polarized light beam, wherein said coating is selected to have an optical thickness selected in relation to the 0° orientation of the plane of polarization and the half wave optical thickness corresponding to the wavelength of the polarized light, such that the selected optical thickness differs from the half wave optical thickness sufficiently to provide a minimum variation in the magnitude of reflectance of the incident light beam over the range of varying angles of incidence.

5,438,447

## OPTICAL DEFLECTOR

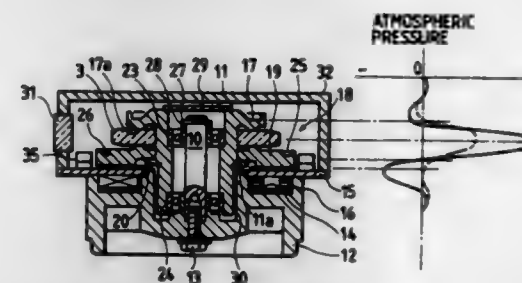
Yoshimasa Kunii, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1993, Ser. No. 127,728

Claims priority, application Japan, Sep. 29, 1992, 4-259457 Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359-200

4 Claims



1. An optical deflector, comprising:

a motor body; a rotatable shaft supported rotatably on said motor body; an optical deflecting element fitted around said rotatable shaft; a magnet fitted around said rotatable shaft between said optical deflecting element and motor body; and a stationary annular turbulence forming member secured on said motor body around said magnet, said turbulence forming member including a plurality of projections ori-

ented at an acute angle with respect to the motor body, whereby rotation of said optical deflecting element is in a direction into the acute angle between each projection and the motor body so that said projections interrupt and make turbulent the flow of air generated by said rotation.

5,438,448

## TURNING MIRROR AND METHOD OF MANUFACTURE

Tomoko Nishimura, Nara; Tomiaki Sakano, Hirakata, and Katsuhiko Murano, Otsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

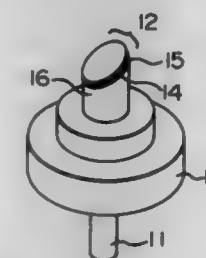
Filed Dec. 30, 1992, Ser. No. 998,614

Claims priority, application Japan, Jan. 7, 1992, 4-000641; Jul. 17, 1992, 4-190447; Jul. 20, 1992, 4-191820

Int. Cl.<sup>6</sup> G02B 26/08, 5/08

U.S. Cl. 359-214

7 Claims



1. A turning mirror comprising a base mount having at its center a rotating shaft, a support pole, extended from the rotating shaft, having a slantly cut end which serves as a substrate, a photo-setting resin layer attached onto the substrate at the slant end of the support pole, and a reflector mirror surface made mainly of metallic film and formed on the photo-setting resin layer, wherein the reflector mirror surface is rotated by the rotation of the rotating shaft allowing reflected light by the reflector mirror surface to scan.

5,438,449

## BEAM POINTING SWITCH

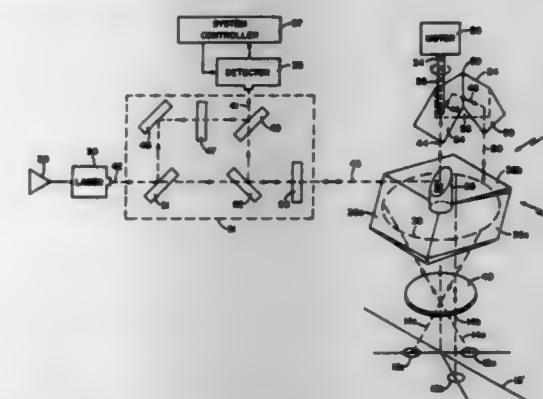
Arthur A. Chabot, Westford; Albert V. Jelalian, Bedford, and Wayne H. Keene, South Natick, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 25, 1987, Ser. No. 125,519

Int. Cl.<sup>6</sup> G02B 26/08, 5/122

U.S. Cl. 359-216

31 Claims



1. An apparatus for sequentially illuminating a plurality of target surface locations from a light beam, said apparatus comprising:

a deflection means including a plurality of light deflecting segments, each of said light deflecting segments deflecting said light beam toward a location on said target surface at a predetermined angle of incidence;

means for directing said light beam sequentially to each of said plurality of light deflecting segments; said directing means includes a retroreflector responsive to an input light beam for providing an output light beam parallel to and laterally displaced from said input light beam; and means for rotating said retroreflector about an axis substantially coaxial with said input light beam.

5,438,450

## OPTICAL SCANNING APPARATUS

Hiroshi Saito, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 172,903, Dec. 27, 1993, abandoned.

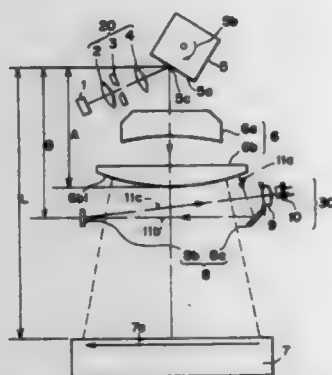
This application Oct. 28, 1994, Ser. No. 330,612

Claims priority, application Japan, Dec. 29, 1992, 4-361589

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359—216

8 Claims



1. An optical scanning apparatus comprising: light source means for generating a light beam; deflecting means for deflecting the light beam from said light source means; an optical system for focusing the light beam deflected by said deflecting means onto a scanning surface; reflecting means for reflecting the light beam from said optical system, said reflecting means reflecting the light beam to have an angle with respect to a main scanning surface; and detecting means for detecting the light beam reflected by said reflecting means, wherein the following condition is satisfied:

$$0 < (B - A)/L < 0.2$$

where L is a distance from a deflection point of said deflecting means to said scanning surface along a direction of an optical axis of said optical system, A is a distance from said deflection point to a lens surface of said optical system at a position closest to said scanning surface, and B is a maximum distance from said deflection point to said reflecting means.

5,438,451

## LINEARLY FINE-ADJUSTABLE STAGE

Bruno Schweizer, 7082 Oberkochen, Jenastr. 31, Germany

Filed Sep. 17, 1993, Ser. No. 123,378

Claims priority, application Germany, Sep. 25, 1992, 42 32 079.8; Sep. 25, 1992, 42 32 077.1

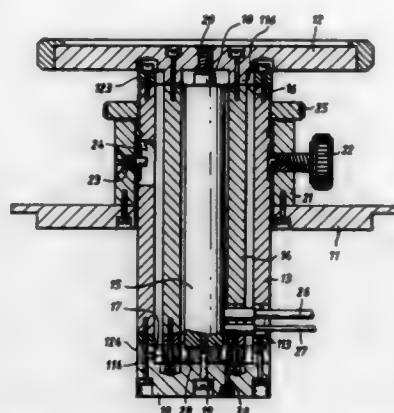
Int. Cl.<sup>6</sup> G02B 21/26, 26/08

U.S. Cl. 359—393

10 Claims

1. A linearly fine-adjustable stage device comprising: displaceable stage means, piezoelectric translator means that drives said displaceable stage means centrally and directly, and linear guide means comprising at least two elastic elements to guide said displaceable stage means,

wherein said elastic elements are arranged coaxially of said piezoelectric translator means and have central apertures



through which said piezoelectric translator means extends to drive said displaceable stage means.

5,438,452

## BLOOMING PROTECTION FOR A NIGHTSIGHT

René Gruber, Widnau, Switzerland, assignor to Leica Heerbrugg AG, Heerbrugg, Switzerland

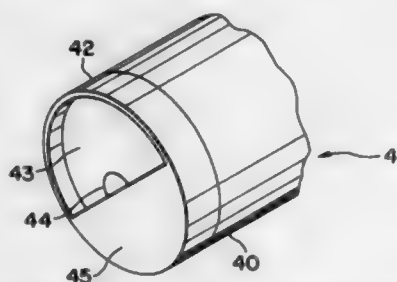
Filed Sep. 23, 1992, Ser. No. 948,352

Claims priority, application Germany, Sep. 27, 1991, 41 32 259.2

Int. Cl.<sup>6</sup> G03B 11/04; G02B 26/02

U.S. Cl. 359—511

4 Claims



1. Blooming protection for a night vision device comprising: an objective mounted in a tube; and a cylindrical cover arranged in front of the objective, on the objective side, which cylindrical cover is rotatably supported on said tube such that it can be rotated about an axis of said objective; wherein said cylindrical cover is made of an opaque material and has an opening through which light can pass, and wherein the opening through which light can pass is constructed in the form of a circular section and is arranged eccentrically with respect to the axis of the objective.

5,438,453

## LIGHT SOURCE FOR FLAT-PANEL DISPLAY

Kaeko Kuga, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jul. 1, 1993, Ser. No. 84,124

Claims priority, application Japan, Jul. 3, 1992, 4-176869

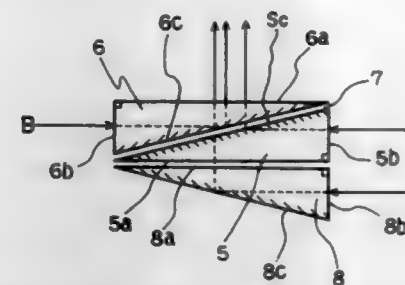
Int. Cl.<sup>6</sup> G02B 27/14, 5/04

U.S. Cl. 359—636

8 Claims

1. A light source for flat-panel display comprising: reflectors each having a triangular shape in section which are stacked on top of another so as to have three slant faces such that at least an uppermost face of the stacked reflectors is perpendicular to a lateral side thereof, a slant face of each of the reflectors being subjected to a

surface treatment such that a ray of light incident laterally to the reflectors is reflected substantially parallel to a lateral side thereof,



wherein rays of three colors which are incident laterally to each of the reflectors advance via the uppermost face of the stacked reflectors substantially perpendicularly.

5,438,454

## METHOD FOR SELECTING MINIMUM WIDTH OF LEAF IN MULTILEAF ADJUSTABLE COLLIMATOR WHILE INHIBITING PASSAGE OF PARTICLE BEAMS OF RADIATION THROUGH SAWTOOTH JOINTS BETWEEN COLLIMATOR LEAVES

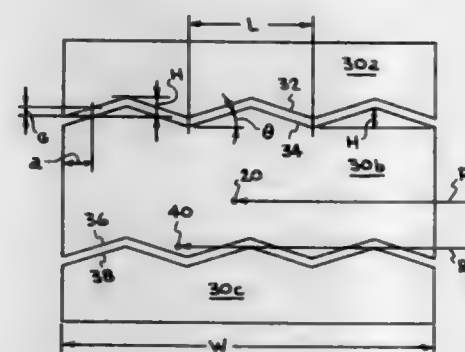
Bernhard Ludewigt, Berkeley; John Bercovitz, Hayward; Mark Nymann, Berkeley, and William Chu, Lafayette, all of Calif., assignors to Regents, University of California, Berkeley, Calif.

Filed Nov. 1, 1993, Ser. No. 146,503

Int. Cl.<sup>6</sup> B32B 3/28

U.S. Cl. 359—641

11 Claims



3. A method for selecting the minimum width of a leaf needed to prevent penetration of a particle beam of radiation completely through a sawtooth joint formed between adjacent or abutting leaves in an adjustable leaf collimator, where said leaf width=W, and  $W = R + A + \frac{1}{2}L$  which comprises the steps of:

- measuring the penetration depth R in said leaf of said particle beam into a solid portion of said leaf;
- determining the length A of the path through air in the spaces between the sawteeth, where  $A = a \times n$ , n=twice the number of sawteeth, and  $a = GL/2H$ , where G is the gap between adjoining surfaces of the leaves, L is the length of the base of the sawtooth, and H is the height of a sawtooth, by:
  - selecting the number of sawteeth to be formed along the width of the leaf; and
  - selecting the distance G between adjoining leaves;
  - selecting the value of H from a ratio of G to H within a range of  $H = 2G$  to  $H = 10G$ , and
- then adding to the sum of  $R + A$  at least one half the length L of a single sawtooth period to determine said minimum width of said leaf needed to prevent said penetration of said particle beam of radiation through said sawtooth joint.

5,438,455

## INTERNAL FOCUS TELEPHOTO LENS FOR AN AUTO FOCUS CAMERA

Masahiro Nakatsuji, Machida, and Susumu Sato, Chiba, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

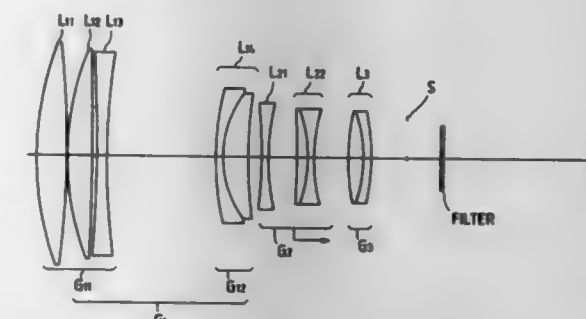
Filed Dec. 15, 1993, Ser. No. 166,836

Claims priority, application Japan, Dec. 28, 1992, 4-348316

Int. Cl.<sup>6</sup> G02B 13/02

U.S. Cl. 359—748

20 Claims



1. An internal focus telephoto lens system comprising, in succession from an object side to an image side: a first lens unit G1 of positive refractive power, a second lens unit G2 of negative refractive power and a third lens unit G3 of positive refractive power, said first lens unit G1 and said second lens unit G2 together forming a substantially a focal system, focusing being effected by said second lens unit G2, characterized in that said first lens unit G1 comprises, in succession from the object side, a front group G11 of positive refractive power and a rear group G12 having weak positive refractive power relative to said front group, said front group G11 being comprised, in succession from the object side, of a positive lens component L11, a positive lens component L12 and a negative lens component L13, said second lens unit G2 comprises, in succession from the object side, a negative lens component L21 and a negative lens component L22, said third lens unit G3 comprises a positive lens component L3, and said internal focus telephoto lens satisfies the following conditions:

- $0.35 < f_1/F < 0.60$
- $0.7 < f_{22}/f_{21} < 1.6$
- $-1.0 < (R_b + R_a)/(R_b - R_a) < -0.4$
- $-2.1 < (R_d + R_c)/(R_d - R_c) < -1.7$

where

- $f_1$ : the focal length of the first lens unit G1;  
 $F$ : the focal length of the system;  
 $f_{21}$ : the focal length of the negative lens component L21 in the second lens unit G2;  
 $f_{22}$ : the focal length of the negative lens component L22 in the second lens unit G2;  
 $R_a$ : the radius of curvature of the object side of the negative lens component L21 in the second lens unit G2;  
 $R_b$ : the radius of curvature of the image side of the negative lens component L21 in the second lens unit G2;  
 $R_c$ : the radius of curvature of the image side of the positive lens component L12 in the first lens unit G1;  
 $R_d$ : the radius of curvature of the object side of the negative lens component L13 in the first lens unit G1.

5,438,456

## OPTICAL STEREOSCOPIC MICROSCOPE SYSTEM

Avi Grinblat, 25 Central Park West - Apt. 4V, New York, N.Y. 10023

Continuation-in-part of Ser. No. 651,788, Mar. 14, 1991, abandoned. This application Jul. 2, 1992, Ser. No. 907,676

Int. Cl.<sup>6</sup> G02B 5/04, 21/22

U.S. Cl. 359—835

15 Claims

1. A stereoscopic microscope system adapted for vitrectomy eye microsurgery comprising:  
 (a) positioning means to position an eye to be viewed;  
 (b) an aspherical lens system located adjacent the positioning









the first means in response to the electric motor of said first driving means being turned ON;

second means, in constant drive connection with said first driving means, for selectively providing a drive connection between said first driving means and one of said first and second reels so that the selected one of said first and second reels is driven to rotate and cause the tape to be wound onto the selected one of said first and second reels;

third means for turning OFF the electric motor of said first driving means for a predetermined time period when (a) the traveling direction of the tape is to be switched between said first direction and said second direction, and (b) while said pinch roller presses the tape against said rotatable axle;

fourth means for forcing said second means to provide a drive connection between said first driving means and the first reel when (a) the traveling direction of the tape is to be switched from the second direction to the first direction and (b) while the electric motor of said first driving means is turned OFF by said third means for said predetermined time period, and for forcing said second means to disconnect the drive connection between said first driving means and the first reel and to establish a drive connection between said first driving means and the second reel when (a) the traveling direction of the tape is to be switched from the first direction to the second direction and (b) during said predetermined period the electric motor of said first driving means is turned OFF by said third means for said predetermined time period; and second driving means for driving said fourth means.

5,438,467

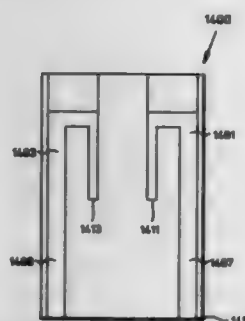
## NEGATIVE PRESSURE AIR BEARING DESIGN

Lee K. Dorius, San Jose; John M. Harker, Palo Alto, and Lawrence S. Samuelson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Oct. 28, 1992, Ser. No. 967,359

Int. Cl.<sup>6</sup> G11B 21/20

U.S. Cl. 360—103

2 Claims



1. A slider for supporting a transducer in relation to a moving data storage medium, comprising:
  - a slider structure with a leading edge, a trailing edge, and first and second side edges;
  - a bottom surface adjoining said leading, trailing and side edges;
  - a first U-shaped rail projecting outwardly from said bottom surface, said first U-shaped rail including:
    - a cross rail substantially parallel to said leading edge and extending across less than one-half a width of said bottom surface;
    - the cross rail having a tapered portion which is adjacent said leading edge of the slider;
    - a first side rail substantially perpendicular to and adjoining said cross rail, said first side rail substantially adjacent and parallel to the first side edge and extending from said cross rail towards said trailing edge;
    - a second side rail, substantially parallel to said first side rail and offset from said first side rail toward the center of said bottom surface; and

the second side rail being narrower and shorter than the first side rail; and

a second U-shaped rail projecting outwardly from said bottom surface, said second U-shaped rail including:
 

- a cross rail substantially parallel to said leading edge and extending across less than one-half a width of said bottom surface;
- the cross rail having a tapered portion which is adjacent said leading edge of the slider;
- a first side rail substantially perpendicular to and adjoining said cross rail, said first side rail substantially adjacent and parallel to the first side edge and extending from said cross rail towards said trailing edge;
- a second side rail, substantially parallel to said first side rail and offset from said first side rail toward the center of said bottom surface; and
- the second side rail being narrower and shorter than the first side rail; and the cross rail and the first and second side rails of the first and second U-shaped rails having surfaces which lie in a common plane.

5,438,468

## ROTARY HEAD DRUM HAVING REDUCED EXTERIOR DIMENSIONS

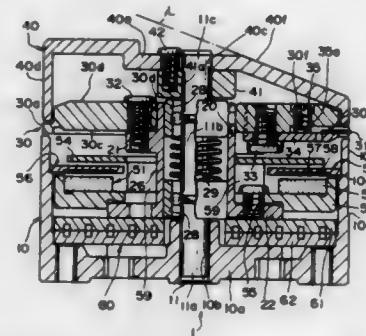
Shinichi Hasegawa, Chiba, and Akihiro Uetake, Tokyo, both of Japan, assignors to Sony Corporation, Japan  
Continuation of Ser. No. 914,827, Jul. 15, 1992, abandoned. This application Apr. 12, 1994, Ser. No. 226,440

Claims priority, application Japan, Jul. 18, 1991, 3-177893

Int. Cl.<sup>6</sup> G11B 5/52

U.S. Cl. 360—107

10 Claims



1. Apparatus for recording and/or reproducing a signal on slanted tracks positioned at a predetermined angle on a magnetic tape, said apparatus comprising:
  - a chassis;
  - a rotary head drum unit comprising:
    - a lower stationary drum mounted on said chassis in an inclined position suitable for forming said slanted tracks at said predetermined angle such that said magnetic tape travels in a substantially level tape path;
    - a rotary drum rotatably and coaxially mounted above said lower stationary drum;
    - a transducer mounted on a periphery of said rotary drum; rotary means for rotating said rotary drum, said rotary means having a coreless motor which includes a rotor having a disk shaped rotor case and a donut shaped magnet;
    - a stator positioned above said magnet;
    - a vibration damping element for reducing vibration of said rotary means and said stator, said vibration damping element including a disk shaped back yoke and a support element for supporting said back yoke above said stator;
  - an upper stationary drum coaxially mounted above said rotary drum wherein an upper portion of said upper stationary drum at the farther side from said chassis is cut so that the total height of said rotary head drum unit is reduced;

a shaft extending through said upper stationary drum, said rotary drum and said lower stationary drum;

a bearing housing rotatably attached to said shaft, wherein said bearing housing includes a lower flange and said rotor is secured to said lower flange;

first securing means for securing said shaft to said upper stationary drum such that said first securing means is substantially within said upper stationary drum; and

second securing means for securing said shaft to said lower stationary drum such that said second securing means is completely within said lower stationary drum.

5,438,469

## METHOD AND APPARATUS FOR COARSE AND FINE POSITIONING A MAGNETIC HEAD WITH THREE PIEZOELECTRIC ELEMENTS ARRANGED IN A TRIPOD ARRANGEMENT

Guttorm Rudi, Fjellhamar, Norway, assignor to Tandberg Data A/S, Oslo, Norway

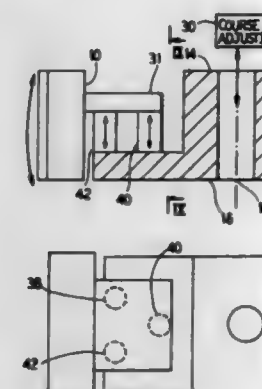
Continuation of Ser. No. 836,955, Feb. 19, 1992, abandoned.

This application Dec. 7, 1993, Ser. No. 163,486

Int. Cl.<sup>6</sup> G11B 5/584, 5/56, 5/55

U.S. Cl. 360—109

15 Claims



1. An apparatus for positioning a magnetic head with respect to a magnetic tape comprising:
  - mechanical magnetic head positioning means for vertical coarse positioning said magnetic head with respect to said magnetic tape; and
  - piezoelectric operated means, carried on said mechanical magnetic head positioning means and connected to said magnetic head, for finely adjusting the position of said magnetic head with respect to said magnetic tape;
 wherein said piezoelectric operated means comprises three piezoelectric elements in a tripod arrangement which selectively elongate or contract along an axis parallel to a direction of position adjusting of said head to provide for vertical and angular adjustment of said head.

5,438,470

## MAGNETORESISTIVE STRUCTURE WITH CONTIGUOUS JUNCTION HARD BIAS DESIGN WITH LOW LEAD RESISTANCE

Durga Ravipati, Saratoga; Yong Shen, Milpitas, and William C. Cain, San Jose, all of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.

Filed May 13, 1994, Ser. No. 242,457

Int. Cl.<sup>6</sup> G11B 5/33

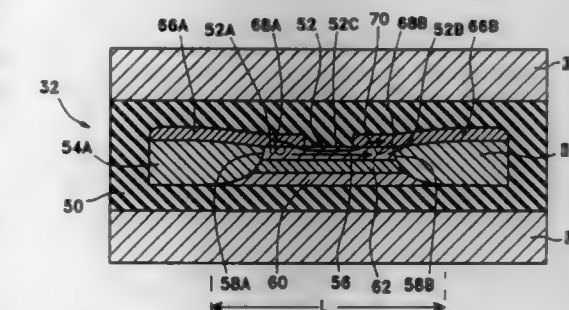
U.S. Cl. 360—113

15 Claims

1. A thin-film magnetoresistive transducer comprising:
  - a magnetoresistive layer formed of a ferromagnetic material, said magnetoresistive layer including end regions spaced by a central active region;
  - first and second hard-magnetic layers, each of said hard-magnetic layers being disposed in abutting contact with one of said end regions of said magnetoresistive layer, said

hard-magnetic layers cooperatively providing a magnetic bias to said magnetoresistive layer; and

first and second electrical leads formed of an electrically conductive material, each of said electrical leads being disposed in contact respectively with one of said end



regions of said magnetoresistive layer, such that said first and second electrical leads and said magnetoresistive layer form a direct electrical path of low lead resistances, said each one of said electrical leads forming abutting junctions with said magnetoresistive layer and one of said hard magnetic layers.

5,438,471

## TAPE CASSETTE HAVING A PIVOTABLY MOVABLE MAIN LID AND A GUIDABLY MOVABLE TOP LID

Takashi Sawada, and Shuichi Ota, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

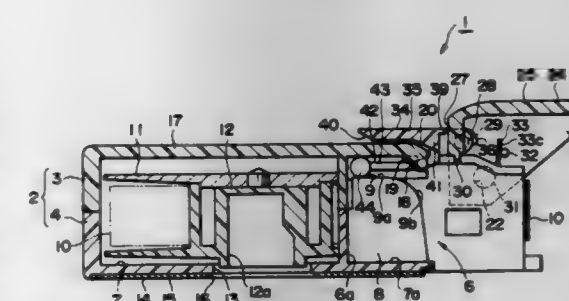
Filed Mar. 4, 1994, Ser. No. 205,382

Claims priority, application Japan, Mar. 5, 1993, 5-069097

Int. Cl.<sup>6</sup> G11B 23/02

U.S. Cl. 360—132

11 Claims



1. A tape cassette comprising:
  - a pair of tape reels having a recording tape wound therebetween;
  - a cassette case holding said pair of tape reels therein and having an opening for providing access to said recording tape, said cassette case further having an upper wall and only one cam located in a central portion of said cassette case which is adjacent to said opening;
  - a main lid pivotably mounted on opposite side faces of said cassette case for covering at least a front portion of said opening when said main lid is in a closed position and exposing said at least front portion of said opening when said main lid is in an opened position;
  - a top lid pivotably mounted on said main lid so as to be movable therewith, said top lid being located so as to cover an upper portion of said opening when said main lid is in said closed position and being at least partially located on top of an upper surface of said upper wall of said cassette case when said main lid is in said opened position; and
  - guide means, including a cam shaft and only one guide groove formed of an outer edge of said cam and a horizontal portion and an inclined portion of an inner surface of

said upper wall of said cassette case, for guiding said top lid over said upper surface of said upper wall of said cassette case when said main lid is opened and closed by having said cam shaft contact at least one of said outer edge of said cam and said horizontal portion and said inclined portion of said inner surface of said upper wall so as to prevent an inner surface of said top lid from sliding along said upper surface of said upper wall;  
said recording tape being accessible when said main lid is in said opened position and being substantially covered when said main lid is in said closed position.

5,438,472

# MAGNETIC TAPE CASSETTE WITH AN IMPROVED REEL SPRING

Ju-Yeol Oh, Chungcheongnam-Do, Rep. of Korea, assignor to SKC Limited, Rep. of Korea

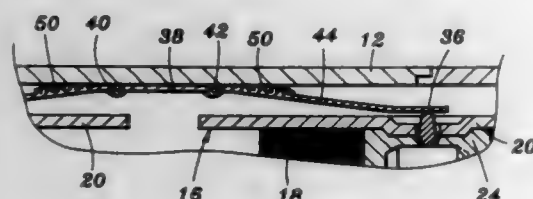
Filed Jun. 16, 1994, Ser. No. 260,952

Claims priority, application Rep. of Korea, Jun. 26, 1993, 93-11426

Int. Cl.<sup>6</sup> G11B 23/02

U.S. Cl. 360-132

6 Claims



1. A magnetic tape cassette including upper and lower cassette casings joined with each other along their peripheral edges; a pair of reels each having a length of magnetic tape wound therearound; and a pressure spring for urging the reels toward the lower cassette casing, the pressure spring comprising:

- a central base portion secured to the upper casing; opposite end portions which are adapted to engage with the reels;
- canted middle portions defined between the central base portion and the opposite end portions, each of the middle portions joined to the central base portion at its proximal end and to the opposite end portions at its distal end; and
- a pair of laterally extending rib groups each formed along a limited length of the middle portions in close proximity with the central portion to face the upper cassette casing, the individual ribs of said rib groups being arranged closely with respect to each other to ensure that the ribs cooperate to support the upper casing.

5,438,473

# VARISTOR CONNECTION AND USAGE

Edward F. Allina, 605 Capri Blvd., Treasure Island, Fla. 33706

Filed Sep. 30, 1993, Ser. No. 129,448

Int. Cl.<sup>6</sup> H01C 7/12

U.S. Cl. 361-118

12 Claims



1. Transient voltage surge suppression (TVSS) apparatus,

comprising a two-faced varistor-carrying circuit board having distinct laminar electrical conductors spaced apart on a face thereof, covered by contiguous varistor material, including a plurality of terminal strips, and associated with each terminal strip a plurality of conductive strips extending from conductive contact therewith, the conductive strips from the respective terminal strips being mutually interleaved so that the spacing of their respective adjacent edges from one another increases from the vicinity of one terminal strip to another terminal strip.

5,438,474

# PROTECTIVE SHEATH

Hugh MacPherson, Fife; David McNaughton, Keltie Bridge; Neal Croxford, and Christopher F. Parsons, both of Warwickshire, all of England, assignors to W. L. Gore & Associates (UK) Ltd., London, United Kingdom

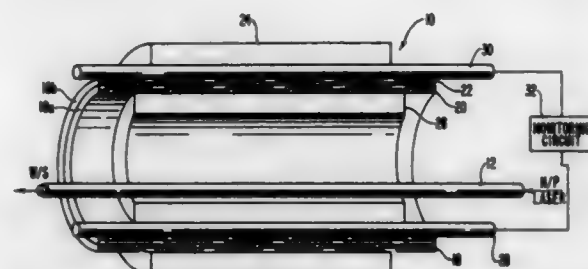
Continuation of Ser. No. 915,483, Jul. 16, 1992, abandoned. This application Jun. 24, 1994, Ser. No. 265,055

Claims priority, application United Kingdom, Jul. 19, 1991, 9115641

Int. Cl.<sup>6</sup> G08B 29/00; H01B 7/00

U.S. Cl. 361-158

13 Claims



1. A tubular protective sheath for containing a power transmission conduit, the sheath comprising:

- first and second flexible elements each helically arranged to form one of an inner and outer tubular member, the first element in the form of a first electrically insulating film having respective first and second layers of electrically conductive low melt material adherent to its opposite surfaces, the second element in the form of a second electrically insulating film having a third layer of electrically conductive low melt material adherent to one surface, the first element configured in overlapping arrangement with the respective first and second low melt layers in contact, the second element configured in overlapping arrangement with the third low melt layer spaced from the adjacent first or second low melt layer of the first element by the second insulating film, a break in the power transmission conduit resulting in heating of the sheath and melting of one or more of the low melt layers and flow of low melt material to form an electrical connection between the respective low melt layers of the elements; and
- monitoring means connected to the low melt layers for detecting such electrical connection between the layers.

5,438,475

# PORTABLE COMPUTER WITH AN ELECTRONIC PEN STORAGE TURRET

Pam E. Bradley, Woodside, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 30, 1993, Ser. No. 129,811

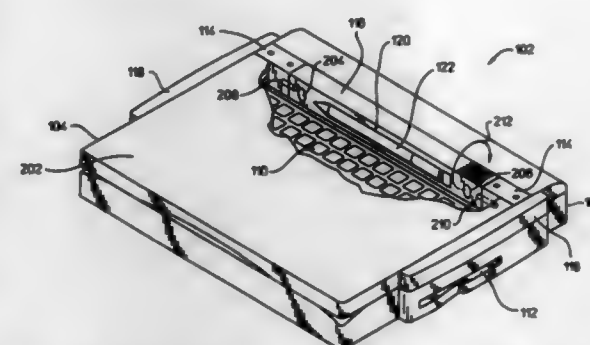
Int. Cl.<sup>6</sup> H05K 5/02, 7/16; G06F 1/16

U.S. Cl. 361-683

5 Claims

- 1. A portable computer comprising:
  - a housing having a base and a lid closable thereon;
  - a rotating pen turret having a pen holding side and the pen holding side having a pen holding recess;
  - the pen turret being mounted to the base such that the pen

holding side is accessible when the lid is open relative to the housing; and



the pen turret is mounted to the base such that the pen holding side is accessible when the lid is closed on the base.

5,438,476

# APPARATUS FOR UPGRADING A PERSONAL COMPUTER

Karl Steffen, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.

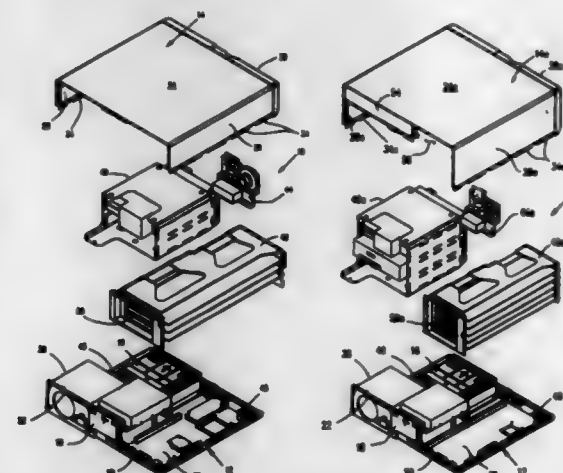
Division of Ser. No. 979,731, Nov. 20, 1992, Pat. No. 5,337,464.

This application Jan. 11, 1994, Ser. No. 180,176

Int. Cl.<sup>6</sup> H05K 5/02, 7/02; A47B 81/00; G06F 1/16

U.S. Cl. 361-683

6 Claims



1. An upgrade kit for economically increasing the disk drive and expansion card installation capacities of a personal desktop computer of the type having:

- an existing bottom housing portion having a base wall with a back wall projecting upwardly from a rear edge portion thereof,
- internal operating components disposed atop the base wall, the internal operating components partially including:
  - an existing drive bay structure adapted to operatively receive a first maximum number of disk drives,
  - an existing expansion card cage structure adapted to operatively receive a first maximum number of expansion cards,
  - an existing control panel bracket removably supporting a control panel, a battery and a speaker, and
  - an existing top housing portion comprising an upper side wall having opposite vertical side walls depending from opposite side edge portions thereof, and a front end wall depending from a front end edge portion thereof and extending between the opposite vertical side walls, the existing top housing portion being removably connected to the existing bottom housing portion and coop-

erating therewith to substantially enclose the existing internal operating components, the upper side wall of the existing top housing portion closely overlying the tops of the existing drive bay and expansion card cage structures, said upgrade kit comprising:

- a replacement drive bay structure having an installation height substantially larger than that of the existing drive bay structure, said replacement drive bay structure being adapted to operatively receive a second maximum number of disk drives larger than said first maximum number of disk drives and being installable in place of the existing drive bay structure;
- a replacement expansion card cage structure having an installation height substantially larger than that of the existing expansion card cage structure, said replacement expansion card cage structure being adapted to operatively receive a second maximum number of expansion cards larger than said first maximum number of expansion cards and being installable in place of the existing expansion card cage structure;
- a replacement control panel bracket installable in place of the existing control panel bracket and being adapted to support the existing control panel, battery and speaker; and
- a replacement top housing portion removably connectable to the existing bottom housing portion, in place of the existing top housing portion, and having a height greater than that of the existing top housing portion to accommodate the increased installation heights of the replacement drive bay and expansion card cage structures, and further having a back wall portion depending from a rear edge portion of its top side wall and having a vertical height substantially equal to the height difference between the existing and replacement top housing portions.

5,438,477

# DIE-ATTACH TECHNIQUE FOR FLIP-CHIP STYLE MOUNTING OF SEMICONDUCTOR DIES

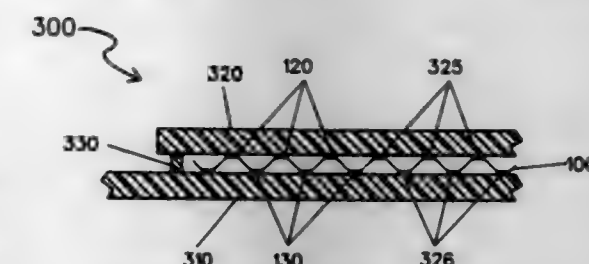
Nicholas F. Pasch, Pacifica, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Aug. 12, 1993, Ser. No. 105,832

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361-689

14 Claims



- 1. A semiconductor device assembly comprising:
  - a semiconductor die having a first thermal coefficient of expansion;
  - a substrate having a second thermal coefficient of expansion;
  - conductive bump contacts between a surface of the



5,438,478

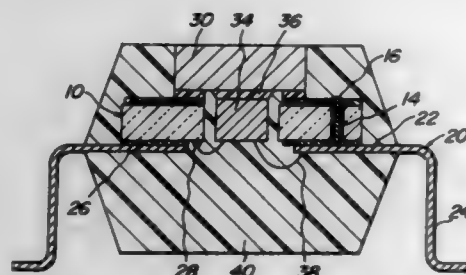
**ELECTRONIC COMPONENT CARRIERS AND METHOD OF PRODUCING THE SAME AS WELL AS ELECTRONIC DEVICES**

Mitsuhiko Kondo, Osamu Fujikawa, and Katsumi Sagisaka, all of Ohgaki, Japan, assignors to Ibiden Co., Ltd., Japan  
Filed Oct. 18, 1993, Ser. No. 136,905

Claims priority, application Japan, Oct. 20, 1992, 4-306218; Jan. 21, 1993, 5-024920; Feb. 9, 1993, 5-044625; Sep. 16, 1993, 5-230378

Int. Cl.<sup>6</sup> H05K 7/00; H01L 21/44

U.S. Cl. 361—704



1. An electronic component carrier comprising: a printed wiring substrate having front and rear surfaces, a through-hole extending through the substrate so as to pass between the front and rear surfaces, and a conductor pattern formed on each of the front and rear surfaces; an adhesive layer formed on at least an outer peripheral portion of the front surface of the substrate; a lead frame joined to the substrate through the adhesive layer and comprised of plural leads for external connection; and a solder layer formed in the through-hole for electrically connecting an inner lead portion of the lead frame to the conductor pattern formed on the rear surface of the substrate.

5,438,479

**HIGH DENSITY, HEAT-DISSIPATING CIRCUIT ASSEMBLY WITH ACCESSIBLE COMPONENTS**

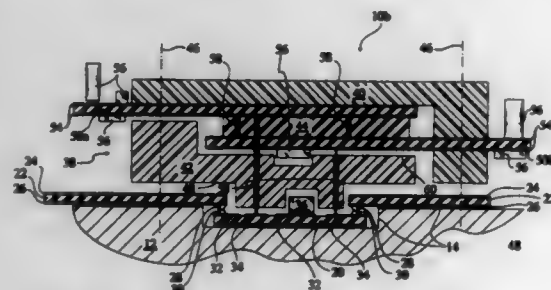
Heinrich Heilbrunner, Stein, Germany, assignor to Export-Contor Anzenhandels-gesellschaft mbH, Nuremberg, Germany  
Filed Nov. 8, 1993, Ser. No. 148,972

Claims priority, application Germany, Nov. 7, 1992, 42 37 632.7

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361—707

20 Claims



1. A high density circuit assembly, comprising: a heat sink; a carrier plate having at least one component to be cooled; a platen having a substrate attached thereto; structure pressing said carrier plate against said heat sink, whereby said carrier plate and said at least one component are cooled; said substrate having a first circuit; said carrier plate having a second circuit;

said substrate being substantially parallel to said carrier plate; said platen having a conductor electrically connecting said first circuit to said second circuit; and said platen having further a rigid mounting element, a rigid bridge element, and a resilient cushion element positioned between said rigid mounting element and said rigid bridge element.

5,438,480

**PRINTED CIRCUIT BOARD AND ELECTRONIC PARTS TO BE MOUNTED THEREON**

Masayasu Yamashita, Shimizu, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

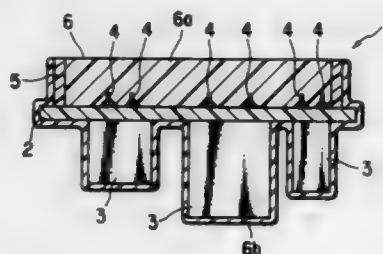
Filed Nov. 12, 1993, Ser. No. 151,103

Claims priority, application Japan, Nov. 13, 1992, 4-084332 U

Int. Cl.<sup>6</sup> H05K 7/02; H01L 23/28

U.S. Cl. 361—760

8 Claims



1. A printed circuit board comprising: a printed board having a predetermined circuit pattern formed thereon; electronic parts with leads, mounted on said printed board; a frame surrounding all or a part of a soldering surface of said printed board and protruding therefrom, the amount of protrusion of said frame from said soldering surface of said printed board being made larger than that of protrusion of said leads of said electronic parts from said soldering surface side of said printed board; and a coating material filling space within said frame to bury said leads and soldered portions of said electronic parts.

5,438,481

**MOLDED-IN LEAD FRAMES**

James V. Murphy, Warwick, and Michael J. Murphy, East Greenwich, both of R.I., assignors to Advanced Interconnections Corporation, West Warwick, R.I.

Continuation-in-part of Ser. No. 991,978, Dec. 17, 1992, which is a continuation of Ser. No. 121,568, Nov. 17, 1987, Pat. No. 5,184,285. This application May 20, 1993, Ser. No. 64,841

The portion of the term of this patent subsequent to Dec. 1, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> H05K 5/02

U.S. Cl. 361—813

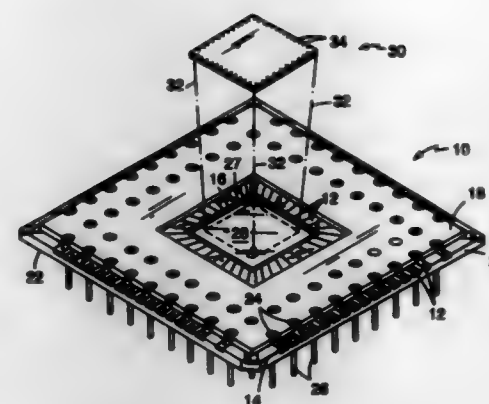
6 Claims

1. An intercoupling component for connection of an integrated circuit package to a circuit board, the package being of the type having a plurality of leads which are placed on said intercoupling component, said intercoupling component comprising

a plurality of pins for connection to the circuit board, a plurality of lead frame elements, each said lead frame element being cut from the same lead frame and position relative to other said lead frame elements in the same general orientation as in the lead frame prior to being cut, each said pin being individually secured to a said lead frame element and each said lead frame element including a connection region sized and positioned for making a connection to one of the plurality of leads of the integrated circuit package, and insulative plastic molded around said pins and said lead frame elements to form a molded plastic body, the molded

plastic body having a shape providing a plurality of grooves that are adapted to serve in aligning the leads of

and the second contact portion contacts the second ground.



the integrated circuit package with said connection regions.

5,438,482

**ELECTRONIC APPARATUS HAVING A SHIELD STRUCTURE**

Yutaka Nakamura, and Noboru Koike, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

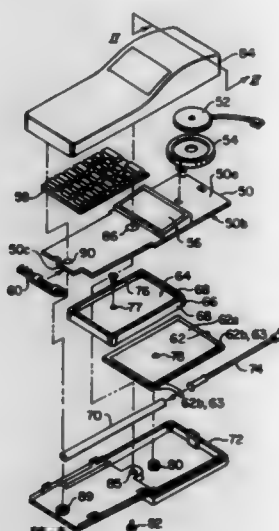
Filed Jun. 3, 1994, Ser. No. 254,057

Claims priority, application Japan, Jul. 28, 1993, 5-186120

Int. Cl.<sup>6</sup> H05K 9/00

U.S. Cl. 361—816

20 Claims



1. An electronic apparatus comprising: a first circuit board having a first ground, a first circuitry block being mounted on the first circuit board; a second circuit board having a second ground, a second circuitry block being mounted on the second circuit board; a conductive shield case having a wall for protecting the first circuitry block and the second circuitry block, and a partition connected to the wall for electromagnetically isolating the first circuitry block from the second circuitry block, the wall having opposite ends; and a conductive component including a fastening portion for fastening the conductive component to the conductive shield case, a first contact portion opposite to one end of the wall, a second contact portion opposite to the other end of the wall, and a connecting portion for connecting the first contact portion to the second contact portion, wherein the first contact portion contacts the first ground

5,438,483

**BRACKET ASSEMBLY FOR FRONT MOUNTED CIRCUIT BREAKER**

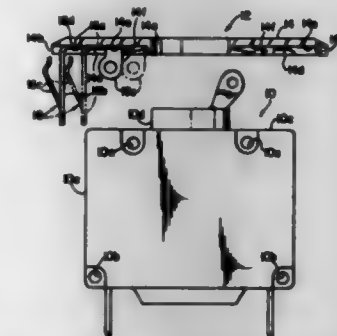
Michael Fasano, Watertown, and James Bugryn, Bristol, both of Conn., assignors to Carlingswitch, Inc., Plainville, Conn.

Filed Aug. 31, 1994, Ser. No. 298,609

Int. Cl.<sup>6</sup> H02B 1/01

U.S. Cl. 361—825

7 Claims



1. A bracket assembly for front mounting of a split case molded circuit breaker in a rectangular panel opening, said bracket assembly comprising:

a molded plastic cover plate having an opening for receiving the circuit breaker handle or toggle, said cover plate having a length such that the plate ends about the panel's front face adjacent the ends of the panel opening, a pair of rearwardly projecting wings for engaging the ends of the panel opening, said wings having tab portions aligned with openings in the split case circuit breaker for receiving fasteners that secure the split case circuit breaker together, and means mounting said wings to the rear of said cover plate.

5,438,484

**SURFACE LIGHTING DEVICE AND A DISPLAY HAVING SUCH A LIGHTING DEVICE**

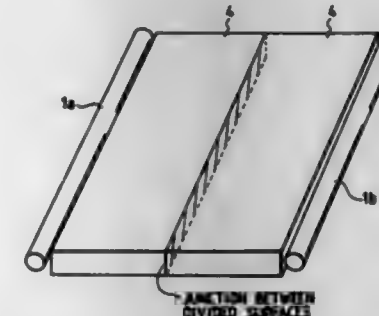
Toshiyuki Kanda, Chigasaki; Hisao Tajima, Yokohama; Hiroshi Takabayashi, Kawasaki; Takashi Yamamoto, Yamato, and Hideo Mori, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1992, Ser. No. 984,836

Int. Cl.<sup>6</sup> F21V 7/04; G02F 1/13

U.S. Cl. 362—31

86 Claims



1. A lighting device with a light emitting flat surface, comprising: a light guide having the emitting surface, and a pair of end surfaces crossing the light emitting surface; and two light sources arranged correspondingly to the pair of end surfaces, wherein said light guide comprises plural light transmitting members

joined together, so that the junction surface therebetween crosses the light emitting surface.

5,438,485

# ILLUMINATOR FOR USE WITH A REMOTE LIGHT SOURCE

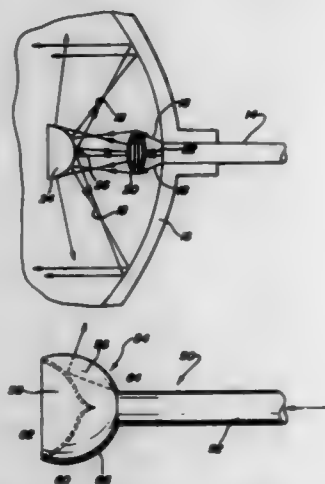
John X. Li, Farmington Hills; Jeffrey A. Erion, Plymouth, and Amir Fallahi, Holly, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1993, Ser. No. 1,709

Int. Cl.<sup>6</sup> F21V 8/00; B60Q 1/04

U.S. Cl. 362—32

6 Claims



1. An illuminator for use with a light source, optically coupled to an end of a light pipe comprising: a solid body optically coupled to another end of said light pipe including a first reflective surface on an end of said solid body such that light from said light source entering said solid body is reflected out of said body by said first reflective surface; a second reflective surface spaced from said first reflective surface for collecting and reflecting substantially all of the light reflected by said first reflective surface; said second reflective surface includes a paraboloidal shaped reflector having a focal point and said first reflective surface having a center point aligned with said focal point; and said first reflective surface includes a spherical portion and a cone shaped portion.

5,438,486

# HEADLIGHTS WITH VARIABLY SHAPED OPTICAL ELEMENTS

Edward P. McNair, 59 Chimney Ridge Dr., Convent Station, N.J. 07961

Filed Jul. 20, 1992, Ser. No. 916,373

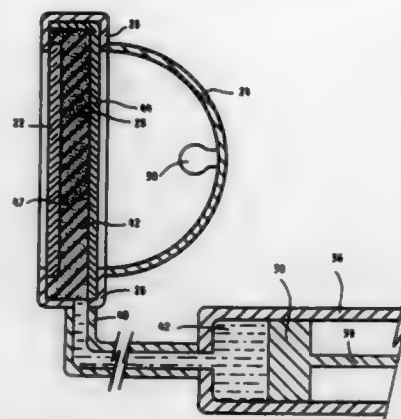
Int. Cl.<sup>6</sup> B60Q 1/064

U.S. Cl. 362—61

12 Claims

1. A vehicle headlight comprised of: (a) a housing fixed to the body of a vehicle, said housing having a forward light exit aperture, a light source mounted within said housing, a reflector mounted within said housing, said reflector positioned to a rear of said housing for reflecting at least some of the light rays generated by said light source through said exit aperture; (b) a lens comprised of two transparent members, at least one of said transparent members being flexible, said transparent members and a rim defining a hollow chamber, said chamber being filled with a transparent liquid, said chamber having a port, said port being fluidly connected to an external means of adjusting the volume of said liquid in said chamber; (c) said lens covering said aperture, the periphery of said lens

being positioned in contact with said housing by said rim, whereby at least some of said light rays pass through said chamber containing said liquid;



- (d) the improvement wherein said chamber contains at least one baffle, said baffle being supported by at least one said transparent member.

5,438,487

# LIGHT DEVICE FOR VEHICLES

Heinrich Schmid, Nuertingen, and Margret S. Von Ohr, Reutlingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

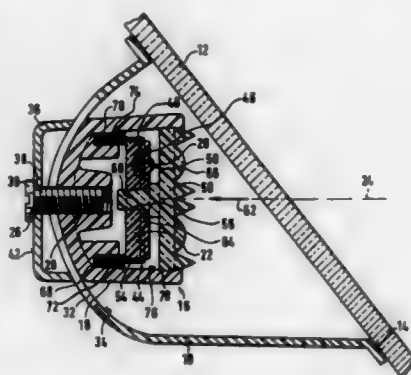
Filed Oct. 14, 1993, Ser. No. 136,684

Claims priority, application Germany, Dec. 19, 1992, 42 43 173.5

Int. Cl.<sup>6</sup> B60Q 1/26; G01M 11/06

U.S. Cl. 362—61

15 Claims



1. A light device for vehicles, comprising a housing mountable on a vehicle part, said housing being provided with a region which is curved; a light received in said housing and abutting against said region; at least one mounting element extending through said housing and fixing said light to said housing so that when said mounting element is released, said light is displaceable inside said housing along said curved region; and a control element arranged outside of said housing and coupled with said light for following an adjusting movement of said light, said control element being provided with indicating means for indicating an orientation of an optical axis of said light, said at least one mounting element being fixedly connected with said light in an adjusting direction, extending through said control element and entraining said control element during an adjustment of said light.

5,438,488

# ILLUMINATED ARTICLE OF APPAREL

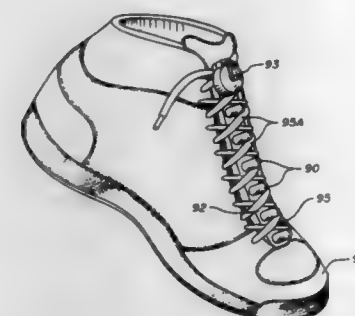
Larry Dion, Rydal, Pa., assignor to LaMi Products, Inc., Huntingdon Valley, Pa.

Continuation-in-part of Ser. No. 8,043, May 6, 1993. This application Dec. 13, 1993, Ser. No. 166,518

Int. Cl.<sup>6</sup> A43B 23/24

U.S. Cl. 362—103

8 Claims



4. An illuminated footwear item, comprising: a footwear article including an upper and a sole; a strip of material having a series of light-emitting diodes spaced on said strip; and means secured to said strip for causing said light-emitting diodes to be individually activated to provide a novel aesthetic appearance to said shoe; said strip affixed to said upper of said footwear article.

5,438,489

# SOLENOID DRIVER CIRCUIT AND DIAGNOSTICS

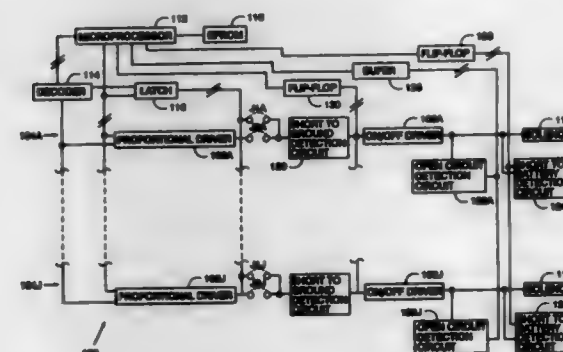
Steven W. Judy, 1119 W. Sycamore St., Chillicothe, Ill. 61523; Stephen J. Morey, 1524 W. Gilbert Ave., Peoria, Ill. 61604; April D. Ohlson, 112 Cobblestone Ln., East Peoria, Ill. 61611, and Weldon L. Phelps, 12140 Whispering Woods, Dunlap, Ill. 61525

Filed Sep. 30, 1993, Ser. No. 129,505

Int. Cl.<sup>6</sup> H01H 47/00

U.S. Cl. 361—191

6 Claims



1. An apparatus, for controllably driving a plurality of solenoids, comprising: a plurality of driver circuits, said plurality of driver circuits configurable as one of proportional and binary driver circuits, wherein a first number of said plurality of driver circuits include proportional driver circuits and a second number of said plurality of driver circuits include binary driver circuits; controlling means, connected to said plurality of driver circuits, for controllably actuating said proportional driver circuits and said binary driver circuits; means for detecting failure conditions on said proportional driver circuits and said binary driver circuits and respon-

sively producing respective failure condition signals; and wherein, said controlling means including means for receiving said failure condition signals and being adapted to perform a proportional diagnostic routine on said proportional driver circuits and to perform a binary diagnostics routine on said binary driver circuits via said failure conditions detecting means.

5,438,490

# LIGHT MOUNT FOR VEHICLE BEING TOWED

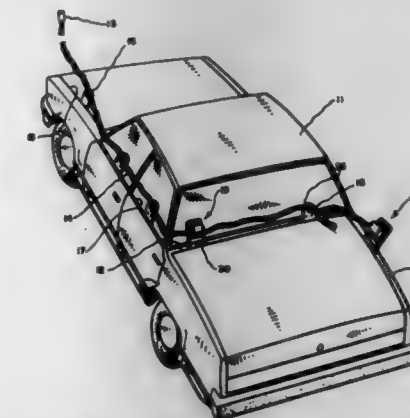
Davis Woodbury, 2024 Adams St., Ogden, Utah 84401

Filed Apr. 18, 1994, Ser. No. 229,353

Int. Cl.<sup>6</sup> B60Q 1/26

U.S. Cl. 362—61

12 Claims



1. A warning light assembly for mounting upon a vehicle being towed by a towing vehicle, comprising a pair of light units for mounting spaced apart upon the rear portion of the towed vehicle, and electrical control cable means connecting the light units to the warning light control means of the towing vehicle, wherein each light unit comprises: light bulb means for providing steady taillight illumination, brake light illumination and intermittent turn light illumination; a red tinted, light permeable, shell installed so that light from the bulb means is visible therethrough; and a base member with a front side, a left side, a right side and a rear side, and means securing the bulb and the shell thereto; and a thin plate member of pliable plastic joined to and extending downwardly of the base member, for forcible insertion into gaps existing between joining movable and stationary body portions of the towed vehicle when said movable portions are closed against said stationary portions, to secure the light unit to said vehicle by frictional contact between said plate member and said movable and stationary body portions.

5,438,491

# VEHICULAR SUN VISOR ASSEMBLY

Jay R. White, Bloomfield Hills, Mich., assignor to Jay Roberts Company, Rochester Hills, Mich.

Filed Nov. 19, 1993, Ser. No. 153,461

Int. Cl.<sup>6</sup> B60Q 3/00

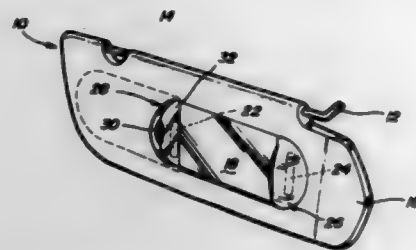
U.S. Cl. 362—83.1

9 Claims

1. A vehicular sun visor assembly comprising: a longitudinally extending core member; a vanity mirror having a longitudinally extending top, a longitudinally extending bottom and generally transverse sides mounted in said core member; a sliding door mounted in said core member for movement from a closed position covering said vanity mirror to an open position exposing said vanity mirror for use and



concealing said sliding door within said vehicular sun visor assembly;  
a pair of lamps, one located adjacent to each transverse side of said vanity mirror;  
a first lens mounted to said core member aligned with one of said pair of lamps;



a second lens mounted on said sliding door aligned with the other of said pair of lamps when said sliding door is in its open position; and  
a lighting circuit actuating said pair of lamps for directing light through said first and second lenses toward an object to be observed in said vanity mirror.

5,438,492

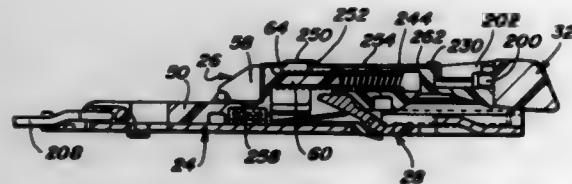
## END RELEASE SEAT BELT BUCKLE

Cecil A. Collins, Shelby Township; Tammy M. Butchko, Warren; Kurt W. Schulz, Harper Woods, and Gerald F. Durbin, Algonac, all of Mich., assignors to AlliedSignal Inc., Morris-town, N.J.

Continuation-in-part of Ser. No. 38,661, Mar. 26, 1993, abandoned. This application Nov. 1, 1993, Ser. No. 146,219  
Int. Cl.<sup>6</sup> A44B 11/25; B60Q 3/00

U.S. Cl. 362-108

13 Claims



13. An illuminated belt buckle for a vehicular safety belt restraint system comprising:

a base having a latched portion for releasably locking a tongue plate retained on a vehicular safety belt such that said tongue plate is maintained in a held relationship with respect to said base when operatively engaged therewith;  
an actuator supported for movement on said base for selectively disengaging said tongue plate from said latch portion of said base such that said tongue plate can be selectively released from said held relationship;  
an illumination mechanism affixed to said actuator;  
an electrical current source including a harness assembly having a pair of wires connected to a remote current line; and  
a pair of sliding electrically conductive contact strips, each of said contact strips including a cantilevered wiper member that slidably engages a strip affixed to said actuator such that as said actuator is slid with respect to said base said cantilevered wiper member slides along and maintains electrical contact with said strip for illuminating portion of said actuator.

5,438,493  
ROLLING BALL-CONTROLLED LIGHT EMITTING  
DEVICE FOR SHOES  
Shen-Ko Tseng, No. 28, Lane 41, Chyau-Dong St., Shih-Chih  
Jenn, Taipei Hsien, Taiwan

Filed Jun. 8, 1994, Ser. No. 255,693

Int. Cl.<sup>6</sup> F21V 33/00; A43B 3/00

U.S. Cl. 362-103

4 Claims



1. A light emitting device adapted to be installed in the sole of a shoe comprising:

a casing covered with a cover and having a battery chamber to hold a battery cell and a sliding way at one side of the casing alongside the battery chamber;  
a circuit board disposed above said battery chamber;  
a light emitting element disposed inside said casing and controlled by said circuit board to give light;  
a first contact metal element having one end connected to a negative terminal of said battery cell and an opposite end connected to a negative terminal of said circuit board;  
a second contact metal element having one end connected to a positive terminal of said battery cell and an opposite end attached to a negative terminal of the circuit board;  
a third contact metal element having one end connected to the positive terminal of said circuit board and an opposite end attached to a first end of the sliding way; and  
a steel ball that moves between the first end of the sliding way and a second opposing end of the sliding way; and wherein

when the shoe is moved, said steel ball is forced to pass through a gap between said second and third contact metal elements causing said circuit board to turn on said light emitting element.

5,438,494

## LIGHT HOLDER FOR HEAD GEAR

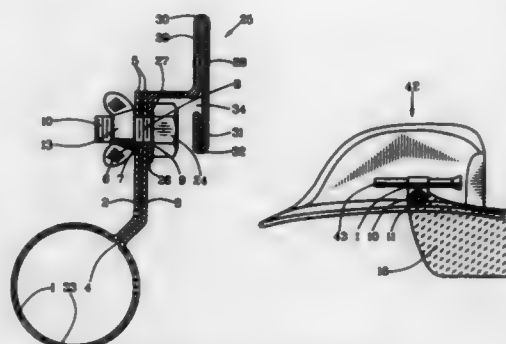
Benjamin L. Harlan, 6935 Country Corner La., Orlando, Fla. 32809

Filed Sep. 25, 1993, Ser. No. 125,758

Int. Cl.<sup>6</sup> F21L 15/14

U.S. Cl. 362-106

4 Claims



1. A head-gear-light holder comprising:  
a leaf-spring strap sized and shaped cylindrically to be

wrapped circumferentially around a cylindrical outside periphery of a flashlight body;  
opposite circumferential ends of the leaf-spring strap extended outward perpendicularly to an axis of a cylindrical configuration of the leaf-spring strap between which a gap is formed linearly to the axis of the cylindrical configuration of the leaf-spring strap;  
at least one fastener orifice in each of the opposite circumferential ends of the leaf-spring strap;  
the fastener orifice in one of the circumferential ends of the leaf-spring strap being concentric to the fastener orifice in an opposite circumferential end of the leaf-spring strap such that two fastener orifices are positioned concentrically with axes in line;  
a fastener-bolt shaft having a threaded end that is fittable snugly into the two fastener orifices;  
a fastener-bolt base juxtaposed to an outside surface of one of the circumferential ends of the leaf-spring strap proximate outside peripheries of the fastener orifices in the circumferential ends of the leaf-spring strap wherein the fastener-bolt base is a bolt head having a desired shape;  
a mating-threaded fastener member threadable onto the threaded end of the fastener-bolt shaft such that the opposite circumferential ends of the leaf-spring strap can be drawn together to decrease the gap selectively intermediate the circumferential ends linearly to the axis of the cylindrical configuration of the leaf-spring strap and an inside periphery of the cylindrical configuration of the leaf-spring strap can be tightened selectively against the cylindrical outside periphery of the flashlight body by screwing the mating-threaded fastener member selectively onto the fastener-bolt shaft wherein the mating-threaded fastener member is a hand-rotative nut having at least one finger-graspable member extended in a desired direction from the mating-threaded fastener member;  
a head-gear clasp having a base plate;  
a top front plate attached to a top of the base plate and extended downward;  
a bottom front plate attached to a bottom of the base plate and extended upward;  
a fastener section extended from one end of the top front plate toward the fastener-bolt shaft; and  
a fastener orifice of the fastener section sized and shaped to receive the fastener-bolt shaft.

5,438,495

## EMBEDDED LIGHT FITTING FOR RUNWAYS

Hans Ahlen, Vällingby, and Lelf Ek, Bandhagen, both of Sweden, assignors to Airport Technology In Scandinavia AB, Frosen, Sweden

PCT No. PCT/SE90/00416, § 371 Date Jan. 24, 1992, § 102(e) Date Jan. 24, 1992, PCT Pub. No. WO90/15954, PCT Pub. Date Dec. 27, 1990

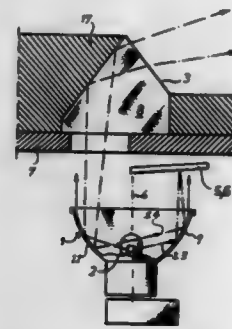
PCT Filed Jun. 14, 1990, Ser. No. 778,810

Claims priority, application Sweden, Jun. 16, 1989, 8902177

Int. Cl.<sup>6</sup> F21V 13/04

U.S. Cl. 362-153.1

4 Claims



1. A light fitting adapted to be embedded in the surface of a runway, comprising:

a light source having a field of light;  
a reflector;  
a light opening positioned in the field of light;  
a mirror device arranged for reflecting a part of the field of light back towards the reflector, the part of the field of light being reflected a second time off the reflector and thereafter being directed through the light opening; and  
a prism arranged in the light opening for closing the opening against moisture and contaminants and for reflecting and refracting departing light into a light flow directed substantially along the a runway.

5,438,496

## CONNECTION DEVICE WITH NO ELECTRICAL CONTACT

Jean-Pierre Meur, La Ville Du Bois, and Bernard Vermeuse, L'Hay les Roses, both of France, assignors to Societe Anonyme Dite: Neopost Industrie, Bagneux, France

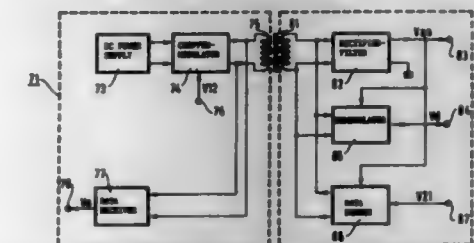
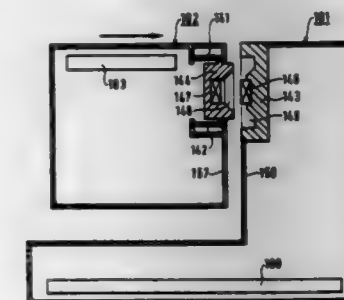
Filed Mar. 18, 1993, Ser. No. 34,395

Claims priority, application France, Mar. 23, 1992, 92 03458

Int. Cl.<sup>6</sup> H02M 3/335; G06F 15/20

U.S. Cl. 363-16

25 Claims



1. Connection device with no electrical contact for making and breaking at will a connection for transmitting electrical power and an electrical signal from a first part of a machine to a second part of the machine, said device comprising a first transformer separable into two parts, a first part of said transformer being fastened to said first part of said machine and comprising a first magnetic circuit portion passing through a first winding to which the power and the electrical signal to be transmitted are applied, a second part of said transformer comprising a second magnetic circuit portion fastened to said second part of said machine and passing through at least one second electrical winding, said device further comprising:

—means for chopping a current supplied to a first winding of said first transformer by a DC power supply,  
—means for modulating one characteristic of the current supplied to said first winding in sympathy with a signal to be transmitted from said first part to said second part of said machine,  
—means for rectifying and filtering a voltage induced in a second winding of said first transformer, the rectified and filtered voltage constituting a supply voltage, and  
—means for demodulating the voltage induced in said second winding and feeding a signal to said second part of said machine.

5,438,497

**TERTIARY SIDE RESONANT DC/DC CONVERTER**  
 Praveen K. Jain, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

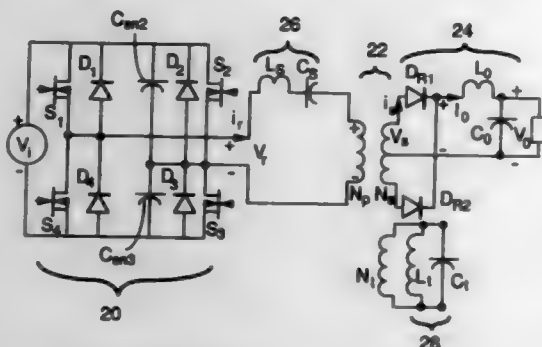
Filed May 13, 1993, Ser. No. 59,973

The portion of the term of this patent subsequent to Oct. 20, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363—17

4 Claims



1. In a resonant DC/DC converter operating at a constant operating frequency which comprises:  
 a bridged inverter means for converting a DC input to an AC of said constant operating frequency;  
 a series resonant branch means connected to said bridged inverter means for sending said AC to the primary winding of transformer means to generate a secondary AC in the secondary winding of said transformer; and  
 a rectifier means connected to said secondary winding to rectify said secondary AC to produce a stable DC output;  
 the invention being characterized in that said transformer further comprises a tertiary winding and a parallel resonant branch means is connected across said tertiary winding, both of said series and parallel resonant branch means being tuned to said constant operating frequency.

5,438,498

**SERIES RESONANT CONVERTER HAVING A RESONANT SNUBBER**

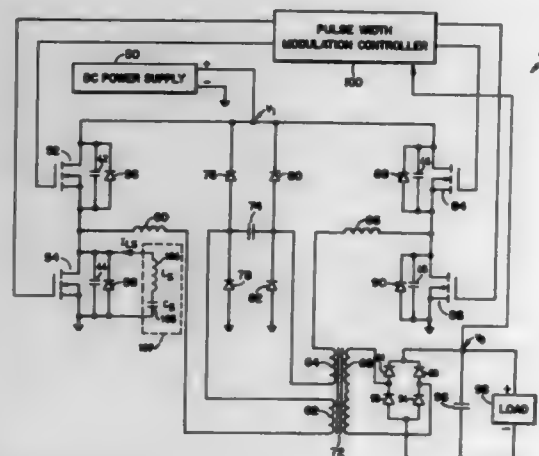
Michael J. Ingemi, Norwood, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 21, 1993, Ser. No. 171,294

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363—17

11 Claims



1. A power converter comprising:  
 a power source;  
 four switching devices arranged as two switching pairs, each of said pairs comprising two series-connected switching devices, each of said two switching pairs being coupled across said power source, each of said switching devices

including means for actuating said switching devices between ON and OFF states;

each of said switching devices comprises an anti-parallel diode shunting corresponding ones of said switching devices, said anti-parallel diode being poled to conduct current in opposition to the current through said corresponding switching device from said power source;

a controller means coupled to said four switching devices for providing control signals individually to said actuating means;

a resonant circuit including inductive elements and a capacitive element in series, said resonant circuit being coupled between a juncture of the two series-connected switching devices of a first of said two switching pairs and a juncture of the two series-connected switching devices of the other of said two switching pairs;

a transformer having primary and secondary windings, said primary windings being coupled in series with said resonant circuit such that current through said resonant circuit impresses a voltage across said primary windings;

means coupled to said resonant circuit for constraining the voltage on said resonant circuit to within a predetermined value;

means connected in parallel with at least one of said switching devices for providing a source current to said one of said switching devices; and

a rectifier means coupled to said secondary winding of said transformer for generating a predetermined output voltage.

5,438,499

**SWITCHING REGULATOR CIRCUIT USING MAGNETIC FLUX-SENSING**

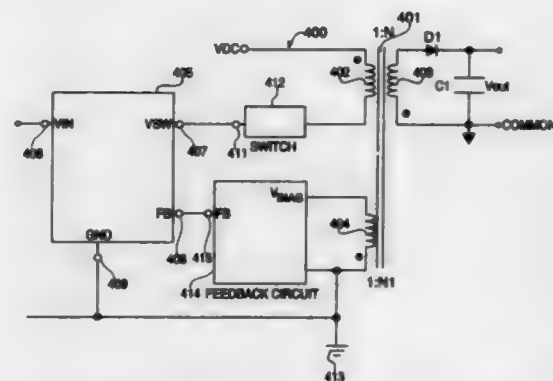
Anthony K. Bonte, Campbell, and Carl T. Nelson, San Jose, both of Calif., assignors to Linear Technology Corp., Milpitas, Calif.

Continuation of Ser. No. 125,429, Sep. 22, 1993, abandoned, which is a continuation of Ser. No. 786,718, Nov. 1, 1991, Pat. No. 5,305,192. This application Jun. 27, 1994, Ser. No. 266,092

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363—21

12 Claims



1. A circuit for use in a switching voltage regulator circuit, the switching voltage regulator circuit having a switching element, control circuitry which turns the switching element on and off, a transformer-coupled output circuit, and a feedback circuit for providing a magnetic flux-sensed feedback signal indicative of the switching voltage regulator circuit output voltage, the circuit comprising:

a feedback terminal for accepting the magnetic flux-sensing feedback signal;

means for generating, from at least one of (1) the magnetic flux-sensed feedback signal and (2) current conducted by the switching element, a first signal which varies during an on-off cycle of the switching element, wherein the means for generating the first signal comprises error am-

plifier circuitry having an input connected to the feedback terminal;

means for detecting a particular value of the first signal at a discrete point in the on-off cycle of the switching element, wherein the particular value of the first signal is indicative of load current being provided by the switching voltage regulator, and wherein the means for detecting a particular value of the first signal comprises sample and hold circuitry having an output connected to the switching element, the error amplifier circuitry providing an error signal indicative of a difference between the feedback signal and a reference signal; and

means connected to the feedback terminal for applying a current signal to the feedback terminal which is controlled by the particular value of the first signal so as to compensate the magnetic flux-sensed feedback signal for load-current dependent effects of parasitic impedances in the transformer-coupled output circuit.

5,438,500

**SWITCHING REGULATOR WITH A PUSH-PULL RESONANCE CONVERTER**

Franz Ohms, Oberrot, Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Germany

PCT No. PCT/DE92/00417, § 371 Date Dec. 17, 1993, § 102(e) Date Dec. 17, 1993, PCT Pub. No. WO92/22956, PCT Pub. Date Dec. 23, 1992

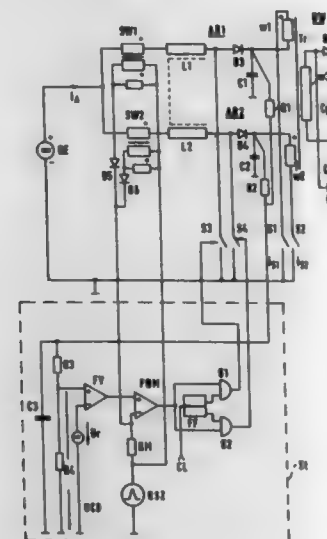
PCT Filed May 23, 1992, Ser. No. 167,819

Claims priority, application Germany, Jun. 19, 1991, 41 20 146.9

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363—24

13 Claims



1. A switching regulator comprising a series resonance push-pull converter (GW) and two clocked boost regulators (AR1 and AR2) connected in series with said converter, wherein:  
 said converter comprises a transformer (Tr) having two primary windings (w1, w2) which are galvanically isolated from one another, and two push-pull switches (S1, S2) each connected in series with a respective one of said primary windings;  
 each of said boost regulators comprises a series inductance (L1, L2) and an output capacitor (C1, C2); and  
 said boost regulators are connected to said converter to form two push-pull branches, each of said push-pull branches being composed of said series inductance of one of said boost regulators connected in series with a respective one of said primary windings and a respective one of said push-pull switches, and said output capacitor of each of said boost regulators constituting a resonance capacitor of said converter.

5,438,501

**TURN-OFF RELIEF NETWORK FOR A DIRECT VOLTAGE CONVERTER**

Basile Margaritis, Paderborn-Elsen, and Lothar Heinemann, Paderborn, both of Germany, assignors to ABB Patent GmbH, Mannheim, Germany

Continuation of Ser. No. 968,413, Oct. 29, 1992, abandoned.

This application May 4, 1994, Ser. No. 238,198

Claims priority, application Germany, Oct. 29, 1991, 41 35 569.5

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363—24

6 Claims



1. A turn-off relief network for a direct voltage converter, comprising a transformer having a primary winding; at least one clocked power transistor connected in series with said primary winding; a first series circuit connected parallel to said primary winding, said first series circuit consisting of a series connection of a diode and a capacitor; and a second series circuit connected parallel to said capacitor, said second series circuit consisting of a series connection composed of a reversing inductor, a reversing diode for blocking a reverse capacitor voltage and an auxiliary transistor.

5,438,502

**VSCF SYSTEM WITH VOLTAGE ESTIMATION**

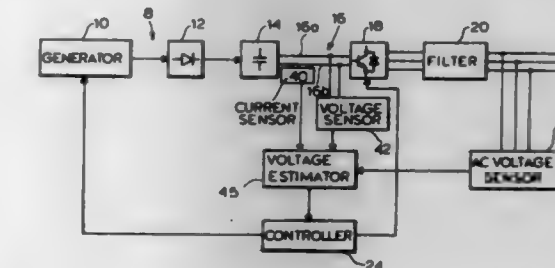
Gregory I. Rozman, and John Risley, both of P.O. Box 7003, Rockford, Ill. 61125-7003

Filed Dec. 22, 1992, Ser. No. 995,472

Int. Cl.<sup>6</sup> H02J 3/36

U.S. Cl. 363—35

21 Claims



1. An AC electric power generating system producing an AC output waveform comprising:  
 a source of DC power;  
 a DC-to-AC power inverter having a DC input and an AC output, said DC-to-AC power inverter comprising switching means for switchably coupling said DC input to said AC output producing said AC output waveform thereby;  
 a control unit for controlling said DC-to-AC power inverter;  
 a DC link conductor electrically connecting said source of DC power and said DC-to-AC power inverter DC input, said DC-to-AC power inverter converting said DC power to AC power and producing said AC output waveform at said inverter output;  
 means for sensing a parameter of DC power on the DC link conductor;



means coupled to the DC sensing means and responsive to the parameter of DC power on the DC link conductor for developing an estimate signal representing an estimated magnitude of the AC output waveform;  
means for providing a direct feed back of a parameter of said AC output waveform; and  
means directly coupled to said feed back means and responsive to said estimate signal for deriving a correction signal representing a correction to said estimate signal, and wherein said control unit is responsive to said estimate signal.

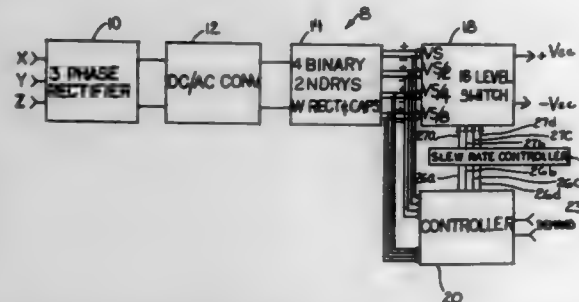
5,438,503

**SLEW RATE CONTROL IN A MULTI-LEVEL SWITCH**  
Gerald R. Stanley, Ocoola, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Continuation of Ser. No. 923,505, Aug. 3, 1992, abandoned. This application Apr. 25, 1994, Ser. No. 232,772  
Int. Cl.<sup>6</sup> H02M 7/537

U.S. Cl. 363-43

11 Claims



1. A device for regulating voltage outputted from a plurality of varying voltage sources supplying said voltage to input of said amplifier comprising:

- a plurality of switching means, each switching means having an output, a said switching means for operative association with each of said voltage sources, each switching means for switching its said associated voltage source on and off;
- a plurality of control means, a said control means operative associated with each of said switching means, each control means connected to a said switching means and adapted for connection to the said voltage source associated with said switching means, each control means for decreasing magnitude of the change in voltage outputted from said connected voltage source over time when the voltage source is being switched on or off, said outputs from said switching means being summed for supplying voltage to said amplifier, at least some of said plurality of control means for delaying turn off of their respective said associated voltage sources in proportion to the voltage sources size.

5,438,504

**VOLTAGE MULTIPLIER CIRCUITS OR THE LIKE**  
Paolo Menegoli, Milpitas, assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

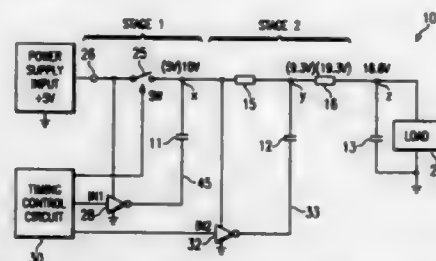
Filed Oct. 8, 1993, Ser. No. 133,573  
Int. Cl.<sup>6</sup> H02M 3/18

U.S. Cl. 363-60

14 Claims

1. A voltage multiplier for producing a multiplied output voltage from a supply voltage, comprising:
- a first voltage multiplying stage for receiving the supply voltage as a power input, for producing at an output, a first multiplied voltage based on the supply voltage;
  - means for rectification having an input for receiving said first multiplied voltage and having an output;
  - a second voltage multiplying stage comprising:
  - a capacitor having a first plate connected to the output of said means for rectification and having a second plate;
  - an inverter powered by the first multiplied voltage, hav-

ing an input receiving a timing control signal and having an output connected to the second plate of said capacitor such that the first plate of said capacitor is charged to the first multiplied voltage responsive to the



output of said inverter being low, and such that the second plate of said capacitor is biased to the first multiplied voltage when the output of said inverter is high to produce a second multiplied voltage at the first plate of said capacitor.

5,438,505

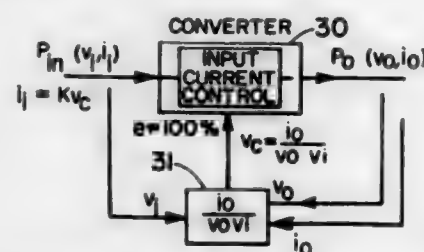
**ADAPTIVE CONTROL METHOD FOR POWER CONVERTERS**

Isaac Cohen, Dix Hills, N.Y., assignor to Lambda Electronics, Inc., Melville, N.Y.

Continuation of Ser. No. 815,763, Jan. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 650,733, Feb. 5, 1991, abandoned. This application Jul. 15, 1993, Ser. No. 92,284  
Int. Cl.<sup>6</sup> G05F 1/565

U.S. Cl. 363-95

15 Claims



1. A method of regulating the output of a power converter comprising the steps of:
- (1) monitoring the output voltage and current parameters of said power converter;
  - (2) deriving a control function by generating a control signal as a function of factors including a ratio between said output current and said output voltage;
  - (3) sensing the input current such that the average of said input current is maintained as a function of a constant and said control function.

5,438,506

**COLLECTIVE WIRING SYSTEM AND METHOD OF CONTROL THEREOF**

Shigeru Oho, Hitachi; Takeshi Hirayama, Mito; Masahiro Matsumoto, Yokohama; Akira Hasegawa; Fumio Hamano, both of Katsuta, and Takanori Shibata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

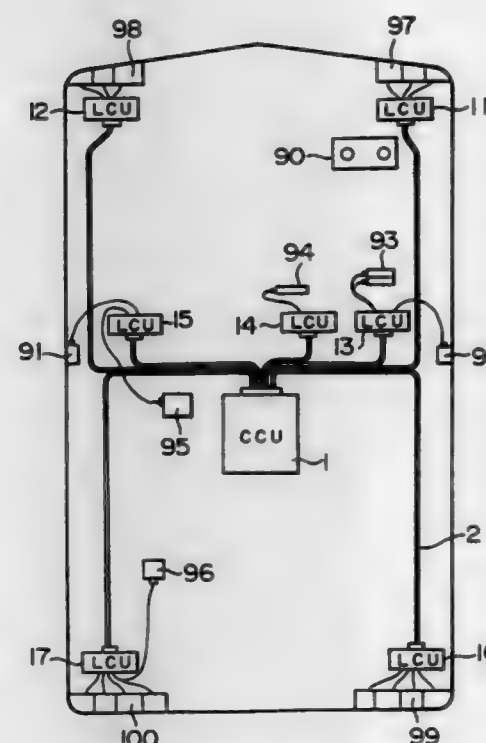
Continuation of Ser. No. 874,223, Apr. 27, 1992, abandoned, which is a continuation of Ser. No. 604,465, Oct. 29, 1990, abandoned, which is a continuation of Ser. No. 372,698, Jun. 28, 1989, Pat. No. 4,969,082, which is a continuation of Ser. No. 171,419, Mar. 21, 1988, Pat. No. 4,855,896, which is a continuation of Ser. No. 777,441, Sep. 28, 1985, abandoned. This application Jan. 10, 1994, Ser. No. 179,540

Claims priority, application Japan, Feb. 23, 1985, 60-33658; Mar. 25, 1985, 60-58438

Int. Cl.<sup>6</sup> G06F 19/00

U.S. Cl. 364-138

18 Claims



1. A method of control of a collective wiring system for a motor vehicle in which a central control unit fetches input data representing a status condition and outputs control data via a transmission path to a plurality of terminal control units which control vehicle electrical devices by transmitting said control data thereto, comprising the steps of:

- (1) generating control data on the basis of fetched input data representing status conditions and holding the generated control data;
- (2) storing in memory a listing of identifiers of terminal control units in an arbitrary predetermined order;
- (3) generating addresses of terminal control units in response to the identifiers stored in said memory and in the order in which said identifiers are stored in said memory;
- (4) formatting a sequence of messages each including a generated address of a terminal control unit and control data to be sent to the terminal control unit; and
- (5) transmitting said sequence of messages periodically via said transmission path to said terminal control units according to the addresses thereof and in the arbitrary order of said listing of identifiers, independent of said generating and holding step (1).

5,438,507

**METHOD OF AND APPARATUS FOR CONTROLLING WASHING OPERATION OF WASHER**

Jung H. Kim, Seoul; Hyung S. Kim, Kyungki-Do; Byoung H. Lee, Kyungki-Do; Young H. Roh, Kyungki-Do, and Hae Y. Chung, Seoul, all of Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

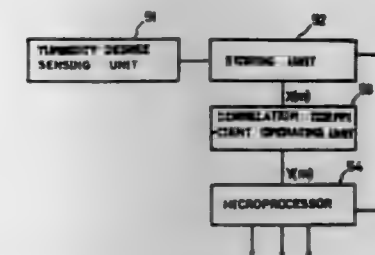
Filed Oct. 8, 1993, Ser. No. 134,297

Claims priority, application Rep. of Korea, Jun. 19, 1993, 11230/1993

Int. Cl.<sup>6</sup> D06F 33/02

U.S. Cl. 364-140

8 Claims



1. A method for controlling a washing operation of a washer comprising the steps of:

- (A) checking an operation mode of said washer selected by a user;
- (B) starting a washing operation when said operation mode checked is a washing mode, sampling, at predetermined time intervals, turbidity data supplied from polluted degree sensing means equipped in the washer until the washer starts to operate at a stable state, and storing said turbidity data sampled;
- (C) analyzing the turbidity data stored at said step (B) and deriving a correlation coefficient of the turbidity data; and
- (D) comparing said correlation coefficient operated at said step (C) with reference data and determining various information required to control the washer, based on the result of said comparison.

5,438,508

**LICENSE DOCUMENT INTERCHANGE FORMAT FOR LICENSE MANAGEMENT SYSTEM**

Robert M. Wyman, Kirkland, Wash., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 723,456, Jun. 28, 1991, abandoned.

This application Sep. 12, 1994, Ser. No. 304,632

Int. Cl.<sup>6</sup> G06F 17/40; H04L 9/00

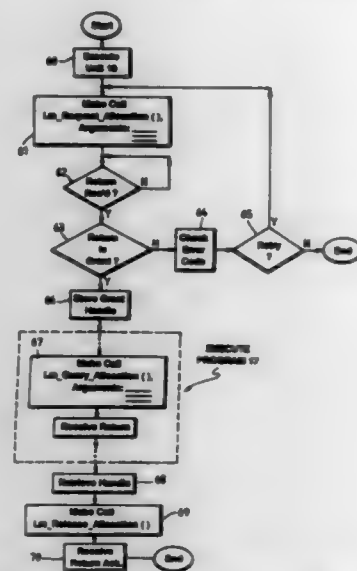
U.S. Cl. 364-401

26 Claims

1. A method operating in a computer system for managing execution of licensed software items in said computer system, comprising the steps of:

- maintaining by said computer system a store of license authorizations for said software items; each license authorization including an indication of license management policy for a software item, said indication being in the format of an encoded document of a data type consisting of an ordered sequence of three elements, the three elements including a document descriptor, a document header and the document content;
- accessing by said computer system said store to retrieve information from said license authorization for said soft-

ware item, in response to a request from a client, and comparing said client request, including identification of



said client and said software item, with said retrieved information, to produce a grant or refusal of said request.

5,438,509

#### TRANSACTION PROCESSING IN A DISTRIBUTED DATA PROCESSING SYSTEM

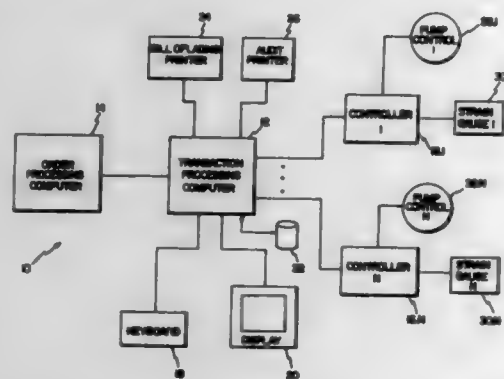
Donald J. Heffron, 2421 Third Ave. South B-6, Minneapolis, Minn. 55404

Continuation of Ser. No. 652,184, Feb. 7, 1991, abandoned. This application Oct. 7, 1993, Ser. No. 133,824

Int. Cl.<sup>6</sup> G06F 15/24, 15/46

U.S. Cl. 364-408

10 Claims



1. A transaction processing method for use in a transaction processing system comprising a first processor for processing a plurality of orders, a second processor connected to the first processor, and a controller connected to the second processor, wherein the second processor receives, stores, and controls execution of a transaction associated with the one of plurality of orders, and formats transaction results resulting from the transaction execution, and wherein the controller executes the transaction, the method comprising the steps of:

- entering a first order at the first processor;
- building a first order record representative of the first order, wherein the first order record comprises:
  - a record identifier identifying a record type;
  - a first data structure, the first data structure comprising:
    - a first data field length;
    - a first data field, wherein the first data field contains first data; and
    - a first attribute code identifying the first data field; and

- a second data structure, the second data structure comprising:
  - a second data field length;
  - a second data field, wherein the second data field contains second data; and
  - a second attribute code identifying the second data field;

transferring the first order record from the first processor to the second processor;

storing the first order record in the second processor with other order records received from the first processor;

retrieving the first order record;

building a controller record comprising a data structure derived from at least one data structure from the first order record;

transferring the controller record to the controller;

executing the first order at the controller;

reporting, from the controller to the second processor; transaction results of the first order execution; and

formatting the transaction results as one or more transaction result records, wherein each of the transaction results records comprise:

- a record identifier identifying a record type;
- a data structure, the data structure comprising:
  - a data field length;
  - a data field, wherein the data field contains transaction data; and
  - an attribute code identifying the data field;

wherein the step of formatting the transaction results is performed in the second processor.

5,438,510

#### USER INTERFACE AND MONITORING FUNCTIONS FOR AUTOMATED PERITONEAL DIALYSIS SYSTEMS

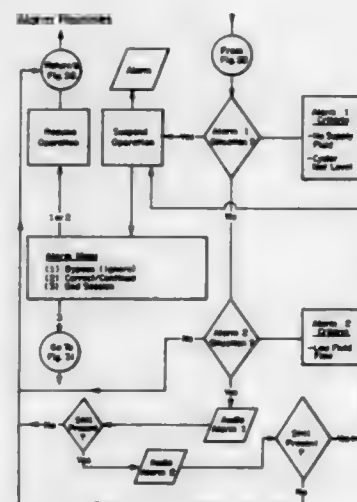
Robert J. Bryant, Manchester, N.H.; Jeffrey Finkelstein, Shelburne, Vt.; Dean Kamen, Bedford, N.H.; Richard Lanigan, Concord, N.H.; Bradley D. Miller, Londonderry, N.H., and Geoffrey P. Spencer, Manchester, N.H., assignors to Deko Products Limited Partnership, Manchester, N.H.

Filed Mar. 3, 1993, Ser. No. 25,531

Int. Cl.<sup>6</sup> A61M 1/28

U.S. Cl. 364-413.11

22 Claims



1. An automated peritoneal dialysis system including means for establishing flow communication with the patient's peritoneal cavity catheter through a pumping mechanism,

actuator means for operating the pumping mechanism to emulate gravity flow conditions independent of head height conditions and:

- (i) drain spent peritoneal dialysis liquid from the peritoneal cavity, and

(ii) infuse fresh dialysis liquid from a source into the peritoneal cavity,

control means for directing operation of the actuator means to conduct a peritoneal dialysis modality, and

means for monitoring system operation including means for generating a first alarm signal when system operation fails to satisfy a first predetermined set of criteria,

means for generating a second alarm signal when system operation fails to satisfy a second predetermined set of criteria different than the first set of criteria,

means for (i) suspending system operation in response to the first alarm signal; and (ii) requiring user intervention to resume system operation, and

means for (i) continuing system operation for a predetermined time period in response to the second alarm signal; (ii) canceling the second alarm condition without user intervention when, after the predetermined time period, system operation satisfies the second set of criteria; and (iii) initiating a first alarm condition when, after the predetermined time period, system operation fails to satisfy the second set of criteria.

5,438,511

#### DISJUNCTIVE UNIFICATION

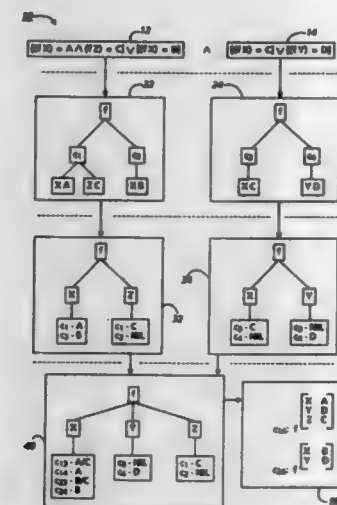
John T. Maxwell, III, Sunnyvale, and Ronald M. Kaplan, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 19, 1988, Ser. No. 260,205

Int. Cl.<sup>6</sup> G06F 17/20

U.S. Cl. 364-419.01

51 Claims



1. A system for solving a logical formula using unification, the logical formula including a plurality of terms; at least one of the terms including a disjunction, each disjunction having a plurality of disjuncts, each disjunct having a respective context; the system comprising:

- a first data unit and a second data unit, the first data unit including data relating to a first one of the terms of the logical formula and the second data unit including data relating to a second one of the terms of the logical formula;
- a first context identifier identifying a first context that includes the respective context of each of a first set of one or more disjuncts of the logical formula; a second context identifier identifying a second context that includes the respective context of each of a second set of one or more disjuncts of the logical formula; the first context applying to the first data unit and the second context applying to the second data unit; and
- a processor for performing unification, the processor including:
  - first means for accessing the first data unit and the second

data unit and the first and second context identifiers; and

second means for using the first and second context identifiers to determine whether to unify the first and second data units.

5,438,512

#### METHOD AND APPARATUS FOR SPECIFYING LAYOUT PROCESSING OF STRUCTURED DOCUMENTS

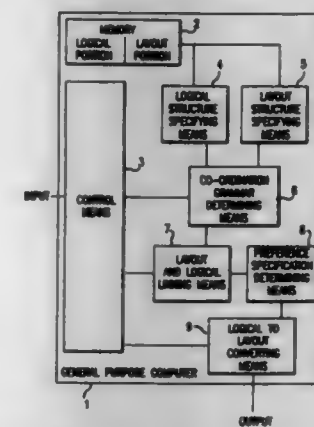
Suryanarayana M. Mantha, Webster, N.Y.; Allen L. Brown, Jr., Solana Beach, Calif., and Toshiro Wakayama, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 22, 1993, Ser. No. 139,686

Int. Cl.<sup>6</sup> G06F 15/38; G06G 7/60

U.S. Cl. 364-419.1

5 Claims



4. An apparatus for outputting a specific layout structure of a specific logical structure based on a given generic logical structure of said specific logical structure, comprising:

- means for specifying said generic logical structure of said specific logical structure in terms of relational attribute grammars, said relational attributes being specified in terms of binary relationships;
- means for specifying a generic layout structure for said generic logical structure in terms of relational attribute grammars;
- means for specifying coordination grammars for said generic logical structure and said generic layout structure and expressing said coordination grammars in terms of relational attribute grammars;
- means for specifying preference specifications to resolve potential ambiguities in said layout structures;
- means for determining an optimal specific layout structure for said specific logical structure using said coordination grammars and said preference specifications; and
- means for generating said specific said logical structure.

5,438,513

#### AUTOMOTIVE ELECTRONICS TEST SYSTEM

Neil L. Borkowicz, Plymouth; David S. Meir, Southfield, both of Mich.; John L. Evans, Madison, and Robert W. Johnson, Auburn, both of Ala., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 19, 1993, Ser. No. 155,942

Int. Cl.<sup>6</sup> G06F 15/20

U.S. Cl. 364-424.03

8 Claims

1. An Apparatus for adding additional memory to an electronic controller having a printed circuit board designed with at least a first removable microcontrol means having memory available to it for controlling at least one functional system, said first removable microcontrol means being mountable on the printed board by a connection means having a particular configuration, comprising:

- a module board having a module attachment means for









transmission means, and the delivery unit having at least one delivery door arranged on a front side of the delivery unit;  
 positioning means for moving the delivery door relative to the plurality of compartments into a delivery position in which one of said plurality of compartments is in alignment with the at least one delivery door;  
 release means for releasing the delivery door for exposing a corresponding one of said plurality of compartments located behind the door; and  
 signal generating means for generating signals representative of alignment of one of said plurality of compartments with the delivery position and the release of the door, and said long-range transmission means being for transmitting said signals to a data processing central unit remote from the delivery unit for recording door releases and delivery position alignments of said delivery unit and delivery door relative to individual ones of said plurality of compartments.

5,438,524

## LOGIC SYNTHESIZER

Michio Komoda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

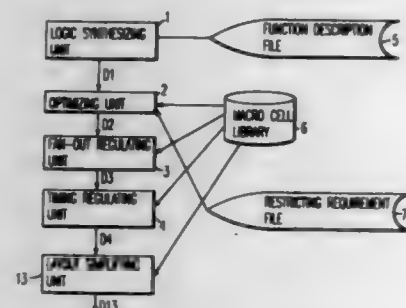
Filed Aug. 3, 1993, Ser. No. 100,992

Claims priority, application Japan, Sep. 1, 1992, 4-233466

Int. Cl.<sup>6</sup> G06F 17/50

U.S. Cl. 364—489

15 Claims



1. A logic synthesizer comprising:  
 logic function description applying means for applying a logic function description which defines conditions of logic connections;  
 net list generating means receiving said logic function description for generating a net list which defines element information about logic elements comprised of macro cells and connection information about connections of them, based upon said logic function description; and  
 layout simplifying means receiving said net list, evaluating as GOOD or NO GOOD a layout aptitude of a logic circuit comprised of said macro cells defined by said net list based upon a predetermined reference, and replacing said macro cells defined by said net list with alternative ones without changing a logic of said whole logic circuit when said layout aptitude is evaluated as NO GOOD, for producing a net list according to which said layout aptitude is evaluated as GOOD.

5,438,525

## SYSTEM AND METHOD FOR THE DETECTION OF DEFECTS OF A COATING

Yoshima Shimbara, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 8, 1993, Ser. No. 148,261

Claims priority, application Japan, Nov. 9, 1992, 4-298356

Int. Cl.<sup>6</sup> G06F 19/00

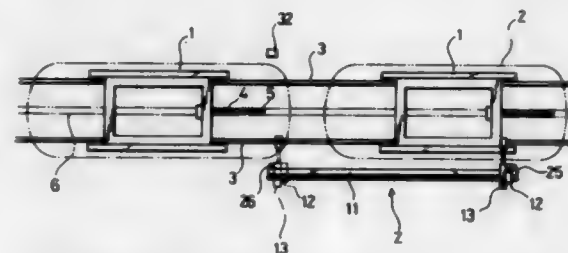
U.S. Cl. 364—507

30 Claims

1. A system for the detection of defects or damages of or on a coating formed on an object to be investigated, so arranged as for an investigating robot to fetch an image of said object

mounted on a carrier while said carrier with said object is being transferred and detect such defects or damages of a coating formed on the surface of the object by processing said image of the object with an image processing means, comprising:

a first detection means for detecting an amount or a distance



of movement of said carrier with said object mounted thereon, so arranged as to come into direct contact with said carrier; and

a first control means for controlling fetch of said image of the object by said investigating robot in response to an output from said first detection means when said carrier moves in a predetermined distance.

5,438,526

## PROGRAM GENERATION METHOD FOR PARTICLES SIMULATION

Satoshi Itoh, Kodaira, and Sigeo Ihara, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

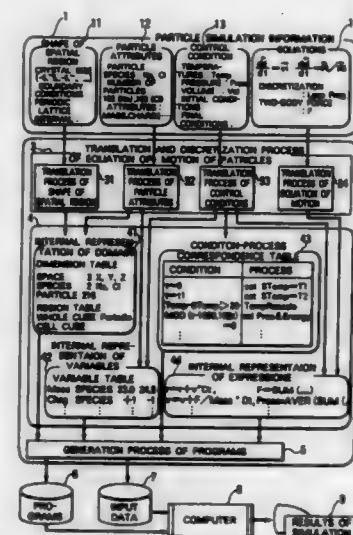
Filed Jul. 7, 1992, Ser. No. 914,747

Claims priority, application Japan, Jul. 12, 1991, 3-172175

Int. Cl.<sup>6</sup> G06F 15/328

U.S. Cl. 364—578

21 Claims



1. A program generation method for particles simulation of generating particle simulation programs in a computer which has a memory and to which an input/output device is connected, comprising the following steps of:

(1) inputting particle simulation information from the input/output device to analyze a physical phenomenon as individual motion of a plurality of particles in a spatial region, reducing a volume of input particle simulation information to form reduced inputted information, and storing the reduced inputted information in the memory, said particle simulation information including,

a description of attributes of particles representing particle species and a number of particles as objects of the simulation,

a description of a shape of a spatial region representing a boundary condition in which a physical phenomenon is generated,  
 a description of control conditions of an environment of the simulation, and  
 equations of motion dominating behaviors of interactive particles in time and space;

(2) generating, according to the reduced inputted information stored in the memory, information describing specifications of the particle simulation programs according to each of said plurality of particles; and  
 (3) creating, based on the information describing specifications of the particle simulation programs, the particle simulation programs and input data necessary therefor.

5,438,527

## YIELD SURFACE MODELING METHODOLOGY

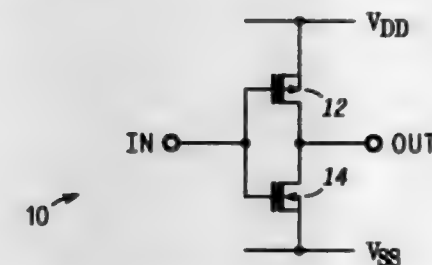
David W. Feldbaumer, Chandler, and Eric Maass, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 247,608, May 23, 1994, abandoned, which is a continuation of Ser. No. 628,781, Dec. 17, 1990, abandoned. This application Feb. 23, 1995, Ser. No. 392,664

Int. Cl.<sup>6</sup> G06F 17/00

U.S. Cl. 364—578

4 Claims



1. A computer implemented method of evaluating and optimizing integrated circuit yields with respect to transistor parametric variations and/or design and process variables and/or alternatives seen in the process for fabricating the integrated circuits wherein the integrated circuits have a given set of outcomes that are a function of a given set of independent variables and which meet stated specification limits, comprising the steps of:

providing a predetermined set of independent variables that are related to the integrated circuit function to which predetermined desired ones of the outcomes are functionally related;  
 obtaining a data set for each of said outcomes as related to said set of independent variables;  
 deriving a regression or functional model for each of the desired outcomes as a function of the given set of independent variables;  
 generating respective response surfaces from each of said regression or functional models;  
 converting each respective response surface to a normalized process capability index or Z-value surface for all combinations of the independent variables;  
 converting each process capability index to a respective percent yield surface;  
 combining each of said percent yield surfaces into a two or more-dimensional composite percent yield surface containing all desired parametric operating points of the outcomes associated with the integrated circuit;  
 using the computer to implement a two or more-dimensional composite percent yield surface plot from said combining step;  
 selecting a value of the at least one of the predetermined set of independent variables from the two or more-dimensional composite yield surface plot to provide a desired yield; and  
 adjusting the design and process variables seen in the process for fabricating the integrated circuits such that the at least

one of the predetermined set of independent variables has the selected value to provide the desired yield.

5,438,528

## METHOD AND APPARATUS FOR TESTING AN INTERACTIVE NETWORK BOARD IN A LOCAL AREA NETWORK (LAN)

H. Brad Emerson; George A. Kalwitz, both of Costa Mesa; Nastruko Takahashi, Long Beach; William C. Russell, Laguna Hills, and Willis J. Luther, Irvine, all of Calif., assignors to Canon Information Systems, Inc., Costa Mesa, Calif.

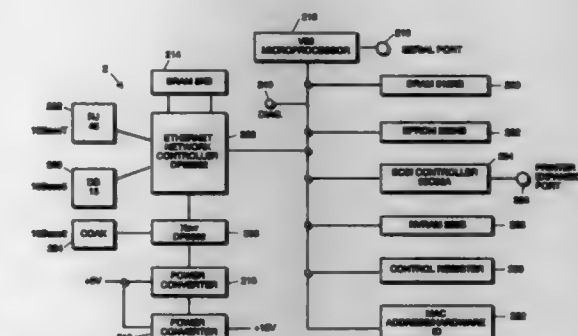
Continuation of Ser. No. 978,285, Nov. 18, 1992, abandoned.

This application Sep. 29, 1994, Ser. No. 314,466

Int. Cl.<sup>6</sup> G05B 15/00

U.S. Cl. 364—580

28 Claims



18. An apparatus for testing an interactive network board having a LAN interface, an SCSI interface, and a test interface, comprising:

a ROM disposed on the interactive network board for storing process steps;  
 a processor disposed on the interactive network board for processing the stored process steps;  
 a RAM disposed on the interactive network board for receiving and for storing operational instructions;  
 a first test station for sending test programs, which are designed to exercise the LAN interface, and the SCSI interface and to monitor the LAN interface and the SCSI interface for abnormalities, to the interactive network board and for receiving test results from the interactive network board through the test interface; and  
 a second test station for receiving requests for test data from the interactive network board, and for sending test data to said interactive network board through either said LAN interface or said SCSI interface;  
 wherein said processor processes said process steps stored in the ROM upon receiving power from a power supply, and wherein said first test station receives a process test result of said stored process steps via the test interface, and wherein said first test station sends a test program to said RAM, detects a test result of said test program, and provides an indication of a test failure in accordance with the detected test result, and  
 further wherein said processor requests test data from said second test station, said second test station sends the test data to said processor, and a confirmation of receipt of the test data is sent to said first test station via the test interface.





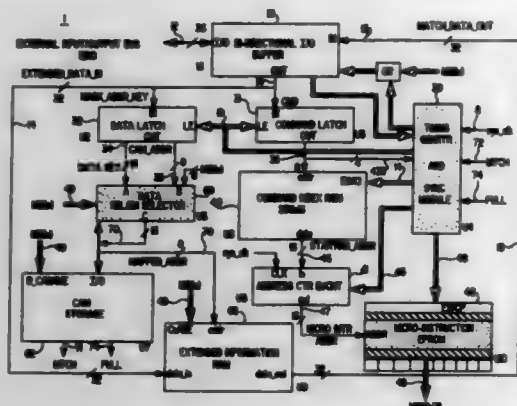
5,438,535

**CONTENT ADDRESSABLE MEMORY SYSTEM**  
Derrick P. Lattibaudiere, Newark, Del., assignor to Panasonic Technologies, Inc., Princeton, N.J.

Filed Mar. 29, 1994, Ser. No. 219,639  
Int. Cl. G11C 15/00

U.S. Cl. 365-49

8 Claims



1. A memory system for holding a plurality of blocks of data, each of said blocks of data including a key portion and an extended portion, and for fetching said extended portion of said blocks of data from memory in response to a search key, said system comprising:

- means for storing the key portion of each data block into a content addressable memory (CAM) at a respective predetermined address;
- means for storing the extended portion of each of said blocks of data into a further memory, at an address derived from the respective predetermined address;
- means for searching the CAM using the search key, wherein, when the search is successful, the CAM provides an address value corresponding to the search key;
- generating a starting address value in the further memory from the address value provided by the CAM;
- fetching the extended portion of each of said blocks of data stored in the further memory at the starting address values.

5,438,536

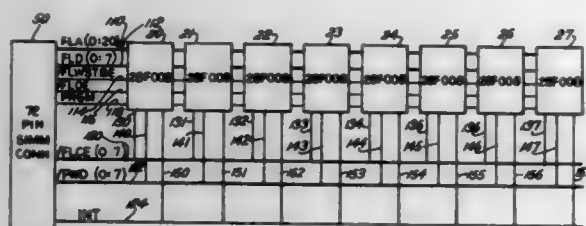
**FLASH MEMORY MODULE**

Scot W. Salzman, Vernon Hills, Ill., assignor to U.S. Robotics, Inc., Skokie, Ill.

Filed Apr. 5, 1994, Ser. No. 223,103  
Int. Cl. G11C 13/00

U.S. Cl. 365-52

8 Claims



1. A memory module comprising in combination:  
a circuit board having mounted thereon a plurality of flash memory chips, each said chip having a status register, a ready line having both a ready state, indicating that the chip has completed a write or erase operation, and a power down state initiated by a power down signal; and interrupt means for indicating when all of said ready lines are in said ready state, whereby the need for polling each of said status registers is reduced.

5,438,537

**STATIC RANDOM ACCESS MEMORY WHICH HAS A PAIR OF THIN FILM TRANSISTORS AND WHEREIN THE CAPACITANCE AND RESISTANCE BETWEEN THE GATE ELECTRODES AND THE CONDUCTOR LAYERS ARE INCREASED SO AS TO REDUCE THE TIME CONSTANT BETWEEN THEM**

Manayoshi Sasaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

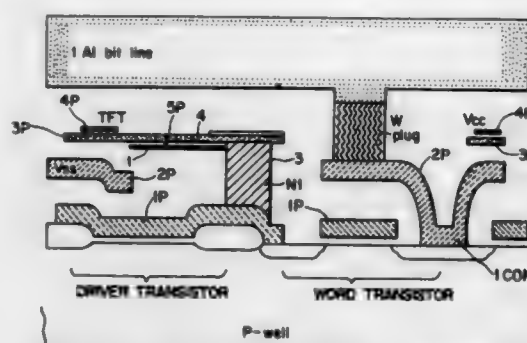
Filed Feb. 18, 1993, Ser. No. 19,439

Claims priority, application Japan, Feb. 25, 1992, 4-075156

Int. Cl. G11C 11/00

U.S. Cl. 365-154

1 Claim



1. A static random access memory of the thin film transistor load type comprising, first and second thin film load transistors, a pair of driver transistors, and a pair of word transistors, a first polycrystalline layer which forms the gate of said first thin film load transistor, a second polycrystalline layer which forms the gate of said second thin film load transistor, a third polycrystalline layer spaced from first and second polycrystalline layers and capacitively coupling them together and forming a coupling capacitance therebetween, fourth and fifth polycrystalline layers which, respectively, form the gates of said pair of driver transistors, a first resistor formed in a through-hole between said first and said fourth polycrystalline layer so as to resistively couple them together, and a second resistor formed in a through-hole between said second and fifth polycrystalline layer so as to resistively couple them together, and wherein the product of the coupling capacitance and the resistance of said first resistor defines a time constant which determines the response speed of said random access memory.

5,438,538

**STATIC RANDOM ACCESS MEMORY FOR GATE ARRAY DEVICES**

Masashi Hashimoto, Tsukuba, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 951,965, Sep. 28, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 312,165

Int. Cl. G11C 11/00

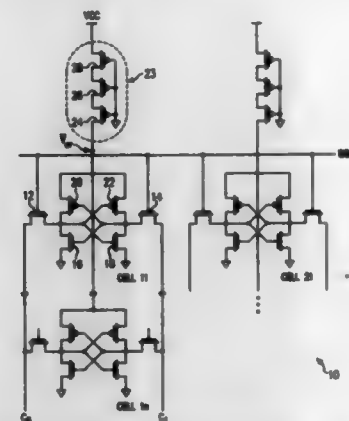
U.S. Cl. 365-154

17 Claims

7. A static random access memory for a CMOS gate array comprising, in combination:

- a plurality of static random access memory cells arranged in columns and rows, each cell consisting of:
  - a first and a second n-channel pass gate transistor, each said pass gate transistor having a gate, a source and a drain, the gate of each said pass gate transistor being connected to a signal line for activating the memory cell;
  - a first and a second n-channel driver transistor, each said driver transistor having a gate, a source and a drain, the source of both said driver transistors being connected to a neutral voltage supply, said first driver transistor having its gate connected to the drain of said second pass gate transistor and having its drain connected to the drain of said first pass gate transistor, said second driver transistor having its gate connected the drain of

said first pass gate transistor and having its drain connected to the drain of said second pass gate transistor; first and second p-channel transistors, each having a gate, a source and a drain, said p-channel transistors being coupled to said pass gate and driver transistors, said first p-channel transistor having its gate connected to the gate of said first driver transistor and having its source connected to the drain of said first driver transistor, said



second p-channel transistor having its gate connected to the gate of said second driver transistor and having its source connected to the drain of said second driver transistor;

- all of said n-channel and p-channel transistors being of approximately the same physical size; and
- a resistance element coupled between the drain of said first and second p-channel transistors of all said memory cells in each column of cells and a supply voltage.

5,438,539

**MEMORY DEVICE, METHOD FOR READING INFORMATION FROM THE MEMORY DEVICE, METHOD FOR WRITING INFORMATION INTO THE MEMORY DEVICE, AND METHOD FOR PRODUCING THE MEMORY DEVICE**

Toshihiko Mori, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

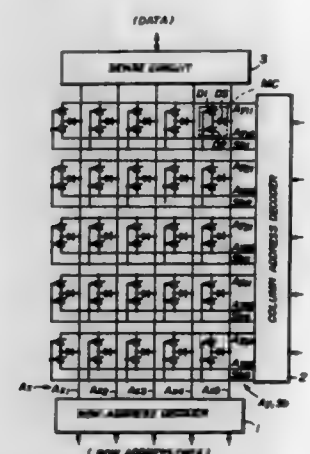
Continuation of Ser. No. 126,168, Sep. 24, 1993, abandoned. This application Sep. 2, 1994, Ser. No. 299,669

Claims priority, application Japan, Sep. 25, 1992, 4-256701

Int. Cl. G11C 11/00

U.S. Cl. 365-159

19 Claims



16. A semiconductor device comprising:  
a plurality of first address signal lines;  
a plurality of pairs of second address signal lines;

a plurality of standby signal lines extending in parallel with the plurality of pairs of second address signal lines;  
a plurality of memory cells provided at cross points at which the plurality of first address signal lines and the plurality of pairs of second address signal line cross;  
first address decoder means for supplying first address signals to the plurality of first address signal lines;  
second address decoder means for supplying second address signals to the plurality of pairs of second address signal lines and for supplying standby signals to the plurality of standby signal lines; and  
sense amplifier means for sensing information read from the memory cells to the plurality of first address signal lines, each of the memory cells comprising:

- first and second elements connected, via a connection node, in series between one of the pairs of second address signal lines in a forward direction, each of the first and second elements having a negative-differential conductance characteristic;
- a threshold diode connected between one of the first address signal lines and the connection node, the threshold diode having a characteristic in accordance with which a current flows in the threshold diode when a voltage applied across the threshold diode exceeds one of a negative threshold voltage and a positive threshold voltage; and
- a gate which is connected to one of the standby signal lines and controls currents flowing in the first and second elements.

5,438,540

**SEMICONDUCTOR SRAM MEMORY DEVICE**

Han-soo Kim, Suwon-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon-City, Rep. of Korea

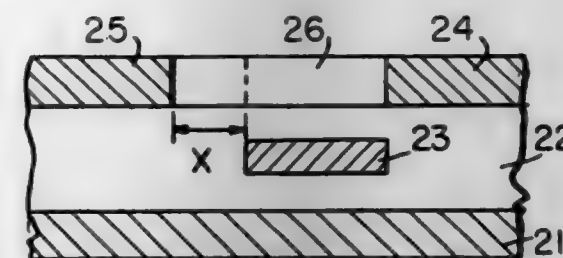
Filed Nov. 18, 1993, Ser. No. 153,927

Claims priority, application Rep. of Korea, Nov. 18, 1992, 92-21651

Int. Cl. H01L 21/335

U.S. Cl. 365-174

16 Claims



1. A semiconductor memory device having a PMOS thin film transistor formed as a load element, wherein said PMOS thin film transistor comprises:

- a source region;
- a channel region adjacent said source region;
- a drain region;
- an offset region disposed between said channel region said drain region;
- a channel gate substantially aligned with and insulated from said channel region; and
- an offset gate at least substantially aligned with and insulated from said offset region for reducing a hot carrier effect in said offset region, said offset gate being electrically isolated from said channel gate, and said offset gate being maintainable at a constant potential.

5,438,541

# SEMICONDUCTOR DYNAMIC RANDOM ACCESS MEMORY CELL FREE FROM LEAKAGE BETWEEN ACCUMULATING ELECTRODE AND COUNTER ELECTRODE

Kotchi Ando, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

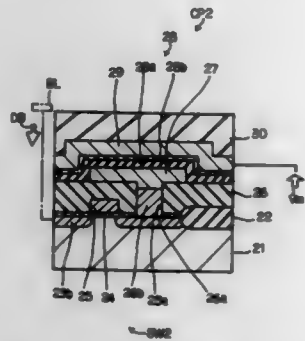
Filed Sep. 7, 1994, Ser. No. 301,589

Claims priority, application Japan, Sep. 7, 1993, 5-221564

Int. Cl. G11C 13/00

U.S. Cl. 365-182

7 Claims



1. A semiconductor dynamic random access memory cell fabricated on a semiconductor substrate, comprising:

- a switching transistor having a first impurity region formed in a surface portion of said semiconductor substrate and coupled to a signal line, and
- a second impurity region formed in another surface portion of said semiconductor substrate and connectable to said first impurity region; and
- a storage capacitor having an accumulating electrode electrically connected to said second impurity region in an ohmic manner, a dielectric film structure covering said accumulating electrode, and a counter electrode held in contact with said dielectric film structure in an opposing relation to said accumulating electrode, at least one of said accumulating electrode and said counter electrode having a p-type polysilicon layer held in contact with said dielectric film structure.

5,438,542

# NONVOLATILE SEMICONDUCTOR MEMORY DEVICE

Shigeru Atsumi, and Sumio Tanaka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 210,279, Mar. 18, 1994, abandoned.

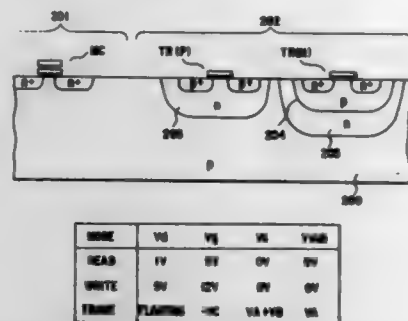
This application Oct. 31, 1994, Ser. No. 332,493

Claims priority, application Japan, May 28, 1993, 5-126588

Int. Cl. G11C 7/00; H01L 27/02

U.S. Cl. 365-182

23 Claims



1. A nonvolatile semiconductor memory device with a stacked gate structure, comprising:

a semiconductor substrate of a first conductivity type; first and second wells of a second conductivity type formed in a surface region of said semiconductor substrate; a third well of the first conductivity type formed in said second well; a memory cell having a drain, a source, and control gate formed in said semiconductor substrate; a transistor of the first conductivity type formed in said first well for constituting a peripheral circuit; a transistor of the second conductivity type formed in said third well for constituting said peripheral circuit; and means for controlling the voltages of said semiconductor substrate and the source/drain and the control gate of said memory cell.

5,438,543

# SEMICONDUCTOR MEMORY USING LOW POWER SUPPLY VOLTAGE

Sei-Seung Yoon, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

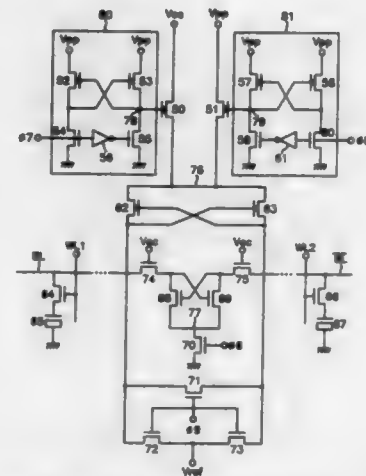
Filed Apr. 5, 1994, Ser. No. 223,120

Claims priority, application Rep. of Korea, Apr. 6, 1993, 1993-5724

Int. Cl. G11C 7/00

U.S. Cl. 365-189.11

20 Claims



1. In a semiconductor memory device having an array of memory cells each comprised of a select transistor and a storage capacitor, a sense amplifier having a pull-up node and a pull-down node, a plurality of word lines each of which is coupled to the gate electrode of the select transistor of each of a plurality of the memory cells arranged in a common row, and a pair of complementary bit lines coupled to respective first and second terminals of the sense amplifier and to an electrode of the select transistor of respective ones of a plurality of memory cells arranged in corresponding columns, a peripheral circuit, comprising:

- a first pull-up device connected between a supply voltage and said pull-up node of said sense amplifier, said first pull-up device having a first mode of operation wherein said supply voltage is coupled to said pull-up node and a second mode of operation wherein said supply voltage is isolated from said pull-up node;
- a second pull-up device coupled between a boosting voltage greater than said supply voltage and said pull-up node of said sense amplifier, said second pull-up device having a first mode of operation wherein said boosting voltage is coupled to said pull-up node and a second mode of operation wherein said boosting voltage is isolated from said pull-up node;
- a first pull-up control circuit for selectively switching said first pull-up device between its said first and second modes of operation; and,

5,438,545

# DATA OUTPUT BUFFER OF SEMICONDUCTOR MEMORY DEVICE FOR PREVENTING NOISES

Jae K. Sim, Chungcheongbuk, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Rep. of Korea

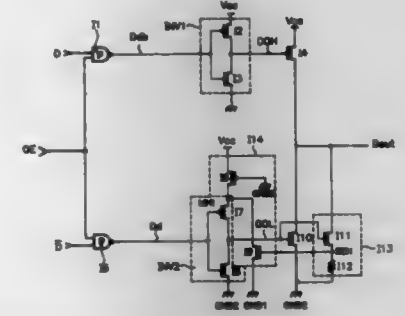
Filed Feb. 23, 1994, Ser. No. 200,818

Claims priority, application Rep. of Korea, Dec. 21, 1993, 28855

Int. Cl. H03K 17/16

U.S. Cl. 365-189.05

4 Claims



1. A data output buffer, comprising:  
a data output driver including pull-up means operable in response to a first signal and pull-down means operable in response to a second signal;  
control means for detecting a current flowing into said pull-down means and for controlling the slope of the second signal in accordance with the detected current; wherein said control means includes an inverter and sensing means for sensing the current flowing into said pull-down means and the magnitude of noises generated at the ground of said pull-down means; and  
voltage adjusting means operable in accordance with an output signal of said sensing means for adjusting a gate voltage of said pull-down means; wherein said sensing means includes (a) an N-MOS transistor which has a gate electrode for receiving an output signal of the inverter, a drain electrode connected to an output of said data output driver, and a source electrode, and (b) a current sensing resistor connected in between said source electrode and the ground.

5,438,546

# PROGRAMMABLE REDUNDANCY SCHEME SUITABLE FOR SINGLE-BIT STATE AND MULTIBIT STATE NONVOLATILE MEMORIES

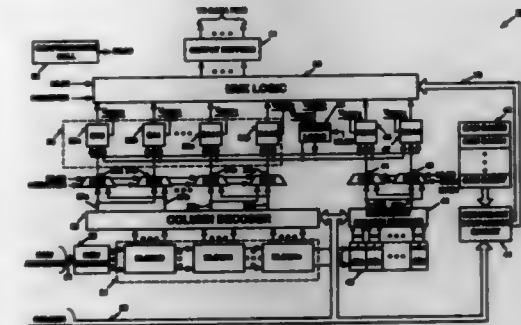
Michel I. Ishac, Citrus Heights; Sanjay S. Talreja, Folsom, and Mark E. Bauer, Cameron Park, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 2, 1994, Ser. No. 252,682

Int. Cl. G11C 7/00

U.S. Cl. 365-200

15 Claims



1. A memory having a first output and a second output, comprising:

a second pull-up control circuit for selectively switching said second pull-up device between its said first and second modes of operation.

5,438,544

# NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE WITH FUNCTION OF BRINGING MEMORY CELL TRANSISTORS TO OVERERASED STATE, AND METHOD OF WRITING DATA IN THE DEVICE

Takami Makino, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

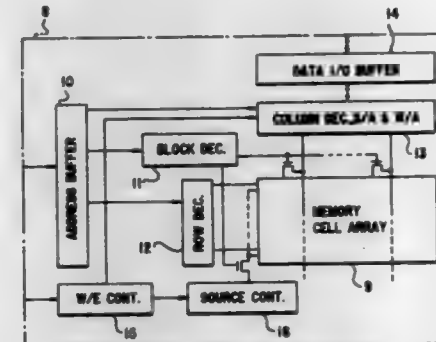
Filed Jan. 28, 1994, Ser. No. 187,541

Claims priority, application Japan, Mar. 19, 1993, 5-059857

Int. Cl. G11C 7/00

U.S. Cl. 365-185

6 Claims



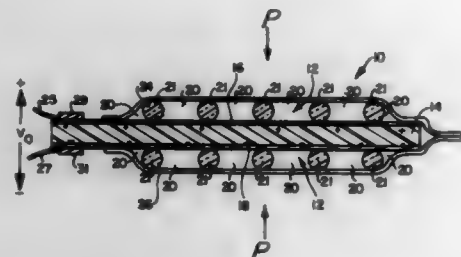
1. A non-volatile semiconductor memory device wherein each transistor having a two-layer gate structure with a control gate and a floating gate is constituted as a memory cell transistor, the non-volatile semiconductor memory device comprising:

- a control circuit provided for controlling erasure and writing of data with respect to memory cell transistors, the control circuit generating, in an erase operation, a voltage required for bringing memory cell transistors to an overerased state, and in a write operation, the control circuit applying an identical voltage to each control gate of a plurality of memory cell transistors connected to an identical word line, and generating a first voltage required for releasing memory cell transistors in an overerased state from the overerased state to thereby cause the memory cell transistors to retain data corresponding to a first logic level, and a second voltage required for releasing memory cell transistors in an overerased state from the overerased state to thereby cause the memory cell transistors to retain data corresponding to a second logic level, one of said generated first voltage and second voltage being supplied to a bit line corresponding to each of the memory cell transistors,
- the control circuit bringing all of memory cell transistors included in an object block portion of erasure, to an overerased state, by means of a flash erasure, wherein the control circuit controls a write operation with units of a plurality of memory cell transistors in an overerased state connected to an identical word line, the write operation including a first writing into memory cell transistors which should be released from the overerased state to thereby retain data corresponding to the first logic level, and a second writing into memory cell transistors which should be released from the overerased state to thereby retain data corresponding to the second logic level.





duced thermal changes in a material having both pyroelectric and piezoelectric characteristics to detect such pressure, with an electrical signal produced having a first component produced as a result of the pyroelectric characteristic of the material which predominates over a second component of the signal produced as a result of the piezoelectric characteristic of the material.



5. A transducer comprising:

- (a) means for converting mechanical energy into thermal energy; and
- (b) means, including a pyroelectric material disposed in thermal energy transfer relationship with the energy converting means, for producing an electrical output predominantly in response to the converted thermal energy.

5,438,554

**TUNABLE ACOUSTIC RESONATOR FOR CLINICAL ULTRASONIC TRANSDUCERS**

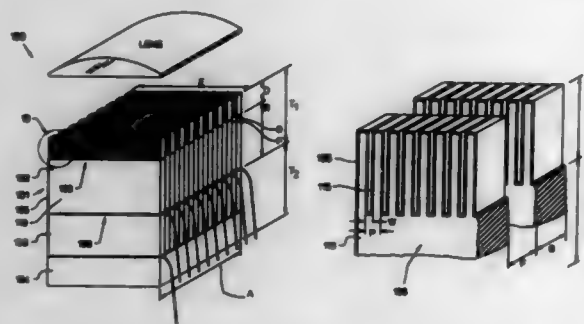
Mir S. Seyed-Bolorforosh, Palo Alto; Michael Greenstein, Los Altos, both of Calif.; Turuvekere R. Gururaja, North Andover, Mass., and Henry Yoshida, San Jose, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 77,530, Jun. 15, 1993. This application Feb. 28, 1994, Ser. No. 203,216

Int. Cl.<sup>6</sup> H04R 17/00

U.S. Cl. 367—140

20 Claims



1. A tunable ultrasonic probe for coupling acoustic signals between the probe and a medium having an acoustic impedance, comprising:

- a body of a first piezoelectric ceramic material having a Curie temperature;
- a body of a second piezoelectric material acoustically coupled in series with the body of the first piezoelectric material, body of the second piezoelectric material having a polarization and further having a Curie temperature that is substantially different than that of the first piezoelectric material;
- an electrode means for electrically coupling the bodies in parallel with one another and for applying a voltage potential to each of the bodies;
- an oscillating voltage means for exciting the acoustic signals in the probe, the oscillating voltage means being coupled with the electrode means; and
- a bias voltage means for variably controlling the polarization of the second piezoelectric material, the bias voltage means being coupled with the electrode means.

5,438,555

**MULTI-PURPOSE KEY RING**

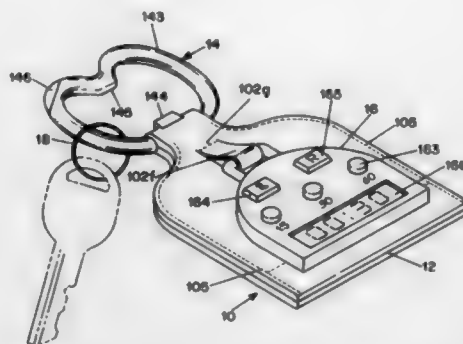
Ho C. Kim, 105 Windham Loop, Staten Island, N.Y. 10314

Filed Jul. 5, 1994, Ser. No. 270,915

Int. Cl.<sup>6</sup> G04B 47/00

U.S. Cl. 368—10

12 Claims



1. A multi-purpose key ring comprising a pouch formed a durable flexible sheet material, having a closable opening and adapted to receive coins, a ring adapted to hold keys and attached to the pouch, and a timer attached to the pouch, settable to a selected one of a plurality of time periods and having a sounder for signaling the end of the selected time period a predetermined time before the end of the selected time period, the timer being a solid state digital timer having an LCD for displaying the selected time when the timer is started and the time remaining when the timer is running, a selector key for each time period, a start key, and a reset key.

5,438,556

**HOROLOGICAL PIECE COMPRISING A PHOTOVOLTAIC CELL HAVING A PHOTOCHEMICAL REGION**

Rudolf Dinger, St-Aubin; Eric Saurer, Bevaix, and Michael Graetzel, St-Sulpice, all of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

PCT No. PCT/CH93/00083, § 371 Date Dec. 8, 1993, § 102(e) Date Dec. 8, 1993, PCT Pub. No. WO93/19405, PCT Pub. Date Sep. 30, 1993

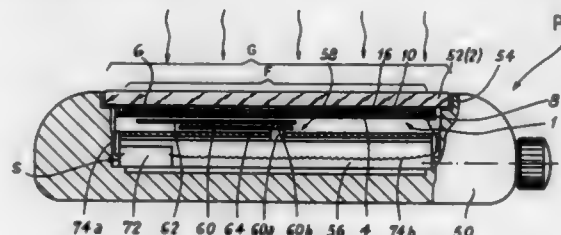
PCT Filed Mar. 24, 1993, Ser. No. 142,409

Claims priority, application Switzerland, Mar. 26, 1992, 00961/92

Int. Cl.<sup>6</sup> G04C 10/00; H01M 6/36

U.S. Cl. 368—205

27 Claims



1. A horological piece comprising: an energy source including at least one photovoltaic cell capable of transforming luminous radiation into an electrical current, this photovoltaic cell including an active surface sensitive to luminous radiation, horometrical means supplied by said energy source and capable of supplying time keeping information, and display means adapted to receive the time keeping information supplied by the horometrical means and to display this information so that it is readable by a user, the active surface of said photovoltaic cell having at least one transparent region which at least partially covers the display means, said transparent region comprising a first transparent sub-

strate which has thereon a first transparent electrode, and a second transparent substrate which has thereon a second transparent electrode on which is deposited a first layer of a photoelectrochemically active semiconductor oxide in the form of a porous nanostructure of sintered colloidal particles,

said substrates being so disposed in relation to one another as to define a space filled with electrolyte,

said electrolyte impregnating said porous structure in a manner such that it is in electrical contact on the one hand with the first transparent electrode disposed on the first transparent substrate and on the other hand with the second transparent electrode disposed on the second transparent substrate,

and said second transparent substrate also having thereon a second semiconductor oxide layer which is compact, continuous and extends between the second electrode and the first semiconductor oxide layer.

5,438,557

**OPTICAL DISK STORAGE WHICH PROVIDES PULL-IN OF FOCUS SERVO AND PULL-IN OF TRACKING SERVO**

Osamu Ito; Kyosuke Yoshimoto; Yoshihiro Kiyose; Kazuhiko Nakane, all of Amagasaki; Akira Mashimo, Tokorozawa; Hiroyuki Onda, Hoya; Koji Yamana, Setagaya, and Takuya Nagata, Hoya, all of Japan, assignors to Mitsubishi Electric Corporation and TEAC Corporation, both of Japan

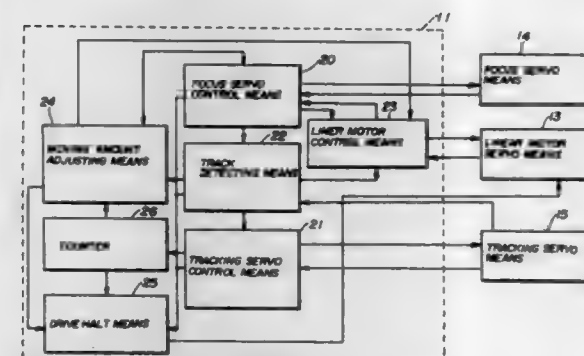
Continuation of Ser. No. 767,080, Sep. 27, 1991, abandoned. This application Mar. 24, 1994, Ser. No. 217,772

Claims priority, application Japan, Oct. 1, 1990, 2-263554

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—44.32

18 Claims



13. An optical disk apparatus comprising:

an optical head which records information on an optical disk and/or reproduces information therefrom by radiating an optical beam of the optical head on a predetermined track of a recording surface on the optical disk;

head moving means for moving said optical head;

focus servo means for performing a focus servo to make the optical beam of the optical head focus on the recording surface, and for determining whether or not a pull-in of a focus servo has failed; and

tracking error signal generating means for generating a tracking error signal representing an offset of a track on the optical disk;

tracking servo means, coupled to said tracking error signal generating means, for performing a tracking servo at a position having a least offset of a track so as to make the optical beam of the optical head follow the track on the optical disk;

track detecting means, coupled to said tracking error signal generating means, for determining whether or not there is a track at an arbitrary position on the optical disk by using the tracking error signal generated by said tracking error signal generating means; and

control means, coupled to said head moving means, focus servo means, tracking error signal generating means,

5,438,558

**IMAGE SIGNAL APPARATUS INCLUDING CLAMPING PROCESSING OF IMAGE SIGNAL**

Kazuhito Ohashi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

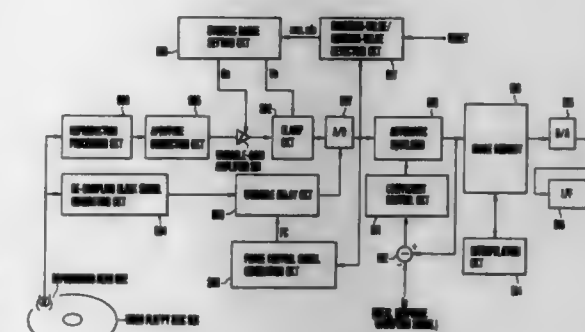
Continuation of Ser. No. 56,817, Apr. 29, 1993, abandoned, which is a continuation of Ser. No. 662,775, Feb. 28, 1991, abandoned. This application Nov. 10, 1993, Ser. No. 150,588

Claims priority, application Japan, Mar. 7, 1990, 2-053516; Mar. 7, 1990, 2-503515

Int. Cl.<sup>6</sup> G11B 5/09; H04N 5/78

U.S. Cl. 369—48

25 Claims



1. An image signal reproducing apparatus for reproducing an image signal recorded on a recording medium, comprising:

(A) reproducing means for effecting reproduction from the recording medium on which the image signal is recorded and for outputting a reproduced signal reproduced from the recording medium;

(B) clamp means for clamping the reproduced signal outputted from said reproducing means and for outputting a clamped signal;

(C) analog-to-digital converting means for converting the reproduced signal outputted from said clamp means into a digital signal and for outputting a converted digital signal;

(D) digital signal processing means for processing the digital signal output from said analog-to-digital converting means; and

(E) control means for controlling a clamping characteristic of said clamp means in accordance with a level of a signal represented by the digital signal outputted from said analog-to-digital converting means.



5,438,559

# METHOD FOR LOCATING PHYSICAL SECTORS IN A FIXED BLOCK ARCHITECTURE EMBEDDED SERVO DISK FILE #14

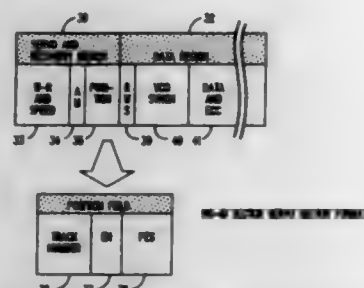
John S. Best, San Jose, and Steven R. Hetzler, Sunnyvale, both of Calif., assignors to International Business Machines, Armonk, N.Y.

Continuation of Ser. No. 73,950, Jun. 9, 1993, abandoned, which is a division of Ser. No. 727,680, Jul. 10, 1991, abandoned. This application Oct. 20, 1994, Ser. No. 327,528

Int. Cl.<sup>6</sup> G11B 3/90, 5/09

U.S. Cl. 369—54

6 Claims



1. In a fixed block architecture embedded servo disk drive having a data recording disk with radially spaced tracks and circumferentially spaced physical sectors that include servo regions and data regions but no identification regions for identifying the data regions in the physical sectors and no identifiers for bad or spare physical sectors, and a head capable of reading information from the data recording disk, a method for locating a physical sector so that data may be read or written in the data region of the located physical sector, comprising the steps of

providing on the disk a start of track indicating mark and in the servo regions a start-of-servo-region indicating mark; receiving a requested logical sector location identifier; referencing the requested logical sector location identifier into a sector mapping table having entries which map out bad physical sectors or spare physical sectors from the data recording disk; identifying an entry in the sector mapping table corresponding to the logical sector location identifier; computing, based on the identified entry and the logical sector location identifier, a physical sector location identifier; moving the head to the track containing the physical sector corresponding to the computed physical sector location identifier; reading the start of track indicating mark; counting the start-of-servo-region indicating marks in successive servo regions to locate the physical sector corresponding to the computed physical sector location identifier, whereby data may be read or written in the data region of the located physical sector without use of identification regions on the disk for identifying the data regions in the physical sectors.

5,438,560

# APPARATUS AND METHOD FOR RECORDING/REPRODUCING OPTICAL INFORMATION AND OPTICAL DISK-SHAPED RECORDING MEDIUM

Si H. Lee, Kyongki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Oct. 21, 1993, Ser. No. 139,033

Claims priority, application Rep. of Korea, Dec. 31, 1992, 27199

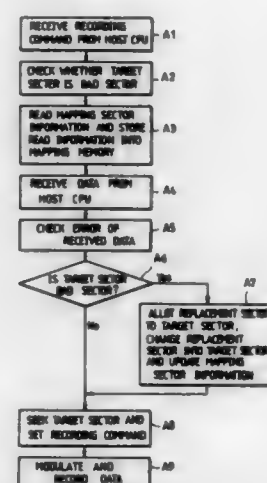
Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—58

3 Claims

1. A method of recording optical information using an optical disk, comprising the steps of: checking whether a target sector of the optical disk on

which data is to be recorded is a bad sector, upon receiving a data recording command from main processing means; storing information into storage means in accordance with the checked result; reading information from mapping sectors of a block of the optical disk to which said target sector belongs and storing the read information into mapping memory means; receiving the data to be recorded from said main processing means and checking for an error in the received data; checking whether said target sector is the bad sector;



allotting a replacement sector located in a center of the optical disk to the target sector if it is detected that said target sector is the bad sector, and updating the mapping sector information in said mapping memory means; seeking said target sector if it is checked that said target sector is normal and setting the recording command in sector read/write control means so that the data can be recorded on said target sector; and modulating the data and recording the modulated data on said target sector.

5,438,561

# METHOD FOR RECORDING AND REPRODUCING INFORMATION USING AN OPTICAL MEMORY

Kazuo Van, Nara; Kenji Ohta, Kitakatsuragi, and Toshio Ishikawa, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 741,806, Aug. 6, 1991, abandoned. This application Oct. 26, 1994, Ser. No. 329,690

Claims priority, application Japan, Aug. 10, 1990, 2-212620

Int. Cl.<sup>6</sup> G11B 7/00

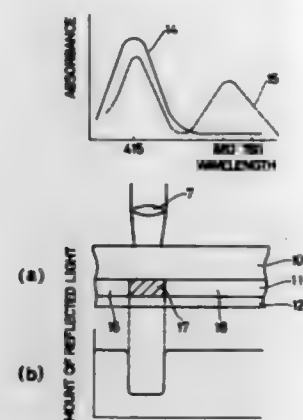
U.S. Cl. 369—100

9 Claims

1. A method of recording and reproducing information using an optical memory device comprising a transparent substrate, a recording film formed on said substrate and made of a resin containing a photochromic material dispersed therein, said photochromic material being capable of reversibly changing its state from achromatic to chromatic and absorbing light of at least 780 nm wavelength in the chromatic state, and a reflecting film formed on said recording film for reflecting light, said method comprising the steps of:

applying a visible light beam of a long wavelength onto said optical memory device to turn said recording film into the achromatic state for initialization, applying thereafter a visible light beam of a short wavelength onto said optical memory device to turn said recording film into the chromatic state in accordance with binary-coded data of information for recording said information, and applying another visible light beam of a long wavelength

having a light intensity lower than that of said visible light beam for initialization onto said optical memory device for reproducing said information having been recorded therein, the information being reproduced by using a difference in the light intensity between the light reflected



by a chromatic region in which information is recorded and the light reflected by an achromatic region in which information is not recorded, the light intensity reflected by the chromatic region being smaller than the light intensity reflected by the achromatic region.

5,438,562

# OPTICAL HEAD FOR RECORDING AND/OR REPRODUCING INFORMATION ON AND/OR FROM OPTO-MAGNETIC RECORD MEDIUM

Shohei Kobayashi; Yasuhiro Miyazaki, and Yasuhiro Fujiwara, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

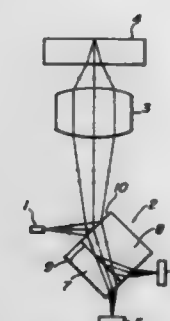
Filed Oct. 8, 1993, Ser. No. 133,243

Claims priority, application Japan, Oct. 9, 1992, 4-271743; Jan. 19, 1993, 5-006699; Mar. 22, 1993, 5-062035; Apr. 27, 1993, 5-101204

Int. Cl.<sup>6</sup> G11B 11/12

U.S. Cl. 369—110

24 Claims



1. An optical head for recording and/or reproducing information on and/or from an opto-magnetic record medium comprising:

a laser light source for emitting an incident laser beam; a beam splitting means for splitting said incident laser beam emitted from the laser light source from a return laser beam reflected by the opto-magnetic record medium; an objective lens for projecting said incident laser beam onto the opto-magnetic record medium and introducing said return laser beam reflected by said opto-magnetic record medium onto said beam splitting means; a polarizing beam splitting means for dividing said return laser beam into first and second laser beams having mutually orthogonal directions of polarization; first and second photodetectors for receiving said first and second laser beams, respectively; and an optical member which comprises said beam splitting

means and said polarizing beam splitting means, said optical member comprising first and second prisms which are joined with each other via contact surfaces, each of said first and second prisms having opposing parallel surfaces, and wherein said polarizing beam splitting means comprises a polarizing beam splitting plane formed between said contact surfaces of the first and second prisms, and said beam splitting means comprises a beam splitting surface formed on a surface of said optical member which is not parallel with said polarizing beam splitting plane.

5,438,563

# OPTICAL INFORMATION RECORDING/REPRODUCING DEVICE WHICH SIMULTANEOUSLY REPRODUCES INFORMATION FROM PLURAL TRACKS AND OPTICAL INFORMATION RECORDING/REPRODUCING METHOD

Mitsuo Oshiba, Hachioji; Takefumi Sakurada, Akishima; Naoki Tani; Takumi Sugaya, both of Hachioji, and Takao Rokutan, Higashimurayama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

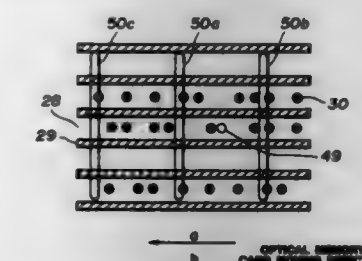
Filed Aug. 16, 1993, Ser. No. 106,717

Claims priority, application Japan, Aug. 19, 1992, 4-220474; Sep. 7, 1992, 4-238407

Int. Cl.<sup>6</sup> G11B 7/08

U.S. Cl. 369—124

20 Claims



1. An optical information recording/reproducing device comprising:

an optical head including

a reproducing light source for irradiating a first reproducing optical beam onto  $n$  ( $n > 1$ ) tracks of an optical recording medium having a plurality of tracks, said tracks being in an information recordable state or an information recorded state, and first light receiving detecting means for receiving a reflected light of said reproducing optical beam from said optical recording medium and outputting information of said tracks of  $m$  ( $n \geq m > 1$ ) as  $m$  detection signals from  $n$  tracks simultaneously;

scanning means for moving said optical recording medium and said optical head relatively to each other; and  $m$  first signal processing means for processing said  $m$  detection signals from said first light receiving detecting means when said scanning means moves said optical recording medium and said optical head relatively to each other.

5,438,564

# MAGNETO-OPTICAL DISK HUB IN WHICH THE INNER PERIPHERAL EDGE PORTION OF THE SPINDLE OPENING IS STRENGTHENED AND MADE ABRASION RESISTANT

Kenji Takahashi, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 7,190, Jan. 21, 1993, Pat. No. 5,289,456, which is a division of Ser. No. 884,305, May 11, 1992, Pat. No. 5,226,033, which is a continuation of Ser. No. 672,834, Mar. 21, 1991, abandoned. This application Jan. 5, 1994, Ser. No. 177,539

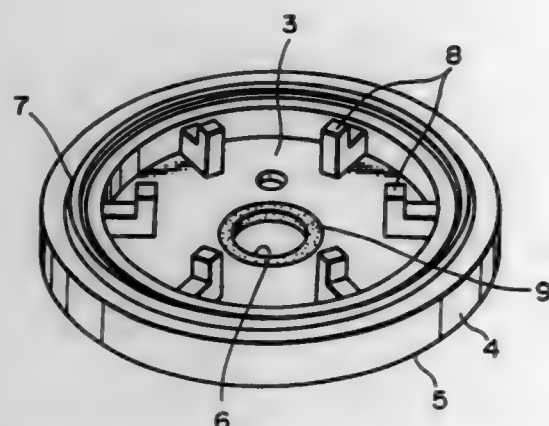
Claims priority, application Japan, Mar. 27, 1990, 2-077972; Mar. 30, 1990, 2-084308

The portion of the term of this patent subsequent to Jul. 6, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> G11B 23/00, 17/02

U.S. Cl. 369-290

3 Claims



1. A magneto-optical disc for use with a disc recording/reproducing apparatus comprising:

- a circular recording disc substrate and
- a hub, said hub having a metal plate, an outer peripheral ring, and an inner peripheral ring,
- said metal plate having a top surface for opposing a magnetic clamping means of the disc recording/reproducing apparatus by a predetermined gap,
- said outer peripheral ring being attached to said metal plate on the outer peripheral side of said metal plate to a central portion of the circular disc substrate having recording tracks,
- said inner peripheral ring being made of a material having a high abrasion resistance and a high smoothness and arranged on the inner peripheral side of said metal plate and having a centering hole for centering the disc, and
- a top surface opposing said magnetic clamping means, said top surface of said metal plate and said top surface of inner peripheral ring forming a substantially flat surface,

wherein said hub is secured to said disc substrate in a manner that the center of said inner peripheral ring is coincident with the center of said disc substrate, wherein said inner peripheral ring and said outer peripheral ring each have constant inner and outer annular diameters, and wherein said inner peripheral ring comprises a portion arranged on one surface side of said metal plate, a portion arranged on an other surface side of said metal plate, and a coupling portion arranged along the inner wall surface of a hole formed through a central portion of said metal plate for coupling said portion arranged on the one surface side of said metal plate with said portion arranged on the other surface side of said metal plate.

5,438,565

# PACKET SWITCH TO PROVIDE CODE DIVISION, MULTIPLE ACCESS CELLULAR SERVICE

Jayant G. Hemmady, Naperville; Craig P. Reilly, Carol Stream; Neil J. Romy, Lisle; Ronald A. Spanke, Wheaton, and Douglas H. Yano, Naperville, all of Ill., assignors to AT&T Corp., Murray Hill, N.J.

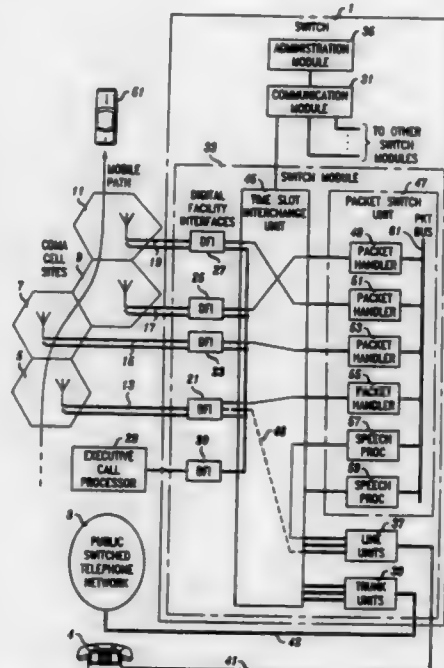
Filed Mar. 31, 1993, Ser. No. 40,819

The portion of the term of this patent subsequent to Mar. 16, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> H04L 12/64

U.S. Cl. 370-60

8 Claims



1. In a wireless telecommunications network, a system for providing connectionless access for wireless communication between cell sites and the PSTN, said wireless communication using packets in a first format, said network comprising:

- a plurality of cell site termination means connected to each of said cell sites for creating and reading packets used in said wireless communication, each of said cell site termination means including means for prepending a destination address on said created packets;
- a plurality of PSTN termination means connected to said PSTN, each of said PSTN termination means having means responsive to said destination address for receiving said created packet and translating said packets from said first format into a form used in said PSTN, said PSTN terminating means also having means responsive to receipt of data in a form used in said PSTN for translating said data into packets in said first format and prepending a destination address on said packets indicative of said cell site termination means;

said network being configured such said all translation into and out of said first format for a given wireless call is performed at one PSTN termination means in said network; and

packet switching means connected between each said cell site termination means and each said PSTN termination means responsive to said prepended destination addresses for transporting said packets between said cell site termination means and said one PSTN termination means to connect said wireless call to said PSTN, so that said one PSTN termination means remains the same for the duration of said call.

5,438,566

# PHOTONIC SWITCHING NETWORK WITH BROADCAST FACILITY

Francesco Masetti, Marcoussis, and Jean-Baptiste Jacob, Perros Guirec, both of France, assignors to Alcatel N.V., Amsterdam, Netherlands

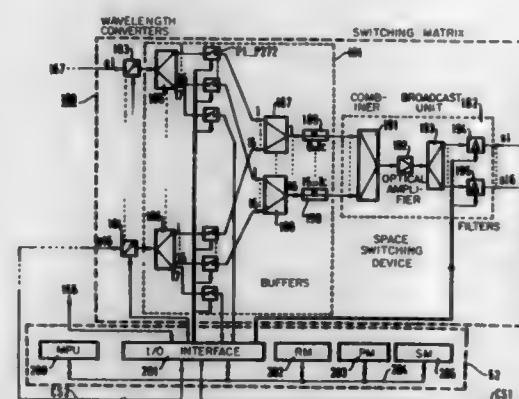
Filed Aug. 6, 1993, Ser. No. 102,842

Claims priority, application Italy, Aug. 7, 1992, MI92A1959

Int. Cl.<sup>6</sup> H04L 12/56; H04J 14/00

U.S. Cl. 370-60

3 Claims



1. Photonic switching network for routing data packets between a plurality of inputs and a plurality of outputs, characterized in that to broadcast a packet from one input to a plurality of outputs of the switching network, it comprises at least two switching stages comprising at least one switch comprising:

- a plurality of tunable wavelength converters at respective inputs of the switch to assign a wavelength to each packet applied to an input of the switch;
- optical buffers common to all the outputs of the switch for receiving packets from the tunable wavelength converters and storing each packet for a duration selectable between 0 and  $K T_c$  where  $K$  is an integer and  $T_c$  is the duration of each packet;
- a space routing stage comprising a tunable filter for each output of the switch, receiving packets from the optical buffers and passing to a given output only packets having a given wavelength; and
- control means for controlling said converters, said filters, and said buffers to forward a same packet several times in succession at least to one output, the number of times it is forwarded depending on the content of an internal routing label associated with said packet.

5,438,567

# PACKET SWITCHING APPARATUS

Chinatsu Ikeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 3, 1993, Ser. No. 116,379

Claims priority, application Japan, Sep. 7, 1992, 4-237927

Int. Cl.<sup>6</sup> H04L 12/56

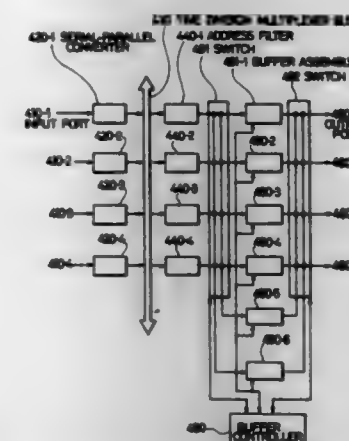
U.S. Cl. 370-60

11 Claims

10. A packet switching apparatus that is an output-buffer packet switching apparatus wherein packets inputted from a plurality of input ports are multiplexed and, based on address information conferred to said packets, stored into any of buffers corresponding to a plurality of output ports, following which said packets are outputted, the packet switching apparatus comprising:

- address filters provided in a number greater than the number of said output ports;
- buffers provided corresponding to said address filters;
- connection means for connecting said buffers with arbitrary said output ports;
- control means that monitors the number of stored packets in said buffers and, when the number of said stored packets

exceeds a threshold value, sets the addresses of packets addressed to identical output ports to still unused address filters, and when the number of said stored packets exceeds the capacity of said buffers, stores inputted packets



in buffers corresponding to those address filters, and when the number of said stored packets becomes 0, switches the connection with said output ports from the former buffers to the latter buffers by means of the fifth connection means.

5,438,568

# MEDIATION OF OPEN ADVANCED INTELLIGENT NETWORK INTERFACE FOR PUBLIC SWITCHED TELEPHONE NETWORK

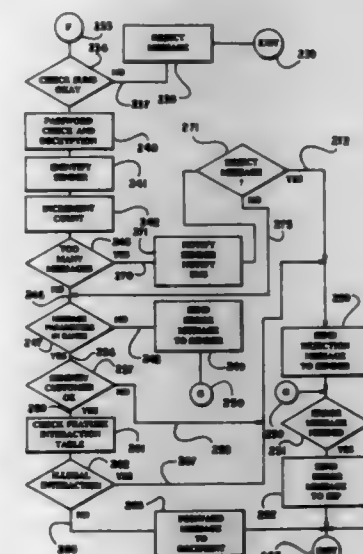
Frank J. Weisser, Jr., Atlanta, Ga., assignor to BellSouth Corporation, Atlanta, Ga.

Continuation of Ser. No. 83,984, Jun. 28, 1993, abandoned. This application Sep. 6, 1994, Ser. No. 300,981

Int. Cl.<sup>6</sup> H04L 12/56

U.S. Cl. 370-60

9 Claims



1. A method of mediating traffic in packet messages in an intelligent switched telephone network that includes a plurality of digital data communications channels between a plurality of central offices and at least one signal transfer point, and an interface to a service provider service control point, said interface being connected to said signal transfer point, comprising the steps of:

- providing at least one mediated service control point that is connected to said signal transfer point, said mediated



service control point including at least one data base containing customer records;  
 detecting a sender identifier in each in-bound packet from said interface;  
 comparing said sender identifier with a port identifier that designates an authorized provider of packets to said interface;  
 rejecting each said in-bound packet for which said sender identifier fails to correspond to port identifier;  
 detecting an affected customer identifier in each said in-bound packet from said interface that includes a message to alter call processing for an affected customer directory number;  
 reading a particular one of said customer records in said data base that contains data for a directory number corresponding to said affected customer identifier and determining whether a sender corresponding to said sender identifier is authorized to alter calls involving said directory number; and  
 rejecting said in-bound packet if said sender corresponding to said sender identifier is not authorized to alter calls involving said directory number.

#### 5,438,569 TRANSCODER

Mayank Kapadia, Swindon; Graham Johnson, Marlborough, and Barry M. King, Swindon, all of United Kingdom, assignors to Motorola, Inc., Schaumburg, Ill.

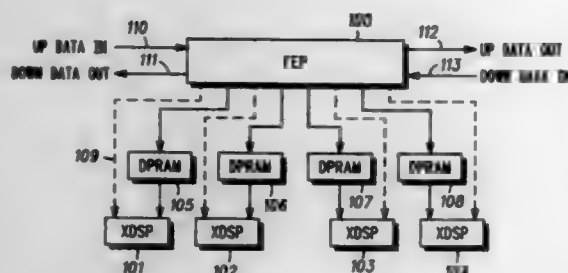
Filed Nov. 16, 1993, Ser. No. 152,513

Claims priority, application United Kingdom, Nov. 28, 1992, 9224974

Int. Cl.<sup>6</sup> H04L 12/66; H04B 7/24

U.S. Cl. 370—79

9 Claims



1. A transcoder for performing transcoding operations on voice data arranged over a plurality of voice data channels, comprising  
 a first interface for inputting and outputting coded voice data;  
 a second interface for inputting and outputting decoded voice data;  
 a plurality of transcoder processors for performing transcoding operations on voice data arranged over a plurality of voice data channels;  
 an input/output processor coupled to the first and second interfaces and the plurality of transcoder processors for controlling the flow of data between the first and second interfaces and the plurality of transcoder processors, whereby the input/output processor controls each of the plurality of transcoder processors to perform transcoding operations on a selected voice data channel at a given time.

#### 5,438,570 SERVICE OBSERVING EQUIPMENT FOR SIGNALLING SYSTEM SEVEN TELEPHONE NETWORK

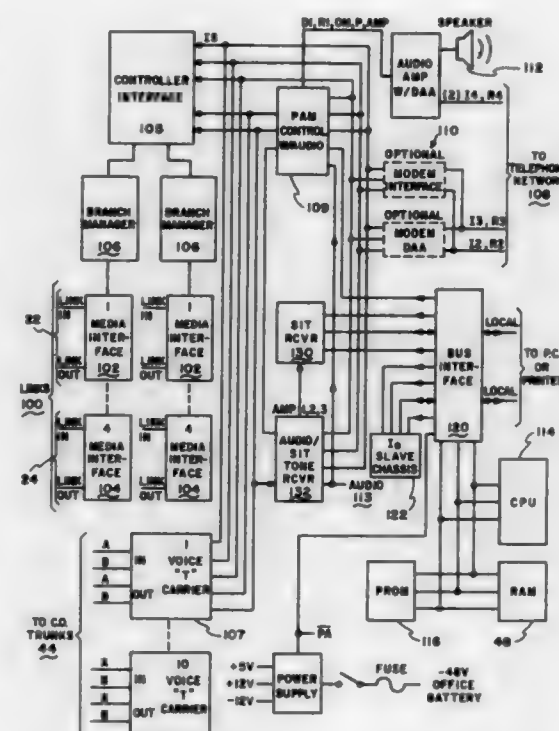
Ernest Karras, Peter Chiodras, and Michael Hatlak, all of Bensenville, Ill., assignors to Tekno Industries, Inc., Bensenville, Ill.

Filed Dec. 29, 1993, Ser. No. 176,821

Int. Cl.<sup>6</sup> H04J 3/24

U.S. Cl. 370—94.2

28 Claims



1. A telephone service observation system for a telephone network controlled by digital data packets sent over high speed data links, said network comprising a plurality of switching points interconnected by said high speed data links, each of said data links carrying said data packets with information relating to individually associated calls which are identified in said packets by addresses assigned to said individually associated calls, said service observation system comprising:

means for giving said service observation system access to at least a selected one of said data links for monitoring said data packets as they are transmitted over said selected links;

memory means having a plurality of data depository memory locations for storing said monitored data packets appearing on said selected data links while said service observation system has access thereto;

means for assigning said packet addresses to identify corresponding individual ones of said data depository memory locations for the duration of an observed call identified by said packet address;

means responsive to said stored data packets for accumulating call record information derived from all of said data packets having the packet address corresponding to the address assigned to the depository memory location where the observed call record information accumulates for the duration of the call; and

means responsive to a termination of an observed call represented by said packet address for reading out the call record information accumulated in said depository memory location identified by that packet address in order to indicate the quality of service given to the observed call.

#### 5,438,571 HIGH SPEED DATA TRANSFER OVER TWISTED PAIR CABLING

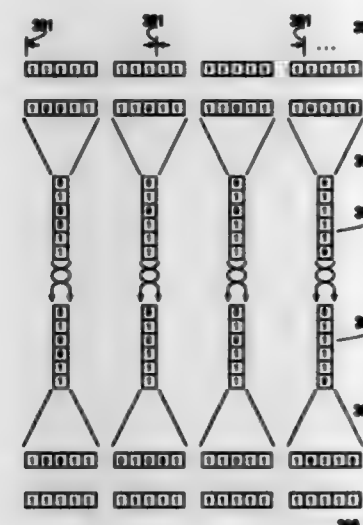
Alan Albrecht, Granite Bay; Steven H. Goody, Roseville, both of Calif.; Michael P. Spratt, Bath, England; Joseph A. Curcio, Jr., Folsom; Daniel J. Dove, Applegate, both of Calif.; Jonathan Jedwab, Clifton, and Simon E. Crouch, Jr., Chippenham, both of England, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 972,694, Nov. 6, 1992. This application May 20, 1994, Ser. No. 246,536

Int. Cl.<sup>6</sup> H04L 12/44

U.S. Cl. 370—94.3

10 Claims



1. In a LAN in which a central hub is linked to each of a plurality of network nodes via a physical medium consisting of four pairs of unshielded-twisted pair (UTP) cable, a data transmission method of exchanging data packet signals, grouped as data octets, across the network at a data transmission rate of 100 Mb/s, the transmission method comprising the steps of:

- sequentially dividing said data octets into 5-bit data quintets;
- sequentially distributing said quintets into four serial code streams;
- sequentially scrambling each of said four serial code streams to produce four streams of randomized 5-bit quintets;
- sequentially block encoding each of said streams of randomized 5-bit quintets into 6-bit symbol data; and
- transmitting said four streams of 6-bit symbol data across the network by transmitting each stream over one of said pairs of UTP cable.

#### 5,438,572 MICROWAVE NON-LOGARITHMIC PERIODIC MULTIPLEXER WITH CHANNELS OF VARYING FRACTIONAL BANDWIDTH

Charles Rauscher, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 29, 1993, Ser. No. 10,948

Int. Cl.<sup>6</sup> H04J 1/08; H01P 5/12

U.S. Cl. 370—123

16 Claims

1. An apparatus comprising:  
 a plurality of core segments having a first and last core segment;  
 each core segment being further comprised of a first, second and third port, and each core segment being responsive to a different predetermined microwave signal;  
 said core segments, having electrically equivalent network

topology, coupled in cascade through interconnection of respective first and third ports of adjacent core segments; each core segment being further comprised of structural components responsive to a predetermined bandwidth and center frequency of a microwave signal, the structural components having parameter values determined through use of a logarithmic-periodic multiplexer technique; in a demultiplexing mode of operation, said plurality of core segments are responsive to a composite signal applied to said first port of said last core segment, with the composite signal being comprised of a plurality of microwave sig-



nals, each microwave signal having a predetermined bandwidth and center frequency, each microwave signal being output as a channelized microwave signal through the second port of an associated core segment; and in a multiplexing mode of operation, each individual core segment is responsive to a microwave signal of a predetermined bandwidth and center frequency applied to the second port of the core segment, the microwave signals from said plurality of cascade coupled core segments being multiplexed and output at the first port of said last core segment.

#### 5,438,573 FLASH EEPROM ARRAY DATA AND HEADER FILE STRUCTURE

John S. Mangan, Santa Cruz; Robert D. Norman, San Jose; Jeffrey Craig, Fremont; Richard Albert, Santa Clara; Anil Gupta, Irvine; Jeffrey D. Stai, Placentia, and Karl M. J. Lofgren, Newport Beach, all of Calif., assignors to SunDisk Corporation, Santa Clara and Western Digital Corporation, Irvine, both of Calif.

Continuation of Ser. No. 759,497, Sep. 13, 1991, abandoned. This application Jan. 1, 1994, Ser. No. 252,052

Int. Cl.<sup>6</sup> G11G 29/00

U.S. Cl. 371—10.3

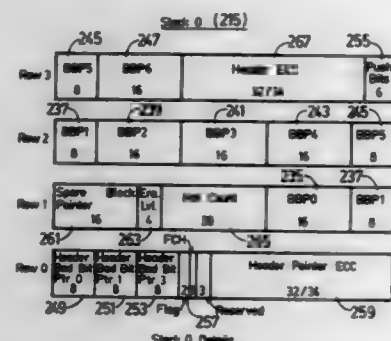
22 Claims

1. A method of utilizing an array of flash EEPROM cells organized into word line rows and bit line columns with cells interposed thereinbetween, such that each cell is addressable by a row and a column, comprising the steps of:  
 dividing said array into a plurality of blocks having unique block addresses for the purpose of simultaneously erasing all of the cells in an addressed block, and individually including cells addressable within a plurality of adjacent rows and a plurality of consecutive columns, designating, within individual blocks,  
 a plurality of header cells addressable within said plurality of adjacent rows and a first portion of said plurality of consecutive columns of said block, such that if a column

defect affecting one of said plurality of consecutive columns of said block exists, then said first portion is designated such that said affected one column is not within said first portion, and

a plurality of data cells addressable within said plurality of adjacent rows and a remaining portion of said plurality of consecutive columns of said block,

designating, within said plurality of header cells, a certain number of bad data bit pointer cells for storing addresses of any defective cells within said plurality of data cells,



and a certain number of spare data cells for storing data redirected from said plurality of data cells as a result of any defective cells within said plurality of data cells, and storing, within individual blocks, addresses of any defective cells within said plurality of data cells, into said bad data bit pointer cells within said plurality of header cells, and storing, within individual blocks, data into said plurality of data cells and a number of spare data cells determined by the number of any defective cells within said plurality of data cells.

5,438,574

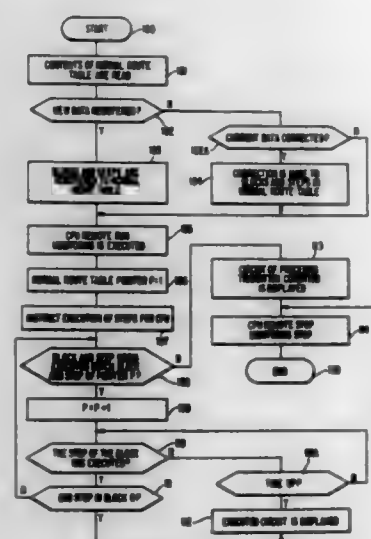
**PROGRAM DEBUGGING DEVICE AND PROCESS**  
Masayuki Taniguchi, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 831,105, Feb. 4, 1992, abandoned. This application Jan. 18, 1994, Ser. No. 181,954

Claims priority, application Japan, Feb. 5, 1991, 3-014373  
Int. Cl. G06F 11/00

U.S. Cl. 395-183.14

17 Claims



1. A program debugging device for debugging SFC programs that include blocks made up of a plurality of steps, comprising:  
normal route registering means in which intended routes, along which a program is intended to run in a programma-

ble controller for program-controlling an object to be controlled, are pre-registered;  
program running means for running said program;  
route comparing means for sequentially comparing the intended route registered in said normal route registering means and an actual route on which said program is actually run;  
program stopping means for stopping the run of said program if a difference is found between said intended route and said actual route by said sequential comparison; and  
displaying means for displaying a corresponding portion of said program where said difference has been found in said sequential comparison.

5,438,575

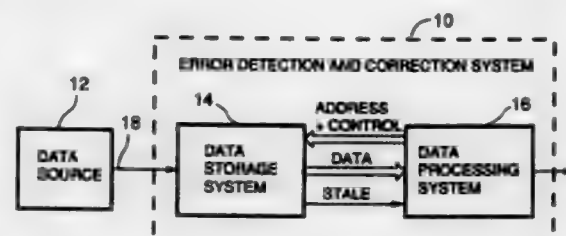
**DATA STORAGE SYSTEM WITH STALE DATA DETECTOR AND METHOD OF OPERATION**

Keith J. Bertrand, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 16, 1992, Ser. No. 976,870

Int. Cl. G06F 11/00; G08C 25/00; H03M 13/00; H04L 1/00  
U.S. Cl. 371-48

17 Claims



1. A data storage system having a stale data detector, the system comprising:

a user data store having a plurality of addressable user data storage locations coupled to store and retrieve data in response to received addresses;  
a flag data store having a plurality of addressable flag data storage locations, each associated with an addressable user data storage location and having first and second stale data flag bits at each addressable flag data storage location, the flag data store being coupled to store and retrieve data in response to received addresses at the addressable flag data storage locations associated with the addressable user data storage locations;

a control circuit coupled to the addressable flag data store and assigning the first and second flag bits to different alternate blocks of received data, the control circuit being operable as a block of data is read from addressable locations in the user data store to cause, at each corresponding addressable location in the flag data store, outputting of the flag bit assigned to the block of data as stale data signal and setting of the flag bit not assigned to the block of data to a first predetermined state, and the control circuit being operable as a block of data is written into the user data store to cause the flag bit in the flag store that is assigned to the block of data to be written to a second state different from the first state at each addressable location in the flag store that corresponds to an addressable location at which data is written in the user data store; and  
said control circuit including means for alternating the first and second states at a start of each successive data write operation.

5,438,576

**DATA COMMUNICATION APPARATUS AND METHOD INCLUDING MEANS FOR AND STEP OF ADDING DUMMY CHARACTER AS A NEW LAST CHARACTER OF DATA TO BE TRANSMITTED**

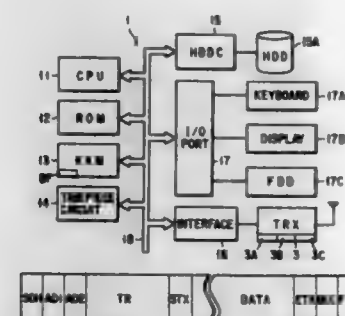
Takashi Futakata, Yokohama; Mitsuo Uchimura, Numazu, and Masashi Suzuki, Mishima, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1993, Ser. No. 144,294

Int. Cl. G06F 11/10

U.S. Cl. 371-53

16 Claims



1. A communication apparatus comprising:

transmission control means for obtaining a transmission text formed of a single character which is one of a specified control character and a character of error check data, and, when said single character is a character of error check data, adding a dummy character after said character of error check data as a new last character except in a case where said character of error check data has a value identical to a code of said dummy character; and  
transmitting means connected to said transmission control means, for storing each character of said transmission text supplied from said transmission control means, and for transmitting said transmission text upon detecting a code of any one of said dummy character in said transmission text and a specified control character in said transmission text.

7. A communication method comprising the steps of:  
obtaining a transmission text formed of a single character which is one of a specified control character and a character of error check data, and, when said single character is a character of error check data, adding a dummy character after said character of error check data as a new last character except in a case where said character of error check data has a value identical to a code of the dummy character; and  
storing each character of said transmission text provided in said obtaining and adding step, and transmitting said transmission text upon detecting a code of any one of said dummy character in said transmission text and a specified control character in said transmission text.

5,438,577

**ERROR CORRECTING SYSTEM**

Junko Nakase, Kokubunji, and Nobukazu Doi, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1992, Ser. No. 868,708

Claims priority, application Japan, Apr. 15, 1991, 3-082229  
Int. Cl. G06F 11/10; H03M 13/00

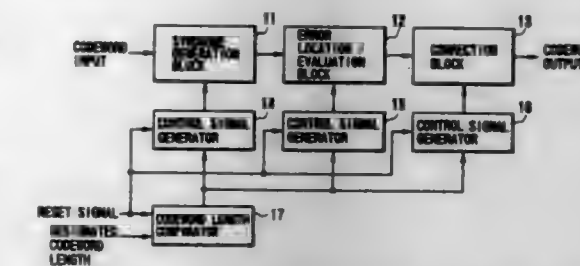
U.S. Cl. 371-37.1

14 Claims

1. An error correcting system for sequentially reading out a codeword string and correcting errors in each codeword in the codeword string for sequential output thereof, said system comprising:

a plurality of processing blocks connected in cascade for executing, as allocated, a plurality of stages of error correction processing including, at least, generating syndrome data on the basis of parity symbols of a read codeword, deriving an error location polynomial and the error evaluation polynomial to find error locations and error

values, and correcting errors in a delayed codeword using the found error locations and error values for output; and  
control means for generating individual processing control



signals for instructing said plurality of processing blocks to start the processing thereof on the basis of reset signals, each reset signal being indicative of a leading head of each of the codewords in the codeword string.

5,438,578

**LIGHT-FREQUENCY CONTROL APPARATUS**

Tekken Lee, Nobunari Takeuchi, Haruyoshi Uchiyama, all of Tokyo; Kaoru Shimizu, and Tsuneo Horiguchi, both of Mito, all of Japan, assignors to Ando Electric Co., Ltd. and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

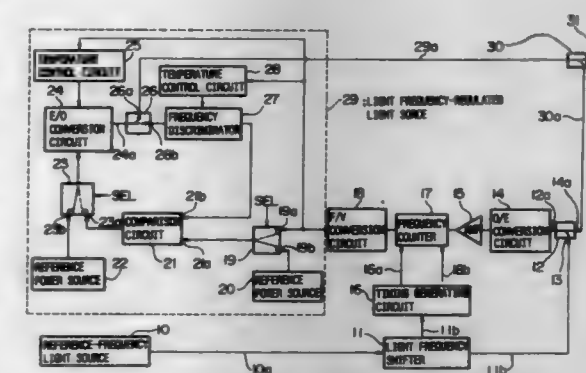
Filed Jun. 24, 1994, Ser. No. 265,724

Claims priority, application Japan, Jun. 30, 1993, 5-162932

Int. Cl. H01S 3/13

U.S. Cl. 372-32

3 Claims



1. A light-frequency control apparatus comprising:  
reference light-generating means, which generates reference light, the light-frequency component of which varies in a stepped manner at specified intervals, repeatedly at pre-specified periods, and generates a timing signal in accordance with the variance;  
detecting means, which detects a frequency difference between a reference light frequency freely selected from among the light frequency components, and a feedback light frequency of feedback light which is fed back in such a manner as to conform to the reference light frequency, and synchronizes this with the timing signal; and  
output light generating means, which is provided with a closed loop circuit which controls the light frequency in accordance with the frequency difference, extracts an output optical signal circulating in this closed loop circuit, and supplies this to a light output terminal, and supplies a portion of this output optical signal to the detecting means as the feedback light.



5,438,579

## WAVELENGTH STABILIZING APPARATUS

Yukio Eda; Hirohisa Fujimoto, both of Hachioji; Nahoko Hisata, Hino, and Yukawa Hiroshi, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
PCT No. PCT/JP93/01824, § 371 Date Aug. 8, 1994, § 102(e)  
Date Aug. 8, 1994, PCT Pub. No. WO94/15388, PCT Pub. Date Jul. 7, 1994

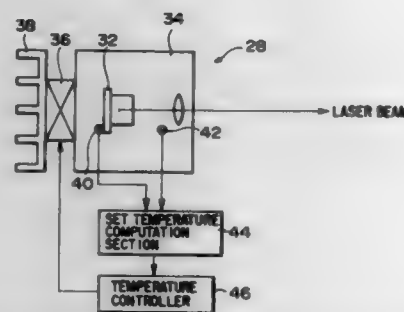
PCT Filed Dec. 16, 1993, Ser. No. 284,525

Claims priority, application Japan, Dec. 18, 1992, 4-338223;  
Apr. 20, 1993, 5-93078

Int. Cl.<sup>6</sup> H01S 3/04

U.S. Cl. 372-34

9 Claims



1. A wavelength stabilizing apparatus characterized by comprising:

- an electric current supply source for supplying a given injection current;
- a semiconductor laser for receiving the injection current from the electric current supply source to output a laser beam;
- a wavelength distinguishing element for distinguishing a wavelength of the laser beam which is output from the semiconductor laser;
- a photodetector for detecting an intensity of the output laser beam from the wavelength distinguishing element; and
- a temperature controller for performing temperature control of the semiconductor laser so as to enable the output of the photodetector to become a predetermined value and for, when the output of the photodetector becomes that predetermined value, reserving a corresponding semiconductor laser temperature and, at a start of the next temperature control, initializing temperature control based on a finally reserved temperature of the semiconductor laser.

5,438,580

## LASER PACKAGE AND METHOD OF ASSEMBLY

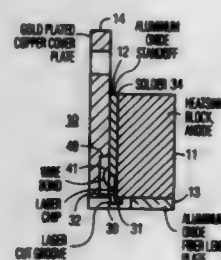
Rushikesh M. Patel, Pomona, and Michael M. Ung, Ontario, both of Calif., assignors to Opto Power Corporation, City of Industry, Calif.

Filed Sep. 24, 1993, Ser. No. 126,259

Int. Cl.<sup>6</sup> H01S 3/04

U.S. Cl. 372-36

11 Claims



1. A laser package, said package including a planar, electrically insulating member and a laser chip having an emitting face, said member having a slot extending therein from said first edge, said chip being positioned within said slot, said member having first and second large area faces with dimensions

large compared to that of said chip, said first face having an electrically conducting surface layer thereon, said member having a thickness greater than that of said chip.

5,438,581

## LASER DRIVER ASIC CHIP

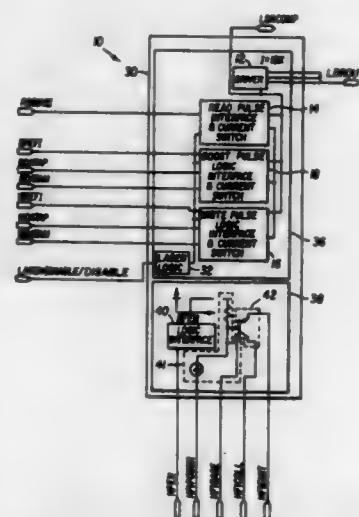
Samuel Reece, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1994, Ser. No. 291,253

Int. Cl.<sup>6</sup> H01S 3/00

U.S. Cl. 372-38

8 Claims



1. An integrated laser driver circuit comprising:  
current driver means for providing a single driving current to a laser as a function of driving signals;  
means for providing a first driving signal to said current driver means for causing a driving current to be forwarded to the laser to generate a laser read output;  
means for providing a second driving signal to said current driver means for causing an increased driving current to be forwarded to the laser to generate a laser write output; and  
means for providing a third driving signal to said current driver means for causing a boost in the increased driving current to be forwarded to the laser during a write operation.

5,438,582

## LASER POWER MONITOR CIRCUIT USED IN A MAGNETO-OPTICAL DISK DEVICE

Shunji Hoshino, Yokohama, and Naoto Inaba, Hiratuka, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Nov. 8, 1994, Ser. No. 337,378

Claims priority, application Japan, Nov. 8, 1993, 5-278393

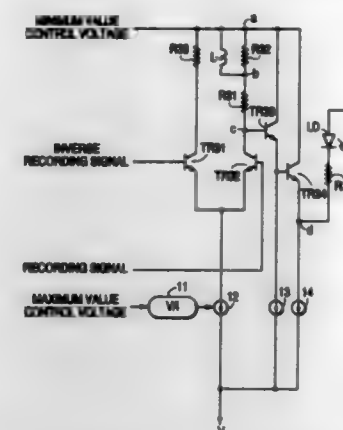
Int. Cl.<sup>6</sup> H01S 3/00

U.S. Cl. 372-38

12 Claims

1. A circuit for monitoring power of light emitted from a laser, said circuit comprising:  
a monitor unit to monitor the power of the light and, as a result, generating a monitor signal;  
a setting circuit to set the power of the light at distinct predetermined levels;

a correction circuit to correct and adjust the power of the light relative to the distinct predetermined levels; and



a reverse correction circuit to reverse correct the correction made by the correction circuit based upon the monitor signal.

5,438,583

## SEMICONDUCTOR LASER WITH OPTIMUM RESONATOR

Hironobu Narui, Masato Doi, Kenji Sahara, and Osamu Matsuda, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

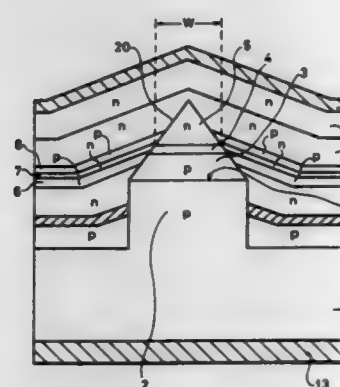
Filed Dec. 15, 1993, Ser. No. 166,949

Claims priority, application Japan, Dec. 15, 1992, 4-334681;  
Jul. 19, 1993, 5-177978

Int. Cl.<sup>6</sup> H01S 3/19

U.S. Cl. 372-45

24 Claims



1. A semiconductor laser comprising:  
an activating layer;  
first and second cladding layers for sandwiching said activating layer, the energy gaps of which are greater than that of said activating layer;  
a current blocking layer provided in contact with both sides of said activating layer;  
a first electrode electrically connected to said first cladding layer; and  
a second electrode electrically connected to said second cladding layer, wherein  
said activating layer has a structure that the activating layer is two-dimensionally confined within said first cladding layer, said second cladding layer, and said current blocking layer;  
reflectivity of at least one facet of a resonator of said activating layer is less than, or equal to 5%; and  
loss in the resonator of said activating layer is higher than, or equal to 100 cm<sup>-1</sup>.

5,438,584

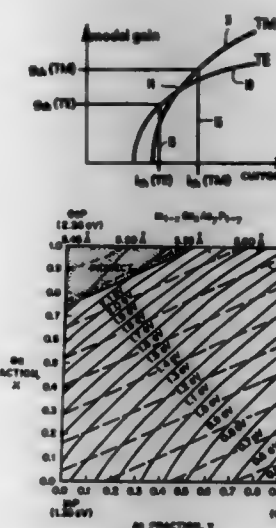
## DUAL POLARIZATION LASER DIODE WITH QUATERNARY MATERIAL SYSTEM

Thomas L. Paoli, Los Altos, and David P. Bour, Cupertino, both of Calif., assignors to Xerox Corporation, Stamford, Conn.  
Continuation-in-part of Ser. No. 948,524, Sep. 22, 1992, Pat. No. 5,396,508, and a continuation-in-part of Ser. No. 948,522, Sep. 22, 1992, Pat. No. 5,412,678. This application Dec. 23, 1993, Ser. No. 173,812

Int. Cl.<sup>6</sup> H01S 3/103

U.S. Cl. 372-45

27 Claims



1. A laser diode comprising:  
(a) a crystalline substrate of a III-V alloy having a first lattice constant and a first bandgap;  
(b) a crystalline active layer deposited over said substrate, said active layer comprising a III-V quaternary alloy such that said active layer has a second lattice constant smaller than said first lattice constant and a second bandgap when unstrained, said active layer when deposited over said substrate being tensile-strained such that said active layer has a third bandgap when strained that is smaller than the second bandgap;  
(c) electrodes for passing current through the active layer to thereby cause TM-polarized laser emission in said active layer at a wavelength exceeding 600 nm.

5,438,585

## UNSTABLE RESONATOR SEMICONDUCTOR LASER

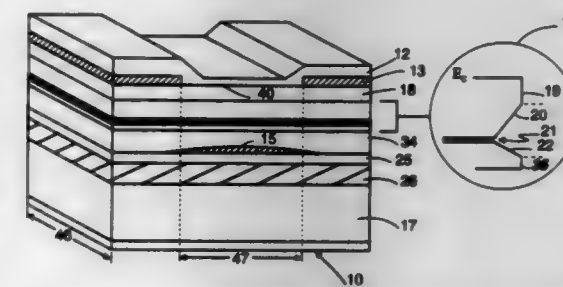
Eric A. Armour, and Stephen D. Hersee, both of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed May 31, 1994, Ser. No. 250,882

Int. Cl.<sup>6</sup> H01S 3/18

U.S. Cl. 372-45

8 Claims



1. In a semiconductor laser diode that provides high optical power in a single spatial mode and that includes cleaved facets, a planar well graded index separate confinement heterostruc-

ture (QW-GRINSCH) active region, the improvement comprising:

- an antiguide layer defining first and second surfaces and optically coupled to said active region; said antiguide layer having a lateral variation in effective index of refraction effective to form a waveguide medium for higher order optical modes resonating in a resonant cavity defined by said cleaved facets; and
- first and second clad layers of GaAs overlying said first and second surfaces to enclose said antiguide layer.

5,438,586

# **APPARATUS WITH LIGHT-EMITTING ELEMENT AND METHOD FOR PRODUCING IT**

Satoshi Ishii, Ohta; Tetsuharu Nishimura, Kawasaki; Koh Ishizuka, Omiya, and Hiroshi Kondo, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

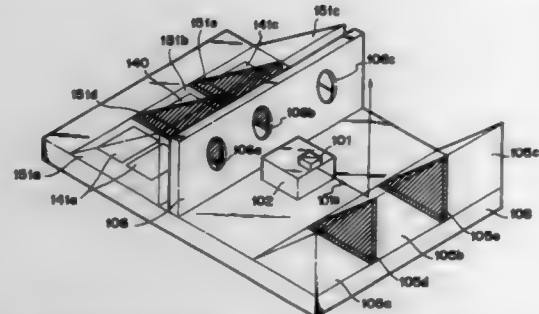
Filed Nov. 24, 1993, Ser. No. 156,634

Claims priority, application Japan, Nov. 30, 1992, 4-345553

Int. Cl. G11B 7/14; H01S 3/18

U.S. Cl. 372-50

3 Claims



1. A photoconductor apparatus comprising:
  - a light-emitting element provided on a substrate, said light-emitting element for emitting light;
  - a plurality of light receiving elements provided on said substrate; and
  - an integrally-formed light-guide member which is disposed on said substrate and which is divided into plural light-guide elements by way of light-absorbing members therebetween, a different one of said plural light-guide elements being provided in correspondence to each of said plurality of light receiving elements, each of the plural light-guide elements for guiding light into a corresponding one of said plurality of light-receiving elements; said light-guide member comprising a prism.

5,438,587

# **PREIONIZER FOR LASER ASSEMBLY**

Fred G. Kinley, Mission Viejo, Calif., assignor to Spectranetics, Colorado Springs, Colo.

Filed Mar. 31, 1994, Ser. No. 221,357

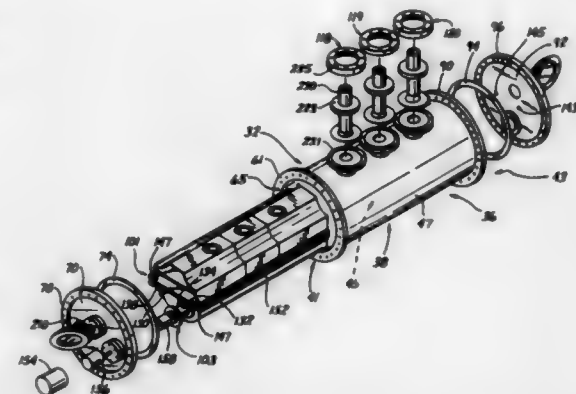
Int. Cl. H01S 3/097

U.S. Cl. 372-96

9 Claims

1. A preionization assembly for a laser including a laser vessel and having a high voltage electrode and a ground electrode defining a discharge region extending longitudinally through the vessel, the assembly comprising:
  - a plurality of pin assemblies arranged in at least one line extending longitudinally through the laser vessel along the discharge region, the pin assemblies being generally equally spaced along the line;
  - an anode pin included in an associated one of the pin assemblies;
  - a cathode pin included in the one pin assembly, and

the anode pin being oriented relative to the cathode pin so that a spark passing between the anode pin and the cath-



ode pin arcs in a direction which is longitudinal of the vessel along the discharge region.

5,438,588

# **DIRECT CURRENT-ELECTRIC ARC FURNACE SYSTEM**

Ernst Wanner, Turgi, Switzerland, assignor to ABB Management AG, Baden, Switzerland

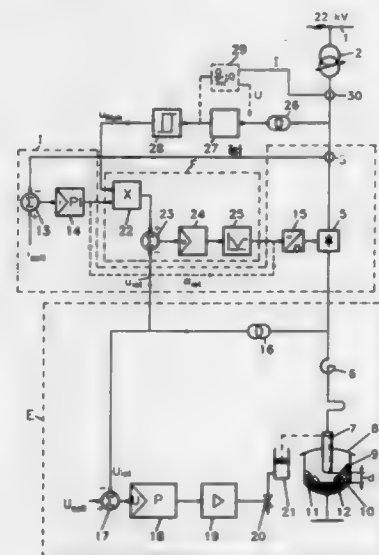
Filed Mar. 17, 1994, Ser. No. 214,211

Claims priority, application Germany, Mar. 25, 1993, 43 09 640.9

Int. Cl. H05B 7/144

U.S. Cl. 373-108

4 Claims



1. A direct current-electric arc furnace system comprising:
  - a) a furnace having
    - (i) a furnace vessel,
    - (ii) at least one electric arc electrode connected to said furnace vessel and serving as a cathode, and
    - (iii) a bottom contact connected to said furnace vessel and serving as an anode;
  - b) a furnace transformer for supplying a voltage between said anode and said cathode of said furnace to generate an electric arc current therebetween;
  - c) an electrode control circuit for controlling a position of said electric arc electrode;
  - d) a current control circuit, for maintaining said electric arc current constant, said current control circuit including a rectifier connected between said furnace transformer and said at least one electric arc electrode, for regulating a

- voltage supplied from said furnace transformer to said at least one electric arc electrode; and
- e) a voltage regulating circuit including
  - (i) a multiplier for receiving a voltage output from said current control circuit and multiplying said voltage by a first value to generate an output,
  - (ii) a summing circuit for summing said output of said multiplier and a voltage output from said rectifier to generate a voltage output,
  - (iii) a voltage regulator for regulating said voltage output from said summing circuit, and
  - (iv) a filter exhibiting a frequency characteristic which is tuned to a filter frequency perceivable by the human eye, for eliminating components of said output of said voltage regulator having said filter frequency and outputting a filtered signal to said rectifier for controlling said voltage applied to said at least one electric arc electrode.

5,438,589

# **SPREAD SPECTRUM COMMUNICATION SYSTEM**

Masaru Nakamura, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

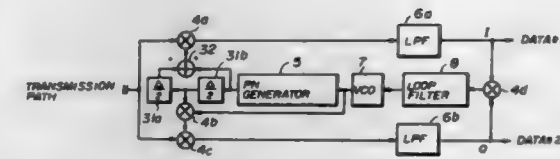
Filed Jan. 4, 1994, Ser. No. 177,606

Claims priority, application Japan, Jan. 6, 1993, 5-016732; Mar. 3, 1993, 5-067543; Sep. 14, 1993, 5-228377

Int. Cl. H04K 1/00

U.S. Cl. 375-200

22 Claims



1. A spread spectrum communication system which comprises:
  - a transmitter comprising:
    - a pseudonoise signal generator for generating a pseudonoise signal in accordance with a clock signal;
    - pseudonoise signal means for generating a Manchester coded pseudonoise signal by encoding the pseudonoise signal output from said pseudonoise signal generator in accordance with the clock signal;
    - first modulation means for generating a first spread spectrum signal by multiplying said pseudonoise signal output from said pseudonoise signal generator by a first data signal indicating first information;
    - second modulation means for generating a second spread spectrum signal by multiplying said Manchester coded pseudonoise signal output from said pseudonoise signal means by a second data signal indicating second information; and
    - synthesizing means for generating a signal to be transmitted, by adding the first spread spectrum signal output from said first modulation means to the second spread spectrum signal output from said second modulation means, and
    - a receiver responsive to the signal transmitted by said transmitter.

5,438,590

# **TRANSMITTING AND RECEIVING APPARATUS AND METHOD INCLUDING PUNCTURED CONVOLUTIONAL ENCODING AND DECODING**

Shimon Tsukerman, Israel, Israel, and James N. Esserman, San Diego, Calif., assignors to Comstream Corporation, San Diego, Calif.

Filed May 24, 1993, Ser. No. 65,292

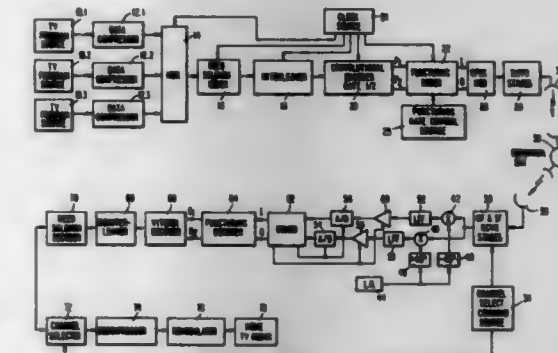
Int. Cl. H04L 27/00

U.S. Cl. 375-259

47 Claims

1. A method of communicating a digital data signal from a

transmitter to a receiver during mutually exclusive transmitting periods comprising encoding the digital data signal into a  $\frac{1}{2}$  rate convolutional encoded signal during each of said periods; during the first transmission period (1) encoding the convolutional encoded signal into a first forward error correction convolutional encoded signal having a  $\frac{1}{2}$  punctured code and (2) transmitting the encoded first forward error correction signal to the receiver via a geosynchronous satellite; during the second transmission period (1) encoding the convolutional encoded signal into a second forward error correction convolutional encoded signal having a  $\frac{6}{7}$  punctured code and (2) transmitting the encoded second forward error correction



signal to the receiver via the geosynchronous satellite; controlling the power emitted from the satellite so the power emitted from the satellite of the encoded forward error correction signal having the  $\frac{1}{2}$  punctured code during the first period is appreciably lower than the power emitted from the satellite of the encoded forward error correction signal having the  $\frac{6}{7}$  punctured code during the second period; during both the first and second periods receiving the encoded forward error correction signals emitted from the satellite at the receiver with an antenna including a dish having a diameter no greater than about 1 meter, and decoding the received encoded forward error correction signals into a further signal that is an approximate replica of the digital data signal.

5,438,591

# **QUADRATURE AMPLITUDE MODULATION TYPE DIGITAL RADIO COMMUNICATION DEVICE AND METHOD FOR PREVENTING ABNORMAL SYNCHRONIZATION IN DEMODULATION SYSTEM**

Yasunori Oie, Tokyo; Mitsuru Hiram, Kawasaki; Yasushi Fujii, and Hidekazu Tanaka, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

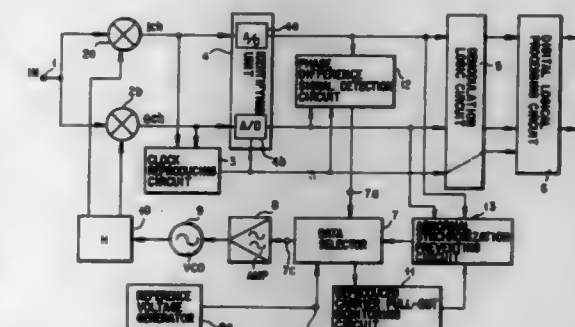
Filed Jul. 30, 1992, Ser. No. 921,687

Claims priority, application Japan, Jul. 31, 1991, 3-191448; Oct. 17, 1991, 3-269519

Int. Cl. H03K 9/00; H04L 27/06

U.S. Cl. 375-261

6 Claims



1. A demodulation device of a quadrature amplitude modulation type digital radio device having an oscillator means with



an oscillation frequency controlled by a control signal, wherein identifying means for identifying levels of demodulated base band signals to derive a value corresponding to the levels, phase difference detection means for deriving a phase difference signal of a reproduced carrier wave based on the value, the phase difference signal is used as the control signal to control the oscillation frequency so as to derive an oscillation frequency corresponding to the phase difference signal, an output signal having the thus derived frequency is used as the reproduced carrier wave, the reproduced carrier wave is subjected to a 90° phase-shifting process to create two reproduced carrier waves with 90° phase difference which are separately multiplied with a reception signal to create demodulated base band signals, clock reproducing means for reproducing a transmission clock signal from the demodulated base band signals to define timings for identification of the levels of the demodulated base band signals, and the reception signal is restored based on the value derived by the identification, comprising:

monitoring means for monitoring the carrier pull-out based on the demodulated base band signals and outputting a carrier pull-out alarm signal when the carrier pull-out occurs;

abnormal synchronization detecting means for sampling the reception signal level at a speed twice the transmission speed of the reception data based on the identification value derived by the identification and for detecting abnormal synchronization when a detection area of the sampled data derived by abnormal synchronization detecting means corresponds to a predetermined area of a plurality of areas;

abnormal synchronization signal generating means for generating a signal for a preset period of time, when the abnormal synchronization is detected and the carrier pull-out alarm signal is not generated; and

selection means for receiving a reference signal used for generating a signal having a reference carrier frequency nearly equal to the frequency of the carrier and the phase difference signal, selecting the phase difference signal as the control signal in the normal operation state, selecting the reference signal as the control signal and supplying the same to the oscillator means while receiving an output signal of said abnormal synchronization signal generating means; wherein said identifying means is operated at a speed twice the transmission clock to effect the identification.

5,438,592

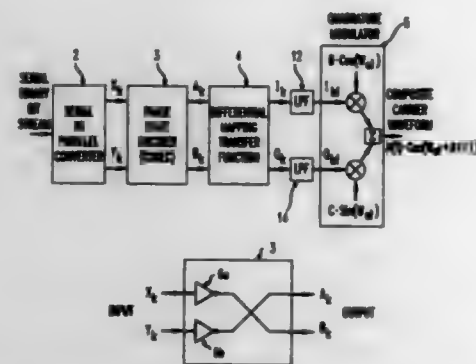
PI/4-DQPSK PHASE STATE ENCODER/DECODER  
Joseph Bocuzzi, Brooklyn, N.Y., assignor to AT&T Corp., Murray Hill, N.J.

Filed Mar. 31, 1994, Ser. No. 221,632

Int. Cl. H04L 27/10, 27/18

U.S. Cl. 375—283

4 Claims



2. An improvement in a  $\pi/4$ -Differential Quadrature Phase Shift Keying ( $\pi/4$ -DQPSK) transmitter for modulating a carrier waveform with binary data prior to transmission over a channel, wherein said transmitter comprises serial to parallel

converter means to convert serial binary data into first and second bit streams, differential mapping transfer function means for providing an output data symbol as a function of a previous output data symbol, said differential mapping transfer function having said previous output data symbol and a third and fourth bit stream as input signals for producing said output data symbol in the form of first and second quadrature component signals, low pass filter means for limiting the frequency spectrum of said quadrature component signals producing filtered quadrature component signals, and quadrature modulator means for shifting the frequency of said filtered quadrature component signals and summing the shifted and filtered quadrature component signals to form a composite carrier waveform for transmission over said channel; the improvement comprising phase state encoder means for encoding said first and second bit streams and producing said third and fourth bit streams, said phase state encoder means comprising

a first logic inverter, wherein said first bit stream is inverted by said first logic inverter prior to said differential mapping transfer function means to produce said fourth bit stream,

a second logic inverter, wherein said second bit stream is inverted by said second logic inverter prior to said differential mapping transfer function means to produce said third bit stream,

and interconnecting means between said first and second logic inverters for providing phase state changes of said transmitter that result in the following table:

first bit stream	second bit stream	phase state changes
0	0	$\pi/4$
0	1	$3\pi/4$
1	0	$-\pi/4$
1	1	$-3\pi/4$

5,438,593

# ADAPTIVE THRESHOLD DECISION DEVICE FOR MULTISTATE MODULATION

Georges Karam, and Jean-Louis Jacquart, both of Paris, France, assignors to SAT (Société Anonyme de Télécommunications, France)

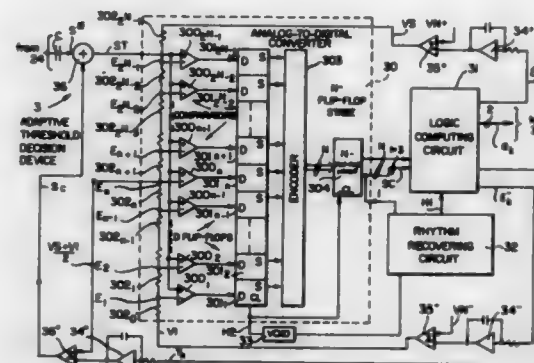
Filed Apr. 28, 1994, Ser. No. 234,832

Claims priority, application France, Apr. 18, 1994, 94 04606

Int. Cl. H04L 25/06, 25/10

U.S. Cl. 375—317

10 Claims



1. A decision device for producing at a symbol frequency symbols according to levels of a baseband signal resulting from demodulation of a multistate frequency modulated signal, comprising

voltage divider means having first and second inputs to which are respectively applied lower and upper voltages

delimiting a voltage range for establishing plural voltages in said voltage range, adding means for adding said baseband signal to a midpoint voltage which is substantially equal to a mean of said lower and upper voltages and established by said voltage divider means thereby producing a transposed signal, plural comparator means for comparing said transposed signal with said plural voltages respectively thereby producing comparison result signals, encoder means for deriving control words at said symbol frequency, each control word being dependent on comparison result signals which are representative of a level of said baseband signal relative to lower, midpoint and upper decision thresholds corresponding to three respective voltages of said plural voltages, and first and second control means for respectively and independently slaving said lower and upper voltages as a function of said control words.

5,438,594

# DEVICE FOR DEMODULATING DIGITAL SIGNALS MODULATED BY AN ALTERNATING MODULATION CONSTELLATION TECHNIQUE

Thierry Podolak, Levallois-Perret, France, assignor to Societe Anonyme dite Alcatel Telspace, Nanterre Cedex, France

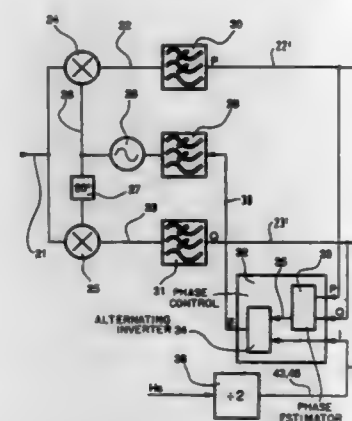
Filed Apr. 2, 1993, Ser. No. 41,967

Claims priority, application France, Apr. 3, 1992, 92 04101

Int. Cl. H03D 3/22; H04L 27/22

U.S. Cl. 375—332

6 Claims



1. Device for demodulating a received signal (21; 41, 42) at a carrier frequency modulated on two axes in phase quadrature using a  $\pi/4$ -QPSK type digital modulation technique employing two modulation constellations with four alternately selected and relatively shifted phase states, of the type comprising:

a voltage-controlled oscillator (28) supplying a local signal substantially at said carrier frequency, demodulator means using said local signal and supplying, after filtering (30, 31), the phase component P (22') and quadrature component Q (23') of the demodulated received signal,

phase control means (32) producing a control signal (39) for controlling said oscillator (28) and including a phase estimator (33) producing a phase estimation signal E (35) satisfying substantially the condition:

$$S(\phi + \pi/4) = -E(\phi)$$

where:

$$\cos \phi = \frac{P}{\sqrt{P^2 + Q^2}} \text{ and } \sin \phi = \frac{Q}{\sqrt{P^2 + Q^2}}$$

and involved in control of the oscillator (28), said phase estima-

tion signal E (35) being derived from said phase component P (22') and quadrature component Q (23') of the demodulated received signal, characterized in that said phase control means (32) comprise means (34) for alternately inverting the polarity of said phase estimation signal E (35), at the rate at which said constellations alternate to supply said control signal (39) for controlling said oscillator (28) after loop-filtering.

5,438,595

# METHOD OF ESTIMATING THE SPEED OF A MOBILE UNIT IN A DIGITAL WIRELESS COMMUNICATION SYSTEM

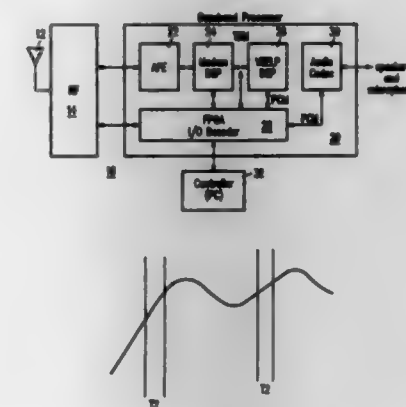
Jong-Keung Cheng, Danville, Calif., and Ravi Subramanian, E. Brunswick, N.J., assignors to Teknekron Communication Systems, Inc., Berkeley, Calif.

Filed Aug. 17, 1993, Ser. No. 108,061

Int. Cl. H04L 27/06

U.S. Cl. 375—340

7 Claims



1. A method of estimating the speed of relative motion between a first unit and a second unit, in a digital wireless communication system communicating between said first and second units, wherein said first unit transmits a digitally encoded signal, at a substantially constant power, said method comprising:

receiving said digitally encoded signal by said second unit; sampling said received digitally encoded signal to produce a first sampled digital signal having a plurality of symbols; measuring the short term energy over a plurality of contiguous symbols of said first sampled digital signal symbols further comprising the steps of;

measuring the average of short term energy (hereinafter: first short term energy average) over a first plurality of contiguous short term energy points;

measuring the average of short term energy (hereinafter: second short term energy average) over a second plurality of contiguous short term energy points, said second plurality of contiguous short term energy points spaced apart from said first plurality of contiguous short term energy points; and

determining the difference between said first short term energy average and said second short term energy average to derive said estimate of the speed of relative motion between said first unit and said second unit.

5,438,596

## METHOD AND APPARATUS FOR GENERATING DIFFUSION CODE

Takehiro Sugita, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

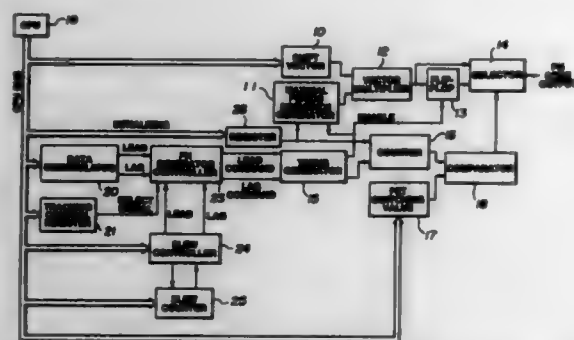
Filed Aug. 10, 1994, Ser. No. 288,333

Claims priority, application Japan, Aug. 10, 1993, 5-198460

Int. Cl.<sup>6</sup> H04B 1/69; G06F 1/02

U.S. Cl. 375-200

6 Claims



4. An apparatus for generating a PN code for spread spectrum communication comprising:
- maximal period sequence generating means for generating a maximal period sequence which is to be the base of the PN code and in which a code 0 is inserted at some position in the sequence;
  - vector producing means for finding the delay time of the PN code required in the spread spectrum communication as a shift vector value;
  - first maximal period sequence outputting means for multiplying the vector having the state of each register of the maximal period sequence generating step as an element by said shift vector for outputting the temporally shifted first maximal period sequence;
  - second maximal period sequence outputting means for outputting a second maximal period sequence delayed further by one PN rate from said first maximal period sequence;
  - and
  - selecting means for outputting a PN code by changing over the first maximal period sequence to the second maximal period sequence or vice versa at a timing as set from outside.

5,438,597

## CONTAINERS FOR TRANSPORTATION AND STORAGE OF SPENT NUCLEAR FUEL

Robert A. Lehnert, Milpitas; Robert D. Quinn, Morgan Hill; Steven E. Siale, Fremont, and Brandon D. Thomas, San Jose, all of Calif., assignors to Vectra Technologies, Inc., Federal Way, Wash.

Filed Oct. 8, 1993, Ser. No. 131,971

Int. Cl.<sup>6</sup> G21F 5/012

U.S. Cl. 376-272

13 Claims

1. A canister for storing and transporting nuclear fuel assemblies, comprising:
- (a) a basket assembly, including:
    - (i) a plurality of apertured plates; and
    - (ii) structural members interconnecting the apertured plates, maintaining the plates in a spaced apart relationship with the apertures in each plate axially aligned into a plurality of rows;
  - (b) an exterior shell, forming an enclosure open at one end, the exterior shell receiving and surrounding the basket assembly, the basket assembly being oriented within the shell, so that the longitudinal axis of each row is substantially parallel to the longitudinal axis of the shell;
  - (c) a plurality of guide sleeves, corresponding to the number of rows of axially aligned plate apertures, each guide sleeve for receiving a nuclear fuel assembly and having a

longitudinal axis generally coincident with a respective corresponding row, each guide sleeve comprising:

- (i) a first structural layer;
- (ii) a second structural layer;
- (iii) a neutron absorbing layer interposed between the first structural layer and the second structural layer, the neutron absorbing layer including a channel; and



- (iv) a first retainer having two ends, one end being connected to at least one of the structural layers, and the other end of the retainer being received in the channel in the neutron absorbing layer for limiting movement of the neutron absorbing layer in a first direction; and
- (d) a lid, adapted to mate with the open end of the shell, thereby closing the open end of the shell.

5,438,598

## COMBINED LOWER END FITTING AND DEBRIS FILTER

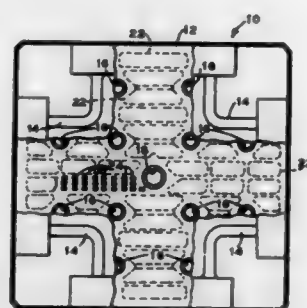
Douglas J. Attix, Lynchburg, Va., assignor to B&amp;W Fuel Company, Lynchburg, Va.

Filed Mar. 15, 1994, Ser. No. 213,756

Int. Cl.<sup>6</sup> G21C 1/04

U.S. Cl. 376-352

1 Claim



1. A combined lower end fitting and debris filter for a nuclear fuel assembly, comprising a single piece cast lower end fitting wherein the upper horizontal portion that faces the fuel assembly has a plurality of interconnected ribs with a thickness of approximately 0.625 inch and a plurality of sections between said ribs with a thickness of approximately 0.080 inch that include a plurality of debris filtering coolant flow holes there-through formed during the casting of said lower end fitting, where the coolant flow holes are tapered inwardly in the direction of coolant flow through the flow holes.

5,438,599

## SELF-CALIBRATION TIMING CIRCUIT

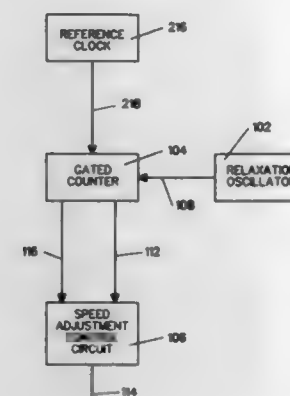
Daniel J. Lincoln, Bowie, Md., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 30, 1993, Ser. No. 129,913

Int. Cl.<sup>6</sup> H03D 3/02

U.S. Cl. 377-20

22 Claims



1. An apparatus for determining the optimal operating speed of a semiconductor die, comprising:
- a relaxation oscillator disposed on the semiconductor die and operating at a natural frequency thereof;
  - a reference clock operating at a reference frequency;
  - means for calculating a ratio of the relaxation oscillator frequency and the reference clock frequency; and
  - means for determining a system clock frequency from the ratio at which the semiconductor die operates in substantially the most efficient and reliable manner.

5,438,600

## ODD-NUMBER FREQUENCY DIVIDER AND METHOD OF CONSTITUTING THE SAME

Fusao Seki, and Masato Abe, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

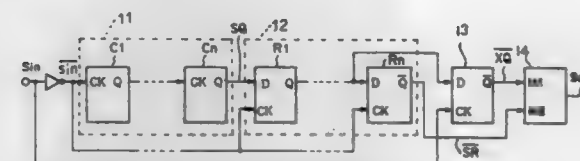
Filed Nov. 23, 1993, Ser. No. 155,824

Claims priority, application Japan, Dec. 3, 1992, 4-324373

Int. Cl.<sup>6</sup> H03K 21/00

U.S. Cl. 377-47

16 Claims



1. An odd-number frequency divider comprising:
- a counter having cascade-connected  $n$  ( $n=1, 2, 3$ ) elements of flip-flop circuits, said counter receiving an input signal having a predetermined frequency and outputting a  $1/(2n+1)$  frequency-divided signal of said input signal;
  - a register having cascade-connected  $n$  ( $n=1, 2, 3$ ) elements of flip-flop circuits, said counter receiving said  $1/(2n+1)$  frequency-divided signal from said counter and shifting thereof successively and synchronously with said input signal;
  - a latch circuit for holding a register output signal from the  $(n-1)$ th flip-flop circuit in said register synchronously with an inverted signal of said input signal; and
  - a logic circuit which receives an inverted latch output signal from an inverted output terminal of said latch circuit and a register output signal from the  $n$ th flip-flop circuit in said register so as to output a  $1/(2n+1)$  frequency-divided signal of said input signal.

5,438,601

## REFERENCE CLOCK FREQUENCY DIVIDER

Hiroshi Maegawa, Yokohama; Tooshiro Shigemori, Sagami, and Yutchi Kadokawa, Tokyo, all of Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

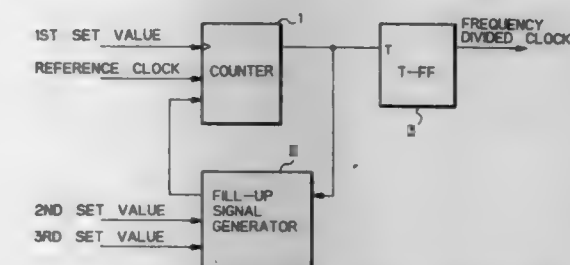
Filed Sep. 23, 1994, Ser. No. 311,144

Claims priority, application Japan, Sep. 25, 1993, 5-261701

Int. Cl.<sup>6</sup> H03K 21/00

U.S. Cl. 377-48

9 Claims



1. A reference clock frequency divider for dividing a frequency of a reference clock on the basis of set values to thereby generate a frequency divided clock pulse, comprising:
- a counter for outputting the frequency divided clock pulse in response to a first set value and a fill-up signal; and
  - fill-up signal generating means responsive to the frequency divided clock pulse and a second and a third set value for performing an arithmetic operation based on said second and third set values every time said frequency divided clock pulse appears, and for generating said fill-up signal in accordance with a result of said arithmetic operation;
- said counter dividing, when said fill-up signal generating means does not generate the fill-up signal, the frequency of the reference clock by said first set value or dividing, when said fill-up signal generating means generates said fill-up signal, said frequency of said reference clock by a value produced by adding 1 (one) to said first set value.

5,438,602

## CORRECTION OF CT ATTENUATION DATA USING FAN BEAM REPROJECTIONS

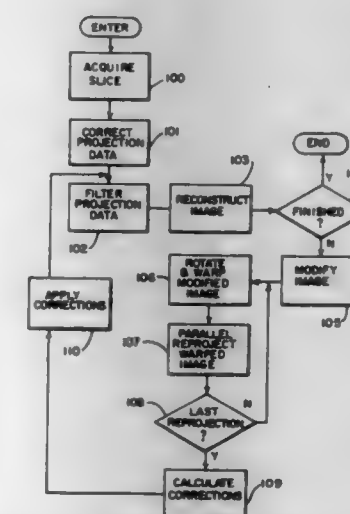
Carl R. Crawford, Milwaukee, Wis., and Cameron J. Ritchie, Seattle, Wash., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 23, 1993, Ser. No. 172,660

Int. Cl.<sup>6</sup> A61B 6/03; G01N 23/083

U.S. Cl. 378-4

9 Claims



1. In an imaging system which acquires a plurality of fan beam projections during a scan and which reconstructs the fan beam projections to produce image data, a method comprising:



- a) reprojecting the image data to produce a fan beam reprojection at an angle  $\beta$  by;
- warping the image data by translating image data along a set of lines emanating from the vertex of a fan beam to a corresponding set of parallel lines; and
  - reprojecting the warped image data along said set of parallel lines; and
- b) repeating step (a) at different angles  $\beta$  to produce a corresponding set of fan beam reproductions.

5,438,603

# DEVICE FOR RADIOGRAPHY WITHOUT THE USE OF FILM

Norbert Schüratz, Mettmann, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

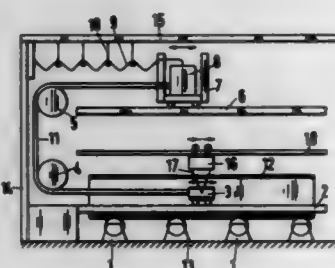
Filed Jan. 25, 1994, Ser. No. 186,304

Claims priority, application Germany, Jan. 25, 1993, 43 02 286.3

Int. Cl.<sup>6</sup> G01B 15/06

U.S. Cl. 378—39

14 Claims



1. A device for testing the welds of elongate, welded hollow metal bodies, each hollow body to be tested having a first end and a second end, comprising:

- an X-ray tube positionable within a hollow body to be tested for displacement from the first end to the second end;
- a high-voltage generator displaceable relative to the first and second ends in response to movement of said X-ray tube;
- connecting means interconnecting said high voltage generator to said X-ray tube, said connecting means including at least one cable of sufficient length to enable displacement of said X-ray tube from the first end to the second end; and
- an X-ray image converter adapted for synchronous movement with said X-ray tube, wherein said image converter is always positioned in a region irradiated by the X-ray tube.

5,438,604

# X-RAY DIAGNOSTICS INSTALLATION FOR INTERMITTENT TRANSILLUMINATION

Heinz Horbaschek, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 32,092, Mar. 17, 1993. This application Jul. 26, 1994, Ser. No. 280,410

Claims priority, application Germany, Apr. 15, 1992, 42 12 644.4

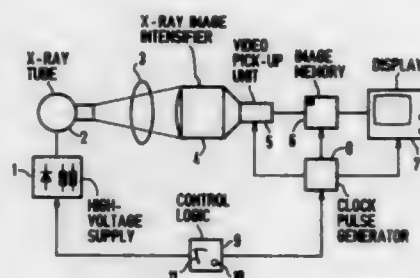
Int. Cl.<sup>6</sup> H05G 1/64

U.S. Cl. 378—98.2

6 Claims

1. An x-ray diagnostics installation comprising:
- an x-ray tube fed by a high-voltage supply for generating x-rays for fluoroscopic examination of a subject;
  - a video chain including image pick-up means for converting an optical x-ray image of said subject into a video signal sequence, by integrating said optical x-ray image, said video signal sequence consisting of a plurality of video images, and display means for displaying said x-ray image represented by said video images; and
  - control means for, in a first mode, controlling operation of said high-voltage supply for continuously operating said x-ray tube to generate x-rays at a first intensity and for controlling operation of said video chain for reading out

optical x-ray images, respectively integrated over first integration times, from said image pick-up means to obtain a plurality of successive video images supplied to said display means and for controlling display of said successive video images by said display means as displayed successive images each having an image duration, and, in a second mode, for controlling operation of said high-voltage supply for continuously operating said x-ray tube to generate x-rays at a second intensity, lower than said first intensity, said images pick-up means in said second mode



integrating respective optical x-ray images generated at said second intensity over second integration times each of which is longer than any of said first integration times, and for controlling operation of said video chain for intermittently reading out said image pick-up means in a pulsed mode after a period of multiple image durations to obtain a plurality of intermittent video images supplied to said display means and for controlling display of said intermittent video images by said display means as displayed intermittent images each having the same image duration as said displayed successive video images.

5,438,605

# RING TUBE X-RAY SOURCE WITH ACTIVE VACUUM PUMPING

James E. Burke, Villa Park, and Lester Miller, Forest Park, both of Ill., assignors to Picker International, Inc., Highland Hts., Ohio

Continuation-in-part of Ser. No. 862,805, Apr. 3, 1992, Pat. No. 5,268,955, and a continuation-in-part of Ser. No. 863,182, Apr. 3, 1992, Pat. No. 5,305,363, which is a continuation-in-part of Ser. No. 817,294, Jan. 6, 1992, Pat. No. 5,241,577, which is a

continuation-in-part of Ser. No. 817,295, Jan. 6, 1992, Pat. No. 5,200,985, which is a continuation-in-part of Ser. No. 817,296, Jan. 6, 1992, abandoned. This application Dec. 6, 1993, Ser. No. 163,148

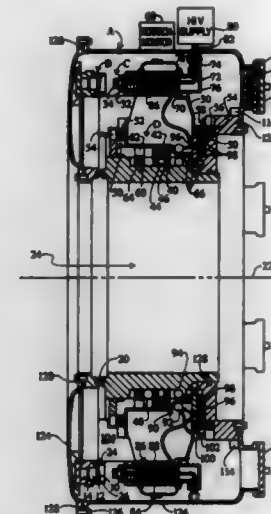
Int. Cl.<sup>6</sup> H01J 35/04

U.S. Cl. 378—135

27 Claims

2. An x-ray tube comprising:
- a generally toroidal housing having an evacuated interior;
  - an annular anode surface mounted in the toroidal housing interior, the anode surface being in thermal communication with a circulated cooling fluid passage such that the cooling fluid removes heat from the anode surface;
  - an annular rotor rotatably disposed within the housing interior;
  - at least one cathode assembly mounted to the rotor for rotation therewith, the cathode assembly including a cathode for emitting electrons to form an electron beam that strikes the anode surface to generate an x-ray beam;
  - a means for rotating the annular rotor such that electron beam is rotated around the anode surface;
  - an active vacuum pump hermetically sealed into the housing

interior with no exhaust for discharging atoms evacuated from the interior region, the active vacuum pump actively



maintaining a vacuum of at least  $10^{-6}$  Torr in the housing interior.

5,438,606

# OPEN POWER LOOP DETECTOR FOR TRANSMISSION LINE ELEMENTS

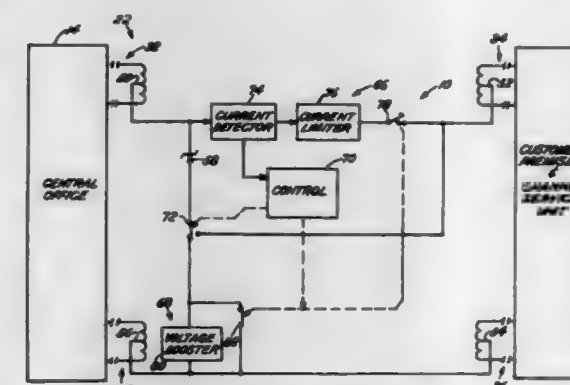
Guy C. Cerulli, Bolingbrook, Ill., assignor to Teltrend Inc., St. Charles, Ill.

Filed Apr. 30, 1993, Ser. No. 55,531

Int. Cl.<sup>6</sup> H04M 1/24, 3/22

U.S. Cl. 379—24

5 Claims



1. An open power loop detector for an element within a digital transmission line system, said system including first and second transmit spans and first and second receive spans interconnected to said element, said element including a first center tap lead for said first transmit span and a second center tap lead for said second transmit span and including a third center tap lead for said first receive span and a fourth center tap lead for said second receive span comprising, in combination:

- a first switch for moving said element between a through powered and a loop powered mode;
- a voltage regulator for producing a first voltage drop between said first and second center tap leads for said transmit spans, when said element is in a through powered mode, and for producing a second voltage drop between one of said first and second center tap leads for said transmit spans and one of said third and fourth center tap leads for said receive spans, when said element is in said loop powered mode;
- a current detector for detecting current between said third and fourth center tap leads of said first and second receive

spans upon receiving a current sense activation signal and responsively providing a current detection signal, said current detection signal comprising a low voltage signal when substantially no current is detected and a high voltage signal when substantial current is detected;

a voltage boost circuit for producing a third voltage drop between one of said first and second center tap leads for said transmit spans and one of said third and fourth center tap leads for said receive spans, upon receiving a voltage activation signal; and

a controller, interconnected to said first switch, for detecting that said element is in said loop powered mode and periodically performing a cycle of providing said current sense activation signal to said current detector and providing said voltage activation signal to said voltage boost means, and receiving said current detection signal; said controller activating said first switch to move said element from said loop powered mode to said through powered mode upon receiving said high current signal and said controller maintaining said element in said loop powered mode upon receiving said low current signal.

5,438,607

# PROGRAMMABLE MONITORING SYSTEM AND METHOD

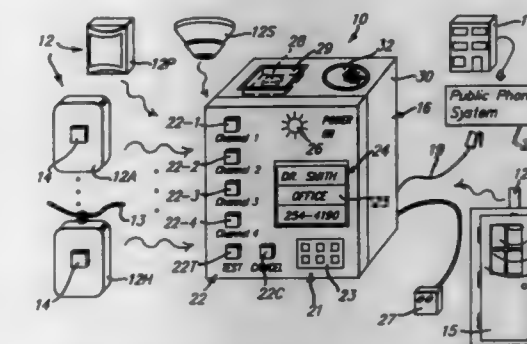
Chester T. Przygoda, Jr., Troy, and Daniel J. Serafin, Jr., Rochester, both of Mich., assignors to U.S. Monitors, Ltd., Madison Heights, Mich.

Filed Nov. 25, 1992, Ser. No. 981,362

Int. Cl.<sup>6</sup> H04M 11/04

U.S. Cl. 379—38

37 Claims



1. A programmable personal monitoring system for monitoring one or more conditions in a predetermined local area using at least one wireless microtransmitter and a radio-receiving base unit and providing a communications link to a central monitoring station, the system comprising:

- (a) at least one wireless battery-operated transmitter unit sized to be easily portable by one hand and operable to transmit, at a predetermined high frequency, a first coded signal indicative of an external condition of a first predetermined type outside of the transmitter unit and a second coded signal indicative of a low-battery condition within the transmitter unit, the one transmitter unit including:
  - a micropower transmitter for generating a high frequency pulse-modulated signals in response to a serially encoded digital control signal,
  - an encoding circuit for providing first and second predetermined serially encoded digital control signals, the encoding circuit including first means for encoding programming into each of the digital control signals a unique transmitter identification ("XMTR-ID") code associated with the one transmitter unit, and one of first and second condition codes respectively indicating an external condition and a low battery condition,
  - a low voltage detector circuit connectable to a battery used to power the one transmitter unit for providing a

warning signal indicative of battery voltage dropping below a certain level, and

- (4) a timing circuit for providing an intermittent timed signal to the encoding circuit upon receipt of the warning signal from the detector circuit to automatically cause the encoding circuit to include in the next digital control signal to be transmitted the condition code indicating a low battery condition; and
- (b) a base unit for providing a communications link to a monitoring station, including
  - (1) a receiver for receiving high frequency signals from the one transmitter unit, when the one transmitter unit is within a predetermined range of the base unit, and for obtaining from the high frequency signals the digital control signals encoded in the high frequency signals,
  - (2) a programmable microcontroller for deciphering from the received digital control signals the XMTR-ID codes and condition codes contained therein, and for validating the deciphered XMTR-ID codes and condition codes,
  - (3) means for short-term storage of validated information deciphered from at least the high-frequency signal most recently received,
  - (4) means for long-term storage of information including a base identification ("BASE-ID") code uniquely identifying the base unit and a phone number to be dialed,
  - (5) means for generating telephone dialing signals for transmission to telephone system lines, said means for generating telephone dialing signals including a dual-tone multi-frequency (DTMF) circuit means for providing DTMF signals in response to signals from the programmable microcontroller and a pulse-dial relay circuit means for generating pulse-code telephone signals to apply to the telephone lines, said DTMF signals and said pulse-code signals being used in combination to provide alternate methods of accessing the telephone lines so as to increase the probability that the base unit can contact the central monitoring station,
  - (6) means for automatically establishing a communications link-up to the monitoring station once telephone equipment at the monitoring station responds to the telephone dialing signals, and
  - (7) means for transmitting to the monitoring station from the base unit the BASE-ID code, and selected validated information stored in the means for storage.

5,438,608

# MOBILE RADIO COMMUNICATION SYSTEM HAVING BASE STATIONS AND RADIO TERMINALS EACH HAVING TENANT IDENTIFICATION DATA STORAGE FOR STORING TENANT ID DATA

Susumu Kojima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 873,227, Apr. 24, 1992, abandoned.

This application Mar. 14, 1994, Ser. No. 213,455

Claims priority, application Japan, Apr. 24, 1991, 3-122581

Int. Cl.<sup>6</sup> H04Q 7/38

U.S. Cl. 379-58

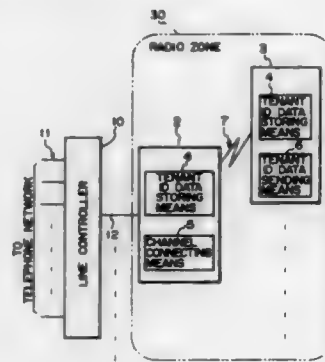
3 Claims

1. A mobile radio communication system having a service area divided into a plurality of radio zones and comprising a radio base station assigned to each of said plurality of radio zones, each of said radio base stations being connected to a line controller which is connected to subscriber lines which extend from a public switched telephone network, and a plurality of radio terminals which are connected to said radio base stations over a radio channel, said radio base stations each comprising first tenant identification (ID) data storing means for storing first tenant ID data, said first tenant ID data indicating at least one service group of said radio terminals, and said radio terminals each comprising second tenant ID data storing means for storing second tenant ID data, said second tenant ID data indicating a particular one of said service groups to which the radio terminals belong;

said radio terminals each comprising tenant ID data trans-

mitting means for transmitting, before a connection of a radio channel is set up, the second tenant ID data, read out of said second tenant ID data storing means, to said radio base station;

each of said radio base stations comprising radio channel connecting means for comparing the second tenant ID data received from said tenant ID data transmitting means of a particular one of said radio terminals with the first tenant ID data stored in said first tenant ID data storing



means thereof and, if the first and second tenant ID data are identical, said radio channel connecting means causes a setting means to set up a connection of the radio channel between an associated one of said base stations and a particular one of said radio terminals, if the first and second tenant ID data are not identical, said radio channel connecting means prohibits a connection of the radio channel between the associated one of said base stations and the particular one of said radio terminals.

5,438,609

# MOBILE COMMUNICATION METHOD FOR COMPLETING CALLS UTILIZING A MOBILITY MANAGER AND SYSTEM THEREFOR

Masahiko Yahagi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

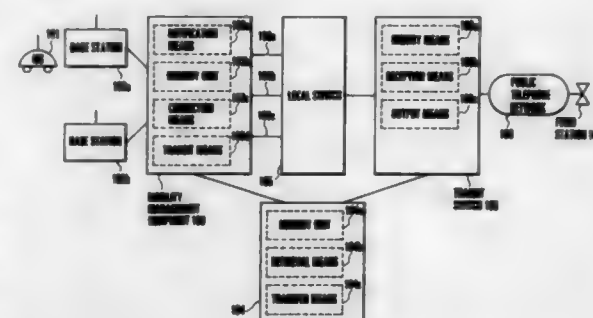
Filed May 19, 1994, Ser. No. 246,349

Claims priority, application Japan, May 19, 1993, 5-117085

Int. Cl.<sup>6</sup> H04Q 7/22; H04M 11/00

U.S. Cl. 379-58

13 Claims



1. A mobile communication method comprising the steps of: when a terminating call is generated to a mobile station, retrieving position information about said mobile station as a called party and a mobile station identification number for paging said mobile station as the called party on the basis of a mobile station terminating dial number from a station as a calling party; determining a local switch located in a local service area corresponding to a position indicated by the retrieved position information; selecting one subscriber line dial number, to which terminat-

ing connection is to be performed, from subscriber line dial numbers of a plurality of subscriber lines connected to said determined local switch; storing the selected subscriber line dial number in correspondence with the retrieved mobile station identification number; reserving a subscriber line indicated by the subscriber line dial number stored in correspondence with the mobile station identification number; connecting the terminating call to the reserved subscriber line; and paging said mobile station as the called party in accordance with the mobile station identification number stored in correspondence with the subscriber line to which the terminating call is connected.

5,438,610

# METHOD FOR ESTABLISHING A COMMUNICATION LINK BETWEEN A GROUND-BASE CALLER AND A PASSENGER ON BOARD AN AIRCRAFT

Jai P. Bhagat; William D. Hays, both of Jackson, and Ernest A. Oswald, Raymond, all of Miss., assignors to Mobile Telecommunication Technologies, Jackson, Miss.

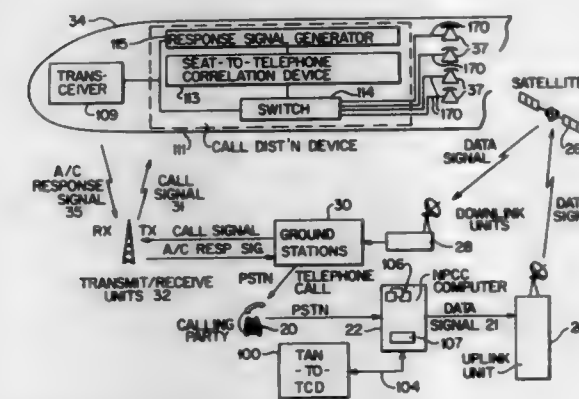
Continuation of Ser. No. 226,394, Apr. 12, 1994, which is a continuation of Ser. No. 980,756, Nov. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 759,626, Sep. 16, 1991, Pat. No. 5,278,891, which is a continuation of Ser. No. 501,430, Mar. 22, 1990, abandoned, which is a continuation of Ser. No. 188,557, Apr. 29, 1988, abandoned. This application May 19, 1994, Ser. No. 246,089

The portion of the term of this patent subsequent to Jan. 11, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> H04Q 7/38

U.S. Cl. 379-58

4 Claims



1. A method of establishing a communication link between a ground-based caller and a passenger on board an aircraft having a plurality of telephones, the method comprising the steps of:

correlating the passenger to a predetermined aircraft seat having a predetermined telephone; receiving a call for the passenger; receiving the caller's telephone number; transmitting a signal over a predetermined geographic region, said signal including information to alert said passenger to a call; receiving said signal at the aircraft; alerting said passenger via said predetermined telephone that said signal has been received; transmitting a response signal from the aircraft to a ground station in response to said signal; and calling the caller's telephone number from the ground station in response to receipt of the response signal.

# 5,438,611 ELECTRONIC MAIL SYSTEM WITH RF COMMUNICATIONS TO MOBILE PROCESSORS ORIGINATING FROM OUTSIDE OF THE ELECTRONIC MAIL SYSTEM AND METHOD OF OPERATION THEREOF

Thomas J. Campana, Jr., Chicago; Michael P. Ponschke, Lockport, and Gary F. Thelen, Palos Park, all of Ill., assignors to NTP Incorporated, Annandale, Va.

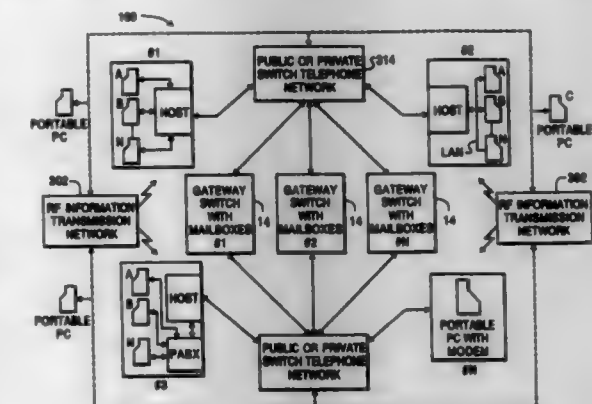
Continuation of Ser. No. 702,319, May 20, 1991, abandoned.

This application May 23, 1994, Ser. No. 247,466

Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 379-58

80 Claims



46. A system for transmitting originated information from one of a plurality of originating processors in an electronic mail system to at least one of a plurality of destination processors in an electronic mail system comprising:

a RF information transmission network for transmitting the originated information to at least one RF receiver which transfers the originated information to the at least one of the plurality of destination processors; at least one interface switch, the at least one interface switch being coupled to the electronic mail system containing the plurality of the originating processors and to the RF information transmission network and transmitting the originated information received from the electronic mail system containing the plurality of originating processors to the RF information transmission network; and at least one additional processor with each additional processor being coupled to at least one interface switch, one of the at least one additional processor originating other originated information from outside any electronic mail system for transmission to the at least one of the plurality of destination processors by the RF information transmission network and an address of the at least one of the plurality of destination processors to receive the other originated information transmitted by the RF information transmission network or an identification number of the at least one RF receiver receiving the other originated information for transmission to the at least one of the plurality of destination processors and transferring the other originated information to the at least one of the plurality of destination processors; and wherein the interface switch receiving the other originated information originating from the one additional processor and the address or identification number adds RF network information used by the RF information transmission network during transmission of the other originated information to the at least one RF receiver receiving the other originated information to the other originated information; and each electronic mail system in the system transmits other information from one of its plurality of originating processors through a wireline to at least one of its plurality of destination processors without transmission using the RF information transmission network.



5,438,612

**RADIO TELEPHONE APPARATUS HAVING CALL LIMITING FUNCTION**

Noriko Norimatsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 935,263, Aug. 27, 1992, abandoned.

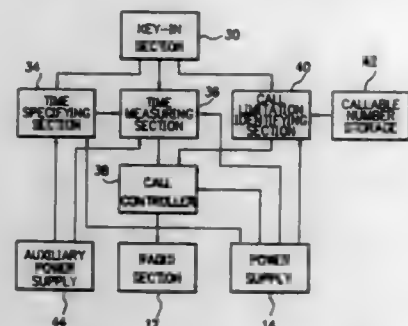
This application Sep. 16, 1994, Ser. No. 307,046

Claims priority, application Japan, Sep. 6, 1991, 3-254478

Int. Cl.<sup>6</sup> H04M 11/00, 3/00, 15/00

U.S. Cl. 379-58

14 Claims



1. A radio telephone apparatus having a call limiting function, comprising:

a memory means for storing therein a list of callable numbers, a set of programmed procedures including a first procedure for receiving a set of time data, a second procedure for specifying a call limiting time period according to said set of time data, a third procedure for receiving a measurement start command, a fourth procedure for continuously measuring a lapse of said call limiting time period with said start command given, a fifth procedure for rendering said call limiting function active after said call limiting time period has elapsed, a sixth procedure for prohibiting entering said fifth procedure, a seventh procedure for receiving a request for call issuance containing a destination number, an eighth procedure for searching said callable numbers for matching one of said callable numbers to said destination number, a ninth procedure for rendering said call limiting function active when said matching callable number is not found, a tenth procedure for prohibiting entering said ninth procedure, an eleventh procedure for establishing a programmed combination of said fifth, said sixth, said ninth and said tenth procedures, and a twelfth procedure for allowing a request for said call limiting function held inactive as normal;

a radio means for issuing a call when said request is allowed;

a CPU means for reading said callable numbers, said programmed procedures and executing said programmed procedures including a thirteenth procedure for operating said memory means and a fourteenth procedure for operating said radio means; and

a power supply means for supplying power to said memory means, said radio means and said CPU means.

5,438,613

**X-RAY ANALYSIS APPARATUS AND SCANNING UNIT SUITABLE FOR USE IN SUCH AN APPARATUS**

Wilhelmus A. H. Gijzen; Walterus A. L. A. Van Egerast; Johannes P. M. Van Aalen, all of Almelo, and Albert Vischer, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1992, Ser. No. 993,342

Claims priority, application European Pat. Off., Dec. 18, 1991, 91203343

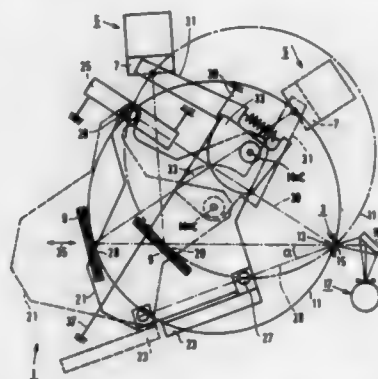
Int. Cl.<sup>6</sup> G01T 1/36

U.S. Cl. 378-82

20 Claims

1. An X-ray analysis apparatus, comprising a scanning unit with an X-ray source, a crystal holder, an X-ray detection system with an X-ray detector and a motion mechanism for effecting a coupled displacement of the crystal holder and the X-ray detector relative to the X-ray source, a point of the

X-ray source, a point of the crystal holder and a point of the X-ray detector remaining on a circle having a constant diameter, referred to herein as a Rowland circle, during said coupled displacement, which coupled displacement effects a rectilinear displacement of the point of the crystal holder relative to the point of the X-ray source along a fixed line directed between the point of the crystal holder and the point of the X-ray source, referred to as the radiation pick-up direction, wherein the motion mechanism of the scanning unit comprises a base plate, referred to herein as a Rowland plate, to which the crystal holder is fixed, first guide guiding a first point of the Rowland plate, which first guide is arranged such that the first point can be displaced along a line, referred to herein as a drive direction from a drive point, a second guide guiding a second



point of the Rowland plate, which second guide is arranged such that the second point can be displaced along a line, referred to herein as a shift direction from a shift point, the drive direction enclosing an acute angle  $\alpha$  relative to said fixed pick-up direction and an acute angle  $\gamma$  relative to said shift direction, said coupled displacement of the crystal and the X-ray detector relative to the X-ray source varying an angle  $\theta$  enclosed between said fixed pick-up direction and a tangent to the Rowland circle at said point on the crystal over a scanning range within or equal to a range between fixed extreme values of the angle  $\theta$ , and said angle  $\gamma$  being chosen to minimize the displacement of said second point along the shift direction during a coupled displacement of the crystal holder and the X-ray detector relative to the X-ray source effecting variation of the angle  $\theta$  from one of the fixed extreme values to the other.

5,438,614

**MODEM MANAGEMENT TECHNIQUES**

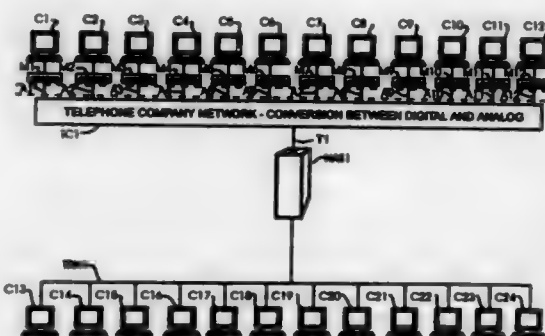
Christopher J. Rozman, Park Ridge, and Scot W. Salzman, Vernon Hills, both of Ill., assignors to U.S. Robotics, Inc., Skokie, Ill.

Filed May 25, 1994, Ser. No. 249,169

Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 379-93

27 Claims



1. In a system comprising a telephone line carrying a first

telephone signal resulting from modulation by a first modem of a first digital computer signal representing digital first data from a digital first computer, said telephone line also carrying a second telephone signal resulting from modulation by a second modem of a second digital computer signal representing digital second data from a digital second computer, said system also comprising a network for transmitting a digital first network signal representing digital third data from a digital third computer, for transmitting a digital second network signal representing digital fourth data from a digital fourth computer, and for transmitting digital network management signals adapted for use by a management station executing a predetermined management application using a predetermined first management protocol, improved apparatus for managing transmission of said digital data between said telephone line and said network comprising in combination:

first modem means responsive to said first network signal and said first telephone signal for enabling communication between said first computer and said third computer, responsive to management instruction signals for executing predetermined management objectives and for generating management response signals representing one or more conditions of said first modem means;

second modem means responsive to said second network signal and said second telephone signal for enabling communication between said second and fourth computers, responsive to management instruction signals for executing predetermined management objectives and for generating management response signals representing one or more conditions of said second modem means;

telephone control means for transmitting said first, second, third and fourth digital telephone signals between said telephone line and said first and second modem means, responsive to management instruction signals for executing predetermined management objectives and for generating management response signals representing one or more conditions of said telephone control means;

network control means for transmitting said first, second, third and fourth network signals between said first and second modem means and said network, responsive to management instruction signals for executing predetermined management objectives and for generating management response signals representing one or more conditions of said network control means; and

management means responsive to said network management signals for generating said management instruction signals, for independently addressing said management instruction signals to one or more of said first modem means, second modem means, telephone control means and network control means, for converting said management response signals to said network management signals, and for transmitting said network management signals to said management station, whereby said management station can manage said first and second modem means, said telephone control means and said network control means in real time while said first and second modem means enable bilateral communication among said first, second, third and fourth computers.

5,438,615

**METHOD OF PROVIDING MESSAGE SERVICE FOR PINLESS LIMITED ACCESS TELECOMMUNICATIONS**

Arthur J. Moen, Clinton, N.J., assignor to Teles Incorporated, Clinton, N.J.

Filed May 31, 1994, Ser. No. 251,732

Int. Cl.<sup>6</sup> H04M 15/00, 1/56, 17/00

U.S. Cl. 379-144

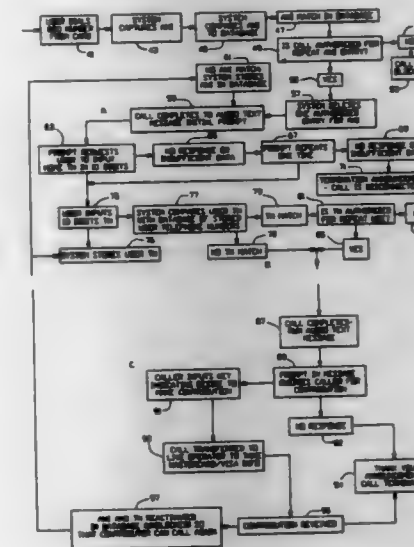
28 Claims

1. A method of operating a telecommunication system for providing a message service to a plurality of end-users, which comprises:

(a.) utilizing a telecommunication system having telecommunication lines with a telecommunication switching network and a computerized central switching station to establish a billing system for sponsors and to form an

account for each sponsor purchasing subsequent usage relating to one or more third party telephone numbers, said usage being based on a predetermined bulk rate for consumption of user time over a reset time period;

(b.) distributing a user unit to each of a plurality of end users for calling said one or more third party telephone numbers and providing to each said end-user said one or more third party telephone numbers, and requiring each end user to provide to the system at least one unique identification number, said at least one unique identification number being unique to each said user unit;



(c.) in connection with said billing system, programming said computerized central switching station to permit a call of a preset message limit to be made by each end user to said third party phone number provided, based on said distributed user unit, accessed only by said end-users providing the requested unique identification number; and

(d.) in response to an end user calling said third party telephone number and the end user providing the requested unique identification number, then providing a predetermined message to said end user in accordance with said preset message limit, automatically terminating said call, and charging an appropriate time amount to said account of said sponsor.

5,438,616

**METHOD AND APPARATUS FOR STORING TELEPHONE NUMBERS AND FOR AUTOMATICALLY CALLING THE STORED NUMBERS**

John T. Peoples, 14 Blue Jay Ct., Warren, N.J. 07059

Filed Mar. 2, 1994, Ser. No. 204,087

Int. Cl.<sup>6</sup> H04M 1/64, 9/00

U.S. Cl. 379-201

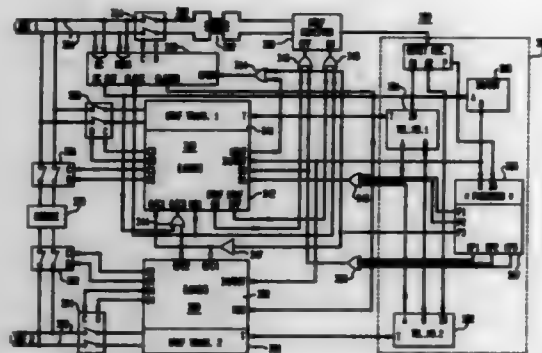
9 Claims

1. A method for interconnecting a first party and a second party with a controller wherein the controller is connected to a serving switching center by two separate telephone loops terminating at a subscriber premises, the first party being at a location remote from the second party and the controller, the second party also being at another remote location, the method comprising the steps of

establishing a first connection between the first party and the controller over the first loop by the first party placing a telephone call to a telephone number to which the controller is responsive, receiving and storing in the controller a first call-back telephone number and a second call-back telephone number as provided by the first party, the first number causing a first telephony device accessible to the first party to respond, and the second number causing a second telephony device accessible to the second party to respond,



taking down the first established connection on the first loop between the first party and the controller, establishing a second connection between the first party and the controller over the first loop by operation of the controller to initiate a telephone call to the first call-back telephone number,



establishing a third connection between the second party and the controller over the second loop by operation of the controller to initiate a telephone call to the second call-back telephone number, and bridging the first party and the second party by coupling the second connection to the third connection within the controller located at the subscriber premises.

5,438,617

# LOW FREQUENCY DIGITAL NETWORK CROSS-CONNECT PANEL

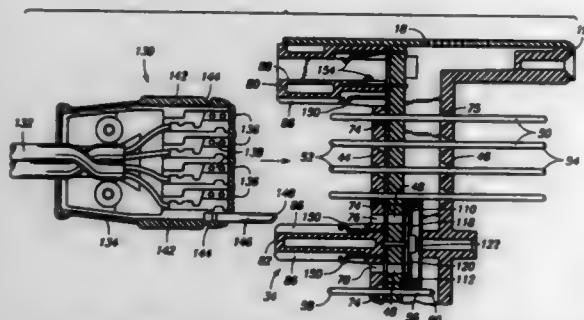
Timothy L. Hill, Spokane, Wash.; Paul D. Johnson, Post Falls, Id.; Donald R. Skiffill, and Douglas E. Prussack, both of Vernale, Wash., assignors to Telect, Inc., Liberty Lake, Wash.

Filed Apr. 4, 1994, Ser. No. 223,107

Int. Cl.<sup>6</sup> H04M 1/00

U.S. Cl. 379—327

37 Claims



1. A high density, low frequency telecommunication digital network cross-connect panel for terminating a plurality of four-wire low frequency telecommunication network elements and for enabling direct front cross-connect of such network elements, comprising:

- a panel housing for normally mounting horizontally between uprights of a panel support;
- one or more cross-connect modules mounted in the panel housing, each module having a module body with a front access face and a rear termination face;
- said module having a plurality of elongated wire wrap pins arranged in a matrix of one or more columns and four vertically spaced sets of four rows;
- said module having an upper front patch access section and a lower front cross-connect field section;
- said upper front patch access section having a first set of four rows of elongated wire wrap pins defining four rows of elongated wire-wrap front access pins of a prescribed first

length extending through the module body with front ends of the wire-wrap pins of the first set of four rows extending outward from the front access face to receive a front access patch plug and opposite ends extending outward from the rear termination face for connecting each column of the first set of four rows of wire-wrap front access pins with a first selected four-wire network element;

said upper front patch access section having a second set of four rows of elongated wire-wrap wires defining four rows of elongated wire-wrap front access pins of a prescribed second length mounted to the module with front ends extending outward from the front access face to receive a front access patch plug;

wherein each column of the second set of four rows of wire-wrap pins is associated with a corresponding column of the first set of four rows of wire-wrap pins;

said lower front cross-connect field section having a third set of four rows of elongated wire-wrap pins defining four rows of elongated wire-wrap cross-connect pins of a prescribed third length mounted to the module with front ends extending outward from the front access face to provide a first portion of a front cross-connect field;

wherein each column of the third set of four rows of wire-wrap pins is associated with a corresponding column of the second set of four rows of wire-wrap pins;

said lower front cross-connect field section having a fourth set of four rows of elongated wire-wrap pins defining four rows of elongated wire-wrap cross-connect pins of a prescribed fourth length extending through the module body with front ends of the second set of wire-wrap cross-connect pins extending outward from the front access face to provide a second portion of a front cross-connect field and opposite ends extending outward from the rear termination face for connecting each column of the fourth set of four rows of the wire-wrap pins with a second selected four-wire network element;

a first internal electrical circuit electrically interconnecting corresponding pins of each of the first, second and third sets of four rows of wire-wrap pins, without internally electrically interconnecting with a pin of the fourth set of rows of wire-wrap pins;

a third internal electrical circuit electrically interconnecting corresponding pins of each of the first, second and third sets of four rows of wire-wrap pins, without internally electrically interconnecting with a pin of the fourth set of rows of wire-wrap pins;

a third internal electrical circuit electrically interconnecting corresponding pins of each of the first, second and third sets of four rows of wire-wrap pins, without internally electrically interconnecting with a pin of the fourth set of rows of wire-wrap pins;

a fourth internal electrical circuit electrically interconnecting corresponding pins of each of the first, second and third sets of four rows of wire-wrap pins, without internally electrically interconnecting with a pin of the fourth set of rows of wire-wrap pins;

said electrical circuits having electrical switch means responsive to insertion of a female access plug onto the front ends of a column of selected first or second set of four rows of wire-wrap pins for interrupting the electrical circuits when the access patch plug is inserted (1) to discontinue electrical communication between the first and second network elements, and (2) to provide direct front signal access to one of the network elements.

5,438,618

# VOCAL FREQUENCY SUPPRESSION APPARATUS AND METHOD

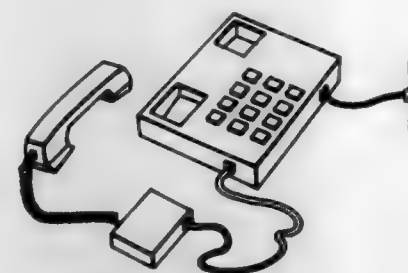
C. Earl Jantzi, Zion, Ill., and Richard C. Gall, Middleton, Wis., assignors to Mytech Systems Corporation, Zion, Ill.

Filed Nov. 15, 1993, Ser. No. 152,854

Int. Cl.<sup>6</sup> H04M 1/50

U.S. Cl. 379—387

10 Claims



1. A vocal frequency suppression apparatus for suppressing selected portions of a vocal signal within a telephone system, said telephone system including at least one component controlled by dual tone multi-frequency ("DTMF") codes, said vocal frequency suppression apparatus comprising:

- means for generating said DTMF codes, said generating means including a plurality of user-selectable switches, wherein each of said user-selectable switches corresponds to a predetermined one of said DTMF codes, each of said DTMF codes comprising a unique pair of frequencies;
- means for producing said vocal signal, wherein said vocal signal may contain vocal frequencies which correspond to at least one frequency of at least one of said DTMF codes;
- means for suppressing a preselected one or more of said vocal frequencies which correspond to said at least one frequency of said at least one of said DTMF codes, so as to prevent inadvertent control of said at least one component controlled by said DTMF codes by said vocal signal, said suppression means being operably located between said producing means and said generating means, so as to suppress one or more of said vocal frequencies which correspond to said at least one frequency of said at least one of said DTMF codes from said vocal signal prior to said vocal signal passing to said generating means.

5,438,619

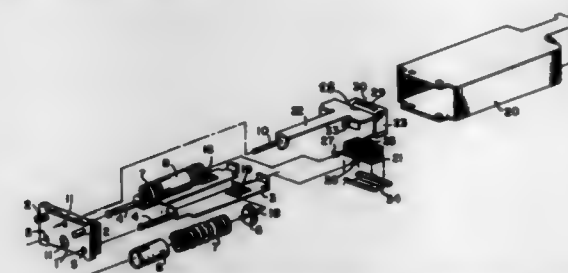
SOLID STATE PRIMARY TELEPHONE PROTECTOR  
William J. Shannon, Saco; John J. Napierkowski, Cape Elizabeth, and Dan Kidd, Cornish, all of Me., assignors to Siecor Puerto Rico, Inc., Hickory, N.C.

Filed Nov. 20, 1990, Ser. No. 616,268

Int. Cl.<sup>6</sup> H02H 9/00

U.S. Cl. 379—412

4 Claims



1. A telephone protector comprising: a cover on an insulative base, the insulative base having an input pin, an output pin and a grounding pin all extending therefrom; a grounding member disposed within the cover and connected to the grounding pin; a rigid plastic packaged solid state switch disposed within the cover, the solid state switch having a lead-in wire electrically connected to the input pin and having another lead-in wire electrically connected to the grounding member;

the solid state switch having a predetermined closing voltage so that a surge voltage at the input pin exceeding said predetermined voltage will be conducted to the grounding member; and clamping means on the solid state switch to prevent the solid state switch from bursting to an open circuit condition, said clamping means consisting of the grounding member and a clamping plate and further includes a horizontal member portion of the grounding member and curls extending horizontally from the grounding member and curls extending horizontally from the bottoms of the vertical sections.

5,438,620

METHOD AND APPARATUS FOR SCRAMBLING AND DECRYPTING OF VIDEO SIGNAL WITH EDGE FILL  
John O. Ryan; Ronald Quan, both of Cupertino; James R. Holzgrafe, Morgan Hill, and Peter J. Wonfor, El Granada, all of Calif., assignors to Macrovision Corporation, Mountain View, Calif.

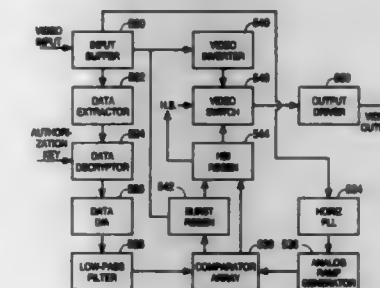
Continuation of Ser. No. 795,890, Nov. 19, 1991, abandoned.

This application Feb. 28, 1994, Ser. No. 202,349

Int. Cl.<sup>6</sup> H04N 7/167

U.S. Cl. 380—15

12 Claims



1. A descrambler for descrambling a line by line timeshifted video signal including random data relating to the amount of timeshifting, comprising:

- an extractor for extracting from the video signal the data;
- means for generating a digitally synthesized waveform from the extracted data;
- means for converting the digitally synthesized waveform into properly timed blanking interval signals for each horizontal line of the video signal on a line by line basis;
- means for switching the horizontal blanking interval signals into the timeshifted video signal.

5,438,621

# DC-FREE LINE CODE AND BIT AND FRAME SYNCHRONIZATION FOR ARBITRARY DATA TRANSMISSION

Thomas Hornak, Portola Valley; Patrick Petruno, San Jose; Richard C. Walker, Palo Alto; Benny W. H. Lai, San Jose; Chu-Sun Yen, Palo Alto; Cheryl L. Stout, Fremont, all of Calif., and Jieh-Tsorn Wu, Taipei, Taiwan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

PCT No. PCT/US91/08483, § 371 Date May 5, 1992, § 102(e) Date May 5, 1992, PCT Pub. No. WO92/09162, PCT Pub. Date May 29, 1992

Continuation-in-part of Ser. No. 612,746, Nov. 13, 1990, abandoned, which is a continuation-in-part of Ser. No. 266,459, Nov. 2, 1988, Pat. No. 5,022,051. This PCT application Nov. 13, 1991, Ser. No. 857,924

Int. Cl.<sup>6</sup> H04L 25/49

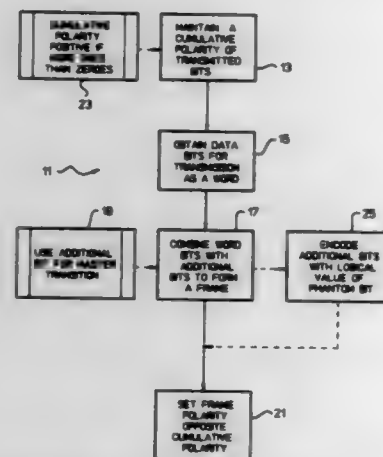
U.S. Cl. 380—43

23 Claims

1. A method of encoding a digital bit stream for transmission over a communication link, the method comprising: maintaining a cumulative polarity indicative of bits which have been transmitted over the link during a predefined time interval, the cumulative polarity being positive if more logical one bits than logical zero bits have been



transmitted and negative if fewer logical one bits than logical zero bits have been transmitted;  
obtaining a plurality of data bits from the stream for transmission as a data word;  
forming a frame by combining the data bits of the data word with a plurality of additional bits, a predetermined first selected bit of the additional bits having a logical value opposite a second selected bit adjacent to the first selected bit such that the first selected bit and the second selected bit establish a master transition in a predetermined location in the frame;  
selecting a third bit immediately preceding the first selected bit, and selecting a fourth bit immediately following the second selected bit;



setting the third selected bit to the same logical value as the first selected bit in various ones of a plurality of frames, and setting the fourth selected bit to the same logical value as the second selected bit in various ones of a plurality of frames such that the master transition is not always immediately preceded or immediately followed by another transition; and  
setting the logical values of the combined bits such that the frame has a different polarity than the cumulative polarity, the frame polarity being positive if the frame contains more logical one bits than logical zero bits and negative if the frame contains fewer logical one bits than logical zero bits.

5,438,622

# METHOD AND APPARATUS FOR IMPROVING THE SECURITY OF AN ELECTRONIC CODEBOOK ENCRYPTION SCHEME UTILIZING AN OFFSET IN THE PSEUDORANDOM SEQUENCE

James O. Normile, Woodside, and Ke-Chiang Chu, Saratoga, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jan. 21, 1994, Ser. No. 184,978  
Int. Cl. H04L 9/00

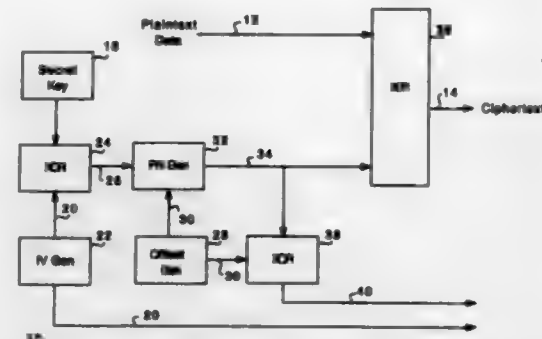
U.S. Cl. 380-46

29 Claims

1. An apparatus for the communication of encrypted data, the apparatus comprising a transmitter which further comprises:

- a first Pseudorandom Number (PN) generator for generating a first sequence of pseudorandom numbers;
- an offset generator which operates to select a subset of the first sequence of pseudorandom numbers; and
- an encoder comprising a first input for receiving the subset of the first sequence of pseudorandom numbers and a

second input for receiving an original sequence of plaintext data, in which the encoder combines the subset of the



first sequence of pseudorandom numbers and the sequence of plaintext data to produce an encrypted data output.

5,438,623

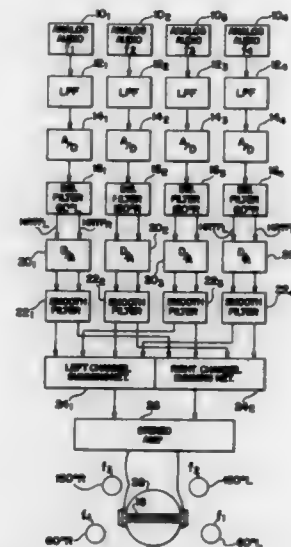
# MULTI-CHANNEL SPATIALIZATION SYSTEM FOR AUDIO SIGNALS

Durand R. Begault, San Francisco, Calif., assignor to The United States of America as represented by the Administrator of National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 4, 1993, Ser. No. 130,948  
Int. Cl. H04S 1/00

U.S. Cl. 381-17

20 Claims



1. A three dimensional audio display system for imposing selectively changeable spatial cues to a plurality of audio signals, comprising:

- a respective plurality of parallel audio signal paths for translating said plurality of audio signals and wherein each signal path includes,
- first filter means having a predetermined filter characteristic and being responsive to one audio signal of said plurality of audio signals,
- means coupled to said first filter means for converting said one audio signal to a digital audio signal,
- selectively changeable digital storage means coupled to said converting means and generating first and second digital audio signals in two discrete signal channels from said digital audio signal, each said channel further including means for storing time delay data and means for storing a set of filter coefficients derived from an arbitrary head related transfer function and implementing a synthetic head related transfer function in the form

of a linear phase finite impulse response filter which operates to impose spatial cues to said first and second digital audio signals for a predetermined spatial location relative to a listener.

means coupled to said digital storage means for converting said first and second digital audio signals to first and second analog audio signals,  
second filter means having a predetermined filter characteristic coupled to said converting means for filtering said first and second analog audio signals;  
first and second circuit means coupled to said second filter means for combining respective first and second analog audio signals and generating therefrom first and second composite first and second audio signals; and  
transducer means coupled to said first and second composite audio signals for generating a plurality of audio output signals which appear to emanate from selectively predetermined different spatial locations.

5,438,625

# ARRANGEMENT TO CORRECT THE LINEAR AND NONLINEAR TRANSFER BEHAVIOR OF ELECTRO-ACOUSTICAL TRANSDUCERS

Wolfgang Klippel, Dresden, Germany, assignor to JBL, Incorporated, Northridge, Calif.

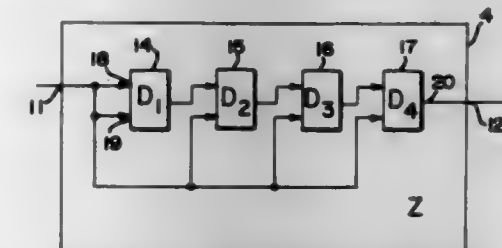
Filed Apr. 9, 1992, Ser. No. 867,314

Claims priority, application Germany, Apr. 9, 1991, 41 11 884.7

Int. Cl. H04R 3/00

U.S. Cl. 381-96

50 Claims



1. A network for the correction of linear and nonlinear transfer characteristics of electro-acoustic transducers over the complete dynamic range of small and large input signal amplitudes comprising:

- an electro-acoustic transducer having an input;
- a distortion reduction system with nonlinear transfer characteristics that are inverse to the same nonlinear transfer characteristics of the transducer and being connected to the input of said transducer;
- said distortion reduction system consisting of at least two two-port distortion reduction circuits connected in series with each other containing predetermined elements to correct predetermined types of distortion, said system having an input for receiving said input signal amplitudes and generating an output to the input of said transducer; each of said two-port distortion reduction circuits containing at least one three-port circuit as said predetermined elements, each of said three-port circuits having first and second inputs and an output;
- said distortion reduction system containing adjustable control elements coupled to each of said two-port distortion reduction circuits to correct distortion using said nonlinear transfer characteristics that are inverse to those same characteristics of the transducer; and
- wherein the transfer characteristics of each of said two-port distortion reduction circuits adjusts said input signals such that the output of said distortion reduction system provides an input to the transducer to compensate for the nonlinear behavior of the electro-acoustic transducer.

5,438,626

# COLLAPSIBLE HEARING DEVICE

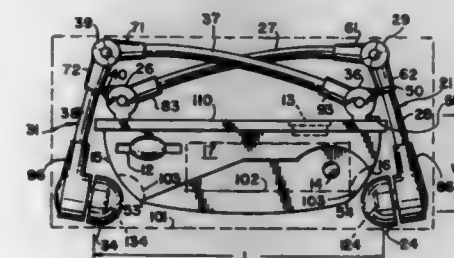
Bernard Neuman, and Sandra J. Neuman, both of 7972-A Lexington Club, Delray Beach, Fla. 33446

Filed Nov. 24, 1993, Ser. No. 157,904

Int. Cl. H04R 25/00

U.S. Cl. 381-183

17 Claims



1. A collapsible hearing device comprising a base housing

1. A device for protecting from outside noises a given volume arranged inside a room, said device comprising an array of acoustic sensors receiving noises to be canceled, an array of acoustic sources, said arrays being arranged at two distinct distances, A and B, respectively, from said volume, the distance B being less than the distance A, and an electronic circuit, at least partly interposed between said sensors and the said sources, for calculating, in time periods less than  $(A-B)/v$ , whereas  $v$  is the speed of sound in air, for each noise received by a sensor, a plurality of signals which are applied instantaneously, respectively, to the sources, so as to provide canceling of said noise in said volume, said electronic circuit comprising means for determining impulse response laws of the room corresponding to emissions of short acoustic pulses, for storing said response laws, for determining counter signals deduced from said response laws by time inversion, for storing said counter signals, and for forming convolution products of some of said response laws, some of said counter signals and some of the signals received by the sensors.





guage character which has N character strokes drawn in a generally accepted predetermined sequence, comprising:

a direction code and means therefor to be used for direction coding a first character stroke based on the direction of travel of said stroke relative to said stroke's starting point, to give said stroke a two-digit direction code comprising first and second types of coding symbols, said direction code and means therefor being used to obtain for each of said N character strokes a two-digit direction code consisting of at least one coding symbol;

a position code and means therefor to be used for position coding the location of the starting point of a subsequent character stroke relative to the location of the ending point of the stroke immediately previous thereto, and wherein said starting point is not constrained to coincide with said ending point, to give said subsequent character stroke a two-digit position code comprising first and second types of coding symbols, said position code and means therefor being used to obtain for each of said N character strokes except the first character stroke a two-digit direction code consisting of at least one coding symbol;

means for accumulating a first string of 4N-2 digits of coding after all said N character strokes are encoded in said predetermined sequence;

storing means for storing said first string of 4N-2 digits; means for receiving and encoding a hand written oriental language character intended to have N character strokes using said direction code and said position code to produce a new string of coding digits; and

means for comparing said new string with said first string, whereby a handwritten character is recognized when a matching exists between said new string and said first string, and wherein said first string is stored in said storing means when a match does not exist.

5,438,632

# JOINT TRANSFORM CORRELATOR USING A 4-F LENS SYSTEM TO ACHIEVE VIRTUAL DISPLACEMENT ALONG THE OPTICAL AXIS

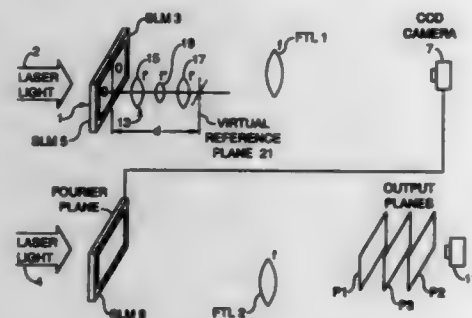
Joseph L. Horner, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 25, 1993, Ser. No. 83,151

Int. Cl. G06F 15/336; G06K 9/64

U.S. Cl. 382-278

10 Claims



1. A joint transform correlator for producing a plurality of joint transform image cross-correlation signals comprising:

- a joint image production means for producing a joint image of a reference image at a reference image plane and an input image at an input image plane;
- a first Fourier transform lens means for producing an interference pattern between Fourier transforms of said reference image and said input image;
- an energy detector for receiving said interference pattern and for outputting a light pattern comprising a Fourier transform interference intensity distribution signal;
- a second Fourier transform lens means for receiving said light pattern from said energy detector and for inverse Fourier transforming said light pattern;
- displacement means positioned between said joint image

production means and said first Fourier transform lens means for providing a virtual displacement of said reference image plane relative to said input image plane, said displacement means including a 4-f lens system having a third and fourth Fourier transform lens means, straddling a Fourier transform plane therebetween, for Fourier transforming only one image produced by said joint image production means.

5,438,633

# METHOD AND APPARATUS FOR GRAY-LEVEL QUANTIZATION

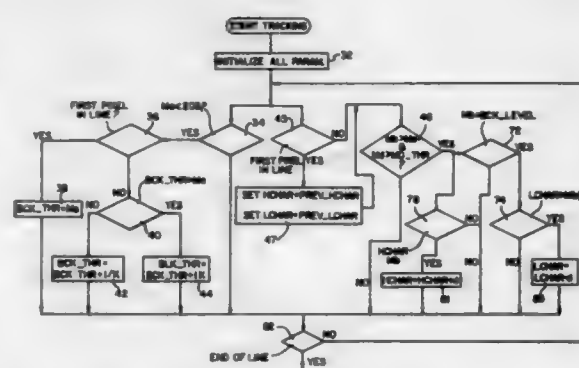
Mohsen Ghaderi, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 841,668, Feb. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 757,107, Sep. 10, 1991, abandoned. This application Mar. 9, 1993, Ser. No. 28,449

Int. Cl. G06K 9/38

U.S. Cl. 382-270

14 Claims



1. A method of processing an input digital image containing an array of input pixels having associated digital input signals, so as to produce digital output signals representative of the values of output pixels of an enhanced output digital image, said method comprising the steps of:

- providing an adaptive quantizing mechanism which is operative to quantize a respective pixel value of an input digital signal associated with a respective input pixel of an input digital image in accordance with a set of quantization levels located outside a range of pixel values representative of image background, said set of quantization levels being adjusted in accordance with approximated average high and low signal levels of successive portions of said input digital image;
- applying digital input signals associated with respective pixels of said input image array to the adaptive quantizing mechanism provided in step (a), so as to produce quantized digital output signals associated with respective output pixels of said output digital image; and wherein said adaptive quantizing mechanism is operative to selectively modify said approximated average high signal level of a respective portion of said input digital image, in accordance with a prescribed relationship between the approximated average high signal levels of another portion of said input digital image, associated digital input signals of which have been previously quantized by said adaptive quantizing mechanism in step (b), and the maximum signal level of said respective portion of said input digital image wherein said adaptive quantizing mechanism is operative to increase the value of said approximated average high signal level of said respective portion of said input digital image in response to said maximum signal level being greater than the approximated average signal level of said another portion of said input digital image, but leaving the value of said approximated average high signal level of said respective portion of said input digital image un-

changed in response to said maximum signal level being no greater than the approximated average high signal level of said another portion of said input digital image and also being no greater than a prescribed combination of the approximated average high signal level of said another portion of said input digital image and a background level of said digital input image.

5,438,634

# DITHER PROCESSING METHOD

Ryohel Kumagai, Tokyo, Japan, assignor to Ezel Inc., Tokyo, Japan

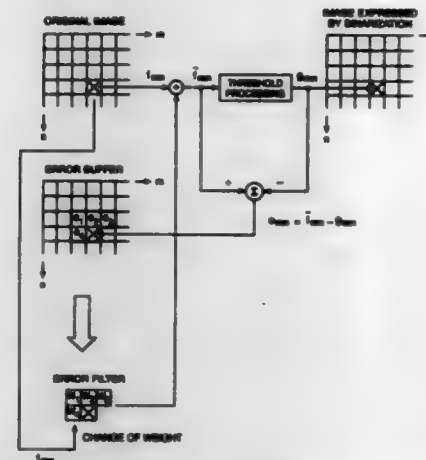
Continuation of Ser. No. 930,784, Aug. 17, 1992, abandoned, which is a division of Ser. No. 512,258, Apr. 20, 1990, Pat. No. 5,201,013. This application May 23, 1994, Ser. No. 247,397

Claims priority, application Japan, Apr. 24, 1989, 1-103695; Jun. 9, 1989, 1-147229; Jun. 20, 1989, 1-157164

Int. Cl. G06K 9/38

U.S. Cl. 382-169

7 Claims



1. An electronic apparatus for converting a multi-tone image into a two-tone image comprising:

- an original image memory having capacity for storing an original image;
- a threshold plane memory having at least enough capacity to store a threshold value for each of a number of areas of the original image memory;
- an output image memory having at least enough capacity to store a binarized image derived from an image stored in the original image memory;
- a dither memory having enough capacity to store values of a dither cell;
- means for applying the dither cell to the original image to generate pixels of a dither image;
- means for deriving representative density values from pixels of the dither image;
- means for determining a threshold value from representative values; and
- means for applying a threshold value to the original image to generate a two-tone image.

5,438,635

# METHOD AND APPARATUS FOR ENCODING AND STORING PIXEL VALUES AND FOR DECODING AND REPRODUCING A DIGITISED IMAGE

Norman D. Richards, Hertsford, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 450,332, Dec. 13, 1989, abandoned.

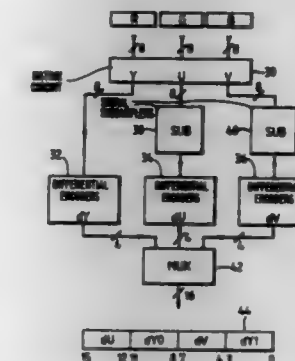
This application Jan. 11, 1991, Ser. No. 715,033

Claims priority, application United Kingdom, Dec. 23, 1988, 8830184

Int. Cl. G06K 9/36; H03M 7/30

U.S. Cl. 382-232

46 Claims



1. A decoding apparatus comprising means for receiving a first series of codes representing a first series of differential values corresponding to a row of pixels of a differentially encoded image, means for expanding each code of the first series into a group of codes to form a second series of codes, each group of codes representing a plurality of differential values whose sum is the differential value represented by the corresponding code of the first series, and a decoder for decoding the second series of codes to generate a second series of pixel values for display.

5,438,636

# APPARATUS FOR SIMULTANEOUSLY CONVOLVING MULTIPLE DIGITAL BINARY IMAGES USING A SINGLE CONVOLVER WITH A BINARY MASK TO DETERMINE PIXEL DENSITIES

Stefan Surka, Sandy Hook, Conn., assignor to United Parcel Service of America, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 883,853, May 14, 1992, abandoned. This application Aug. 17, 1993, Ser. No. 108,190

Int. Cl. G06K 9/64

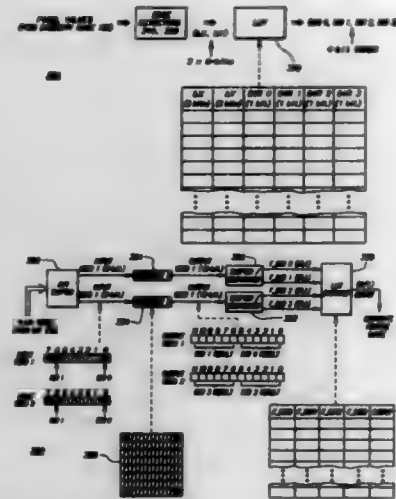
U.S. Cl. 382-279

4 Claims

1. An apparatus for locating a machine readable symbol, comprising:

- An electro-optical scanner for generating an input image containing a digital representation of said machine readable symbol;
- means for providing first and second digital binary images representative of edges in said input image;
- A window selector for selecting a first window from said first digital binary image and a second window from said second digital binary image for processing;
- A pixel selector for selecting a first pixel from said first window and a second pixel from said second window;
- A shifter for bit shifting said first pixel and concatenating a plurality of trailing zero bits to said first pixel;
- bit merging means for forming a multi-bit input pixel by combining said bit shifted first pixel and said second pixel;
- A convolver for generating a single multi-bit output value by simultaneously applying a plurality of multi-bit input pixels to said convolver;
- A word separator for forming a first convolution result from only the least significant bits of said output value and a second convolution result from only the most significant bits of said output value; wherein said first and second

convolution results respectively represent the results of sequentially applying said convolver to said first and second windows; and



(I) means for locating said machine readable symbol within said input image in accordance with said first and second convolution results.

5,438,637

# **ELECTRICALLY CONTROLLABLE OPTICAL FILTER DEVICE**

Björn O. Nilsson, Fjärna, and Pierre J. Rigole, Solna, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

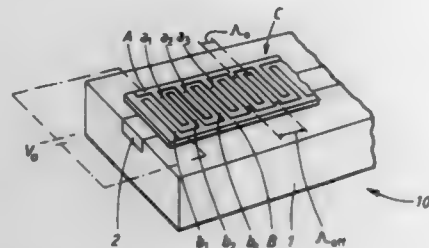
Filed Dec. 8, 1993, Ser. No. 162,873

Claims priority, application Sweden, Dec. 9, 1992, 9203781

Int. Cl.<sup>6</sup> G02B 6/12, 6/10

U.S. Cl. 385—10

28 Claims



1. An electrically controllable filter device comprising: a substrate; an optical waveguide disposed on the substrate; and an electrode structure for inducing a filtering of waves within a given wavelength range that propagate through the optical waveguide, wherein the electrode structure is so formed with respect to the optical waveguide that the electrode structure, within the given wavelength range, induces the filtering merely upon electrical feeding of the electrode structure whereas the electrode structure in the absence of electrical feeding does not induce the filtering; the electrode structure is so arranged that the filter, depending on the electrode structure and the feeding thereof, can be tuned to a plurality of different discrete frequencies; the electrode structure in the absence of feeding has a passive grating period  $\Lambda_0$ , and upon feeding has an effective grating period,  $\Lambda_{eff}$ , which is greater than the passive grating period  $\Lambda_0$ , and wherein the effective grating period  $\Lambda_{eff}$  through variation in feeding can vary.

# **5,438,638 ELECTRICALLY CONTROLLED MECHANICAL OPTICAL SWITCH**

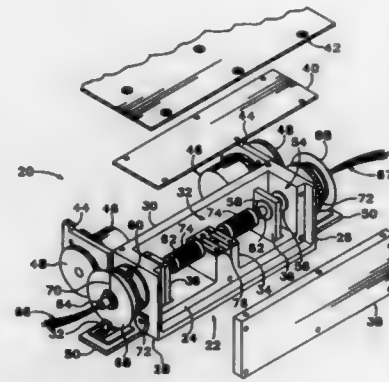
Dwayne R. Anderson, Redmond, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Apr. 5, 1994, Ser. No. 223,296

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—16

69 Claims



1. An optical switch comprising: at least a first optical transmission path rotating about a first independent and offset rotational axis for positioning the first optical transmission path on a first closed curve; at least a second optical transmission path rotating about a second independent and offset rotational axis for positioning the second optical transmission path on a second closed curve, the first and second optical transmission paths being in opposing relationship forming an optical interface, with the closed curves of the optical transmission paths being laterally offset from each other for establishing intersecting points on the closed curves; first and second mounting members for holding the respective first and second optical transmission paths with the first mounting member having a rotational axis axially aligned with the first independent and offset rotational axis and the second mounting member having a rotational axis axially aligned with the second independent and offset rotational axis, the first and second optical transmission paths being positioned off of the respective rotational axes of the mounting members; means for storing angular coordinates representative of the intersecting points of the first and second closed curves of the respective first and second optical transmission paths; and means for axially aligning the first and second optical transmission paths at one of the intersecting points on the closed curves, drive motors coupled to the respective mounting members and responsive to the angular coordinates for selectively rotating the first and second optical transmissions paths relative to each other about their respective independent and offset rotational axes.

5,438,639

# **ION-BEAM DEPOSITED, GAIN ENHANCED RING RESONATORS**

Carol M. Ford, Columbia Heights, and Theodore J. Podgorski, St. Paul, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 997,405, Dec. 28, 1982, Pat. No. 5,319,727.

This application Nov. 22, 1993, Ser. No. 155,268

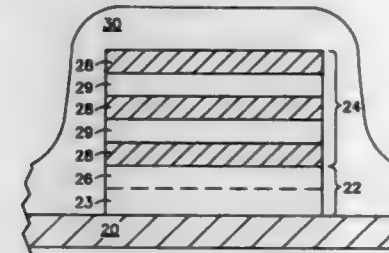
Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—30

14 Claims

1. A gain enhanced ring resonator for supporting two counter-propagating optical signals, comprising: a closed loop optical waveguide comprised of a substrate, a first optical isolation layer wherein the material of the first isolation layer has a first index of refraction and is made up of a first level of material and a second level of material, a

first layer of a first material attached to first isolation layer wherein the first material has a second index of refraction, a second layer of a second material attached to first layer wherein the second material has a third index of refraction, a third layer of the first material and a second optical isolation layer attached to the third layer and made up of the material of the first isolation layer, wherein the closed loop waveguide is continuous, and wherein the first index of refraction and the third index of refraction are lower than the second index of refraction;



a first optical coupler means for coupling a first light source into the closed loop waveguide, wherein the first light source projects a first light signal having a first wavelength; and a second optical coupler means for coupling a second light source into the closed loop waveguide, wherein the second light source projects a light signal having a second wavelength, and wherein the second light signal interacts with the first material causing amplification of the first light signal within the closed loop waveguide.

5,438,640

# **OPTICAL WAVEGUIDE DEVICE FOR RECEIVING FUNCTIONAL COMPONENT**

Eisuke Sasaoka, Hiroo Kanamori, Hiroshi Suganuma, Shinji Ishikawa, and Tatsuhiko Saito, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

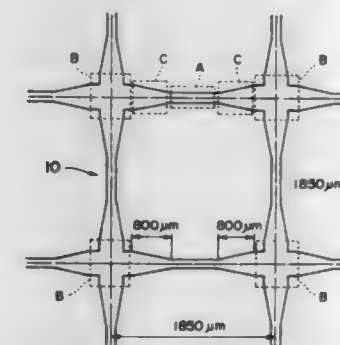
Filed Apr. 8, 1994, Ser. No. 225,716

Claims priority, application Japan, Jul. 16, 1993, 5-176974

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—43

18 Claims



17. An optical waveguide device comprising: a waveguide substrate; an optical waveguide disposed on said waveguide substrate and formed from a core for propagating light therein and a cladding layer covering said core, said optical waveguide including: an optical waveguide region having at least two input/output terminals; a first insertion region having at least two input/output terminals and a mode field width of light propagating therein larger than that of light propagating at a predetermined portion of said optical waveguide region, said first insertion region being constructed and arranged for

allowing an optical functional component to be inserted therein for performing a predetermined function; and a first optical connection region for changing a mode field width of light propagating therein, said first optical connection region having a first input/output terminal directly connected to one of said at least two input/output terminals of said optical waveguide region and a second input/output terminal directly connected to a first of said at least two input/output terminals of said first insertion region, a refractive index difference between a core and a cladding layer in said first optical connection region continuously decreasing in a direction from said first to said second input/output terminal thereof; and a second optical connection region having a first input/output terminal directly connected to a second of said at least two input/output terminals of said first insertion region and a second input/output terminal directly connected to an input/output terminal of a second insertion region,

wherein a refractive index difference between a core and a cladding layer in said second optical connection region is equal to a refractive index difference between a core and a cladding layer in said first insertion region to which said second optical connection region is connected, and smaller than a refractive index difference between a core and a cladding layer at a predetermined portion of said optical waveguide region.

5,438,641

# **OPTICAL FIBER COMPONENT CASSETTE WITH PIGTAIL TUBE ASSEMBLY**

Fabien Malacarne, Fontainebleau, France, assignor to Corning Incorporated, Corning, N.Y.

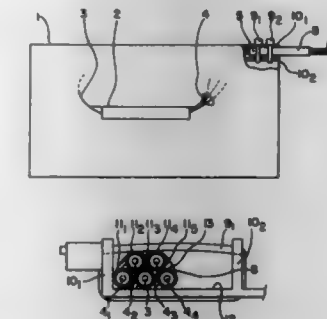
Filed Feb. 22, 1994, Ser. No. 199,084

Claims priority, application France, Mar. 26, 1993, 93 03523

Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385—137

8 Claims



1. A cassette for an optical fiber device equipped with a bundle (6) of flexible tubes (11) protecting fibers (3, 4) extending out of the cassette (1), and with means to attach an end of this bundle onto the cassette, characterized in that the cassette comprises a means (13) constituted by a hardened adhesive product filling the gaps between the tubes (11) to rigidify this end of the bundle of tubes following a stable geometrical configuration suitable for withstanding mechanical bending capable of generating curvature losses for optical signals transmitted through the fibers.

5,438,642

# **INSTANTANEOUS WATER HEATER**

Alan Posen, Littleton, Colo., assignor to Instantaneous Thermal Systems, Inc., Denver, Colo.

Filed Jul. 13, 1993, Ser. No. 90,316

Int. Cl.<sup>6</sup> F24H 1/10; H05B 1/02

U.S. Cl. 392—485

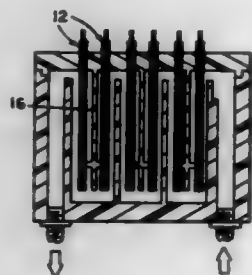
3 Claims

1. An instantaneous water heater including: a) a main body having an upper portion in which is provided



a plurality of vertically extending cylindrical chambers, each said chambers having a bottom and an open top, and said chambers aligned in a row, and said body including water inlet means for a first chamber of said row and water outlet means connected to a last chamber of said row; and

b) a cover plate, having a bottom surface, and mountable to said body upper portion to form a fluid-tight seal therewith, and said plate having a plurality of spaced-apart combination partition and heating means extending downwardly from said plate bottom, said combination means comprising a vertically elongated partition member having a lower edge, and a heating coil pair mounted to each of said members, one each of said coils secured to opposite



sides of each partition member, and whereby said cover plate has an installed position in which said combination means is received in one of said chambers whereby the partition member cooperates with said chamber to form a first channel for conducting a downward water flow, and an adjacent channel for conducting an upward water flow, one of said coil pair disposed in said first channel, and the other coil disposed in said second channel, and said member lower edge spaced from said chamber bottom to form a flow path between lowerparts of said channels, and the tops of said chambers spaced from the bottom of said cover plate to provide flow paths between a channel of one chamber and a channel of an adjacent chamber.

5,438,643

#### COMPRESSED DATA RECORDING AND/OR REPRODUCING APPARATUS AND SIGNAL PROCESSING METHOD

Kenzo Akagiri; Yoshiaki Oikawa, and Kyoya Tsutsui, all of Kanagawa, Japan, assignors to Sony Corporation, Japan  
Continuation of Ser. No. 902,586, Jun. 22, 1992, abandoned.  
This application Apr. 20, 1994, Ser. No. 230,303  
Claims priority, application Japan, Jun. 28, 1991, 3-184065; Jun. 28, 1991, 3-184066

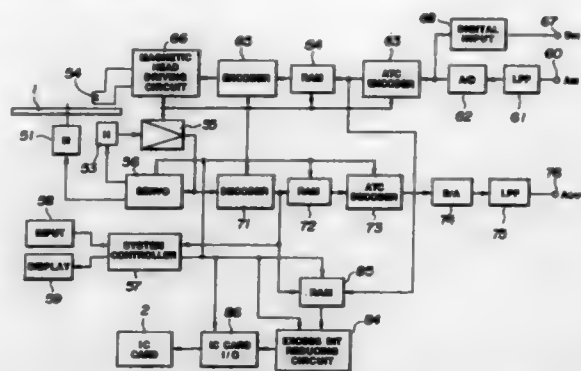
Int. Cl. G10L 3/02

U.S. Cl. 395-2.1

30 Claims

1. Apparatus for recording an information signal as bit-compressed digital data, the apparatus comprising:  
compressor means for receiving the information signal as digital data, the digital data including bits, the bits including redundant bits, and for compressing the digital data to generate the bit-compressed digital data at a variable bit rate, the compressor means removing only the redundant bits from the digital data, the redundant bits being bits that result in a quantizing noise level lower than an allowed noise level at which the quantizing noise is imperceptible to a human auditory sense, the allowable noise level being

determined by a masking threshold and a minimum audibility limit; and



recording means, receiving the bit-compressed digital data from the compressor means, for recording the bit-compressed data on a recording medium.

5,438,644

#### TRANSLATION OF A NEURAL NETWORK INTO A RULE-BASED EXPERT SYSTEM

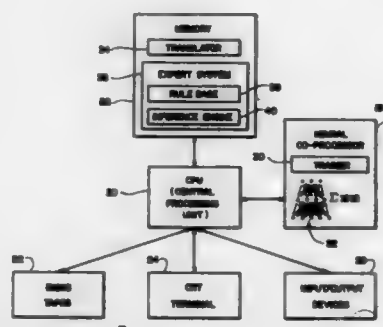
Li M. Fu, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Sep. 9, 1991, Ser. No. 757,040

Int. Cl. G06F 15/18

U.S. Cl. 395-22

18 Claims



1. A data processing system comprising:

a neural network having an input layer of input units, and different layers of processing elements including an output layer of output processing elements and at least one hidden layer of hidden processing elements;  
a translating means for translating knowledge in said neural network having an input layer of input units, and layers of processing elements including an output layer of output processing elements and at least one hidden layer of hidden processing elements, said translating means operable to translate knowledge in the outer layer and each hidden layer of the neural network into a corresponding layer set of rules, there being a corresponding layer set of rules for each of the outer layer and each hidden layer, and there being undefined hidden concepts embodied in the layer sets of rules;  
a rewriting means for rewriting rules from the layer sets of rules by reformulating rules from one layer of said layers of processing elements in terms of rules of another layer of said layers of processing elements to eliminate undefined hidden concepts and thereby generate a rewritten set of rules, the rewritten set of rules comprising rules in IF-THEN form; and a memory for receiving and storing the rewritten set of rules; and wherein said translation means and rewriting means are operably connected to said neural network.

5,438,645

#### NEURAL NETWORK WHICH USES A MONITOR

Shigeru Oyanagi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

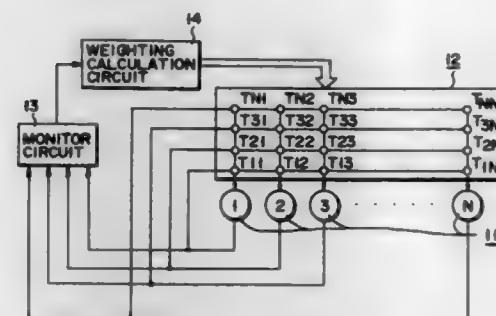
Filed Nov. 28, 1990, Ser. No. 618,884

Claims priority, application Japan, Nov. 28, 1989, 1-306510

Int. Cl. G06F 15/18

U.S. Cl. 395-24

15 Claims



1. A neural network applied to an optimization problem comprising:

a plurality of artificial neurons for outputting signals which respectively correspond to a plurality of input signals;  
a plurality of artificial synapses for setting weighting values which correspond respectively to each of said artificial neurons according to output signals which are output from said artificial neurons, and for respectively outputting said set weighting values to each of the corresponding artificial neurons;  
monitor means for determining whether said output signals satisfy a constrain condition which corresponds to a desired result to be output by said neurons when the output signals from said artificial neurons become substantially constant and for outputting a control signal if said output signals do not satisfy the constrain condition; and

weighting calculating means for changing weightings of said artificial synapses which respectively correspond to said artificial neurons in accordance with said control signal output from said monitor means whereby said monitor means outputs said control signal to said weighting calculating means if said output signals from said artificial neurons do not satisfy the constrain condition.

5,438,646

#### FEED-FORWARD NEURAL NETWORK

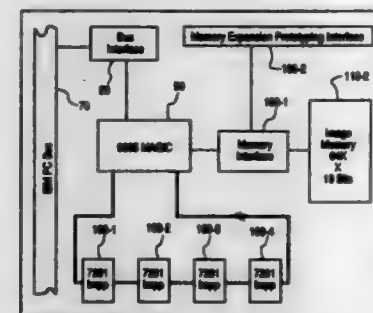
David Davidian, Cambridge, Mass., assignor to NEC Electronics, Inc., Mountain View, Calif.

Filed Aug. 19, 1992, Ser. No. 932,827

Int. Cl. G06F 15/18

U.S. Cl. 395-26

4 Claims



1. A device for performing pattern recognition comprising:  
a data flow processor;  
input means for inputting a set of data tokens into said data flow processor, each data token containing a data value;  
copy means, within said data flow processor, linked to said

input means receiving said set of data tokens for making multiple copies of said set of data tokens;

a plurality of weighting means, within said data flow processor, each linked to said copy means and receiving a copy of said set of data tokens for associating a predetermined weight value to each data value of said set of data tokens and for generating a weighted product of each of said data values with said predetermined weight value associated with each of said data values; and

a plurality of neuron means, within said data flow processor, each linked to one of said weighting means receiving therefrom said weighted products provided, for generating a sum of said weighted products by summing said weighted products, for determining within said data flow processor a first output value whenever said sum is greater than or equal to a predetermined threshold value, and for determining within said data flow processor a second output value whenever said sum is less than said predetermined threshold value, wherein each of said plurality of neuron means comprises

means for receiving said weighted products;  
summing means for receiving two values and for generating a partial sum, which is a sum of said two values, by summing said two values;

queue means receiving said partial sum and said weighted products for holding said partial sum and said weighted products received and for passing a first value and a second value to a summing means, said first value and said second value corresponding to the earliest two values held by the queue means;

convolving means for outputting a predetermined queue means element corresponding to a full neural sum;

comparing means receiving said full neural sum for reading said predetermined threshold value from a storage location and for generating a predetermined third output value based on the arithmetic difference between said full neural sum and said predetermined threshold value.

5,438,647

#### MULTI-MANIPULATOR ROBOT APPARATUS

Shigetaka Nagamatsu, Aichi; Takao Miyatani, Toyota, and Yisaki Sugiura, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

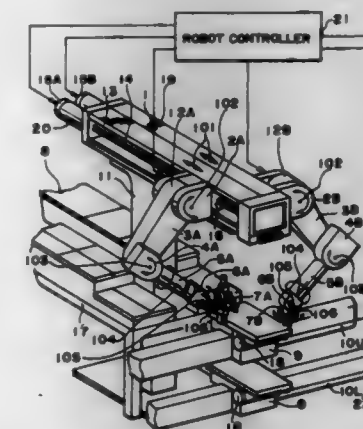
Continuation of Ser. No. 166,983, Dec. 15, 1993, which is a continuation of Ser. No. 865,272, Apr. 8, 1992, abandoned. This application Oct. 19, 1994, Ser. No. 325,645

Claims priority, application United Kingdom, Mar. 12, 1987, 705892

Int. Cl. G06F 15/20

U.S. Cl. 395-82

6 Claims



1. A multi-manipulator robot apparatus for assembling a part to a work conveyed along a conveyor line, the robot apparatus comprising:

at least one manipulator, each having a shoulder element, an arm pivotally connected to the shoulder element, an arm case pivotally connected to the arm, an arm tube connected to the arm case, a wrist case connected to the arm tube, and a hand portion connected to the wrist case;

a manipulator support extending longitudinally in a direction perpendicular to a longitudinal axis of the conveyor line and supporting the at least one manipulator so that said shoulder element of each said manipulator is slidable along the manipulator support and so that said arm extends in a plane perpendicular to said manipulator support, wherein the manipulator support defines a first axis extending in a horizontal direction perpendicular to the conveyor line and said shoulder element is movable along the first axis, wherein each manipulator has a second axis extending parallel to the first axis, said arm being pivotable about the second axis so as to swing in a vertical plane perpendicular to the first axis, and wherein each manipulator has a third axis extending parallel to the second axis, said arm case being pivotable about the third axis so as to swing in a vertical plane perpendicular to the first axis;

a manipulator driving device for driving each said manipulator horizontally in a direction perpendicular to the conveyor line along the manipulator support from one end portion of the manipulator support to another end portion of the manipulator support; and

a robot controller electrically connected to each said manipulator for operating each said manipulator and the manipulator driving device in harmony with each other.

5,438,648

## IMAGE INTERFACE DEVICE

Makoto Takaoka, Kawasaki, and Shigetada Kobayashi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 790,501, Nov. 12, 1991, abandoned.

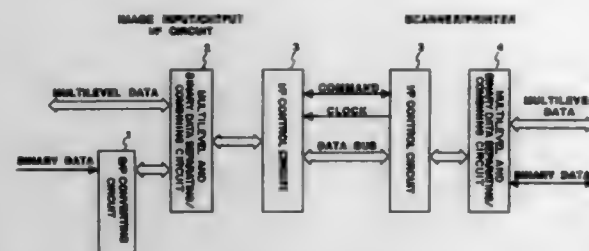
This application Oct. 17, 1994, Ser. No. 324,457

Claims priority, application Japan, Nov. 16, 1990, 2-308494

Int. Cl. G06F 15/00

U.S. Cl. 395—106

15 Claims



1. An image processing apparatus comprising:

- generating means for generating n-bit image data;
- processing means for processing the n-bit image data generated by said generating means and forming m-bit image data;
- outputting means for outputting the m-bit image data formed by said processing means; and
- image interface means for receiving and supplying n-bit image data from/to an external device.

wherein said image interface means further comprises:

- first interface means for receiving the n-bit image data from said generating means and the m-bit image data from said processing means and for supplying n-bit image data to said processing means and m-bit image data to said outputting means;
- second interface means for receiving the n-bit image data from the external device and for supplying the n-bit image data to the external device; and
- combination/separation means for combining the n-bit image data and the m-bit image data received by said first interface means so as to supply n-bit combined image data to the external device via said second inter-

face means, and for separating the n-bit image data received from the external device via said second interface means so as to provide n-bit image data and m-bit image data to said first interface means.

5,438,649

## COLOR PRINTING METHOD AND APPARATUS WHICH COMPENSATES FOR ABNEY EFFECT

Brigitte Ruetz, San Bruno, Calif., assignor to Canon Information Systems, Inc., Costa Mesa, Calif.

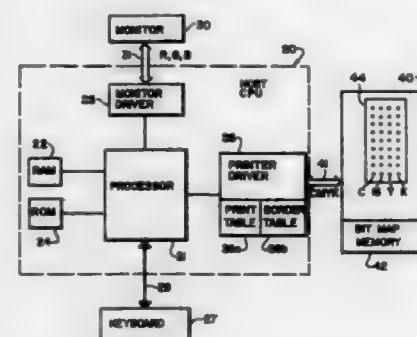
Continuation-in-part of Ser. No. 956,300, Oct. 5, 1992. This application Oct. 28, 1992, Ser. No. 967,050

Int. Cl. G06F 15/00

U.S. Cl. 395—109

43 Claims

## MICROFICHE APPENDIX INCLUDED (43 Microfiche, 1 Pages)



1. A color printer look-up table for providing color primary values corresponding to colors in device-independent color space, the color primary values having warped hue angles which compensate for the Abney effect.

5,438,650

## METHOD AND SYSTEM TO RECOGNIZE ENCODING TYPE IN DOCUMENT PROCESSING LANGUAGE

Tetsuo Motoyama, and Donny Tsay, both of San Jose, Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan and Ricoh Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 931,808, Aug. 11, 1992, which is a continuation-in-part of Ser. No. 876,601, Apr. 30, 1992, Pat. No. 5,319,748, and Ser. No. 876,251, Apr. 30, 1992, Pat. No. 5,325,484. This application Jan. 19, 1993, Ser. No. 6,416

Int. Cl. G06F 3/12

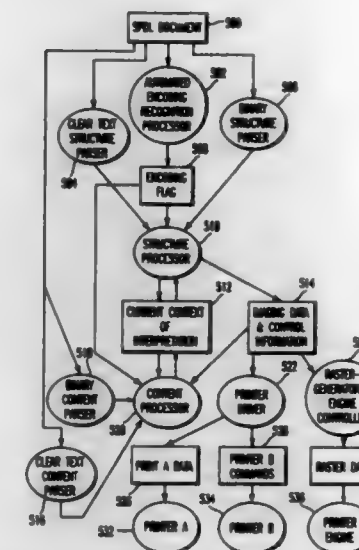
U.S. Cl. 395—114

32 Claims

17. A method for determining whether page description language commands are encoded in a binary or textual format, comprising the steps:

- processing said commands under the encoding of ISO/IEC 8825;
- determining if beginning tags of said commands contain an object identifier indicating that said command are encoded under a binary SPDL format, and if said commands are determined to be encoded under the binary SPDL format, terminating processing of said method;
- returning to a beginning of the commands, processing the commands under a textual encoding format and reading first and subsequent bytes of the commands until said bytes do not contain a byte selected from the group of bytes representing a Space, CR, LF, or Tab;
- determining if subsequent bytes contain a character string

indicating that said commands are encoded in a clear text SPDL format; and



if said command are determined not to be encoded in a clear text SPDL format or binary SPDL format, indicating that said commands are from a non-SPDL file.

5,438,651

## COLOR ADJUSTMENT FOR SMOOTHING A BOUNDARY BETWEEN COLOR IMAGES

Shoji Suzuki, Tadakazu Kusunoki, and Masahiro Mori, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

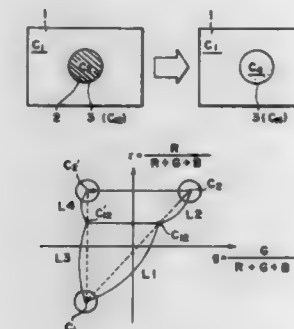
Filed Oct. 29, 1992, Ser. No. 968,078

Claims priority, application Japan, Oct. 30, 1991, 3-283478; Oct. 30, 1991, 3-283479; Jan. 28, 1992, 4-012732

Int. Cl. G06T 11/00

U.S. Cl. 395—131

12 Claims

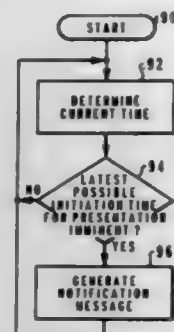






user stations enrolled therein, said data processing system comprising:

- means for automatically determining a period of time required to present a selected distribution to a user in response to a receipt of said selected distribution at a user station;
- means for determining a specified time for response to said selected distribution;



means for calculating a latest possible presentation initiation time which permits completion of presentation of said selected distribution to said user prior to said specified time for response to said selected distribution; and means for automatically generating and presenting a notification to said user within said data processing system prior to said calculated latest possible presentation initiation time wherein said user may efficiently respond to said distribution prior to said specified time.

5,438,659

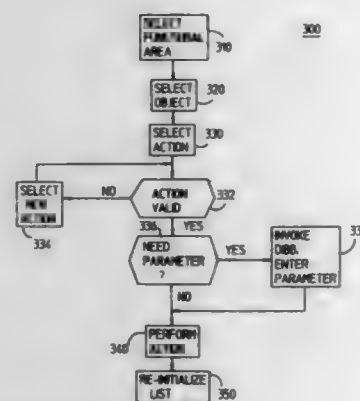
#### OBJECT-ACTION USER INTERFACE MANAGEMENT SYSTEM

Mark H. Notess, Ft. Collins; Scott J. Warren, Timnath; Tammy Heiserman, Ft. Collins, and Michael A. Kingdom, Loveland, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 8, 1992, Ser. No. 958,205  
Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—155

15 Claims



1. A computer system comprising: an object-action manager for building and operating a developer-defined user interface within predetermined parameters, the developer-defined user interface managing interaction between an end-user and an application created by a developer, the object-action manager further comprising parser means for reading a description file and creating data structures from the description file, the description file being created by the developer using a simple definition syntax, the parser means creates the data structures according to a late binding convention; object-list builder means connected to the parser means for defining an object-list interface screen according to

the predetermined parameters and the data structures created from the description file; dialog-box builder means connected to the parser means for defining a task dialog interface screen and a step menu interface screen, both according to the predetermined parameters and the data structures created from the description file; library means connected to the object-list builder means and the dialog-box builder means for storing and operating access functions used during operation of the developer-defined user interface; and display handler means connected to the object-list builder means, the dialog-box builder means and the library means, the display handler means for displaying at least one interface screen and managing interaction between the end-user and the application created by the developer.

5,438,660

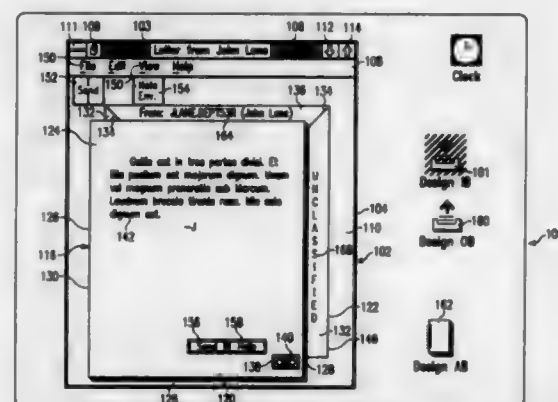
#### METHOD AND APPARATUS FOR INPUTTING ELECTRONIC MAIL

Raymond E. Lee, Irving, and Robert J. Torres, Colleyville, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 860,327, Mar. 30, 1992, abandoned.  
This application Nov. 15, 1994, Ser. No. 340,006  
Int. Cl.<sup>6</sup> G06F 15/60

U.S. Cl. 395—155

14 Claims



4. A data processing system computer user interface for writing, addressing and sending an electronic mail object, comprising:

- means for opening an electronic mail object;
- means for displaying a first view of the electronic mail object, said first view including a first rectangular data entry field bounded on two adjacent sides by a first displayed selection field, said first displayed selection field comprising two adjacent, non-overlapping, discrete rectangular selection fields;
- means for accepting entry of electronic mail text or other data input to the first rectangular data entry field;
- means for displaying, in the first rectangular data entry field, at least a portion of the electronic mail text or other data input to the first rectangular data entry field;
- means, responsive to a selection of either of the rectangular selection fields of the first displayed selection field, for displaying a second view of the electronic mail object, said second view including a second rectangular data entry field bounded on two adjacent sides by a second displayed selection field, said second displayed selection field comprising two adjacent, non-overlapping, discrete rectangular selection fields;
- means for accepting entry of destination information input to the second rectangular data entry field;
- means for displaying, in the second rectangular data entry

field, at least a portion of the destination information input to the second rectangular data entry field; means, responsive to a selection of either of the rectangular selection fields of the second displayed selection field, re-displaying, the first view of the electronic mail object; means for displaying, on the display, the second view of the electronic mail object, in response to a failed attempt to send the electronic mail object because of inadequate or erroneous destination information in the second rectangular data entry field of the electronic mail object; and means for transmitting the electronic mail object to a destination identified in the destination information in the second rectangular data entry field in response to a receipt of a send command.

5,438,661

#### VERSION MANAGEMENT METHOD AND APPARATUS IN MULTI-WINDOW ENVIRONMENT

Tomoya Ogawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 791,307, Nov. 14, 1991, abandoned.

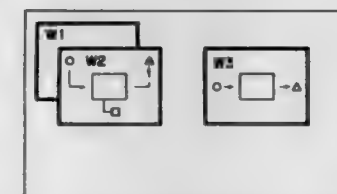
This application Sep. 23, 1994, Ser. No. 312,051

Claims priority, application Japan, Nov. 16, 1990, 2-311093

Int. Cl.<sup>6</sup> G06F 3/14

U.S. Cl. 395—157

28 Claims



W	W2	DIFFERENCE
W1	—	—
W2	W1	add O
		add Δ
		add □
W3	W1	add O
		add Δ

1. A version management method for performing management of a plurality of versions of a data file in a multi-window environment, comprising the steps of:

- displaying contents of the versions of the data file in windows on a display screen, the windows including a basic window for a major version and at least one derived window for at least one minor version derived from a parent window;
- retaining an identifier of the parent window and a differential operation history from the parent window with regard to each derived window in an operation history management table, the differential operation history detailing what and how changes were made in contents between the minor version corresponding to each derived window and a parent version corresponding to the parent window; and
- automatically updating corresponding contents of the operation history management table, when a new window for a new version is created as a derivative of one of the windows on the display screen and when an editing operation is performed in one of the windows, to modify the contents of the minor version corresponding thereto.

5,438,662

#### ELECTRONIC DISPLAY AND DATA PROCESSING APPARATUS FOR DISPLAYING TEXT AND GRAPHICS IN A RING BINDER REPRESENTATION

Stephen Randall, London, United Kingdom, assignor to Eden Group Limited, Rainow, United Kingdom

Continuation of Ser. No. 791,100, Nov. 12, 1991, abandoned.

This application Oct. 25, 1994, Ser. No. 328,538

Claims priority, application United Kingdom, Nov. 12, 1990, 9024526

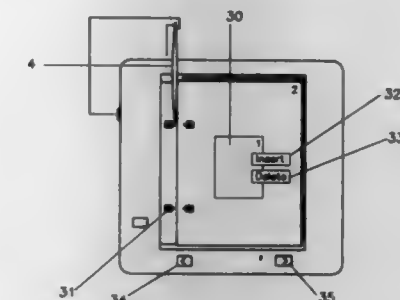
Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 395—161

17 Claims

16. An electronic display and data processing apparatus for

displaying a page of text or graphics and adapted to facilitate deleting or moving such a page of text or graphics, comprising: a computer that stores data and that generates control signals; and



a display controlled by the control signals to display a representation of a ring binder, including a least one ring and at least one page, the ring of the ring binder being selectable as a first step in deleting a page or moving a page whereby selecting the ring results in the ring appearing to be open to permit said page to be moved or deleted.

5,438,663

#### EXTERNAL INTERFACE FOR A HIGH PERFORMANCE GRAPHICS ADAPTER ALLOWING FOR GRAPHICS COMPATIBILITY

John F. Matsumoto, Encinitas, Calif., and Motoaki Ando, Tokyo, Japan, assignors to Toshiba America Information Systems, Irvine, Calif. and Kabushiki Kaisha Toshiba, Kawasaki, Japan

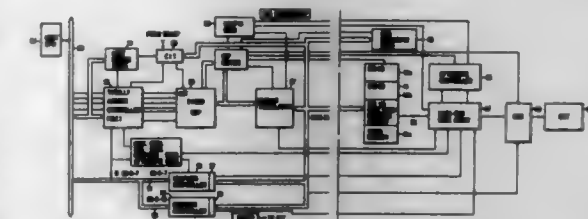
Continuation of Ser. No. 876,569, Apr. 30, 1992, abandoned.

This application Nov. 12, 1993, Ser. No. 150,779

Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 395—162

59 Claims



1. In a computer system comprising a host processor, a coprocessor, and memory at least partially addressable by both the host processor and the coprocessor through a common bus, an interface for interfacing an operating system operating on the host processor with the coprocessor, the interface comprising:

- a plurality of XGA registers for storing XGA control information;
- a hidden register undefined in XGA and VGA standards for storing translation state data, the hidden register being writable from the host processor only by executing a predetermined sequence of register instructions in the host processor to thereby unlock the hidden register;
- memory address translation means having inputs for receiving memory addresses generated by the operating system and outputs for providing translated memory addresses to the coprocessor, the memory address translation means the translating the received memory addresses into the translated memory addresses in response to the translation state data stored in the hidden register and to the XGA control information; and
- a graphics controller, coupled between said common bus and said memory, for receiving data elements generated



by the operating system from said common bus and storing them into said memory.

5,438,664

# METHOD AND APPARATUS FOR PRODUCING SLIPS OF VARIABLE LENGTH AND HAVING USER-DEFINED WORD NAMES AND ASSOCIATED WORD DATA THEREON

Toshio Kashi, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

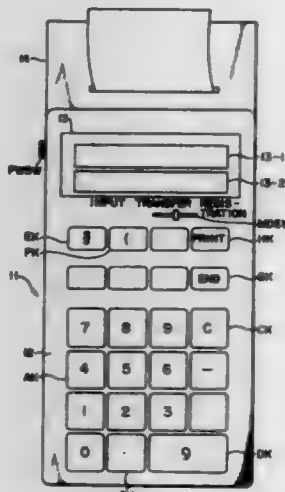
Continuation of Ser. No. 869,826, Apr. 15, 1992, abandoned, which is a continuation of Ser. No. 360,210, Jun. 1, 1989, abandoned. This application Sep. 23, 1993, Ser. No. 126,136

Claims priority, application Japan, Jul. 14, 1988, 63-175415; Jul. 14, 1988, 63-175434; Jul. 14, 1988, 63-175435; Jul. 14, 1988, 63-175436; Jul. 14, 1988, 63-175437; Jul. 14, 1988, 63-175438

Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 364-419.1

6 Claims



1. A slip defining and printing apparatus for defining a slip having an arbitrary number of words and printing the slip in accordance with the definition without a user programming, said apparatus comprising:

slip defining means for, in a slip defining mode, key-inputting by user a plurality of slip names and for key-inputting by user for each slip name a variable number of word names, said word names defining a slip identified by said slip name;

word name storage means for, in the slip defining mode, storing the slip name and the word names defined by said slip defining means in correspondence with the slip name;

slip designating means responsive to a user selection of a particular slip name for, in a slip data entry mode, activating a control means, to thereby read each word name in the slip corresponding to said selected particular slip name;

control means for reading out and displaying the respective word names of the slip corresponding to the selected particular slip name from said word name storage means; word data input means for, in the slip data entry mode, inputting the word data as a value for the respective read-out word names after the word names have been defined in the slip defining mode;

word data storage means for, in the slip data entry mode, storing the word data input by said word data input means; and

slip data print means for, in a print mode, printing, after all the word data have been input by said word data input means, the slip name, and an elongated slip in which the word names stored in said word name storage means corresponding to the slip name, and the word data read out from said word data storage means corresponding to

the word names are arranged in units of rows, the elongated slip being tailored to the number of word names.

5,438,665

# DIRECT MEMORY ACCESS CONTROLLER FOR HANDLING CYCLIC EXECUTION OF DATA TRANSFER IN ACCORDANCE WITH STORED TRANSFER CONTROL INFORMATION

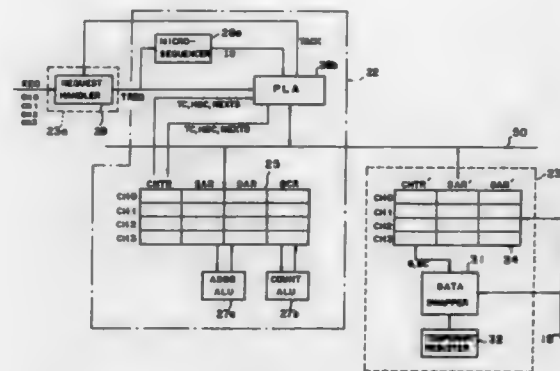
Takayoshi Tanai, Kawasaki; Yasuhiro Tanaka, Koshigaya, and Tadashi Saitoh, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 860,579, Mar. 30, 1992, abandoned, which is a continuation of Ser. No. 325,166, Mar. 17, 1989, abandoned. This application Feb. 1, 1994, Ser. No. 194,871

Claims priority, application Japan, Mar. 18, 1988, 63-66137 Int. Cl.<sup>6</sup> G06F 13/28

U.S. Cl. 395-845

12 Claims



- (a.) providing a first personal computer, comprising a first CPU, a first hard disk drive, from which data is desired to be copied, and a first parallel port;
- (b.) providing a second personal computer containing a second CPU, a second hard disk drive, onto which data is desired to be copied, and a second parallel port;
- (c.) connecting said first and second parallel ports together by a multi-strand cable;
- (d.) running a software process on said first CPU which reads out raw data from each respective individual sector of said first drive, compresses said raw data into substantially non-repeated bytes of compressed data, and transmits said compressed data through said first parallel port;
- (e.) running a software process on said second CPU which receives said compressed data through said second parallel port, decompresses said compressed data to reproduce said raw data, and writes said raw data into individual sectors of said second drive which exactly correspond to said respective sectors of said first drive; and
- (f.) continuing said steps (d.) and (e.), substantially simultaneously on said first and second CPUs, until substantially all of said first drive has been imaged onto said second drive.



5,438,672

# **MICROCONTROLLER EMULATOR FOR PLURAL DEVICE ARCHITECTURE CONFIGURED BY MODE CONTROL DATA AND OPERATED UNDER CONTROL CODE TRANSMITTED VIA SAME SWITCHING BUS**

Shankar Dey, San Jose, Calif., assignor to National Semiconductor Corporation, Del.

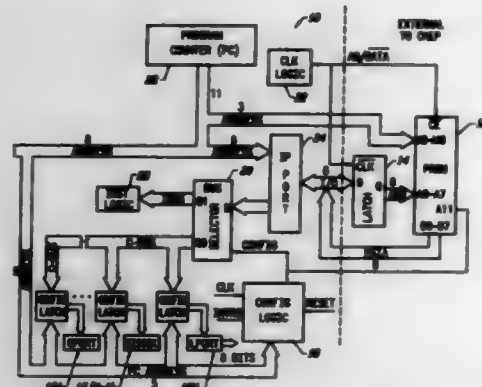
Continuation of Ser. No. 629,478, Dec. 18, 1990, abandoned.

This application Aug. 26, 1993, Ser. No. 113,526

Int. Cl. G06F 19/00

U.S. Cl. 395—500

3 Claims



1. An integrated configurable emulator circuit for emulating a microcontroller device architecture selected from a plurality of microcontroller device architectures, the configurable emulator circuit comprising:

- (a) a master microcontroller emulator comprising at least one functional block responsive to a function select input signal for setting the function of the functional block so that the functional block is configured to perform an integrated circuit function selected from a plurality of possible integrated circuit functions to be performed by the functional block, the master microcontroller emulator including means responsive to control code for executing the control code;
- (b) configuration mode assertion means responsive to an external input signal for asserting a configuration flag;
- (c) bus selector means, having a bus selector means input for receiving configuration data or control code and a configuration data output and a control code output, and responsive to the assertion of the configuration flag, for transferring configuration data provided at the bus selector means input to the configuration data output and for otherwise transferring control code provided at the bus selector means input to the master microcontroller emulator via the control code output; and
- (d) at least one configuration latch/decoder responsive to configuration data provided at the configuration data output for providing the function select input signal to the at least one functional block.

5,438,673

# **AUTOMATIC INTERFACE FOR CPU REAL MACHINE AND LOGIC SIMULATOR DIAGNOSTICS**

Thomas L. Court; Lawrence T. Hsu, and Alan Rivers, all of Eau Claire, Wis., assignors to Cray Research, Inc., Egan, Minn.

Continuation of Ser. No. 569,068, Aug. 17, 1990, abandoned.

This application Aug. 27, 1993, Ser. No. 113,724

Int. Cl. G06F 9/455

U.S. Cl. 395—500

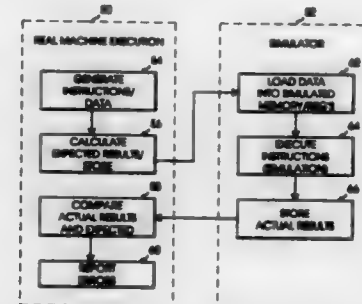
1 Claim

1. A computer implemented method of executing real-machine diagnostics in a software simulator, said real-machine diagnostics comprising a plurality of functions, said method comprising the steps of:

- a. executing program code in the computer to:
  1. identify those functions which can be run on the real-

machine and those which need to be run in the software simulator; and

2. insert a switch interrupt between functions which are to be run on the software simulator and functions which are to be run on the real-machine;
- b. executing those functions that must be run in the software simulator in the software simulator;
- c. executing at least some of those functions that may be run on the real-machine on the real-machine; and
- d. coordinating the functions executed between the real-machine and the simulator to provide a diagnostic check-out of the simulated system, wherein the step of coordinating includes the steps of:
  1. deadstarting a CPU being simulated so that the CPU begins executing a monitor code;
  2. completing a monitor initialization and exchanging to the diagnostic and executing the diagnostic;
  3. exchanging back to the monitor when a switch interrupt is encountered in the diagnostic;
  4. jumping to the switch interrupt handler routine when the monitor determines that the diagnostic is requesting that a switch to hardware mode be performed;



5. the switch interrupt handler saving the contents of desired CPU registers to a reserved area in memory, setting the switch flag and waiting for the hardware to take over and complete;
6. the simulator main driver (which is constantly monitoring the switch flag) initiating a switch when the simulator main driver detects that the switch flag is set;
7. beginning hardware execution of the diagnostic where the simulator left off, and continuing execution until execution reaches the address where execution runs to simulation mode;
8. copying the state of the hardware (memory and registers) back to the simulator memory image, and clearing the switch flag;
9. the simulator main driver resuming to simulation mode;
10. the switch interrupt handler detecting that the switch flag is cleared and resuming execution, restoring the saved-off registers and resuming control to the monitor; and
11. the monitor exchanging back to the diagnostic and continuing to execute from an address that the hardware left off.

5,438,674

# **OPTICAL DISK SYSTEM EMULATING MAGNETIC TAPE UNITS**

Richard V. Keele; Craig D. Mautner, both of San Diego; Tracy J. Thorpe, Encinitas; Sidney R. Thompson, San Diego, and Michael C. Goodsell, Chula Vista, all of Calif., assignors to Data/Ware Development, Inc., San Diego, Calif.

Continuation of Ser. No. 678,547, Mar. 23, 1991, abandoned, which is a continuation of Ser. No. 177,491, Apr. 5, 1988, abandoned. This application Jul. 1, 1994, Ser. No. 270,109

Int. Cl. G06F 5/00

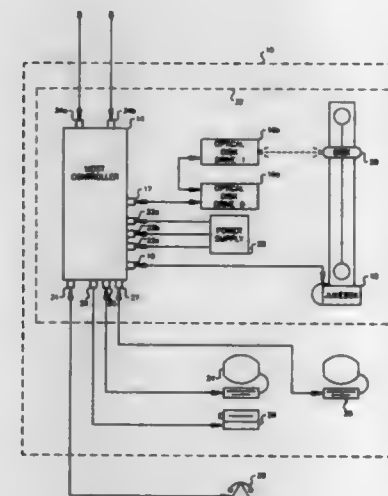
U.S. Cl. 395—404

27 Claims

1. A system for emulating a magnetic tape subsystem having and controlling a plurality of magnetic tape drives so as to read

to write magnetic tape data onto and from magnetic tapes, said magnetic tape subsystem connected to a channel communicating magnetic tape subsystem channel commands and magnetic tape data organized in channel data formats, said system being for the purposes of recording and reading virtual magnetic tape data on optical disks in response to said magnetic tape subsystem channel commands, said system comprising:

- an optical disk drive means responsive to optical disk drive commands, said optical disk drive means serving to record and to read said virtual magnetic tape data on said optical disks;
- a system memory means, connected to said channel and to said optical disk drive means and to a computer means, for buffering said virtual magnetic tape data bidirectionally between said computer means and said optical disk drive means;
- for buffering said magnetic data bidirectionally between said channel and said computer means; and
- for storing computer programs; and
- computer means, connected between said channel and said optical disk drive means and connected to said system memory means,
- for executing said computer programs stored in said system memory means,
- for receiving said channel commands from said channel,



for translating said channel commands into said optical disk drive commands,

for transmitting said optical disk drive commands to said optical disk drive means,

for receiving said magnetic tape data from said channel via buffering in said system memory means,

for organizing said magnetic tape data into said virtual magnetic tape data,

for transmitting said virtual magnetic tape data to said optical disk drive means via buffering in said system memory means,

for receiving said virtual magnetic tape data from said optical disk drive means via buffering in said system memory means,

for reorganizing said virtual magnetic tape data into said magnetic tape data, and

for transmitting said magnetic tape data to said channel via buffering in said system memory means;

wherein said computer means communicates through said channel within said channel data formats;

wherein said computer means accepts channel commands that are sufficient for said magnetic tape subsystem to control said plurality of magnetic tape drives to read and to write in order to, in response to said channel commands and instead of controlling said plurality of magnetic tape

drives, control said optical disk drive means to read and to write; and

wherein said optical disk drive means, said system memory means and said computer means, collectively emulate said magnetic tape subsystem.

5,438,675

# **INITIALIZATION SYSTEM FOR INPUT/OUTPUT PROCESSING UNITS**

Shuntaro Fujioke, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

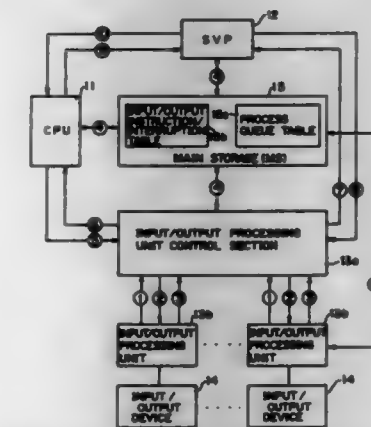
Continuation of Ser. No. 520,616, May 8, 1990, abandoned. This application Apr. 29, 1993, Ser. No. 80,284

Claims priority, application Japan, May 9, 1989, 1-115793

Int. Cl. G06F 11/267

U.S. Cl. 395—182.07

10 Claims



1. In a computer system including a central processing unit, a computer maintenance unit and an input/output processing section having input/output processing units each of which is associated with an input/output device, an initializing system for initializing said input/output processing units comprising:

request means for causing said input/output processing section to request said computer maintenance unit to acquire failure information when a failure occurs in one of the input/output processing units;

initialization means for causing said computer maintenance unit to initialize said one of the input/output processing units which failed after acquisition of the failure information; and

report means for causing said input/output processing section to report to said central processing unit termination of initialization of the one of said input/output processing units which failed, said input/output processing section informing the central processing unit of the failure, and said central processing unit issuing a reset instruction to said input/output processing section, and when the reset instruction is received by said input/output processing section before said computer maintenance unit transmits a reset command to said one of the input/output processing units, said input/output processing section not executing the reset instruction and not initializing said one of the input/output processing units responsive to the reset instruction.

5,438,676

# METHOD FOR ADAPTING A SIMILARITY FUNCTION FOR IDENTIFYING MISCLASSIFIED SOFTWARE OBJECTS

Robert W. Schwank, North Brunswick, N.J., assignor to Siemens Corporate Research, Inc., Princeton, N.J.

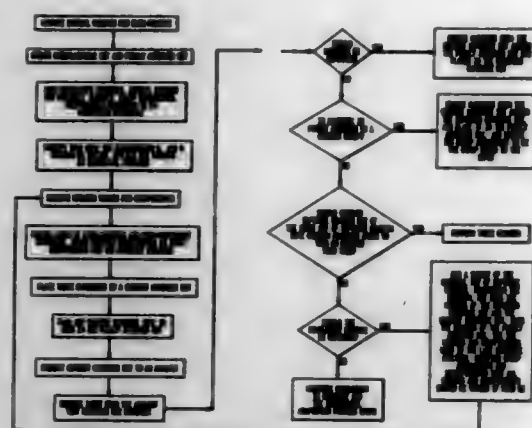
Continuation of Ser. No. 698,637, May 10, 1991, abandoned.

This application Jan. 4, 1993, Ser. No. 72,657

Int. Cl.<sup>6</sup> G06F 9/44

U.S. Cl. 395-650

5 Claims



1. A computer-implemented method for utilizing a similarity function coefficient estimation in a maverick analysis wherein said maverick analysis reoptimizes coefficients associated with said similarity function as mavericks associated with said maverick analysis are resolved, said similarity function receiving a set of software objects, a peer parameter K and a confidence parameter N, wherein said software objects are assigned to a group and are defined by features that encompass at least two software procedures, said method comprising the steps of:

- computing initial weights for each feature in accordance with a given criterion for estimating significance of said feature;
- creating an Unexplainable Set, initially empty;
- creating a Firmly Assigned Set, initially empty;
- passing, as parameters, said similarity function and said initial weights for each of said features to an estimation procedure, along with said set of software objects, and a parameter, wherein said parameter defines the number of software objects associated with at least one of said features;
- receiving, as output parameters, from said estimation procedure updated values for said coefficients of said similarity function;
- using as input parameters, said updated values for said coefficients, said peer parameter K, and said confidence parameter N for said Maverick analysis, to obtain lists of misclassified and poor-confidence mavericks, placing said misclassified and poor-confidence mavericks in a Current Maverick Set;
- outputting said Current Maverick Set while, flagging a current maverick that is also in said Firmly Assigned Set;
- analyzing said outputted Current Maverick Set, resolving one maverick to provide an approved set indicative of one of the following:
  - said one maverick should be deferred and removed from said Current Maverick Set and/or said Firmly Assigned Set and placed in a Deferred Maverick Set;
  - said one maverick is assigned a group assignment and removed from said Current Maverick Set and/or said Deferred Maverick Set, wherein said one maverick is placed in said Firmly Assigned Set, and said group assignment is updated to be the group named in said input;
  - certain software objects out of said input set of software objects should have features altered therein by said analyst;
  - said similarity function should be returned and said

weights of each of said features and said coefficients of said similarity function should be varied if need be and in this case, said estimation procedure is used again, wherein its inputs are: a subset of said set of software objects, comprising said set of software objects less said Deferred Maverick Set and said Current Maverick Set, plus said Firmly Assigned Set; said weights of each feature and said coefficients previously used and any modified group assignments as specified in step (h.2);

- going back to step (e), whereby said Maverick analysis is complete and said method of reoptimizing coefficients stops.

5,438,677

# MUTUAL EXCLUSION FOR COMPUTER SYSTEM

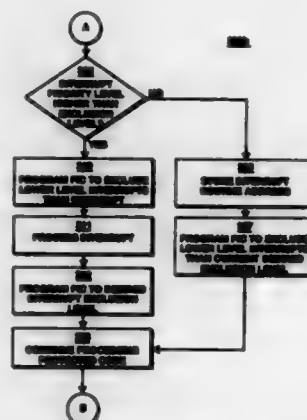
Robert T. Adams, Lake Oswego; Vincent R. Slynstad, Portland, and Seckin Unlu, Aloha, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 17, 1992, Ser. No. 931,928

Int. Cl.<sup>6</sup> G06F 9/46

U.S. Cl. 395-736

20 Claims



1. In a computer system comprising a central processing unit (CPU), a programmable interrupt controller (PIC) coupled to said CPU, a plurality of devices coupled to said CPU and said PIC, each of said devices having a different priority levels of interrupt, and an operating system for controlling the operation of said computer system a method of mutual exclusion for executing protected code in said computer system, said method comprising the following steps:

- storing a current exclusion level of said computer system as an old exclusion level;
- setting a desired exclusion level for the execution of said protected code in the operating system of said computer system as the current exclusion level;
- executing said protected code;
- if an interrupt occurs during the execution of said protected code, then determining whether the interrupt has a priority level higher than said current exclusion level;
- if said interrupt does not have a higher priority level than said current exclusion level, then performing the following steps:
  - programming said PIC to exclude interrupts having a lower priority than said current exclusion level;
  - storing an address of a first interrupt handling routine for said interrupt as a deferred interrupt;
- otherwise, if said interrupt has a higher priority level than said current exclusion level, then performing the following steps:
  - programming said PIC to exclude interrupts having a lower priority level than said interrupt;
  - calling a second interrupt handling routine to service said interrupt;
  - programming said PIC to exclude interrupts having a lower priority level than said current exclusion level;

- continuing to execute said protected code, and if an interrupt occurs during the execution of said protected code then determining whether the interrupt has a priority level higher than said current exclusion level and returning to step e;
- upon the completion of execution of said protected code, then determining whether a deferred interrupt has been stored, and if so, then calling the first interrupt handling routine to service said deferred interrupt;
- resetting the exclusion level in said operation system of said computer system to the old exclusion level;
- determining whether the PIC is excluding more interrupts than the old exclusion level; and
- if the PIC is excluding more interrupts than the old exclusion level then programming the PIC to exclude lower level interrupts than the old exclusion level.

5,438,679

# DATA STORAGE APPARATUS HAVING VOLATILE MEMORY AND NONVOLATILE MEMORY AND DATA INDICATION MEANS FOR INDICATING MEMORY STORING DATA

Shinichi Inomata, Higashiyama; Eiji Nakazawa, Akishima; Hisashi Miyata, Mitaka, and Toru Magihira, Hamura, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

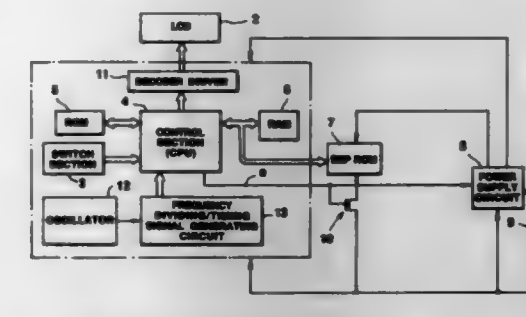
Filed Nov. 21, 1991, Ser. No. 796,549

Claims priority, application Japan, Nov. 30, 1990, 2-334526; Nov. 30, 1990, 2-334528; Dec. 13, 1990, 2-402066; Dec. 27, 1990, 2-402496 U; Dec. 27, 1990, 2-402497 U

Int. Cl.<sup>6</sup> G06F 9/24, 9/445, 12/06, 12/14

U.S. Cl. 395-800

28 Claims



- A data storage apparatus comprising: data input means for inputting data; volatile memory means capable of storing the data input by said data input means; nonvolatile memory means capable of storing the data input by said data input means; selection switch means for selecting one of said volatile memory means and said nonvolatile memory means in which the data input by said data input means is stored; storage control means for causing the memory means selected by said selection switch means to store the data input by said data input means; display means for reading out the data stored in one of said volatile and nonvolatile memory means, and for displaying the read-out data; indication means for indicating whether the data displayed by said display means is stored in said volatile or nonvolatile memory means; transfer means for transferring the data which is displayed by said display means and which is stored in said one of said volatile memory means and said nonvolatile memory means to another one of said volatile memory means and said nonvolatile memory means; count means for counting a number of times that the data is stored in said nonvolatile memory means; and storage count display means for displaying a number of storage operations counted by said count means.

# SELF-POWERED COMPUTER ACCESSORY DEVICE FOR POWER EXTRACTION FROM ATTACHED DATA SIGNALS AND METHOD OF OPERATING THEREOF

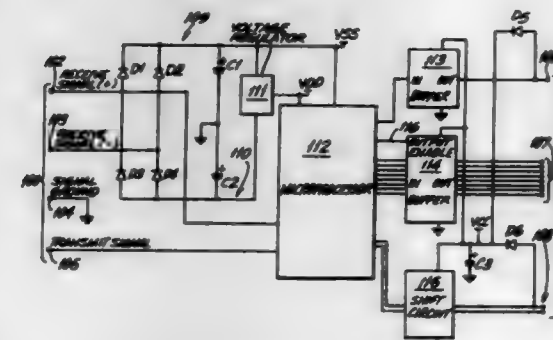
Peter L. Smith, 9-11 Enfield Avenue, Park Orchards, Victoria 3114, Australia

Filed Mar. 23, 1994, Ser. No. 35,934

Int. Cl.<sup>6</sup> G06F 1/32; H02M 7/00

U.S. Cl. 395-750

4 Claims



- A method for extracting operating power from attached signals in a self-powered computer accessory device including a serial data input port, a parallel data output port, a microprocessor between said input port and said output port, and an output buffer circuit, the method comprising the steps of full wave rectifying an incoming data signal input to said input port to generate positive and negative supply voltages to power said microprocessor; deriving supply voltages positive in respect to ground only from a peripheral device connected to said output port to drive said buffer circuit by said supply voltages; directly coupling data signals from said microprocessor to said output buffer circuit; providing in said device a power extract circuit and a level translation circuit each coupled to said buffer circuit; and controlling said output buffer circuit by said power extraction circuit and said level translation circuit so that virtually no power is consumed in driving data to the peripheral device.

5,438,680

# METHOD AND APPARATUS FOR ENHANCING CONCURRENCY IN A PARALLEL DIGITAL COMPUTER

Herbert W. Sullivan, La Jolla, Calif., assignor to Intellectual Properties and Technology, Inc., San Diego, Calif.

Continuation of Ser. No. 188,299, Apr. 29, 1988, abandoned.

This application May 3, 1993, Ser. No. 56,610

Int. Cl.<sup>6</sup> G06F 12/00, 15/16

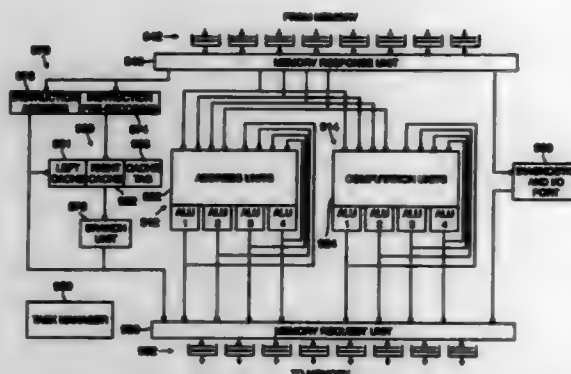
U.S. Cl. 395-650

34 Claims

- A computer system for processing a plurality of tasks with respect to a plurality of data items, at least some of said tasks being sequentially related, said system comprising: a main memory comprising a plurality of separately accessible memory units for the storage of said items; a plurality of independent processors generating requests for said items stored in said memory units, each of said independent processors further comprising:



means for processing runnable tasks which are assigned to a processor while other tasks assigned to said processor are waiting for items, said means for processing runnable tasks further comprising means for executing a task swap;  
means for identifying tasks which have become runnable as a result of said data items becoming available,

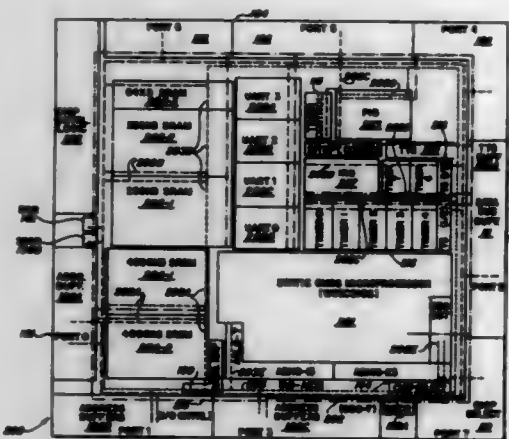


wherein at least one of said independent processors has a plurality of tasks assigned to it;  
a communications network permitting processors to communicate with and request items from said memory units; and  
wherein identifications of said tasks waiting for said items are stored in said memory units to be used for storage of said items.

5,438,681

**TOPOGRAPHY FOR CMOS MICROCOMPUTER**  
William D. Menach, Jr., 1924 E. Hope St., Mesa, Ariz. 85203  
Filed Aug. 24, 1993, Ser. No. 111,379  
Int. Cl.<sup>6</sup> G06F 1/06, 1/08, 15/20, 1/18  
U.S. Cl. 395—800

8 Claims



1. A CMOS integrated circuit microcomputer including first, second, third, and fourth successive edges, the microcomputer comprising in combination:

- a microprocessor including (i) address output buffer means located along a lower left edge and a bottom edge of the microprocessor, (ii) data bus buffer means located along a right edge of the microprocessor, and (iii) interrupt circuitry located in an upper right portion of the microprocessor;
- a plurality of low order address buffer circuits located along a lower part of the first edge;
- a plurality of high order address buffer circuits located along a left and middle part of the second edge, coupled to

and adjacent to the address buffer means of the microprocessor;

- chip selection output circuitry located in a corner portion of the microcomputer bounded by a right part of the second edge and a lower part of the third edge;
- a plurality of data bus buffer circuits located along a middle part of the third edge;
- ROM circuitry located in a lower left portion of the microcomputer adjacent to the low order address buffer circuits and the high order address buffer circuits, the microprocessor being located in the lower middle right portion of the microcomputer between the ROM circuitry and the data bus buffer circuits, and adjacent to and above a portion of the high order address buffer circuits;
- RAM circuitry located directly above the ROM circuitry;
- a first group of interface circuits disposed between the fourth edge and the RAM circuitry;
- a plurality of I/O interface circuits located along the first, second, third, and fourth edges among the low order and high order address buffer circuits, the data bus buffer circuits, and the first group of interface circuits, and multiplexed with a plurality of external terminals, respectively, of the low order and high order address buffer circuits, the data bus buffer circuits, and the first group of interface circuits;
- a plurality of UARTs, a plurality of timers, a parallel interface bus circuit, a tone generator circuit, and an interrupt controller located above the microprocessor between the RAM circuitry and the data bus buffers, the interrupt controller being surrounded by the UARTs, the timers, and the parallel interface bus circuit; and
- chip control circuitry located along an upper part of the first edge operatively coupling the microprocessor to the RAM circuitry and to the ROM circuitry, the first group of interface circuits, the chip selection output circuitry, the high and low order address buffer circuits, the data bus buffer circuits, the timers, and the I/O interface circuits.

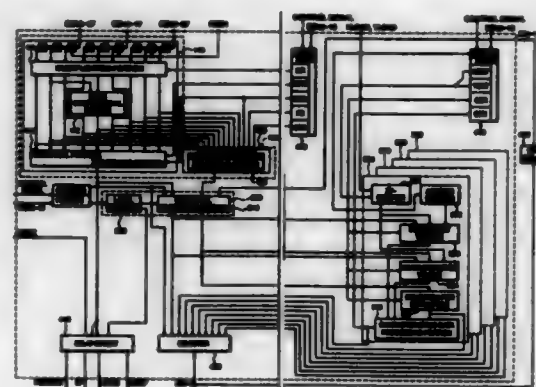
5,438,682

**DATA PROCESSING SYSTEM FOR REWRITING PARALLEL PROCESSOR OUTPUT DATA USING A SEQUENTIAL PROCESSOR**

Ryohel Kumagai, Tokyo, Japan, assignor to Yozan Inc., Tokyo, Japan  
Continuation of Ser. No. 114,236, Sep. 1, 1993, abandoned, which is a continuation of Ser. No. 596,023, Oct. 11, 1990, abandoned. This application Aug. 26, 1994, Ser. No. 297,110  
Claims priority, application Japan, Sep. 7, 1990, 2-235687  
Int. Cl.<sup>6</sup> G06F 15/76; G06T 1/00

U.S. Cl. 395—900

6 Claims



1. A data processing system for rewriting processed data comprising:

a data inputting terminal which receives inputted digital data;

computational means for performing parallel processing on said inputted digital data, said parallel-processed data including numerical data and characteristic data, said computational means including numerical computational means for computing numerical computations on said inputted digital data and for outputting said computed numerical data, and characteristics information extracting means separate from the numerical computational means for performing computations on said inputted digital data to obtain characteristic data and for outputting said characteristic data, said characteristic data being indicative of relationships between neighboring bits of said inputted digital data;

a sequential processing data inputting terminal which receives said parallel-processed numerical data and characteristic data from said computational means;

sequential processing means, connected to said sequential processing data inputting terminal, for performing sequential processing on said parallel-processed numerical data and characteristic data and outputting a corresponding sequential result, thereby rewriting said digital data parallel-processed by said computational means;

a plurality of information compression means, each of which is separate from the computational means and the numerical computational means and is connected to said computational means, for extracting characteristics values from said characteristic data and outputting said characteristics values;

selector means, connected to said computational means, said sequential means and said plurality of information compression means, for selecting one of said output of said computational means, said sequential processing means, and said information compression means; and  
an output terminal for outputting said output selected by said selector means.

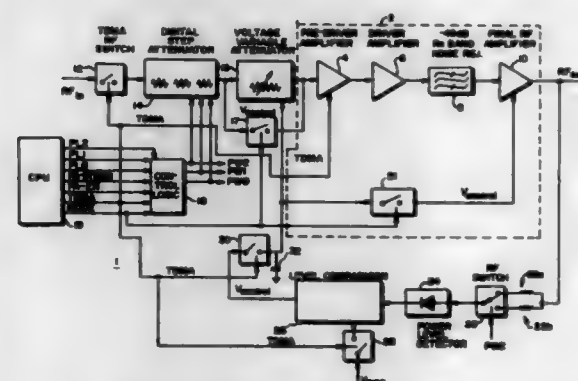
5,438,683

**AUTOMATIC LEVEL CONTROL CIRCUIT FOR DUAL MODE ANALOG/DIGITAL CELLULAR TELEPHONE**

Willem G. Durtler, Calgary, Canada; Kiomars Anvari, Walnut Creek, Calif., and Chih C. Tsien, Calgary, Canada, assignors to NovAtel Communications, Ltd., Calgary, Canada  
Continuation of Ser. No. 844,132, Mar. 2, 1992, abandoned. This application Sep. 19, 1994, Ser. No. 308,636  
Int. Cl.<sup>6</sup> H04G 1/40; H03G 3/12, 3/20

U.S. Cl. 455—74

11 Claims



1. In a cellular telephone transceiver, a radio frequency amplifier for amplifying either an analog input signal or a digital input signal, said radio frequency amplifier comprising:  
a variable attenuator, responsive to a power control signal, for receiving and attenuating digital associated signals associated with the digital input signal to produce an attenuated signal and passing the attenuated signal to a controllable-gain amplifier during a first mode of operation,

said controllable-gain amplifier amplifying said attenuated signal to produce an amplifier output signal associated with said digital input signal;

switching means for allowing analog associated signals associated with the analog input signal to bypass said variable attenuator and for applying said power control signal to said controllable-gain amplifier during a second mode of operation said controllable-gain amplifier producing an amplifier output signal associated with said analog input signal;

a detector connected to receive the amplifier output signal produced by said controllable-gain amplifier and responsively produce a detected signal indicative of the power level of the amplifier output signal;

means for comparing the detected signal to a preselected reference signal and responsively producing said power control signal such that said power control signal is indicative of a difference between said detected signal and said reference signal;

control means, responsive to an operating mode signal, for alternately storing the power control signal and applying the power control signal to the variable attenuator during the first mode of operation; and

means for producing said operating mode signal.

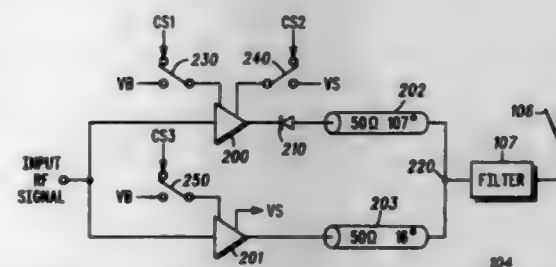
5,438,684

**RADIO FREQUENCY SIGNAL POWER AMPLIFIER COMBINING NETWORK**

Dale G. Schwent, Hoffman Estates; Rashid M. Osmani, Carol Stream, and Robert N. Weisschappel, Barrington, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.  
Continuation of Ser. No. 850,614, Mar. 13, 1992, abandoned. This application Mar. 10, 1994, Ser. No. 209,697  
Int. Cl.<sup>6</sup> H04B 1/04

U.S. Cl. 455—89

9 Claims



1. A radio frequency (RF) signal power amplifier combining network responsive to a control signal for operation in a linear mode or a saturation mode, said RF signal power amplifier combining network comprising:

- a first amplifier for amplifying a first RF signal in the linear mode;
- a second amplifier for amplifying a second RF signal in the saturation mode, the second amplifier coupled to the first amplifier in an electrically parallel configuration;
- first and second output transmission lines coupled to the first and second amplifiers, respectively;
- a common node that couples the first and second output transmission lines; and
- a switch in series with at least one of the first and second output transmission lines and responsive to the control signal for coupling or decoupling the corresponding one of the first and second amplifiers and the common node.

5,438,685

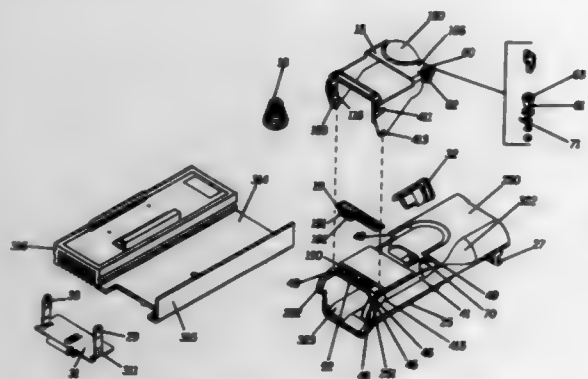
## VEHICULAR ADAPTER POCKET AND HANDLE ASSEMBLY

Robert L. Sorensen, Sunrise; Samandar V. Houseni, Ft. Lauderdale; Faris S. Habbaba, Boca Raton; Craig A. Bartling, North Lauderdale; and Jorge L. Garcia, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 26, 1993, Ser. No. 157,558  
Int. Cl.<sup>6</sup> H04B 1/03, 1/08

U.S. Cl. 455—90

8 Claims



6. A converter console for converting to mobile operation a portable radio, the converter console comprising:

- a housing;
- a four-bar linkage having a portable radio receiving pocket as one of the bars;
- a pair of guideways formed in the pocket including a generally horizontal section and having the four-bar linkage movably engaged therein for generally pivotal movement of the pocket, the generally horizontal section of the guideways each having a lower curvilinear end which defines a loaded position for the pocket wherein the portable radio positioned within the pocket is mated with the housing, and the horizontal section having an upper end which defines an unloaded position wherein the portable radio is easily removable from the pocket; and
- a spring positioned between the housing and the pocket for biasing the pocket toward the unloaded position.

5,438,686

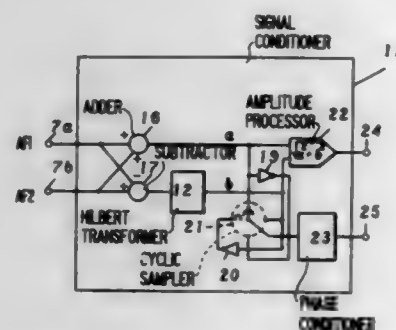
AMPLITUDE-MODULATED BROADCAST TRANSMITTER FOR VARIOUS TYPES OF MODULATION, IN PARTICULAR DSB, SSB AND ISB  
Patrick Gehri, Birr, and Nenad Tomljenovic, Nussbaumen, both of Switzerland, assignors to Thomcast AG, Turgi, Switzerland  
Filed Mar. 3, 1993, Ser. No. 25,657

Claims priority, application Germany, Mar. 27, 1992, 42 10 069.0

Int. Cl.<sup>6</sup> H04B 1/04

U.S. Cl. 455—102

12 Claims



1. An amplitude modulated broadcast transmitter (1) for providing various types of modulation, including DSB (double

sideband), SSB (single sideband) and ISB (independent sideband), comprising:

- a) a signal input (2) for transmitting at least one audio frequency signal;
- b) a signal conditioner (11) having first and second input channels and two outputs, the input channels of the signal conditioner being connected to the signal input, and at a first output (24) of the signal conditioner an amplitude signal is output and at a second output (25) a phase signal is output;
- c) a direct-voltage-coupled power amplifier (9), arranged after the first output, for amplifying the amplitude signal;
- d) a phase conditioner (10), arranged after the second output, for processing the phase signal; and
- e) an output stage with a transmitting tube (5) which exhibits an anode (4) and at least one control grid (3), an output of the power amplifier being connected to the anode (4) and an output of the phase conditioner being connected to the at least one control grid (3);

wherein

- f) the signal conditioner (11) comprises
  - aa) an adder (16) and a subtractor (17) which form a sum and a difference of the input channels (7a, 7b);
  - bb) a Hilbert transformer (12), an input of which is connected to an output of the adder (16) and wherein said Hilbert transformer subjects the sum to a Hilbert transformation;
  - cc) two inverters (19, 20) having inputs which are connected to outputs (a, b) of the subtractor (17) and the Hilbert transformer (12) respectively and wherein said two inverters (19, 20) invert a sign of signals present at their inputs;
  - dd) a cyclic sampler (21) which cyclically samples outputs of the inverters (19, 20) and the outputs of the subtractor (17) and the Hilbert transformer (12) in a particular sequence;
  - ee) a phase conditioner (23), an input of which is connected to an output of the cyclic sampler (21), an output of the phase conditioner of the signal conditioner (11) being connected to the second output (25) of the signal conditioner (11), and wherein said phase conditioner of the signal conditioner (11) generates a phase signal from the samples of the cyclic sampler;
  - ff) an amplitude processor (22) which is connected with its two inputs to the outputs of the subtractor (17) and of the Hilbert transformer (12) for squaring the output signals (a, b) of the subtractor (17) and the Hilbert transformer (12), adding them, taking a square root of the summation of the squared input signals and outputting the square root of the summation as an output signal to its output which is connected to the first output (24) of the signal conditioner (11); and
  - g) the type of modulation being determined by allocating a plurality of audio frequency signals (AF1, AF2) to be transmitted in a particular manner to the two input channels (7a, 7b) of the signal conditioner.

5,438,687

## SYSTEM FOR SELECTING ROUTE-RELEVANT INFORMATION WHEN USING THE RADIO DATA SYSTEM (RDS)

Wadym Suchowskyj, Hildesheim; Jürgen Kaesser, Diekhofen, and Peter Braegas, Hildesheim, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany  
Filed Jul. 29, 1993, Ser. No. 99,165

Claims priority, application Germany, Sep. 10, 1992, 42 30 294.3

Int. Cl.<sup>6</sup> A04B 17/02; G08G 1/09

U.S. Cl. 455—158.4

13 Claims

1. In a radio system for receiving traffic bulletins which include a code identifying a location to which each bulletin relates, comprising

- a mobile radio receiver (1, 9, 10);

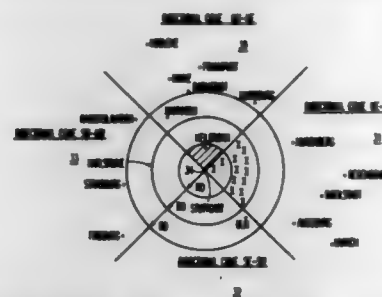
computer means (4, 5, 6) for determining current location (34) of said receiver and for processing said traffic bulletins;

manual actuation means (8) for input of criteria for selection among bulletins received by said receiver; and

means (7, 9, 10, 11), coupled to an output of said computer means, for indicating selected bulletins to a user,

the improvement wherein

said manual actuation means has a plurality of actuation



zones (15, 16, 17, 18), each of which is associated with a respective conical area or set of traffic bulletin locations (30, 31, 32, 33), extending outward from an apex (34) at said receiver location; and

said computer means is responsive to actuation of one of said actuation zones (15, 16, 17, 18) to selectively output, via said indicating means, traffic bulletins whose location code identifies a location falling within the conical area (30, 31, 32, 33) associated with the actuation zone which was actuated.

5,438,688

CHANNEL SELECTING METHOD AND HIGH SPEED SCANNING RADIO RECEIVER WHICH CONCURRENTLY SCANS MULTIPLE CHANNELS  
Tateo Masaki, Ichikawa, Japan, assignor to Uniden Corporation, Chiba, Japan

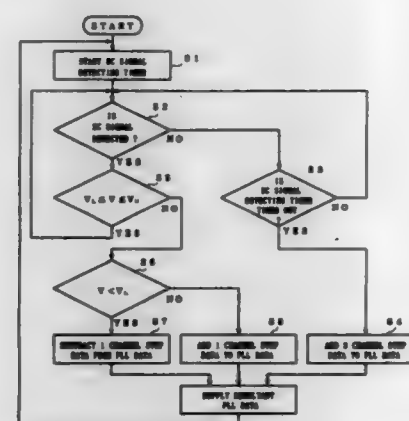
Filed Dec. 6, 1993, Ser. No. 163,038

Claims priority, application Japan, Jun. 2, 1993, 5-131855

Int. Cl.<sup>6</sup> H04B 17/02

U.S. Cl. 455—161.2

10 Claims



1. A channel-selecting method of a radio receiver for scanning a plurality of channels separated from each other by a predetermined frequency, comprising the steps of:

- producing an oscillating frequency signal;
- scanning said plurality of channels by changing said oscillating frequency signal in frequency, in increments corresponding to a multiple of said predetermined frequency;
- mixing a received signal with said oscillating frequency signal during a searching operation of a certain channel, corresponding to the frequency of the oscillating fre-

quency signal, to convert said received signal into an intermediate frequency signal;

converting a change in frequency of said intermediate frequency signal into a change in a voltage signal;

detecting whether or not a desired reception signal is present in multiple channels, including the certain channel, based on the change in said voltage signal; and

stopping the scanning step upon detection of said desired reception signal, and determining at which channel of the multiple channels the scanning step is stopped responsive to said voltage signal.

5,438,689

RADIO RECEIVER FOR A VEHICLE HAVING IMPROVED AUDIBILITY FOR SPEECH  
Hans-Jürgen Kluth, VS-Villingen, Germany, assignor to Deutsche Thomson Brandt GmbH, Villingen-Schwenningen, Germany

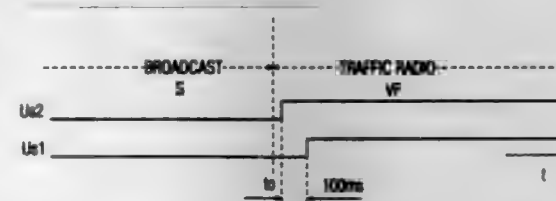
Filed Aug. 24, 1992, Ser. No. 585,111

Claims priority, application Germany, Feb. 22, 1988, 38 05 457.4

Int. Cl.<sup>6</sup> H04B 1/16

U.S. Cl. 455—267

5 Claims



1. A radio receiver for a vehicle having audio volume control, and bass and treble tone controls, the radio receiver comprising:

means for switching-over of the audio volume to a preset value in response to an identification signal transmitted in connection with a traffic radio announcement, and

means for switching-over the tone control settings to a preset value in response to the identification signal transmitted in connection with the traffic radio announcement, said means for switching-over the tone control settings including means for the tone control switch-over being accomplished prior in time to the volume switch-over.

5,438,690

## TUNER CIRCUIT SUBSTRATE HAVING A JACK ATTACHMENT PLATE ELECTRICALLY CONNECTED WITH AN EARTH PATTERN

Masami Tsukuda, Yokohama, Japan, assignor to Shintom Co., Ltd., Kanagawa, Japan

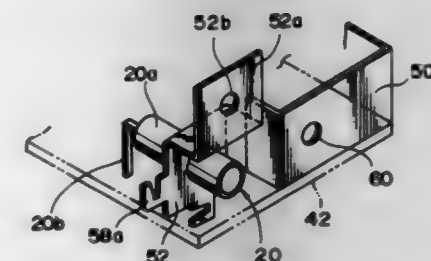
Filed Oct. 27, 1993, Ser. No. 141,617

Claims priority, application Japan, Oct. 30, 1992, 4-316038

Int. Cl.<sup>6</sup> H04B 1/10

U.S. Cl. 455—300

19 Claims



1. A tuner for converting antenna input signals into audio signals, comprising:

- (a) a tuner circuit substrate having an earth pattern and



various signal patterns including an antenna input signal pattern;

- (b) tuner circuit components supported on said tuner circuit substrate and connected to the earth and signal patterns, said tuner circuit components including FM wave front end circuit components mounted on said tuner circuit substrate;
- (c) a signal input/output connector supported on said tuner circuit substrate;
- (d) a shield case set to an earth potential via a chassis and connected to the earth pattern, said shield case fixed to said tuner circuit substrate to surround said FM wave front end circuit components, said front end circuit components comprising a high-frequency amplifying circuit, a mixing circuit and a local oscillating circuit;
- (e) an antenna jack having an earth tube and a signal terminal insulated from said earth tube, the signal terminal being connected to the antenna input signal pattern of said tuner circuit substrate; and
- (f) a jack attachment plate contacting said shield case and supporting said earth tube of said antenna jack to form an electrical connection among said earth tube, said shield case and said earth pattern of said tuner circuit substrate.

5,438,691

# RECEIVER USING A PLURALITY OF AMPLIFIERS AND ANALOG-TO-DIGITAL CONVERTERS FOR DEMODULATING AND DECODING A SIGNAL

Hiroyasu Muto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

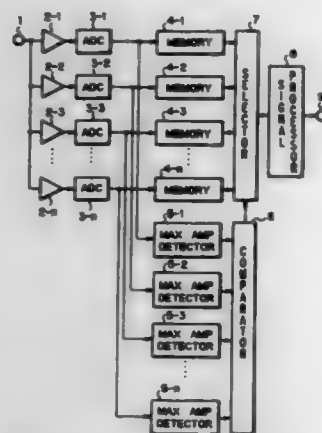
Filed May 26, 1994, Ser. No. 249,220

Claims priority, application Japan, May 27, 1993, 5-126108

Int. Cl.<sup>6</sup> H04B 1/16

U.S. Cl. 455-309

2 Claims



1. A receiver for demodulating and decoding a signal, which is received in an environment causing an input signal strength to change every moment, by converting said signal to a digital value with accuracy great enough for demodulation without changing a characteristic of a transmission path, said receiver comprising:

- a plurality of amplifiers each having a particular amplification factor for amplifying the signal;
- a plurality of analog-to-digital converters (ADCs) respectively connected to said plurality of amplifiers for converting outputs of said amplifiers to digital values;
- a plurality of memories respectively connected to said plurality of ADCs for storing the digital values;
- a plurality of maximum amplitude detectors respectively connected to said plurality of ADCs for detecting maximum amplitudes of the digital values;
- a comparator for comparing the maximum amplitudes output from said plurality of maximum amplitude detectors with a positive and a negative saturation level;
- a selector responsive to a control signal from said compara-

tor for selecting and outputting one of the digital values stored in said plurality of memories; and  
a signal processor for demodulating and decoding the signal on the basis of the digital value fed from said selector.

5,438,692

# DIRECT CONVERSION RECEIVER

Rishi Mohindra, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

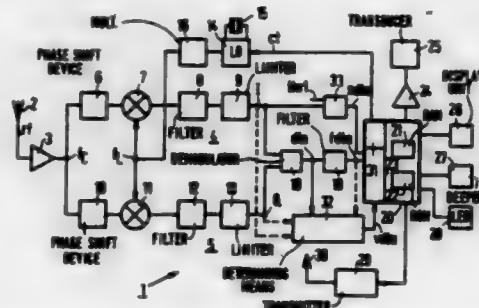
Filed Oct. 7, 1993, Ser. No. 133,546

Claims priority, application European Pat. Off., Nov. 26, 1992, 92203648

Int. Cl.<sup>6</sup> H04B 1/26

U.S. Cl. 455-324

20 Claims



1. A direct conversion receiver comprising a local frequency generating arrangement which is coupled to a pair of quadrature related mixers for mixing down a radio frequency input signal (rf) to derive quadrature related signals (I, Q), a demodulator for demodulating the quadrature related signals into demodulated data (dta), and automatic frequency control (a.f.c.) means for providing a control signal (ct) for the local frequency generating arrangement, the a.f.c. means being coupled to quadrature paths; characterized in that the a.f.c. means comprise a digital-to-analog conversion arrangement for providing the control signal (ct), signal quality determining means for determining a valid data signal (vdta) from the demodulated data (dta), storage means for storing a valid data range (VR) during data scanning intervals, and means for adjusting an output signal of the digital-to-analog conversion arrangement to an adjustment value within the valid data range (VR).

5,438,693

# R. F. MIXER

Ian F. Cox, Old Harlow, United Kingdom, assignor to GEC-Marconi Limited, Middlesex, United Kingdom

Continuation of Ser. No. 992,638, Dec. 18, 1992, abandoned.

This application Nov. 8, 1994, Ser. No. 338,792

Claims priority, application United Kingdom, Dec. 24, 1991, 9127359

Int. Cl.<sup>6</sup> H04B 1/28

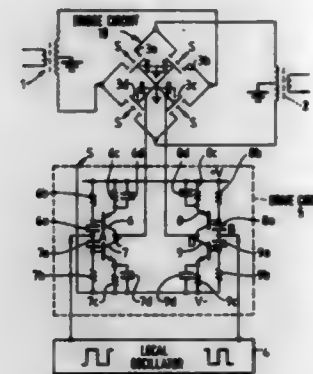
U.S. Cl. 455-333

8 Claims

1. A mixer for changing the frequency of an r.f. signal applied to an input means to an output signal of a different frequency at an output means, comprising  
a pair of insulated gate FET switching devices each having a gate electrode with an associated capacitance, said switching devices connecting the input means to the output means;  
a local oscillator for generating antiphase signals at a predetermined frequency; and  
a drive circuit for generating pulse waveforms in response to said antiphase signals to drive said gate electrodes, the duration of the pulse waveforms being shorter than the duration of a half-cycle of the local oscillator, said drive circuit including  
a pair of transistors, associated with each switching device, each transistor including a control electrode and

an output electrode, the output electrodes of said pair being coupled to the gate electrode of said associated switching device; and

a differentiating circuit, associated with each transistor, each comprising a series capacitor coupled at one end to said local oscillator and at the other end both to the control electrode of said associated transistor and to one



end of a resistive means, the other end of said resistive means being coupled to a reference potential, the pulse waveforms generated by said drive circuit repetitively charging and discharging the capacitance of the gate electrodes of said switching devices between different potentials to switch said switching devices on and off at the frequency of said local oscillator.

5,438,694

# DISTORTION COMPENSATION FOR A PULSEWIDTH-MODULATED CIRCUIT

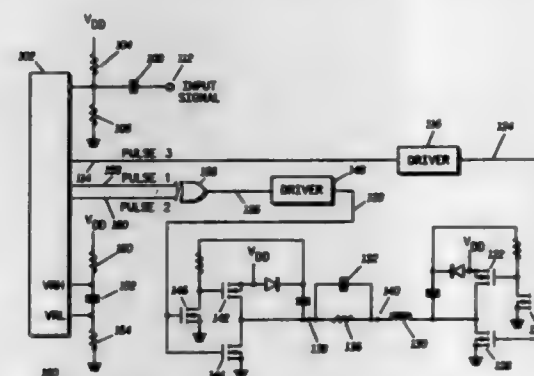
David L. Muri, Sunrise, and Robert E. Stengel, Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 9, 1993, Ser. No. 103,374

Int. Cl.<sup>6</sup> H03F 3/38

U.S. Cl. 455-341

12 Claims



1. A pulsewidth-modulated amplifier, comprising:  
an input terminal for receiving a variable input signal; and  
controller means responsive to the variable input signal for providing a distortion compensated pulsewidth-modulated signal corresponding to the variable input signal, the controller means includes means for sampling the variable input signal and includes conversion means for providing a corresponding distortion compensated pulsewidth-modulated signal.

5,438,695

# RADIO-LINK CONTINUITY KEEPING EQUIPMENT IN CELLULAR TELEPHONE MOBILE STATION

Kazuo Morimura, and Yuichi Fujii, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 631,146, Dec. 29, 1990, abandoned.

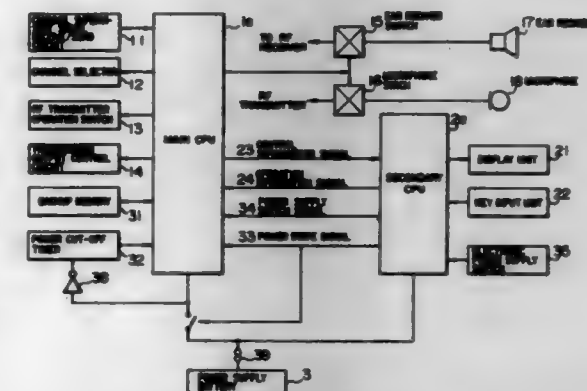
This application May 18, 1993, Ser. No. 62,724

Claims priority, application Japan, Dec. 28, 1989, 1-342640

Int. Cl.<sup>6</sup> H04B 1/16

U.S. Cl. 455-343

4 Claims



1. A radio-link continuity keeping equipment in a telephone mobile station which is capable of communicating with any of a plurality of telephone subscribers through a telephone base station and which is powered via an electrical contact that receives electric power from a first removable battery or from a new removable battery, said equipment comprising:

- a backup memory for storing therein information on a channel connection through which the telephone mobile station has communicated with one of the telephone subscribers before said first removable battery is disconnected from said contact during a conversation mode;
- a timer for measuring an elapsed time after the first removable battery is disconnected from said contact during the conversation mode until said new removable battery is connected to said contact;
- a secondary CPU normally energized via said contact and for generating a first control signal at least when the new removable battery is connected to said contact;
- electronic means, connected to the secondary CPU, for causing, when the electronic means is actuated, the secondary CPU to generate said first control signal and a second control signal;
- a main CPU connected to said secondary CPU to receive said first control signal and said second control signal; and means for energizing the main CPU via the contact in response to the first control signal generated by the secondary CPU;
- said main CPU being operative, in response to said first control signal, for judging whether or not said elapsed time measured by said timer is within a predetermined time and for restoring the channel connection when the elapsed time is within said predetermined time on the basis of the information stored in the backup memory and for generating a control information signal, which stops the secondary CPU from generating the first control signal, thus ending a supply of power from said contact to said main CPU, when the secondary CPU does not generate the second control signal and the main CPU finds no information stored in the backup memory.

5,438,696

# METHOD AND APPARATUS FOR CONTROLLING RADIO FREQUENCY INTERFERENCE GENERATED BY A VOLTAGE MULTIPLIER

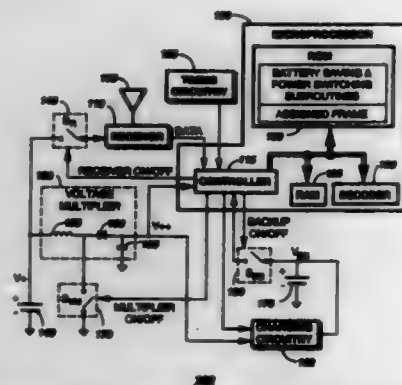
Adrian Napoles, Boynton Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 26, 1993, Ser. No. 96,803

Int. Cl.<sup>6</sup> H04B 1/16

U.S. Cl. 455-343

10 Claims



1. A method for controlling radio frequency interference in a radio communication device comprising a receiver for receiving a radio frequency (RF) signal, a first battery for providing a first voltage for powering the receiver, a voltage multiplier for boosting the first voltage to a second voltage for powering selected circuits included in the radio communication device, a second battery for providing a third voltage greater than the first voltage, timing circuitry for generating time values, and a controller coupled to the first battery, the voltage multiplier, the second battery, the timing circuitry, and the receiver for controlling the operation thereof, wherein: the voltage multiplier comprises:

an inductor having first and second terminals, wherein the first terminal of the inductor is coupled to the first battery for receiving the first voltage therefrom; a diode having an anode and a cathode, wherein the anode is coupled to the second terminal of the inductor; and a capacitor having a first terminal coupled to the cathode of the diode and a second terminal coupled to a fourth voltage of approximately zero volts and said first terminal of the capacitor is further coupled to the selected circuit; and

the method comprising the steps of:

enabling the voltage multiplier for generation of the second voltage during a first time period in which the receiver is disabled by alternating between coupling the second terminal of the inductor to the fourth voltage and decoupling the second terminal of the inductor from the fourth voltage at a predetermined frequency; disabling the voltage multiplier during a second time period in which the receiver is enabled; and powering the selected circuits with the third voltage provided by the second battery during the second time period.

5,438,697

# MICROSTRIP CIRCUIT ASSEMBLY AND COMPONENTS THEREFOR

Wayne D. Fowler, Burlington; Ronald E. Guimond, Amesbury, both of Mass.; Thomas G. Andrikowich, Wear; A. David Konlovski, Atkinson, both of N.H.; Neil E. Foster, Billerica, and Scott A. DeaRoche, Newbury, both of Mass., assignors to M/A-Com, Inc., Lowell, Mass.

Filed Apr. 23, 1992, Ser. No. 872,447

Int. Cl.<sup>6</sup> H04B 1/08

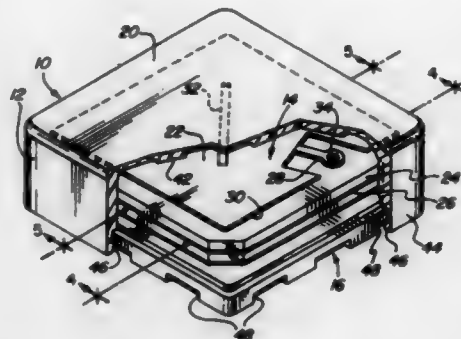
U.S. Cl. 455-347

16 Claims

1. A low noise figure microwave filter and amplifier assembly, comprising:

a stripline circuit formed of upper and lower metal plates

and a carrier board spaced from and between the plates; said carrier board being formed of a thin insulative substrate material carrying a metal cladding shaped to form an input filter having an input port and an output filter having an output port, said input and output filters having in the aggregate a desired passband at a selected microwave frequency; a grounded isolation conductor located on the carrier board between the input and output filters; an amplifier mounted on the isolation conductor on the carrier board between the input and output filters and



having an input line coupled to an output port of the input filter and having an output line coupled to an input port of the output filter, the lengths and locations of the input and output lines being selected to reduce connection losses and preserve a low noise figure for the stripline circuit; and

first connector means for coupling a microwave input signal to the input port of the input filter and second connector means for coupling an amplified microwave signal from the output port of the output filter through one of said plates.

5,438,698

# WEARABLE AUDIO RECEPTION DEVICE

Steven C. Burton; Richard A. Perilli, both of Sunnyvale, and Kenneth T. Perilli, Encinitas, all of Calif., assignors to Sweat Accessories, Inc., Sunnyvale, Calif.

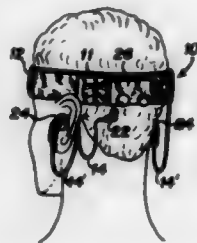
Continuation of Ser. No. 989,595, Dec. 14, 1992, abandoned.

This application Apr. 25, 1994, Ser. No. 233,214

Int. Cl.<sup>6</sup> H04B 1/08

U.S. Cl. 455-351

10 Claims



1. A wearable audio reception device comprising, in combination:

a flexible fabric article of clothing (12) for encircling about a head of a human-being and including a first frictionable receiving tab;

an elongated flexible enclosure (11) having a first and a second exterior surfaces in parallel to each other and forming an internal pocket between said first and second exterior surfaces, the enclosure overlapping a portion of the article of clothing, the enclosure having a second frictional receiving tab (13) about said first exterior surface of the enclosure for interface frictional, removable engagement with said first frictional receiving tab, a first

fabric anchor secured to said second exterior surface about a first terminal end of the elongated enclosure and a second fabric anchor secured to said second exterior surface about a second terminal end of the elongated enclosure, a threaded strap (36) having a first end anchored to said first anchor and a fastener means about a second end to frictionally and removably attach to said second anchor;

an elongated radio receiver housing (26) having a radio receiver with a first and second handles (34, 36) about opposite terminal ends of the receiver housing (26), the receiver housing being positioned with said first handle adjacent to said first fabric anchor and said second handle adjacent said second fabric anchor and said threaded strap threaded through said first and second handles with said fastener means adhered to said second anchor and overlapping the article of clothing and the elongated flexible enclosure, the receiver housing including a receptacle for receiving a headphone plug; and

a flexible wire embedded within said pocket of the flexible enclosure and with a first external end extending from said pocket and connected to said headphone plug for insertion in said receptacle of said radio receiver housing and a second end extending from said pocket and connected to a speaker for physically interfacing with said head of said human-being, whereby said speaker may be electrically connected to the radio receiver while physically positioned about said head of said human-being, and the elongated flexible enclosure may be separated from the flexible article of clothing when removed from said head; whereby the flexible enclosure overlaps the flexible article of clothing and the radio receiver overlaps the enclosure with the enclosure being severable from and replaceable to the article of clothing and the radio receiver being severable from and replaceable to the enclosure.

5,438,699

# ADAPTIVE SYSTEM FOR SELF-TUNING A RECEIVER IN AN RF COMMUNICATION SYSTEM

Michael Coveley, Suite 101, Pansy #16, York University, M. York, Ontario, M3J 3L3, Canada

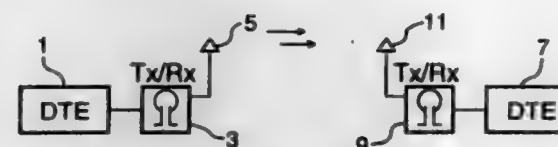
Continuation-in-part of Ser. No. 895,593, Jun. 9, 1992,

abandoned. This application Feb. 14, 1994, Ser. No. 195,026

Int. Cl.<sup>6</sup> H04B 17/00

U.S. Cl. 455-67.4

9 Claims



1. In a transmitter for transmitting an information signal on a predetermined carrier frequency and a receiver for receiving said information signal, an adaptive system for self-tuning said receiver relative to said predetermined carrier signal, comprising:

- means within said receiver for storing a predetermined number of test sequences;
- means within said transmitter for generating and transmitting identical versions of said predetermined test sequences at said predetermined carrier frequency prior to transmitting said information signal;
- means within said receiver for selecting respective ones of a predetermined number of tuning impedances for tuning said receiver to receive respective ones of said test sequences, transmitted by said transmitter, at respective center operating frequencies set by said tuning impedances; and
- means within said receiver for comparing said test sequences received at said respective center operating frequencies with said test sequences stored within said receiver, determining which one of said tuning impedances results

in a least mismatch between said received test sequences and said stored test sequences, and selecting said one of said tuning impedances for receiving said information signal at an associated one of said center operating frequencies which is optimally matched with said predetermined carrier frequency.

5,438,700

# DIGITAL MOBILE RADIO COMMUNICATION APPARATUS

Kazuya Hashimoto, and Takashi Murakami, both of Tokyo, Japan, assignors to NEC Corporation, Japan

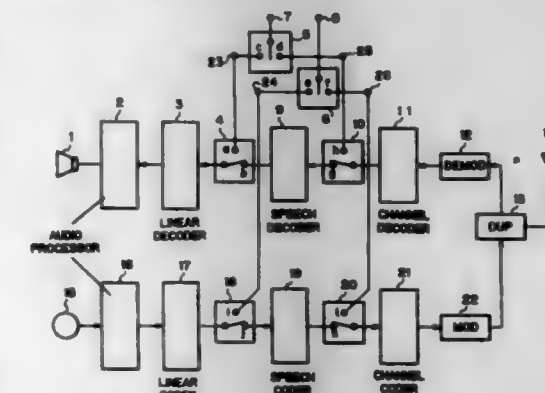
Filed Nov. 30, 1992, Ser. No. 963,789

Claims priority, application Japan, Nov. 30, 1991, 3-342079

Int. Cl.<sup>6</sup> H04B 1/40, 17/00; H04M 11/00

U.S. Cl. 455-89

1 Claim



1. A digital mobile telephone apparatus having a channel decoder, a speech decoder, a linear decoder, a linear coder, a speech coder, and a channel coder, said apparatus comprising: first and second terminals for either receiving or transmitting signals of a first type in a first mode of operation of the apparatus or for receiving or transmitting signals of a second type in a second mode of operation of the apparatus;

a first switch connected between said channel decoder and said speech decoder for connecting an output of said channel decoder to an input of said speech decoder in a third mode of operation of the apparatus and for disconnecting said output of said channel decoder from said input of said speech decoder and connecting said output of said channel decoder to a third terminal in said first mode of operation;

a second switch connected between said speech coder and said channel coder for connecting an input of said channel coder to an output of said speech coder in said third mode of operation and for disconnecting said input of said channel coder from said output of said speech coder and connecting said input of said channel coder to a fourth terminal in said first mode of operation;

a third switch for connecting an input of said linear decoder to an output of said speech decoder in said third mode of operation and for disconnecting said input of said linear decoder from said output of said speech coder and connecting said input of said linear decoder to a fifth terminal in said second mode of operation;

a fourth switch for connecting an output of said linear coder to an input of said speech coder in the third mode of operation and for disconnecting said output of said linear coder from said input of said speech coder and connecting said output of said linear coder to a sixth terminal in said second mode of operation;

a fifth switch for selectively connecting said third terminal to said first terminal in said first mode of operation or connecting said fifth terminal to the first terminal in said second mode of operation; and



a sixth switch for selectively connecting said fourth terminal to said second terminal in said first mode of operation or connecting said sixth terminal to said second terminal in said second mode of operation.

5,438,701

## MOBILE RADIO APPARATUS

Daisuke Yamada, Kawasaki; Osamu Kato, Yokohama; Kazuyuki Miya, and Taku Nagao, both of Machida, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

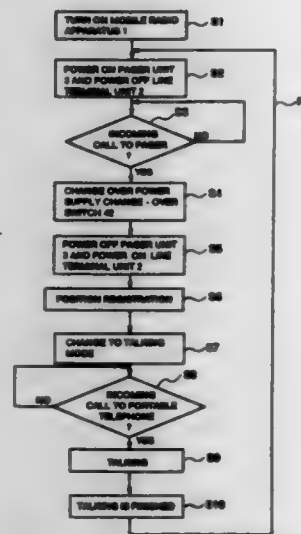
Filed Dec. 7, 1993, Ser. No. 162,358

Claims priority, application Japan, Dec. 11, 1992, 4-331520

Int. Cl.<sup>6</sup> H04B 1/38

U.S. Cl. 455-89

3 Claims



1. A mobile radio apparatus comprising:

- a radio-telephone line terminal unit, having a telephone number, for talking with one of a plurality of radio-telephone base stations in accordance with a position of said mobile radio apparatus and for producing a first control signal when talking of said radio-telephone line terminal unit is finished;
- a pager unit for receiving a calling signal from at least one page base station and for producing a second control signal when said pager unit receives a calling signal specifying said pager unit, said pager unit having the same telephone number as the telephone number of said radio-telephone line terminal unit wherein said radio-telephone line terminal unit also receives a calling signal at the same time said pager unit receives said calling signal;
- a power supply and selector means for supplying electric power to one of said radio-telephone line terminal unit and said pager unit, wherein said radio-line terminal unit and said pager unit are not supplied with electric power at the same time;
- a control circuit for controlling said power supply and selector means to:
  - (a) supply electric power to said pager unit when said mobile radio apparatus is actuated,
  - (b) supply electric power to said radio-telephone line terminal unit when said control circuit receives said second control signal from said pager unit, and
  - (c) supply electric power to said pager unit again when said control circuit receives said first control signal from said radio-telephone line terminal unit.

5,438,702

## BICYCLE HELMET COMMUNICATION DEVICE

Reed B. Jackson, 4247 Blaisdell Ave. South, Minneapolis, Minn. 55409

Filed Dec. 28, 1993, Ser. No. 174,147

Int. Cl.<sup>6</sup> H04B 1/38

U.S. Cl. 455-89

14 Claims



1. A bicycle helmet and communication device comprising:

- (a) a shell for protecting the head of a bicyclist, said shell having an interior, crown, and opposite side portions, a boundary edge encircling said shell, a notch extending upward from said boundary edge proximal to one of said side portions, a penetrating chin strap portion attached to said boundary edge proximate to one of said side portions, a receiving chin strap portion attached to said boundary edge proximate to said the opposite side portion of said shell for engagement to said penetrating chin strap portion, and a sleeve positioned in said notch, said sleeve being affixed to said shell;
- (b) a voice activated communication module permitting wireless communication between said bicyclist and another bicycle rider, said communication module having a base, said base having a forwardly extending boom having a microphone positioned proximate to the mouth of said bicyclist, said base further having an earpiece for positioning over an ear of said bicyclist, said base further having an upwardly extending adjustable slide positioned in said sleeve for adjustable attachment of said communication module to said shell, said communication module further having an antenna; and
- (c) a power module having a transmitter and a receiver connected to said communication module, said transmitter and said receiver providing signal processing for communication between said microphone and said earpiece and for providing communication between said bicyclist and said other bicycle rider.

5,438,703

## RADIO WITH REDUCED FREQUENCY PULL

Christine S. K. Ng, Bayan Lepas, and Eng M. Chong, Penang, both of Malaysia, assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 793,965, Nov. 18, 1991, abandoned.

This application Dec. 9, 1993, Ser. No. 165,759

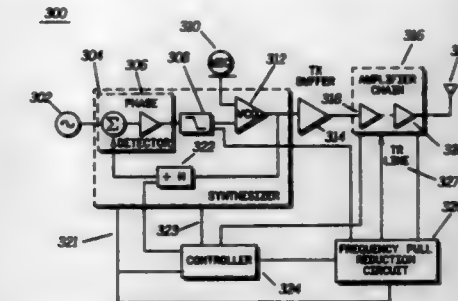
Int. Cl.<sup>6</sup> H04B 1/40

U.S. Cl. 455-127

14 Claims

- 1. In a transmitter having a synthesizer for generating a radio frequency signal and an amplifier for amplifying the radio frequency signal, the synthesizer having a frequency pull and a normal mode of operation, a method for minimizing frequency pull of the radio frequency signal when the amplifier is turned on, comprising the steps of:
  - generating the radio frequency signal in an adapt mode

which mode having a wider loop filter bandwidth than the normal mode of operation;  
locking the synthesizer to the radio frequency signal in the adapt mode;  
utilizing a timer for allowing a desired time to elapse;  
turning the amplifier on in the adapt mode to allow the wider loop filter bandwidth to lower the loading effect to the amplifier on the synthesizer in order to minimize the



frequency pull of the radio frequency signal; and switching the synthesizer to the normal mode of operation.

5,438,704

Patent Not Issued For This Number

**DESIGN PATENTS**

**GRANTED AUG. 1, 1995**

**ERRATA**

**For  
CLASS**

**See  
PATENT NO.**

D19-036 .....	D 360,894
D25-001 .....	D 360,951

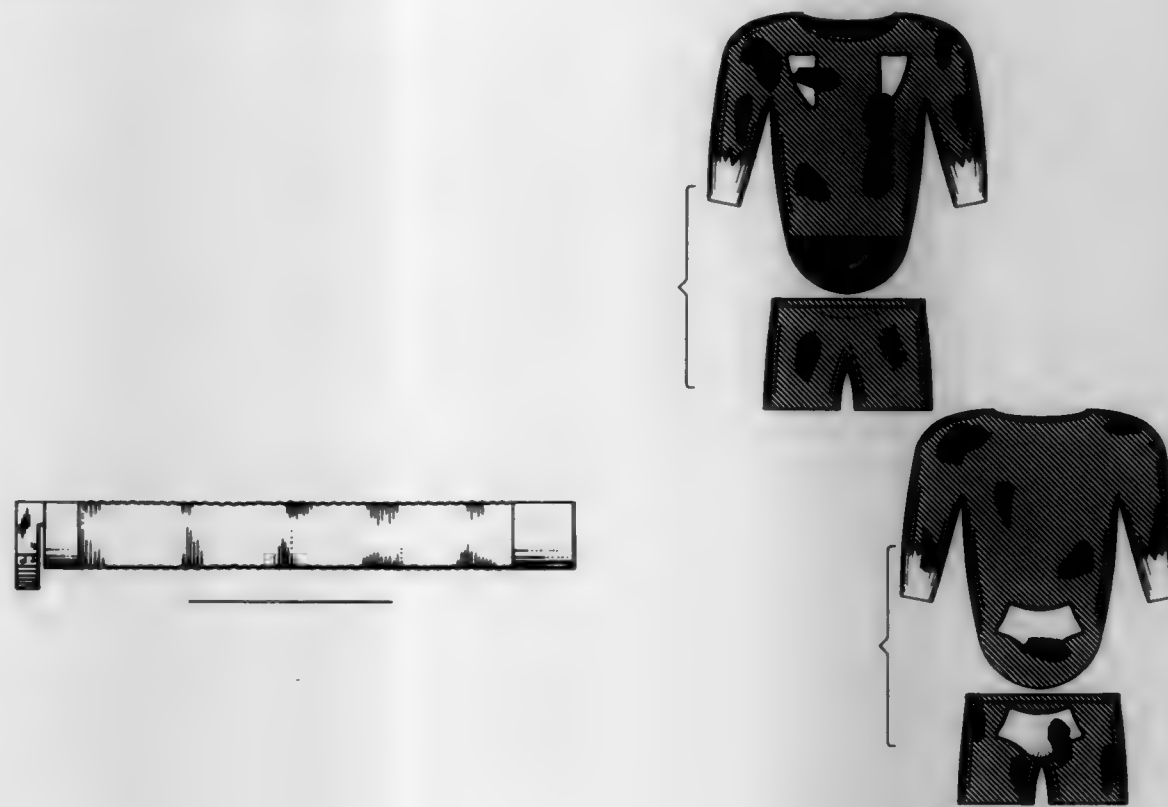


# DESIGNS

AUGUST 1, 1995

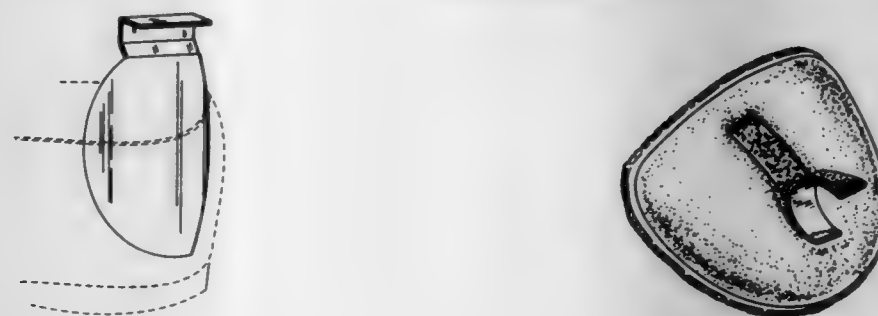
**360,742**  
**BLOUSING BAND FOR TROUSER LEGS**  
 David L. Wilkins, 1610 E. 4th St. N. 10, Long Beach, Calif. 90802  
 Filed Nov. 26, 1993, Ser. No. 15,725  
 Term of patent 14 years  
 U.S. Cl. D2—624

**360,744**  
**PULLOVER AND SHORTS SET**  
 John P. Wagner, 5603 W. Jr. College Rd., Key West, Fla. 33040  
 Filed Jan. 27, 1994, Ser. No. 17,970  
 Term of patent 14 years  
 U.S. Cl. D2—746



**360,743**  
**FLEXIBLE PLASTIC SHOE HORN**  
 Harold G. Simpson, 2311 Fleetwood Dr., San Bruno, Calif. 94066  
 Continuation-in-part of Ser. No. 23,000, May 17, 1994, Pat. No. Des. 355,522. This application Nov. 15, 1994, Ser. No. 31,023  
 Term of patent 14 years  
 U.S. Cl. D2—642

**360,745**  
**SHOULDER STRAP PAD**  
 Joseph C. Nicholson, Carlsbad; Richard G. Saxon, Encino, and Shirley Magidson, Beverly Hills, all of Calif., assignors to S-Tek, Inc., Calver City, Calif.  
 Filed Feb. 14, 1994, Ser. No. 18,699  
 Term of patent 14 years  
 U.S. Cl. D2—856



360,746

## HEAD DRESS CAP

Robert A. Bowser, P.O. Box 722365, Houston, Tex. 77276-2365  
Filed Jul. 23, 1993, Ser. No. 11,016

Term of patent 14 years

U.S. Cl. D2—865



360,747

## UPPER PART OF WALKING SHOE

Jacques J. Autier, Cran Gevrier, France, assignor to Salomon S.A., Chavanod, France

Filed Jan. 21, 1993, Ser. No. 3,929

Claims priority, application Hague Agreement, Jul. 20, 1992, DM/021386

Term of patent 14 years

U.S. Cl. D2—970



360,748

## SIGNAL FOR AN AMBULATORY AID

Miriam C. Larsen, 714 Sceptre Cir., Garland, Tex. 75043, and Douglas C. Thomas, 4021 Windsor, Garland, Tex. 75042

Filed Jun. 14, 1994, Ser. No. 24,417

Term of patent 14 years

U.S. Cl. D3—10



360,749

## UMBRELLA CASE

Magda El-Edwy, Flowery Branch, Ga., assignor to CUI International, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 9,175, Jun. 7, 1993, Pat. No. Des. 347,520. This application May 13, 1994, Ser. No. 22,870

Term of patent 14 years

U.S. Cl. D3—11



360,750

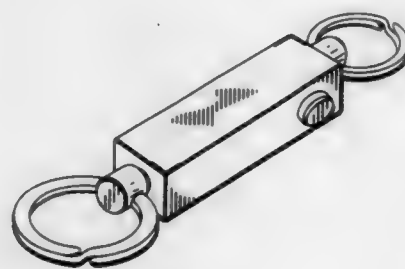
## KEY HOLDER

Woodrow C. Stillwagon, 7610 Ball Mill Rd., Atlanta, Ga. 30338  
Filed May 10, 1993, Ser. No. 8,181

The portion of the term of this patent subsequent to Sep. 24, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D3—207



360,751

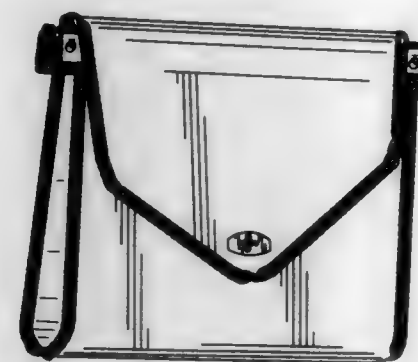
## HANDBAG WITH A CONCEALABLE HANDGUN POUCH

Ruby Nash, 5834 Southwell, Houston, Tex. 77033

Filed Nov. 2, 1992, Ser. No. 1,035

Term of patent 14 years

U.S. Cl. D3—233



360,752

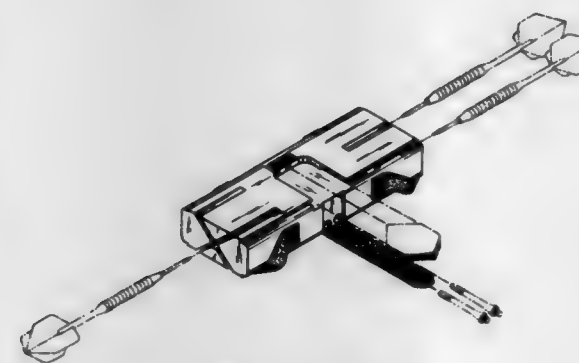
## DART CASE

John J. Hannafin, 221 Cochran Pl., Valley Stream, Long Island, N.Y. 11581-2933

Filed Feb. 28, 1994, Ser. No. 19,284

Term of patent 14 years

U.S. Cl. D3—254



360,753

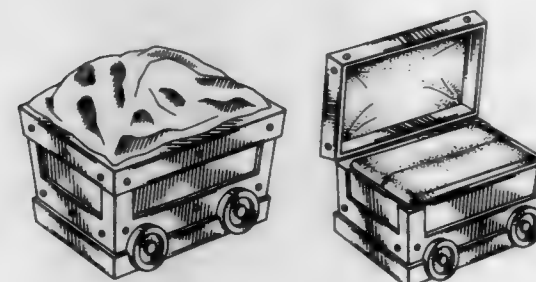
## ORE CART JEWELRY BOX

Darrell M. Willey, 636 Cathedral Dr., #808, Rapid City, S. Dak. 57701

Filed Feb. 22, 1994, Ser. No. 19,014

Term of patent 14 years

U.S. Cl. D3—271



360,754

## CARRYING CASE

Malcolm Watson, 55 Santa Monica Boulevard, Scarborough, Ontario, Canada M1L 4H3

Filed Sep. 23, 1993, Ser. No. 13,395

Claims priority, application Canada, May 11, 1993, 11-05-93-1  
Term of patent 14 years

U.S. Cl. D3—271



360,755

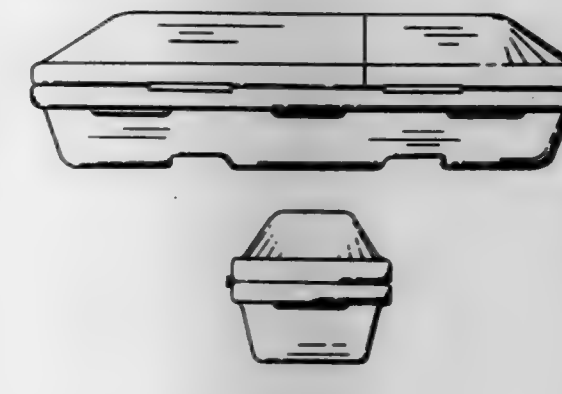
## UTILITY CASE

Wilbur F. McClure, 973 Meadow La., Troy, Ohio 45373

Filed Jan. 3, 1994, Ser. No. 16,961

Term of patent 14 years

U.S. Cl. D3—273



360,756

## MOLDED LUGGAGE CASE

William L. King, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed Feb. 18, 1994, Ser. No. 18,949

Term of patent 14 years

U.S. Cl. D3—279





360,757

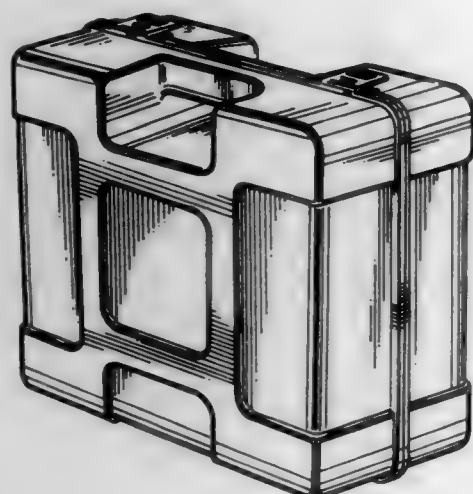
## SPRAY PAINT GUN CARRYING CASE

Mark E. Smetting, Eden Prairie; Timothy D. Steinberg, Coon Rapids, and Paul A. Pilosi, Minneapolis, all of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Apr. 13, 1994, Ser. No. 21,283

Term of patent 14 years

U.S. Cl. D3—282



360,759

## UTILITY BASKET

William W. Emery, Berkeley Heights, and Russell A. Fritts, Warren, both of N.J., assignors to Better Sleep Mfg. Co., Berkeley Heights, N.J.

Filed Apr. 8, 1994, Ser. No. 21,151

Term of patent 14 years

U.S. Cl. D3—306



360,758

## BOTTLE CRATE

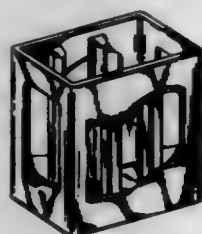
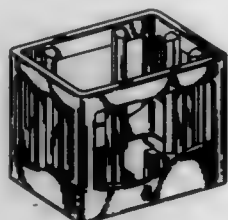
Hans Umiker, Egg/Zürich, Switzerland, assignor to Schoeller-Plast S.A., Switzerland

Filed Apr. 7, 1994, Ser. No. 21,003

Claims priority, application Germany, Oct. 7, 1993, 93 08 034.4

Term of patent 14 years

U.S. Cl. D3—304



360,760

## TOOTHBRUSH

Hans Halm, Herne, Germany, assignor to Lingner & Fischer GmbH, Buhl/Baden, Germany

Filed Jun. 18, 1992, Ser. No. 900,980

Claims priority, application United Kingdom, Dec. 19, 1991, 2019676

Term of patent 14 years

U.S. Cl. D4—104



360,761

## TOOTHBRUSH

Robert Moskovich, East Brunswick, N.J., and Stanley R. Carter, Transvaal, South Africa, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. D. 1,171, Nov. 17, 1992, and a continuation-in-part of Ser. No. D. 1,172, Nov. 17, 1992. This application Dec. 9, 1992, Ser. No. 2,161

Term of patent 14 years

U.S. Cl. D4—104



360,763

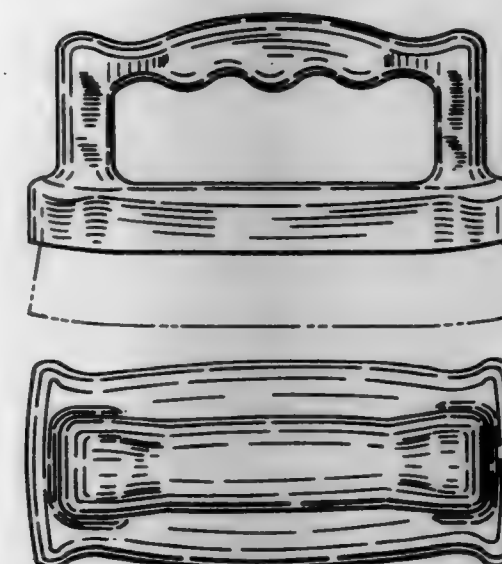
## SCRUB BRUSH HANDLE

William P. Camp, Jr., Millersburg; Bruce Bochnak; Steven C. Tennant, both of Wooster, and Richard K. Bakovitz, Orrville, all of Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Jul. 1, 1993, Ser. No. 10,256

Term of patent 14 years

U.S. Cl. D4—138



360,764

## MERCHANDISING DISPLAY

Larry D. Collins, 10653 Etiwanda Ave., Northridge, Calif. 91326

Filed Sep. 12, 1994, Ser. No. 28,323

Term of patent 14 years

U.S. Cl. D6—396



360,762

## TOOTHBRUSH WITH BASEBALL BAT HANDLE

Timothy R. Porter, 20000 E. 110 North, Claremore, Okla. 74017

Filed Jul. 29, 1991, Ser. No. 737,497

Term of patent 14 years

U.S. Cl. D4—107



360,765

**CORNER PIECE PARTICULARLY FOR REVERSIBLE FRAMES**

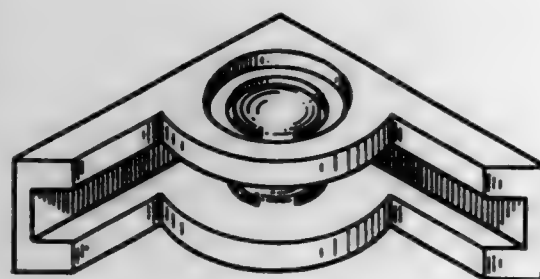
David N. Te'Kannon, 13, chemin du Pont-de-ville, 1224 Chêne-Bougeries, Switzerland

Filed Oct. 12, 1994, Ser. No. 29,616

Claims priority, application Hague Agreement, Apr. 12, 1994, DMA/002484

Term of patent 14 years

U.S. Cl. D6—300



360,767

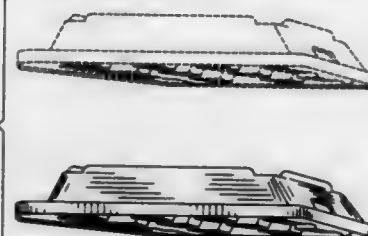
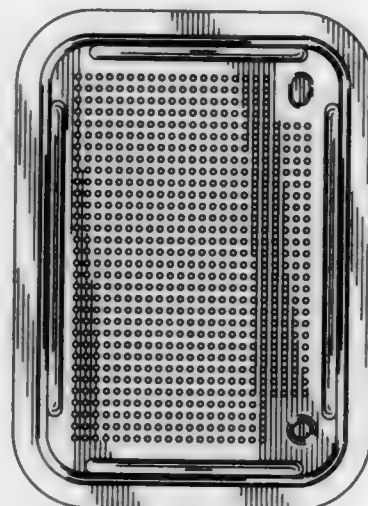
**STACKABLE STEP STOOL**

Darrell Fish, Johns Island, and Mechelle King, Mt. Pleasant, both of S.C., assignors to Card Enterprises, Inc., Mount Pleasant, S.C.

Filed Sep. 27, 1993, Ser. No. 13,537

Term of patent 14 years

U.S. Cl. D6—349



360,766

**MODULAR BENCH**

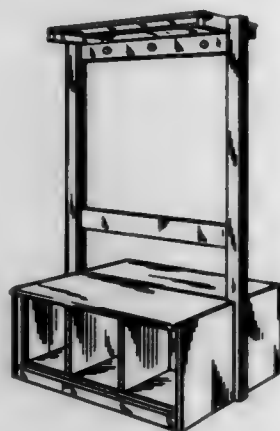
Amelia Sacchi Lodispoto, Piazza Carducci, 7, Bologna, Italy 40125

Filed Apr. 12, 1994, Ser. No. 21,184

Claims priority, application Italy, Oct. 13, 1993, BO9300041

Term of patent 14 years

U.S. Cl. D6—336



360,768

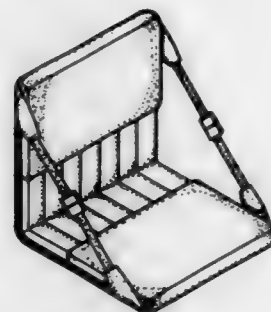
**PORTABLE SEAT**

Phillip Hwang, and Lisa Hwang, both of Rm. 6A, No. 261, Nanking East Rd., Sec. 3, Taipei, Taiwan

Filed Aug. 3, 1994, Ser. No. 26,690

Term of patent 14 years

U.S. Cl. D6—368

360,769  
CHAIR

James M. Groulx, Owensboro, Ky., and Ogden R. Olson, Muscatine, Iowa, assignors to Hon Industries, Inc., Muscatine, Iowa

Filed Jun. 8, 1994, Ser. No. 24,094

Term of patent 14 years

U.S. Cl. D6—372

360,770  
CHAIR

Robert M. Scheper, Grand Rapids; Dale M. Groendal, Jenison; James E. Abraham, Grandville; Thomas R. Hahn, Kentwood; Cheryl D. Baumgartner, East Grand Rapids; Douglas A. Smith, Grand Rapids, and Brian L. Scholten, Jenison, all of Mich., assignors to Steelcase, Inc., Grand Rapids, Mich.

Division of Ser. No. 8,030, May 7, 1993, Pat. No. Des. 355,303.

This application Nov. 2, 1994, Ser. No. 30,589

Term of patent 14 years

U.S. Cl. D6—372



360,771

**CHAIR FRAME**

Stephen C. Hess, Birmingham, Ala., assignor to Winston Furniture Co. of Alabama, Inc., Birmingham, Ala.

Filed Apr. 12, 1994, Ser. No. 21,205

Term of patent 14 years

U.S. Cl. D6—376

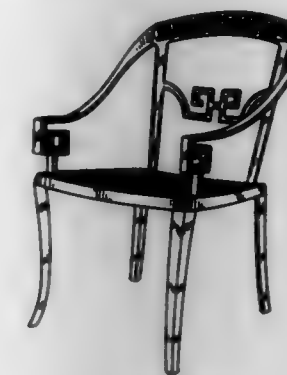
360,772  
PATIO CHAIR

Jeffrey A. Weiss, 222 Hemlock Dr., McMurray, Pa. 15317

Filed Mar. 11, 1994, Ser. No. 19,834

Term of patent 14 years

U.S. Cl. D6—379

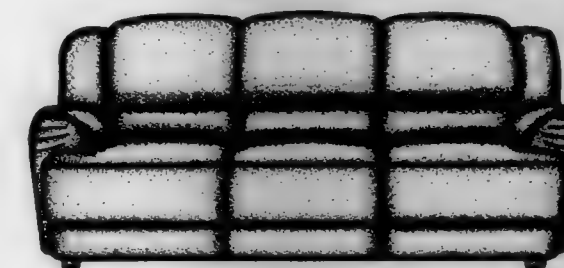
360,773  
SOFA

Pasquale Natuzzi, and Raffaella Lacarelli, both of Santeramo In Colle, Italy, assignors to Industrie Natuzzi Spa, Bari, Italy

Filed Dec. 30, 1993, Ser. No. 17,010

Term of patent 14 years

U.S. Cl. D6—381

360,774  
SOFA

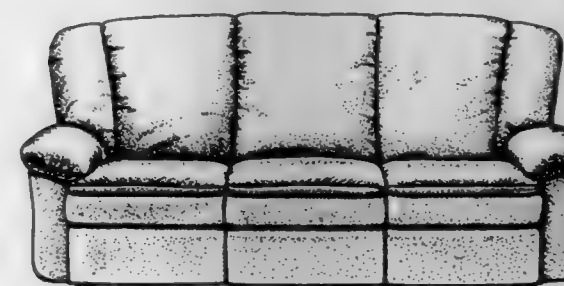
Pasquale Natuzzi, Santeramo In Colle, and Arcangelo Scarati, Talsano, both of Italy, assignors to Industrie Natuzzi, Spa, Bari, Italy

Filed Dec. 30, 1993, Ser. No. 17,014

The portion of the term of this patent subsequent to Nov. 22, 2008, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—381



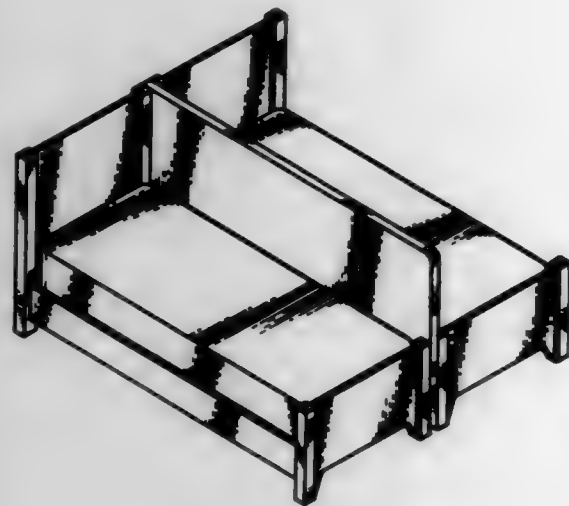


360,775

**BED WITH PRIVACY DIVIDER**

Carol W. Karkoska, and Dennis Karkoska, both of 9501 N. Gregory N. Glebe, 1315 E. Gibson La., Phoenix, Ariz. 85304  
 Sahara #1251, Las Vegas, Nev. 89117  
 Filed Mar. 14, 1994, Ser. No. 19,851  
 Term of patent 14 years

U.S. Cl. D6-383

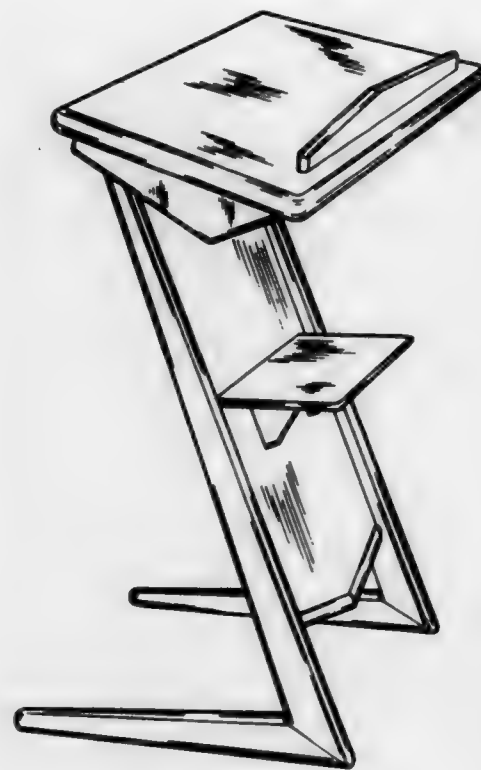


360,777

**COLLAPSIBLE LECTERN**

Gregory N. Glebe, 1315 E. Gibson La., Phoenix, Ariz. 85304  
 Filed Nov. 5, 1993, Ser. No. 15,076  
 Term of patent 14 years

U.S. Cl. D6-419

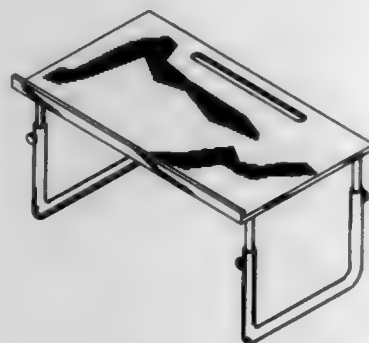


360,776

**READING TRAY**

Robin Blue, 1919 N. 42nd Dr., Phoenix, Ariz. 85009  
 Filed Feb. 28, 1994, Ser. No. 19,268  
 Term of patent 14 years

U.S. Cl. D6-406

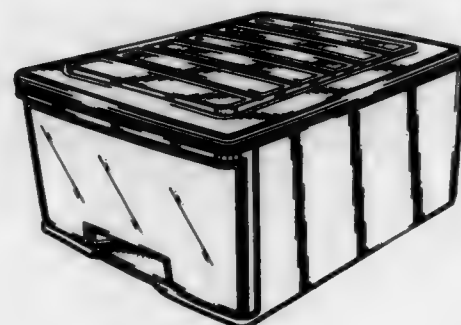


360,778

**STORAGE DRAWER**

Fred G. Apt, III; Keith E. Brightbill; Brian J. Conaway, all of Wooster, and Coy D. Ward, Norton, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio  
 Filed Jan. 8, 1993, Ser. No. 3,473  
 Term of patent 14 years

U.S. Cl. D6-448

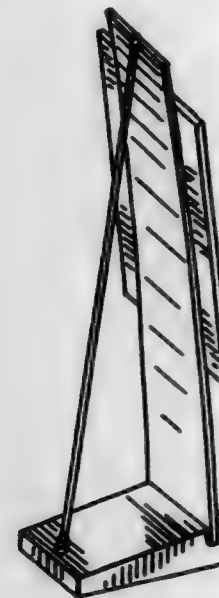


360,779

**MULTI-PURPOSE DISPLAY DEVICE**

Heinz Allekotte, Donatsstrasse 22, D-50767 Köln, and Gunther P. Spitzley, Weyertal 59, D-50937 Köln, both of Germany  
 Filed Oct. 25, 1993, Ser. No. 14,532  
 Term of patent 14 years

U.S. Cl. D6-449

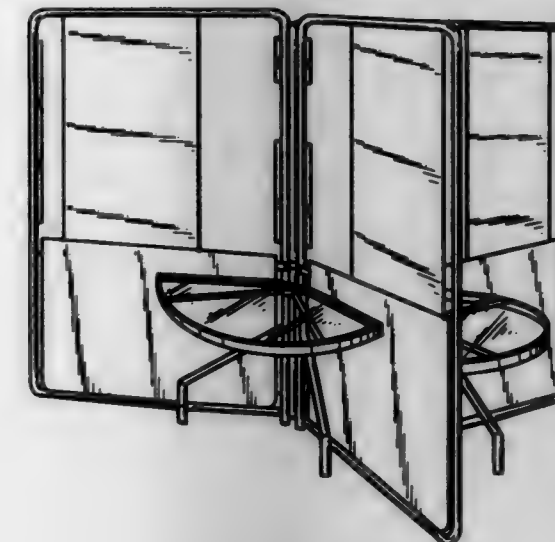


360,781

**FURNITURE DISPLAY**

Andrew C. Hill, Joplin, Mo., and Ronald S. Foster, Hendersonville, Tenn., assignors to Sunbeam Corporation, Fort Lauderdale, Fla.  
 Continuation of Ser. No. 103,836, Aug. 6, 1993. This application Aug. 4, 1994, Ser. No. 26,749  
 Term of patent 14 years

U.S. Cl. D6-455

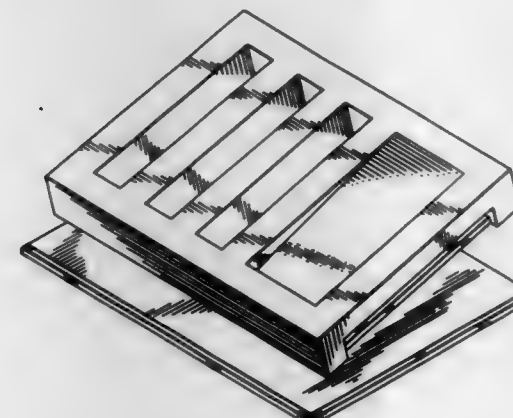


360,780

**VIDEO CASSETTE AND REMOTE CONTROL STORAGE DEVICE**

Alberto V. Kennedy, Jr., 8615 NW. 8 St., Apt. #314, Miami, Fla. 33126  
 Filed Sep. 22, 1994, Ser. No. 28,813  
 Term of patent 14 years

U.S. Cl. D6-449

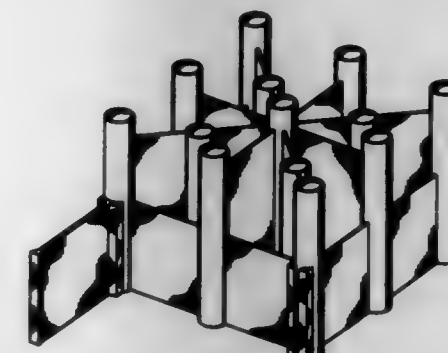


360,782

**MODULAR FREE-STANDING IMPLEMENT HOLDER**

Tim J. Wright, 25256-C Steinbeck Ave., Stevenson Ranch, Calif. 91381  
 Filed Apr. 30, 1993, Ser. No. 7,727  
 Term of patent 14 years

U.S. Cl. D6-467



360,783

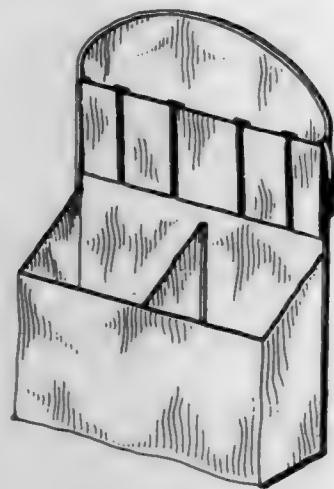
**NURSERY ORGANIZER**

Christopher J. Miller, and Judy Miller, both of 28300 White Rd., Perrysburg, Ohio 43551

Filed Apr. 20, 1993, Ser. No. 7,369

Term of patent 14 years

U.S. Cl. D6-476



360,784

**BOOKCASE**

Pascal Mourgne, Paris, France, assignor to Cinna, Serrieres-de-Briord, France

Filed Jun. 7, 1994, Ser. No. 24,124

Term of patent 14 years

U.S. Cl. D6-479



360,785

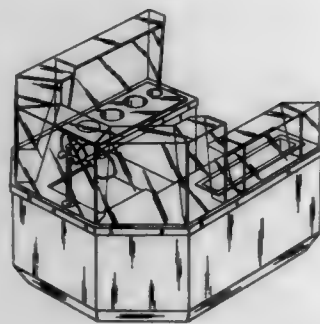
**TURKEY BAR CARVING STATION**

Michael D. Mooslin, Newport Beach, Calif., assignor to Koo Koo Roo, Inc., Los Angeles, Calif.

Filed Feb. 14, 1994, Ser. No. 18,781

Term of patent 14 years

U.S. Cl. D6-481



360,786

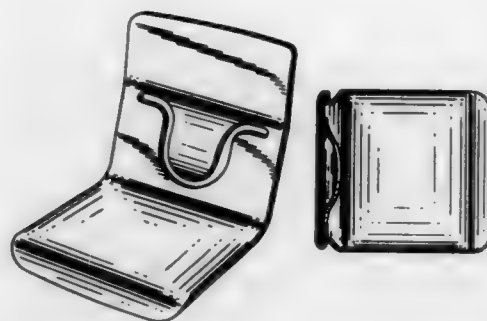
**SEAT**

Otto W. Zapf, Herzog-Adolph-Strasse 5, D-6240 Königstein, Germany

Filed Feb. 18, 1994, Ser. No. 18,988

Term of patent 14 years

U.S. Cl. D6-500



360,787

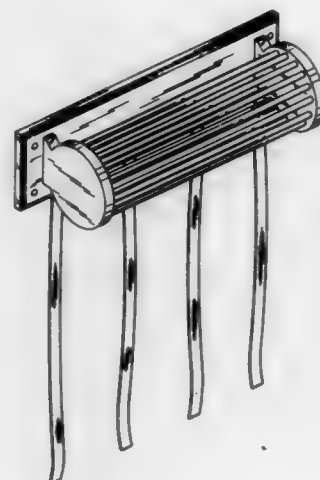
**WALL MOUNTED SUPPORT RACK FOR HEADBAND, BARRETTE, AND BOW WEARING APPAREL**

Richard S. Brown, Sr., 621 University Dr., Rock Hill, S.C. 29730

Filed Mar. 1, 1994, Ser. No. 19,368

Term of patent 14 years

U.S. Cl. D6-512



360,788

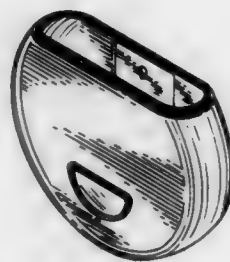
**BAG STORER AND DISPENSER**

Morison S. Cousins, Winter Park, Fla., assignor to Dart Industries Inc., Deerfield, Ill.

Filed Feb. 3, 1994, Ser. No. 18,335

Term of patent 14 years

U.S. Cl. D6-515



360,789

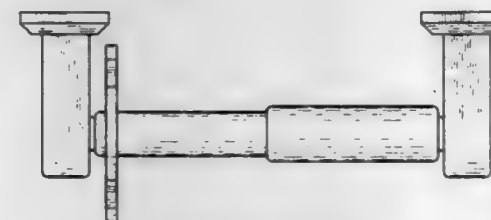
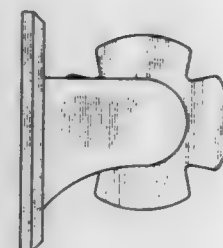
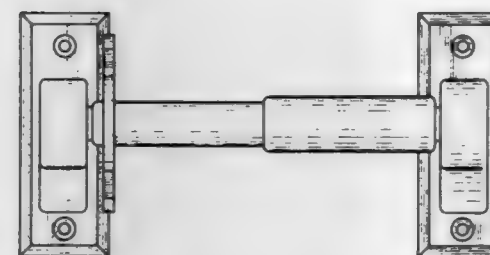
**ROLLED PAPER HOLDER**

Truman R. Keeney, 13121 Martin Rd., Smithsburg, Md. 21783

Filed Feb. 14, 1994, Ser. No. 18,642

Term of patent 14 years

U.S. Cl. D6-518



360,791

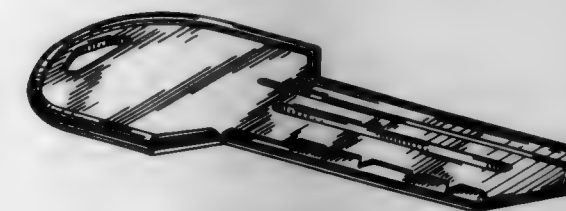
**TUBE KEY**

Steven E. Andrasic, Nashotah; Paul J. Hytken, Fox Point; David A. Wierengo, River Hills, and Craig S. Haralson, Wauwatosa, all of Wis., assignors to Myro, Inc., Milwaukee, Wis.

Filed Jan. 31, 1994, Ser. No. 18,241

Term of patent 14 years

U.S. Cl. D6-541



360,792

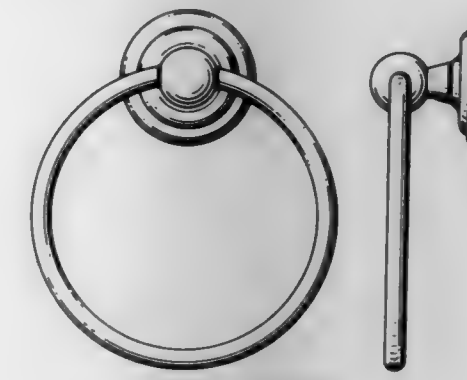
**TOWEL RING**

Norton Sharpe, Los Angeles, Calif., assignor to Franklin Brass Manufacturing Company, Los Angeles, Calif.

Filed Aug. 23, 1993, Ser. No. 12,086

Term of patent 14 years

U.S. Cl. D6-546



360,790

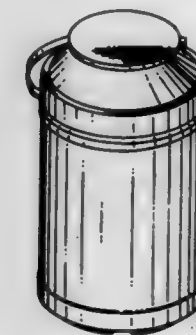
**STORAGE AND DISPENSING CANISTER FOR MOIST TOWELETES**

Henry J. Landis, II, and Russel J. Landis, both of Chicago Ridge, Ill., assignors to Sanford Corporation, Bellwood, Ill.

Filed Apr. 13, 1994, Ser. No. 21,285

Term of patent 14 years

U.S. Cl. D6-518



360,793

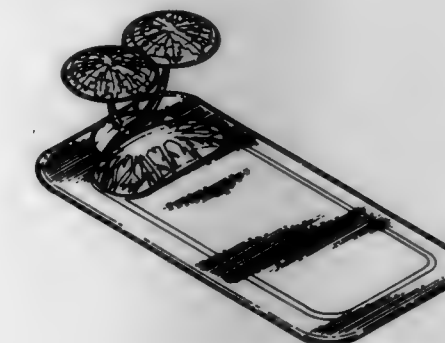
**COMBINED BEACH MAT AND SUNSHADE**

Solomon Nwani, 969 River Road, Suite 302, Ottawa, Ontario, Canada K1K-3V3

Filed Oct. 19, 1992, Ser. No. 558

Term of patent 14 years

U.S. Cl. D6-597

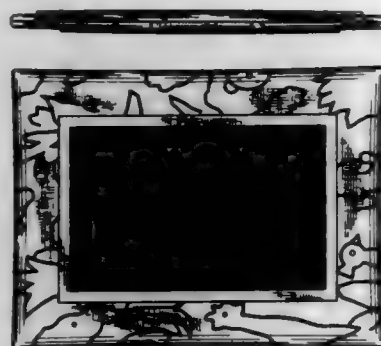




360,794

**COMBINED CHILD CUSHION AND RUBBER GRIP  
PADS UNIT FOR PLACEMENT ON A CHAIR**  
Ellen A. Morin, 102 Los Padres Dr., Oceanside, Calif. 92054  
Filed Feb. 2, 1994, Ser. No. 18,279  
Term of patent 14 years

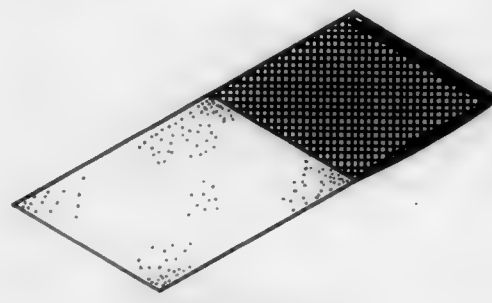
U.S. Cl. D6—601



360,797

**COMBINED TOWEL AND MESH BAG**  
Mildred S. Evans, 10930 Challeux Rd. S., Jacksonville, Fla. 32225  
Filed Aug. 30, 1993, Ser. No. 12,363  
Term of patent 14 years

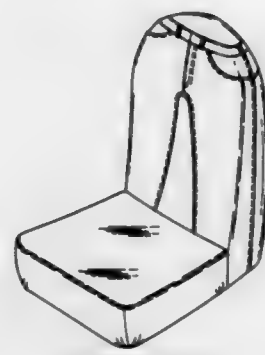
U.S. Cl. D6—608



360,798

**SEAT COVER**  
Anita Hall, 14049 Bel-Red Rd. #23, Bellevue, Wash. 98007  
Filed Nov. 22, 1993, Ser. No. 15,584  
Term of patent 14 years

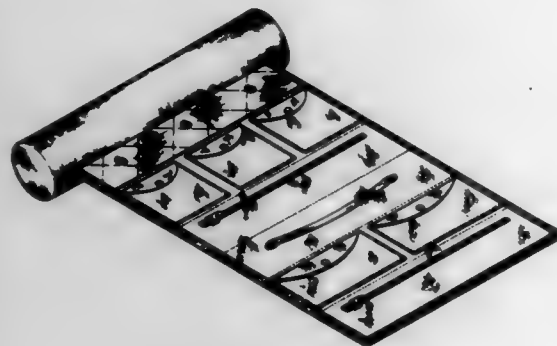
U.S. Cl. D6—611



360,795

**COMBINED PILLOW WITH A JEWELRY ROLL**  
Lisa Saunders, 8369 Sunnybrae Ave., Winnetka, Calif. 91306-1538  
Filed Jun. 23, 1994, Ser. No. 24,901  
Term of patent 14 years

U.S. Cl. D6—601



360,799

**CD STORAGE TOWER**  
Joseph J. Rocco, and Susan B. Turilli, both of 469 Zadig St., Oceanside, N.Y. 11572  
Filed Mar. 28, 1994, Ser. No. 20,500  
Term of patent 14 years

U.S. Cl. D6—629



360,796

**COMBINATION LEG SUPPORT PILLOW AND  
DETACHABLE FOOTREST**  
Michael E. Goldado, 8515 SW. Oak, Tigard, Oreg. 97228-8880  
Filed Jul. 13, 1994, Ser. No. 25,826  
Term of patent 14 years

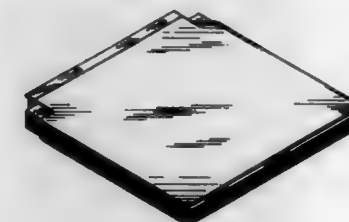
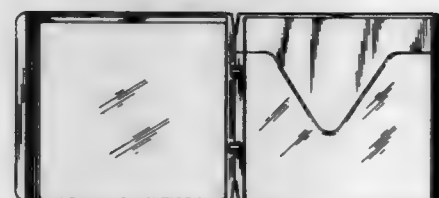
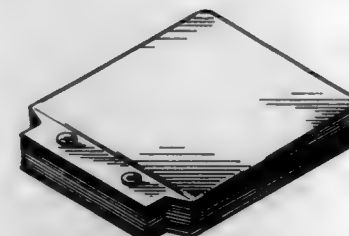
U.S. Cl. D6—601



360,800

**MULTI-LEAF HOLDER FOR COMPACT DISKS**  
James M. Temple; James A. Bergh, both of Boulder, and Robert P. Stanley, Longmont, all of Colo., assignors to Case Logic, Inc., Longmont, Colo.  
Filed Mar. 31, 1994, Ser. No. 20,690  
Term of patent 14 years

U.S. Cl. D6—629



360,801

**DISTILLED WATER DISPENSER**  
Michael Shub, Richmond Hill, Canada, assignor to Professor Purewater Co., Ltd., Concord, Canada  
Filed Dec. 21, 1993, Ser. No. 16,638  
Claims priority, application Canada, Jun. 22, 1993, 22-06-93-1  
Term of patent 14 years

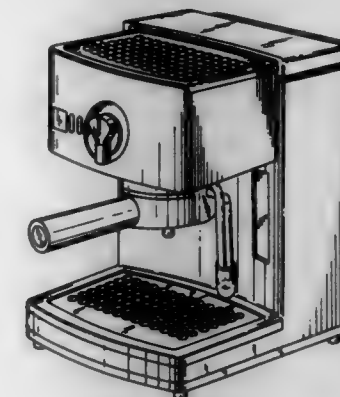
U.S. Cl. D7—300



360,802

**ELECTRIC ESPRESSO MAKER**  
Florian Seiffert, Wiesbaden, Germany, assignor to Robert Krups GmbH & Co. KG, Solingen, Germany  
Filed Jun. 11, 1993, Ser. No. 9,333  
Term of patent 14 years

U.S. Cl. D7—309



360,803

**TWO BURNER COOKER**  
William A. Dutro, Cove, and Ty Measom, Logan, both of Utah, assignors to Dutro Company, Emeryville, Calif.  
Filed Sep. 27, 1993, Ser. No. 13,568  
Term of patent 14 years

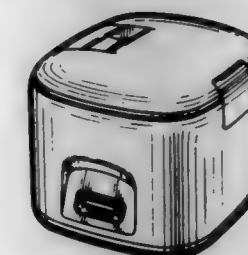
U.S. Cl. D7—332



360,804

**ELECTRIC RICE COOKER**  
Masanori Hamada, and Takashi Sato, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan  
Filed Dec. 30, 1993, Ser. No. 16,947  
Term of patent 14 years

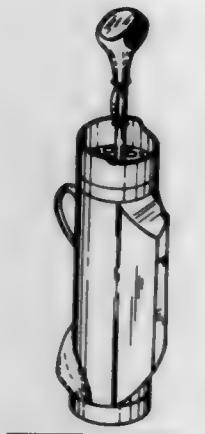
U.S. Cl. D7—354



360,805

**GOLF-BAG SHAPED WATER/BEVERAGE CONTAINER**  
 Dov Friedman, 6233 N. Ridgeway, Chicago, Ill. 60659  
 Continuation-in-part of Ser. No. 111, Oct. 2, 1992, Pat. No. Des.  
 347,968. This application Jun. 13, 1994, Ser. No. 24,452  
 Term of patent 14 years

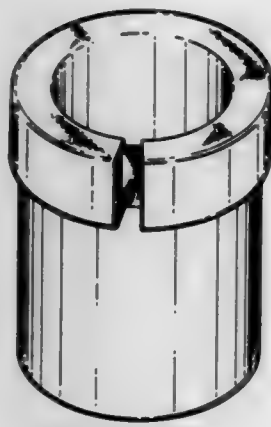
U.S. Cl. D7—515



360,806

**BEVERAGE COOLING SLEEVE**  
 Jerome E. Morris, and Linda Morris, both of 8651 Buena Vista  
 La., Hesperia, Calif. 92345  
 Filed Mar. 3, 1994, Ser. No. 19,479  
 Term of patent 14 years

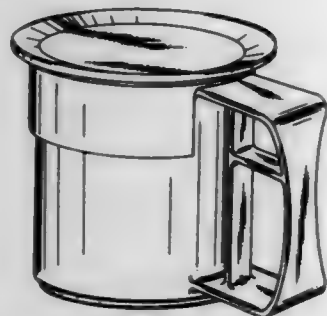
U.S. Cl. D7—608



360,807

**CUP WITH COVER/COASTER**  
 Richard P. Scholfield, 4608 Eastlake Cir., Sarasota, Fla. 34232  
 Filed Apr. 15, 1994, Ser. No. 21,384  
 Term of patent 14 years

U.S. Cl. D7—511



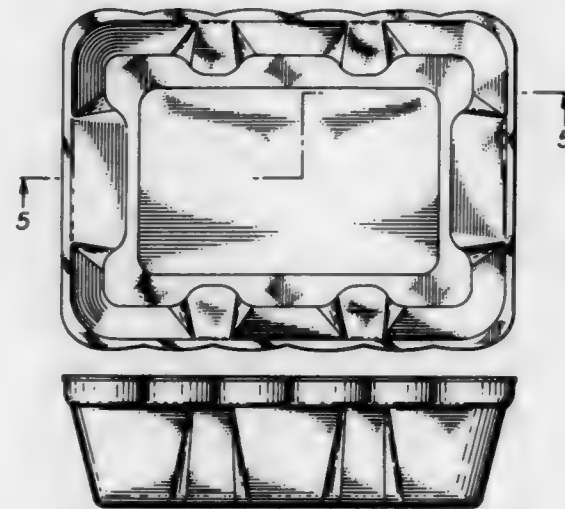
360,808

FOOD TRAY

Carl J. Meier, Lithonia, Ga., and Richard L. Ramirez, Whittier,  
 Calif., assignors to Dolco Packaging Corp., Sherman Oaks,  
 Calif.

Division of Ser. No. 4,502, Feb. 5, 1993, which is a  
 continuation-in-part of Ser. No. 3,425, Jan. 6, 1993, abandoned.  
 This application Apr. 20, 1994, Ser. No. 21,569  
 Term of patent 14 years

U.S. Cl. D7—550



360,809

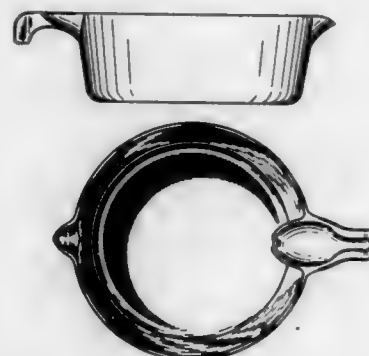
NO MESS SPOON REST

Melinda M. Longtin, and Robert A. Longtin, both of 9A Cres-  
 cent Ct., South Berwick, Me. 03908

Filed Mar. 30, 1994, Ser. No. 20,640

Term of patent 14 years

U.S. Cl. D7—637

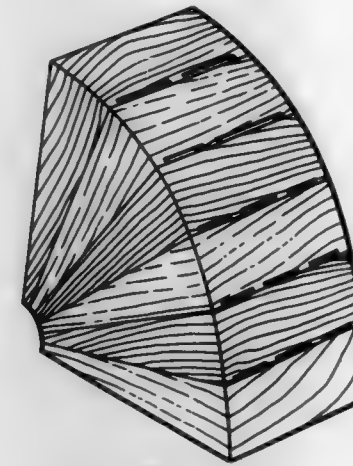


360,810

KNIFE HOLDER

Paul Humaj, 675 McAllister #107, San Francisco, Calif. 94102  
 Filed Jun. 20, 1994, Ser. No. 24,746  
 Term of patent 14 years

U.S. Cl. D7—637



360,811

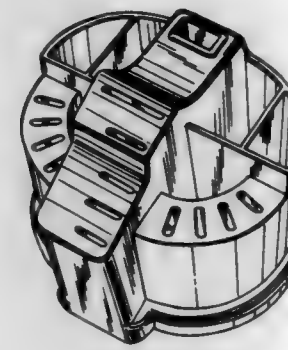
**STORAGE CADDY FOR KNIVES AND KITCHEN TOOLS,  
 UTENSILS AND GADGETS**

Milton L. Cohen, Hewlett Bay Park, and Jeff Siegel, Great  
 Neck, both of N.Y., assignors to Lifetime Hoan Corporation,  
 Westbury, N.Y.

Filed Feb. 25, 1994, Ser. No. 19,191

Term of patent 14 years

U.S. Cl. D7—641



360,812

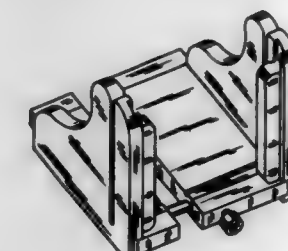
SLICER

Larry L. Johnson, 1859 S. Waverly Rd., Eaton Rapids, Mich.  
 48827

Filed Sep. 22, 1993, Ser. No. 12,036

Term of patent 14 years

U.S. Cl. D7—673



360,813

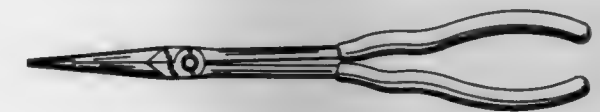
PLIERS

John D. Wiedemann, Dublin, and Cesario C. Augustine, Orient,  
 both of Ohio, assignors to MAC Tools, Inc., Washington  
 Court House, Ohio

Filed Dec. 13, 1993, Ser. No. 16,297

Term of patent 14 years

U.S. Cl. D8—52



360,814

PORTABLE ELECTRIC DRILL

Akinori Kimata, Anjo, Japan, assignor to Makita Corporation,  
 Anjo, Japan

Filed Aug. 12, 1994, Ser. No. 27,113

Claims priority, application Japan, Feb. 15, 1994, 6-3576

Term of patent 14 years

U.S. Cl. D8—68



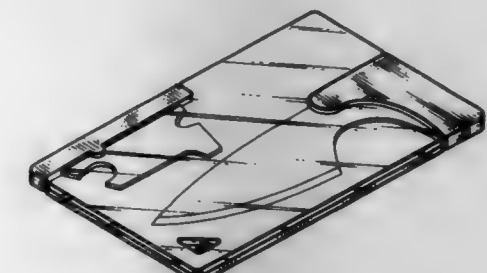
360,815

COMBINED POCKET IMPLEMENTS AND SHEATH

Stephen J. Padden, 1306 Sixth Pl., Port Hueneme, Calif. 93041  
 Filed May 9, 1994, Ser. No. 22,567

Term of patent 14 years

U.S. Cl. D8—105





360,816

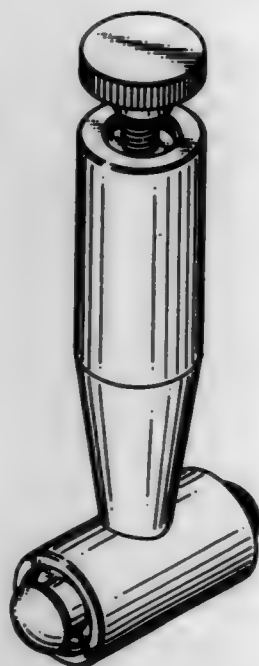
**SHOE AND BOOT EXPANDER**

Dennis N. Brown, Blaine, Wash., assignor to Northwest Podiatric Laboratory, Inc., Blaine, Wash.

Filed Jan. 1, 1994, Ser. No. 23,822

Term of patent 14 years

U.S. Cl. D8—106



360,818

**HEAD FOR KEYS**

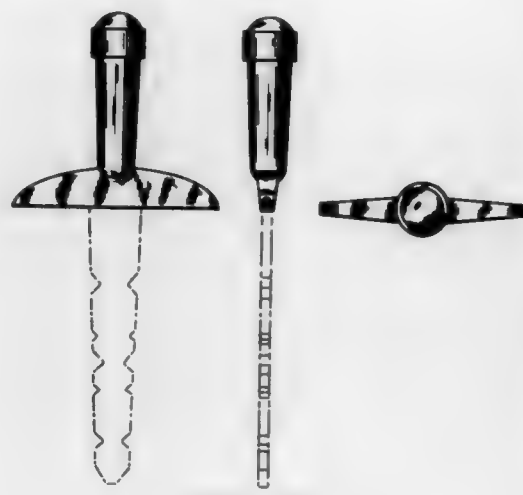
Luca Marchi, 7 Via Toscana, Mestre Venezia, Italy 30170

Filed Jan. 18, 1994, Ser. No. 17,542

Claims priority, application Italy, Jul. 16, 1993, PD 93 0 39

Term of patent 14 years

U.S. Cl. D8—347



360,819

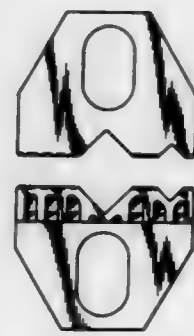
**PEG SUPPORT**

Zbigniew Noniewicz, Kempenich, Germany, assignor to Wolfcraft GmbH, Wolfen, Germany

Filed Sep. 19, 1994, Ser. No. 28,563

Term of patent 14 years

U.S. Cl. D8—354



360,817

**DRYWALL UTILITY KNIFE HANDLE**

William L. Moyer, Jr.; Andrew D. Moyer; William L. Moyer, Sr.; and Gregory A. Moyer, all of R.D. 3; Box 635, Bedford, Pa. 15522

Filed May 26, 1994, Ser. No. 23,557

Term of patent 14 years

U.S. Cl. D8—107



360,820

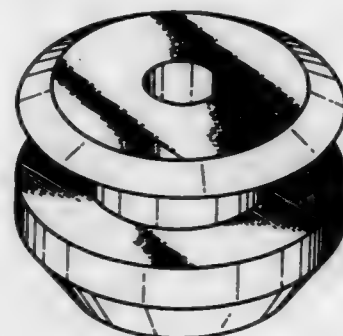
**GROMMET**

Richard Hance, 6012 Beach Dr., Rogers City, Mich. 49779

Filed Mar. 3, 1994, Ser. No. 19,478

Term of patent 14 years

U.S. Cl. D8—356



360,821

**STRONG ARM ADHESIVE SPARK PLUG WIRE BRACKET**

Michael S. Snow, 1011 E. Boundary Rd., Lynden, Wash. 98264

Filed Jun. 20, 1994, Ser. No. 24,710

Term of patent 14 years

U.S. Cl. D8—357



360,823

**PERFUME CONTAINER**

Pierre F. Dinand, Levallois Perret, France, assignor to Pacific Chemical Company, Seoul, Rep. of Korea

Division of Ser. No. 1,683, Nov. 23, 1992, Pat. No. Des. 357,632.

This application Dec. 5, 1994, Ser. No. 32,114

Claims priority, application Germany, May 22, 1992, M 92 04 001.2; May 22, 1992, M 92 04 002.0

Term of patent 14 years

U.S. Cl. D9—300



360,822

**HOSE REEL**

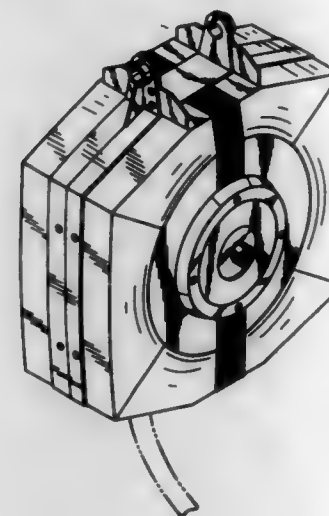
Robert F. Anderson, Nottinghill, Australia, assignor to A. K. Reels Pty Ltd, Victoria, Australia

Filed Oct. 27, 1993, Ser. No. 14,605

Claims priority, application Australia, Apr. 28, 1993, 1355/93; Apr. 28, 1993, 1356/93

Term of patent 14 years

U.S. Cl. D8—358



360,824

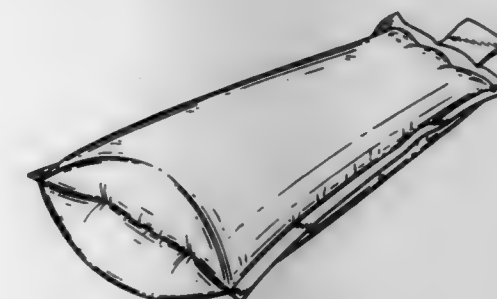
**INFLATABLE SPECIMEN RECEIPTACLE**

Russell Ossendryver, 204 E. 25th St., #3A, New York, N.Y. 10010

Filed Jun. 22, 1994, Ser. No. 24,840

Term of patent 14 years

U.S. Cl. D9—305

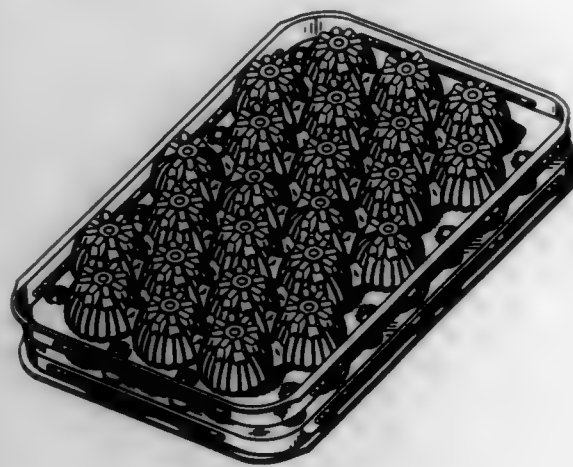


360,825

## FRUIT CONTAINER

Robert Knoss, Anoka, and Calvin S. Krupa, Hamel, both of Arthur W. Ball, P. O. Box 1436, Mead, Wash. 99021-1436  
 Minn., assignors to Ultra Pac, Inc., Rogers, Minn.  
 Filed Jul. 11, 1994, Ser. No. 25,761  
 Term of patent 14 years

U.S. Cl. D9—348

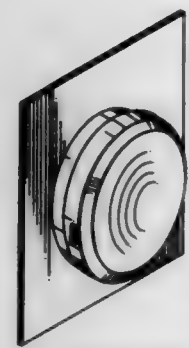


360,826

## PACKAGE FOR COVERED CONTAINER

James T. Harman, and Cindy M. Harman, both of P.O. Box 941612, Maitland, Fla. 32794  
 Filed Apr. 22, 1994, Ser. No. 21,769  
 Term of patent 14 years

U.S. Cl. D9—415

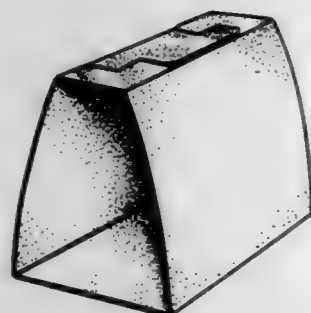


360,827

## PACKAGE

Lindgren Mats, Musevigen, Sweden, assignor to General Protection Dalecarlia AB, Vikmanshyttan, Sweden  
 Filed Dec. 28, 1993, Ser. No. 16,851  
 Claims priority, application Sweden, Jul. 9, 1993, 93-1587  
 Term of patent 14 years

U.S. Cl. D9—433

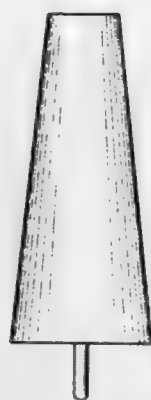


360,828

## CAULK SAVER

Gary Leeds, South Orange, N.J., assignor to United Vitamin Manufacturing Corp., Bohemia, N.Y.  
 Filed Jun. 27, 1994, Ser. No. 25,036  
 Term of patent 14 years

U.S. Cl. D9—439



360,829

## CONTAINER

Gary Leeds, South Orange, N.J., assignor to United Vitamin Manufacturing Corp., Bohemia, N.Y.  
 Filed Apr. 21, 1994, Ser. No. 21,624  
 Term of patent 14 years

U.S. Cl. D9—502



360,830

## WATER BOTTLE

Borge Hestehave, Alta Loma, and Kjeld Hestehave, Upland, both of Calif., assignors to Bomatic, Inc., Ontario, Calif.  
 Filed Jul. 23, 1993, Ser. No. 10,975  
 Term of patent 14 years

U.S. Cl. D9—520



360,831

## BOTTLE

Jean C. Boisset, Vougeot, France, assignor to Grand Vins Jean Claude Boisset, Nuits Saint Georges, France  
 Filed Nov. 5, 1993, Ser. No. 14,949  
 Term of patent 14 years

U.S. Cl. D9—529

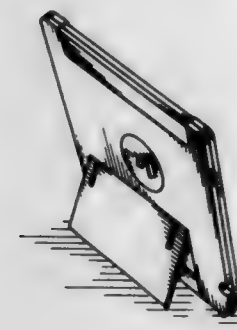


360,832

## DISKETTE CLOCK

Stuart L. Koch, 1917 Midland, Highland Park, Ill. 60035, assignor to Stuart L. Koch, Morton Grove, Ill.  
 Filed Apr. 8, 1994, Ser. No. 21,096  
 Term of patent 14 years

U.S. Cl. D10—6

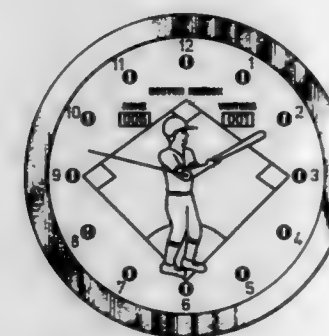


360,833

## CLOCK

John A. Rodriguez, 31 Drury St., Springfield, Mass. 01129  
 Filed Apr. 22, 1994, Ser. No. 21,717  
 Term of patent 14 years

U.S. Cl. D10—8



360,834

## WATCHCASE

Makiko Mizoguchi, and Yukiko Hayashi, both of Tokyo, Japan, assignors to Seiko Instruments, Inc., Japan  
 Filed Jun. 2, 1994, Ser. No. 23,866  
 Term of patent 14 years

U.S. Cl. D10—30



360,835

## WRIST WATCH

Takahiko Sayama, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan  
 Filed Aug. 1, 1994, Ser. No. 26,594  
 Term of patent 14 years

U.S. Cl. D10—38



360,836

## WRIST WATCH

Atsushi Goto, Ome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan  
 Filed Aug. 1, 1994, Ser. No. 26,595  
 Term of patent 14 years

U.S. Cl. D10—38



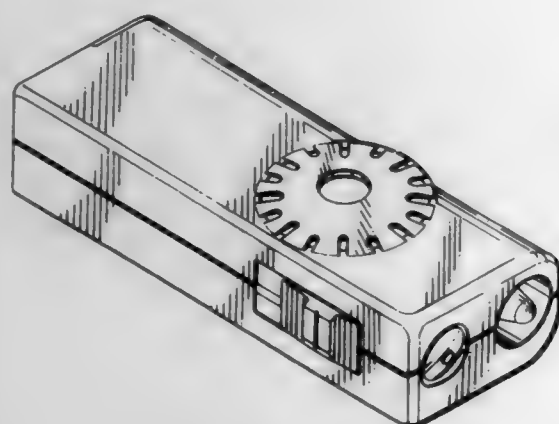


360,837

**COMBINED SECURITY DEVICE TORCH AND COMPASS**

Lawrence L. S. Chui, Kwan Tong, Hong Kong, assignor to Lung San Plastic & Metal Factory Limited, Hong Kong  
 Filed Jun. 28, 1994, Ser. No. 25,237  
 Term of patent 14 years

U.S. Cl. D10—62



360,839

**ELECTROMETER**

Eui M. Kim, Seoul, Rep. of Korea, assignor to Metex Corporation, Seoul, Rep. of Korea  
 Filed Mar. 4, 1994, Ser. No. 19,568  
 Claims priority, application Rep. of Korea, Feb. 23, 1994, 94-3407

Term of patent 14 years

U.S. Cl. D10—78



360,840

**PH METER**

Laura Brockway, Charlestown; Paul Sydlowski, Wakefield, and Nasseredin Nikkhoy-Toussi, East Weymouth, all of Mass., assignors to ATI-Orion, Boston, Mass.

Filed May 18, 1994, Ser. No. 23,195

Term of patent 14 years

U.S. Cl. D10—81



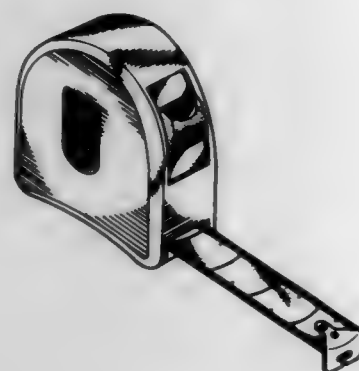
360,838

**MEASURING TAPE**

Henry Lin, Shin Chung, Taiwan, assignor to Index Measuring Tape Co., Ltd., Shin Chung, Taiwan  
 Filed Jun. 9, 1994, Ser. No. 25,147

Term of patent 14 years

U.S. Cl. D10—72

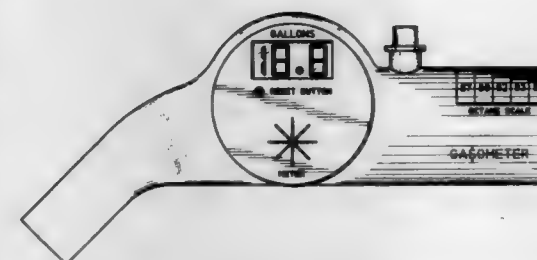


360,841

**GAS FLOW METER**

John J. Stevens, 44 Keefe St., Waterbury, Conn. 06706  
 Filed Jun. 27, 1994, Ser. No. 25,106  
 Term of patent 14 years

U.S. Cl. D10—96



360,842

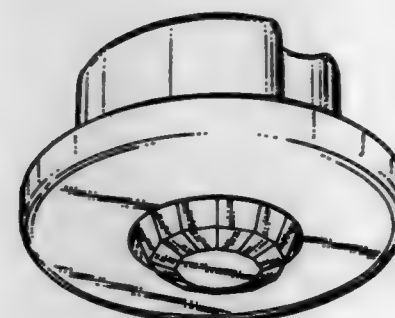
**MOTION SENSOR**

Charles C. Hu, Saratoga, Calif., assignor to The Watt Stopper, Santa Clara, Calif.

Filed Aug. 9, 1994, Ser. No. 26,939

Term of patent 14 years

U.S. Cl. D10—106



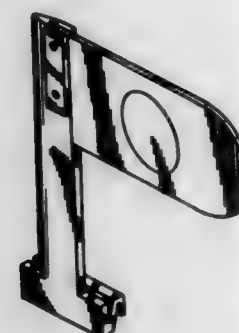
360,843

**VEHICLE WINDOW MOUNTED SPORTS PENNANT**

James R. Harris, 3505 Park Row Dr., Louisville, Ky. 40216  
 Filed Oct. 7, 1994, Ser. No. 29,520

Term of patent 14 years

U.S. Cl. D10—109



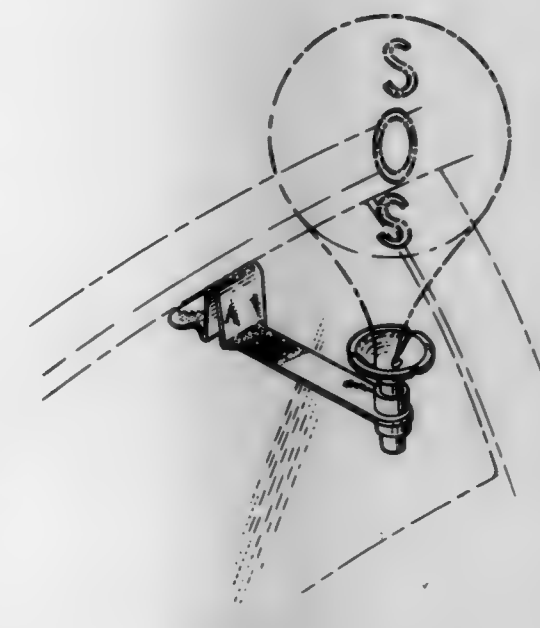
360,844

**SUPPORTING DEVICE FOR A DISPLAY BALLOON**  
 Murray G. W. Miller, 19 Albert Street N., Orillia, Ontario, Canada L3V 3J9, and Melville L. Middleton, 221 Atherley Road, Orillia, Ontario, Canada L3V 1N6

Filed Dec. 22, 1993, Ser. No. 16,742

Term of patent 14 years

U.S. Cl. D10—110



360,845

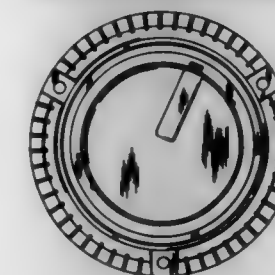
**EMERGENCY WARNING LIGHT BASE**

Andrew G. Smith, St. Louis, Mo., and John H. Loudenslager, Houston, Tex., assignors to Public Safety Equipment, Inc., St. Louis, Mo.

Filed Jul. 6, 1994, Ser. No. 25,599

Term of patent 14 years

U.S. Cl. D10—114



360,846

## TRAFFIC SIGN

Veijo E. Kallionpää, Rauma, Finland, assignor to Leo Kaine Oy, Rauma, Finland

Filed Sep. 20, 1994, Ser. No. 28,712

Claims priority, application Finland, Mar. 25, 1994, 227/94

Term of patent 14 years

U.S. Cl. D10—114



360,847

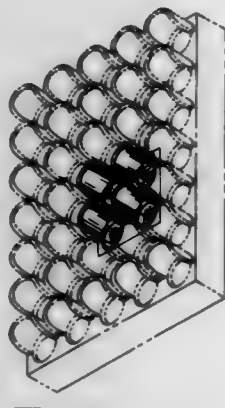
## PANEL FOR AN ELECTRONIC DISPLAY

Christopher J. Salinas, Brookfield, and Ronald A. Levac, Hartland, both of Wis., assignors to Adaptive Micro Systems, Inc., Milwaukee, Wis.

Filed Nov. 4, 1993, Ser. No. 14,938

Term of patent 14 years

U.S. Cl. D10—115



360,848

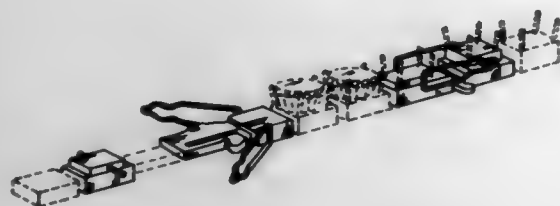
## CLASP SET

Meiriv R. Koven, P.O. Box 52, Chama, N. Mex. 87520

Filed Apr. 12, 1993, Ser. No. 7,056

Term of patent 14 years

U.S. Cl. D11—87



360,849

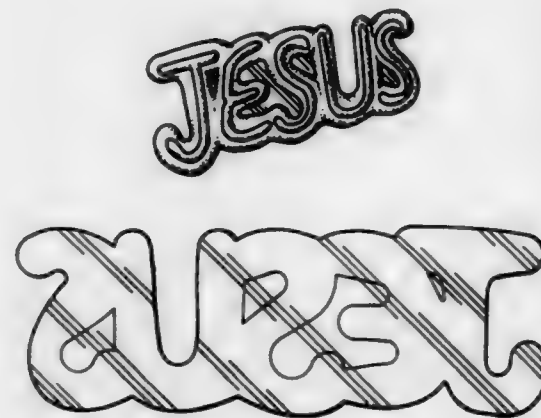
## MAGNET

Sharon M. Beckett, 901 E. Chicago Ave., East Chicago, Ind. 46312

Filed Oct. 1, 1993, Ser. No. 13,753

Term of patent 14 years

U.S. Cl. D11—132



360,850

## COMBINED FLOWER POT WITH FILL SPOUT

Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex Sarl, Oyonnax, France

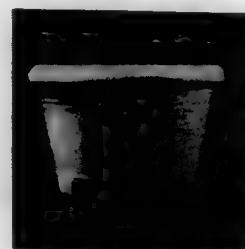
Filed Nov. 12, 1993, Ser. No. 15,287

Claims priority, application Hague Agreement, May 14, 1993, DMA/002151

The portion of the term of this patent subsequent to Jul. 11, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—152



360,851

## FLOWER POT COVER WITH FINS

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No.

Des. 348,634, which is a continuation-in-part of Ser. No.

617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of

Ser. No. 411,249, Sep. 22, 1989, and a continuation-in-part of

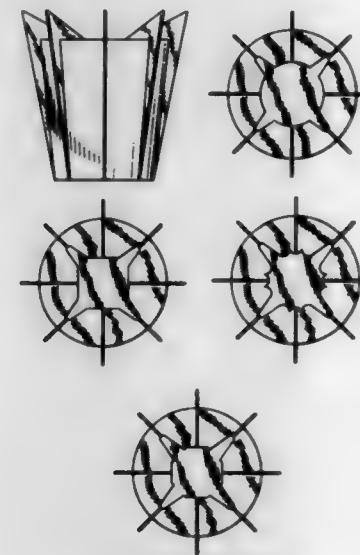
Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of

Ser. No. 411,245, Sep. 22, 1989. This application Sep. 29, 1992,

Ser. No. 953,585

Term of patent 14 years

U.S. Cl. D11—164



360,852

## FLOWER POT COVER WITH FINS

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, which

is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990,

abandoned, and a continuation-in-part of Ser. No. 411,249, Sep.

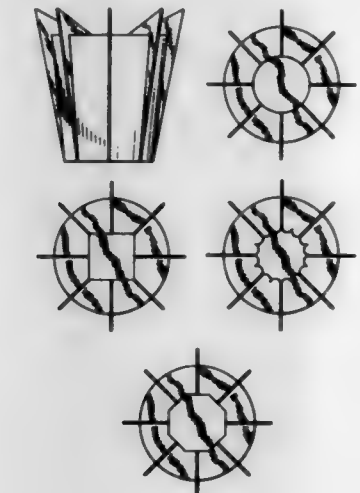
22, 1989, and a continuation-in-part of Ser. No. 411,247, Sep. 22,

1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22,

1989. This application Sep. 29, 1992, Ser. No. 954,065

Term of patent 14 years

U.S. Cl. D11—164



360,853

## PULL TAB FOR SLIDE FASTENER SLIDERS

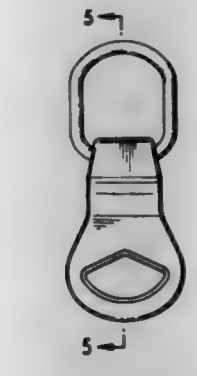
Kenji Yuuki, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 29, 1994, Ser. No. 20,568

Claims priority, application Japan, Sep. 30, 1993, 5-29548

Term of patent 14 years

U.S. Cl. D11—221



360,854

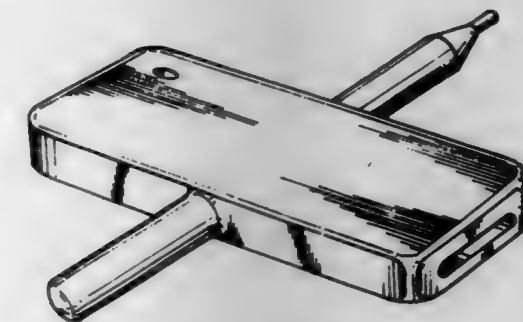
## COMBINATION ZIPPER AND TELEPHONE DIALING MANIPULATOR

Floyd W. Collins, 106 Collins Rd., Morganton, Ga. 30560

Filed Sep. 8, 1994, Ser. No. 28,175

Term of patent 14 years

U.S. Cl. D11—221



360,855

## DEVICE FOR ASSISTING CHILD'S WALKING

David W. Jameson, and Gregory R. King, both of 500 Fair Oaks Dr., Eugene, Oreg. 97401

Filed Sep. 28, 1994, Ser. No. 29,047

Term of patent 14 years

U.S. Cl. D12—130





360,856

## AUTOMOBILE TIRE

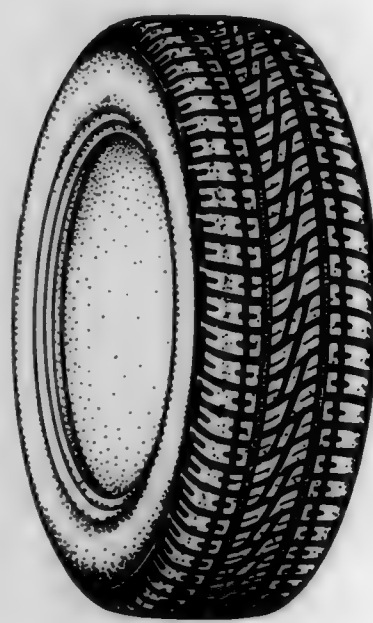
Yasuo Hissuro, and Yasuhiro Hamada, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 28, 1994, Ser. No. 20,470

Claims priority, application Japan, Sep. 29, 1993, 5-29103

Term of patent 14 years

U.S. Cl. D12-146



360,858

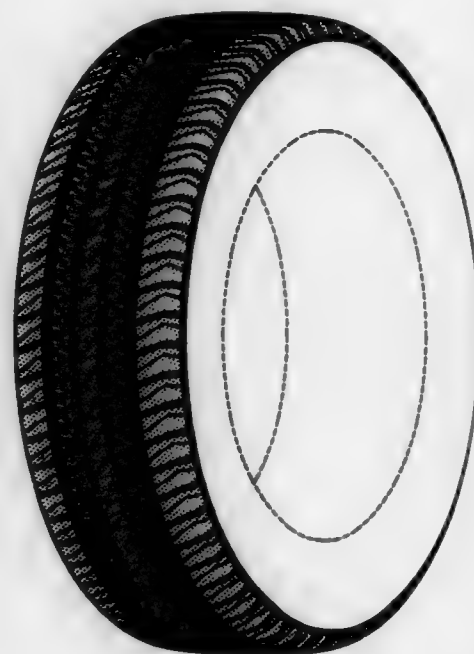
## TIRE TREAD

Randall R. Brayer, North Canton; Beale A. Robinson, North Canton, and Andrew F. Welmer, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 27, 1994, Ser. No. 17,995

Term of patent 14 years

U.S. Cl. D12-147



360,857

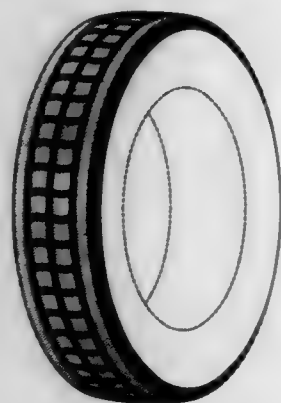
## TIRE TREAD

Robert J. Hermann, Stow, and Daniel E. Schuster, North Royalton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 13, 1994, Ser. No. 17,434

Term of patent 14 years

U.S. Cl. D12-147



360,859

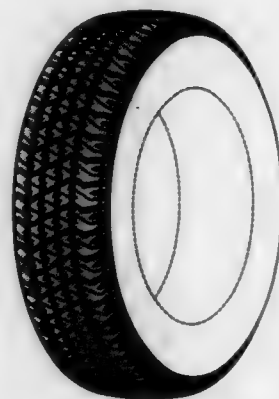
## TIRE TREAD

JOHN S. ATTINELLO, Hartville; William E. Glover, Akron, both of Ohio, and Kevin A. Reid, Asheville, N.C., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 28, 1994, Ser. No. 18,103

Term of patent 14 years

U.S. Cl. D12-147



360,860

## TIRE TREAD

John S. Attinello, Hartville; William E. Glover, Akron, both of Ohio, and Kevin A. Reid, Asheville, N.C., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 31, 1994, Ser. No. 18,175

Term of patent 14 years

U.S. Cl. D12-147



360,862

## TRACTOR TIRE

Mark L. Bonko, Uniontown, and Myron M. McClain, North Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 15, 1993, Ser. No. 15,366

Term of patent 14 years

U.S. Cl. D12-151



360,861

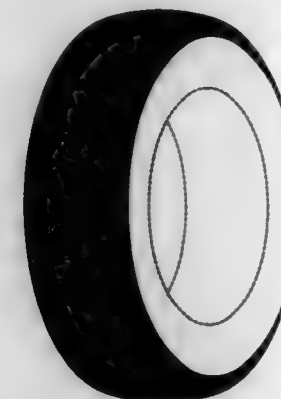
## TIRE TREAD

Maurice Grass, Reichlange, and John C. M. Munster, Ettelbruck, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 28, 1994, Ser. No. 19,232

Term of patent 14 years

U.S. Cl. D12-147



360,863

## TIRE TREAD

John S. Attinello, Hartville; William E. Glover, Akron, both of Ohio, and Kevin A. Reid, Asheville, N.C., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 14, 1994, Ser. No. 18,623

Term of patent 14 years

U.S. Cl. D12-151



360,864  
TIRE TREAD

John C. M. Munster, and Jan H. Van Tuyt, both of Ettelbruck, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 1, 1994, Ser. No. 19,379  
Term of patent 14 years

U.S. Cl. D12-151

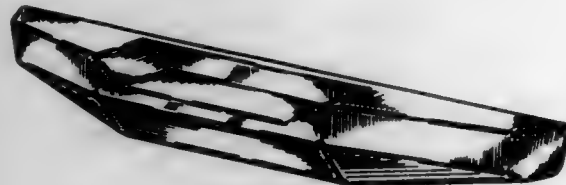


360,865  
VEHICLE BUMPER

Wayne B. Hanson, 716 Cornell Ave., Salinas, Calif. 93901  
Filed Nov. 22, 1993, Ser. No. 15,602

Term of patent 14 years

U.S. Cl. D12-169

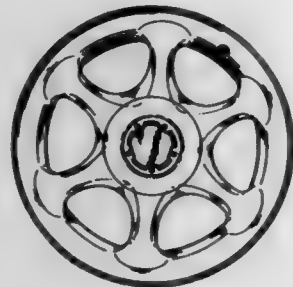


360,866  
VEHICLE WHEEL

Alberto Echazabal, Hialeah Gardens, Fla., and Claudio Beroni, Albano Terme, Italy, assignors to Motoring Accessories Inc., Miami, Fla.

Filed Jan. 10, 1994, Ser. No. 17,266  
Term of patent 14 years

U.S. Cl. D12-209



360,867  
VEHICLE WHEEL

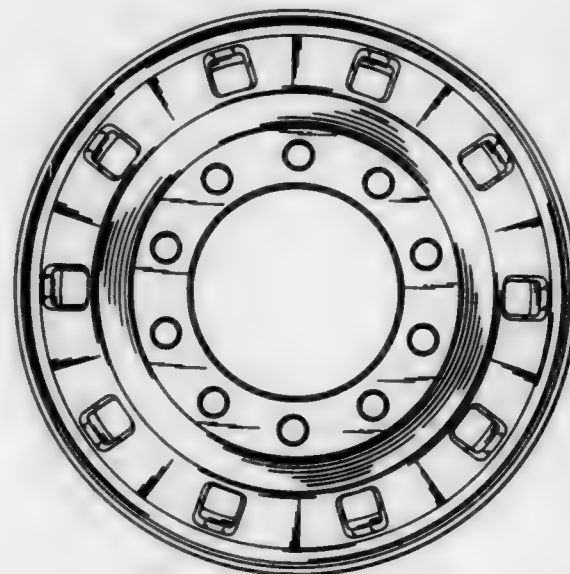
Ralph C. Botterman, Strongsville, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 24, 1992, Ser. No. 1,807

The portion of the term of this patent subsequent to Mar. 21, 2012, has been disclaimed.

Term of patent 14 years

U.S. Cl. D12-211



360,868  
HANDLEBAR MOUNTABLE DRINK HOLDER

Edward W. Kalat, 310 Annelise Ave., Southington, Conn. 06489  
Filed May 5, 1994, Ser. No. 2,489

Term of patent 14 years

U.S. Cl. D12-411



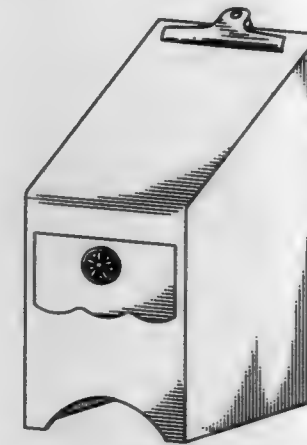
360,869  
PORTABLE DESK FOR MOTOR VEHICLES

Frances G. Brackett, 26405-15 Mile Rd., Big Rapids, Mich. 49307

Filed Nov. 5, 1993, Ser. No. 14,943

Term of patent 14 years

U.S. Cl. D12-423

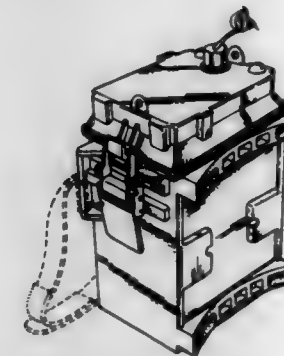


360,870  
BATTERY CASE FOR DIVING USE  
Ming-Chou Huang, No. 16, Lane 43, Hua Cheng Road, Hsin Chuang, Taipei Hsien, Taiwan

Filed Mar. 18, 1994, Ser. No. 20,067

Term of patent 14 years

U.S. Cl. D13-103

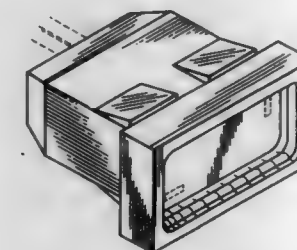


360,871  
ELECTRICAL RECEPTACLE HOUSING  
Daniel P. Wilson, Fontana, Calif., assignor to DSM&T Co., Inc., Fontana, Calif.

Filed Oct. 22, 1993, Ser. No. 14,427

Term of patent 14 years

U.S. Cl. D13-133



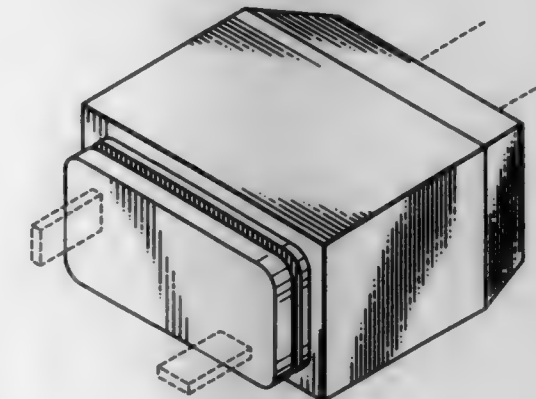
360,872  
ELECTRICAL PLUG HOUSING

Daniel P. Wilson, Fontana, Calif., assignor to DSM&T Co., Inc., Fontana, Calif.

Filed Oct. 22, 1993, Ser. No. 14,451

Term of patent 14 years

U.S. Cl. D13-133

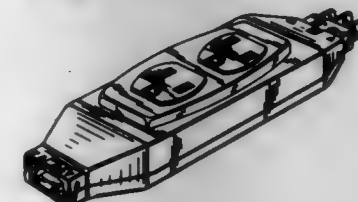
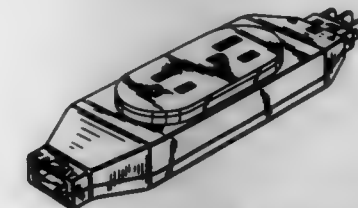


360,873  
MULTI-SOCKET ELECTRICAL CONNECTOR  
Rado Starec, Tullamarine; Antonino Schiavello, Templestone, and James G. Cowhey, Bulleen, all of Australia, assignors to Light on Pty Ltd, Tullamarine, Australia

Filed Nov. 17, 1993, Ser. No. 15,440

Term of patent 14 years

U.S. Cl. D13-143

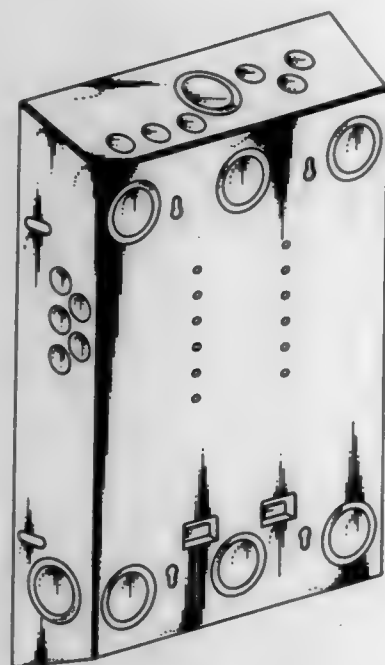




360,874

**HOUSING FOR AN ELECTRICAL DISTRIBUTION PANEL**

Marion V. Duff, 2575 Sancrest Dr., Buford, Ga. 30518; Jeffery P. Unger, 860 Cariton Dr., Conyers, Ga. 30208, and Alfred E. Hoffman, 2550 Bradford Sq., Atlanta, Ga. 30345  
 Filed Dec. 27, 1993, Ser. No. 16,908  
 Term of patent 14 years  
 U.S. Cl. D13—152



360,876

**SWITCH PLATE COVER**

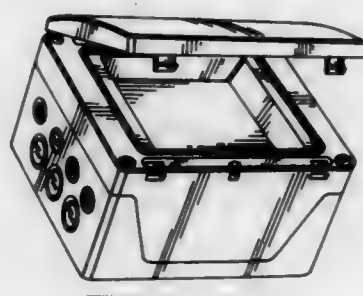
Richard R. Hughes, 1601 Kingsbridge, Garland, Tex. 75044  
 Filed Jan. 19, 1994, Ser. No. 17,649  
 Term of patent 14 years  
 U.S. Cl. D13—177



360,877

**ELECTRONICS AND INSTRUMENTATION HOUSING**  
 Matti Ropponen, Espoo, and Heikki Merilainen, Helsinki, both of Finland, assignors to Fibox Oy Ab, Tammissaari, Finland  
 Filed Apr. 15, 1994, Ser. No. 21,913  
 Claims priority, application Finland, Oct. 18, 1993, 686/93; Oct. 18, 1993, 687/93

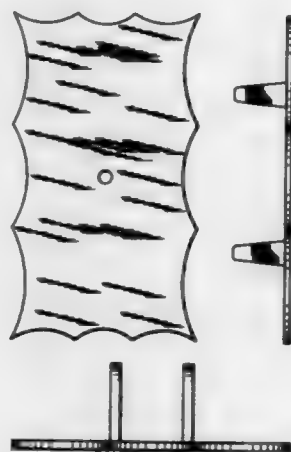
Term of patent 14 years  
 U.S. Cl. D13—184



360,878

**TODDLER-PROOF OUTLET COVER**

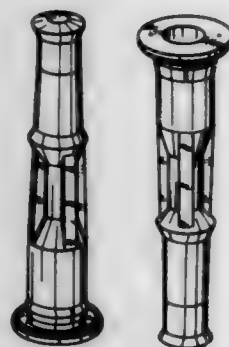
Richard D. Dyer, and Elizabeth A. Dyer, both of 20 N. Bend St., Pawtucket, R.I. 02860  
 Filed Feb. 16, 1994, Ser. No. 18,768  
 Term of patent 14 years  
 U.S. Cl. D13—156



360,875

**PROTECTOR FOR AN ELECTRICAL CONNECTING PART**

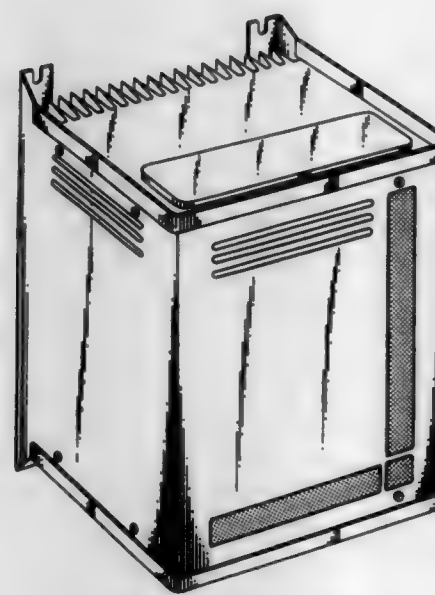
Keiichi Nakajima, Mie, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan  
 Filed Sep. 28, 1993, Ser. No. 13,613  
 Claims priority, application Japan, Mar. 29, 1993, 5-8852  
 Term of patent 14 years  
 U.S. Cl. D13—156



360,879

**ELECTRICAL CONTROL HOUSING FOR ELECTRIC MOTORS**

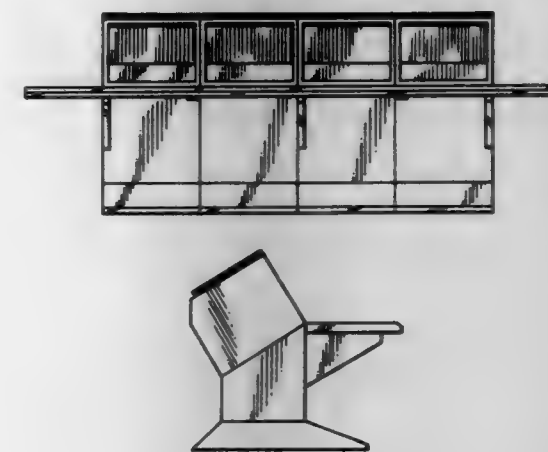
Hans Grönwall, Nyhamnsåge, Sweden, assignor to Emotron AB, Helsingborg, Sweden  
 Filed Oct. 20, 1993, Ser. No. 14,298  
 Claims priority, application Sweden, Apr. 20, 1993, 93 0955  
 Term of patent 14 years  
 U.S. Cl. D13—162



360,881

**AUDIO/VIDEO CONSOLE**

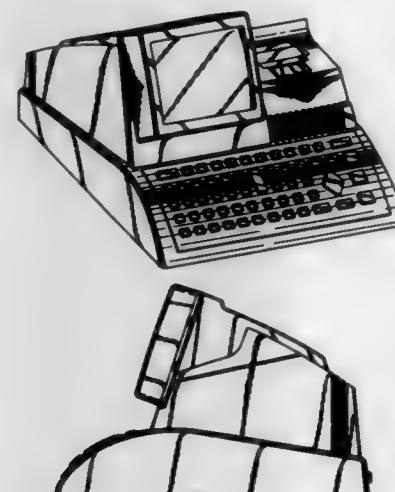
Reed B. Johnson, Cumming, Ga., assignor to Usability Systems, Inc., Alpharetta, Ga.  
 Filed Jul. 18, 1994, Ser. No. 26,064  
 Term of patent 14 years  
 U.S. Cl. D14—103



360,880

**DATA ENTRY TERMINAL**

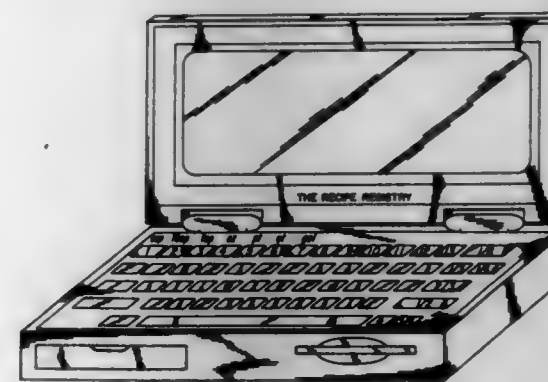
Tracy A. Bailey, Memphis, Tenn., assignor to Federal Express Corporation, Memphis, Tenn.  
 Filed Mar. 24, 1994, Ser. No. 20,309  
 Term of patent 14 years  
 U.S. Cl. D14—100



360,882

**COMPUTER TERMINAL FOR STORAGE AND DISPLAY OF RECIPES**

Anne J. White, 2501 Figtree Ln., Plano, Tex. 75074  
 Filed May 27, 1994, Ser. No. 23,642  
 Term of patent 14 years  
 U.S. Cl. D14—106



360,883

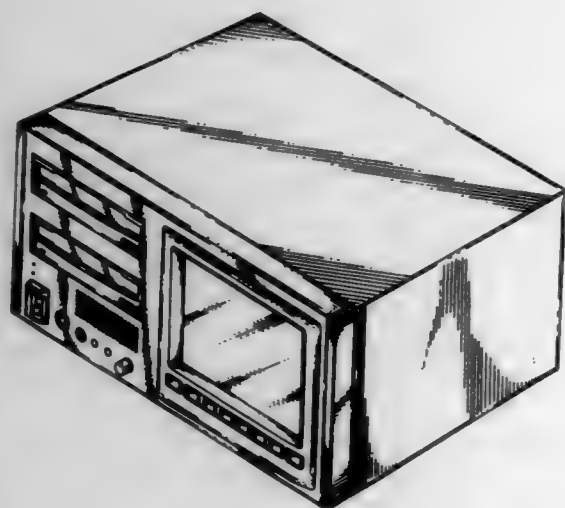
**DATA RECORDING AND REPRODUCING APPARATUS**  
Masafumi Ito, Tokyo; Koji Suzuki, Tokorozawa, and Shigeru Hasegawa, Kodaira, all of Japan, assignors to TEAC Corporation, Tokyo, Japan

Filed Mar. 8, 1994, Ser. No. 19,658

Claims priority, application Japan, Sep. 10, 1993, 5-27529

Term of patent 14 years

U.S. Cl. D14-107



360,885

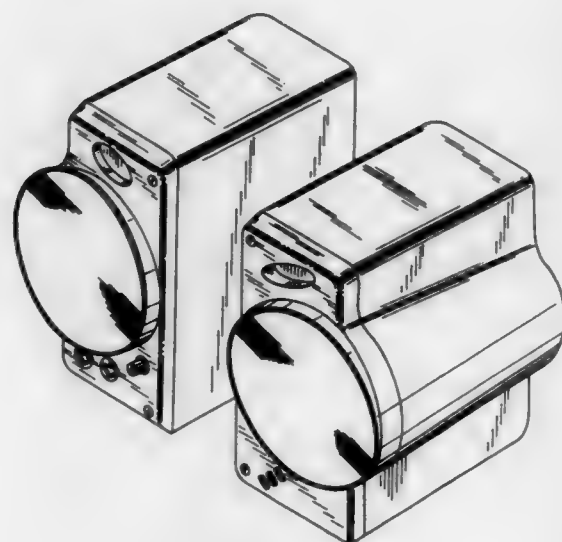
**SPEAKER UNIT**

Wen C. Sheu, Chung-Ho, Taiwan, assignor to High Grade Industries Co., Ltd., Chung-Ho, Taiwan

Filed Dec. 10, 1993, Ser. No. 16,249

Term of patent 14 years

U.S. Cl. D14-215



360,887

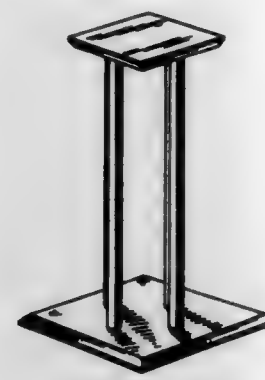
**SPEAKER STAND**

Christopher Karsze, 39 Pond St., San Francisco, Calif. 94114

Filed Jul. 18, 1994, Ser. No. 25,950

Term of patent 14 years

U.S. Cl. D14-224



360,888

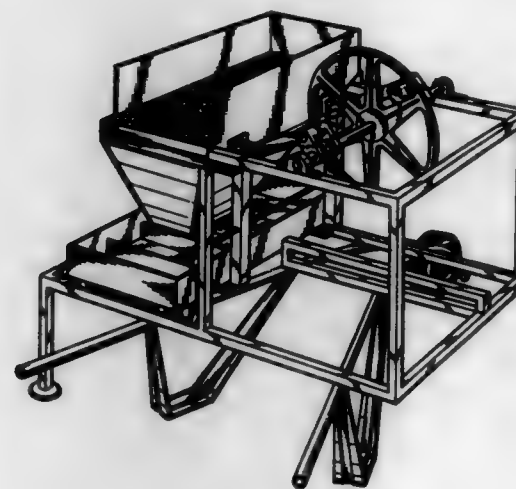
**ORE PROCESSOR**

Roger P. Timm, 1630 E. Greenlee Rd., Tucson, Ariz. 85719

Filed Aug. 22, 1994, Ser. No. 27,477

Term of patent 14 years

U.S. Cl. D15-147



360,886

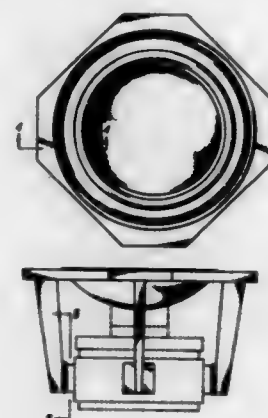
**LOUDSPEAKER**

David Hall, San Jose, Calif., assignor to Velodyne Acoustics, Inc., San Jose, Calif.

Filed Sep. 2, 1994, Ser. No. 27,944

Term of patent 14 years

U.S. Cl. D14-216



360,884

**BASE FOR VIDEO MONITOR**

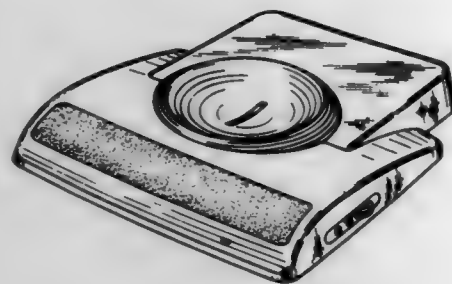
Atsushi Onuma; Hirofumi Takemasa, and Hiroshi Yasuno, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 27, 1994, Ser. No. 26,411

Claims priority, application Japan, Feb. 4, 1994, 6-2574

Term of patent 14 years

U.S. Cl. D14-114



360,890

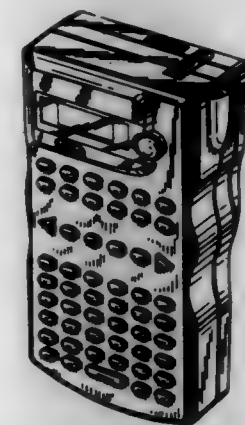
**PRINTER FOR ADHESIVE BACKED LABELS**

Jonathan Tremlett, Tooting, United Kingdom, assignor to Eselte Dymo, N.V., St. Niklaas, Belgium

Filed Nov. 5, 1993, Ser. No. 15,062

Term of patent 14 years

U.S. Cl. D18-19



360,891

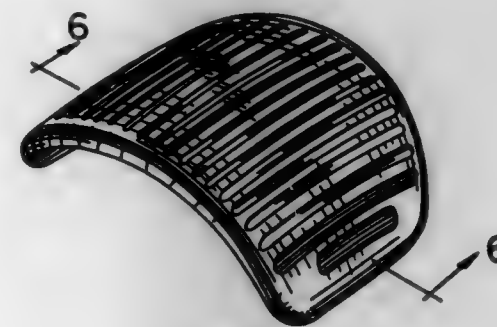
**CAP FOR A ROTARY PAPER TRIMMER CARRIAGE**

Douglas J. Birkholz, DeForest, and James C. Boda, Merrimac, both of Wis., assignors to Fiskars Inc., Wausau, Wis.

Filed May 23, 1994, Ser. No. 23,283

Term of patent 14 years

U.S. Cl. D18-34



360,889

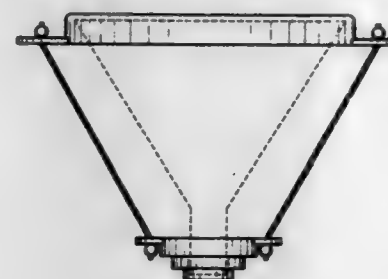
**FUNNEL COVER**

James F. Boekeloo, Box 391, Hennepin, Ill. 61327

Filed May 23, 1994, Ser. No. 23,348

Term of patent 14 years

U.S. Cl. D15-150



360,892

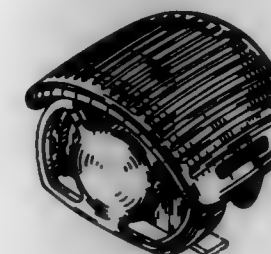
**CARRIAGE FOR A ROTARY BLADE PAPER TRIMMER**

Douglas J. Birkholz, DeForest, and James C. Boda, Merrimac, both of Wis., assignors to Fiskars Inc., Wausau, Wis.

Filed May 23, 1994, Ser. No. 23,290

Term of patent 14 years

U.S. Cl. D18-34





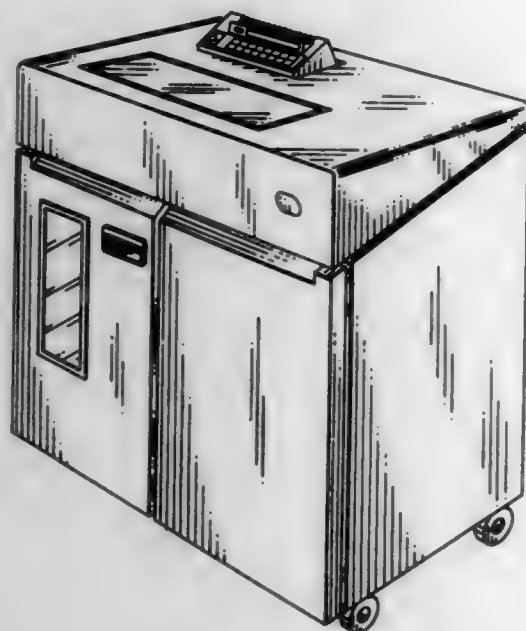
360,893  
PRINTER

Jeffrey L. Quadenfeld, Endicott, and Dennis P. Reynolds, Owego, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 662,896, Mar. 1, 1991, Pat. No. Des. 335,302. This application Jan. 8, 1993, Ser. No. 3,470

Term of patent 14 years

U.S. Cl. D18—53



360,895

INK CARTRIDGE FOR PRINTER

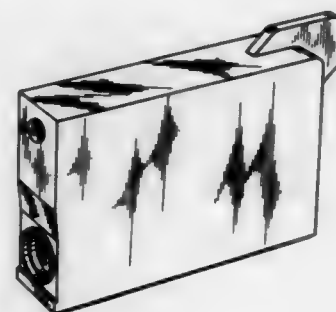
Hiroyuki Tokuda, Yokohama; Tetsuya Sekine, Kawasaki; Masahiko Higuma, Togane; Tsutomu Abe, Isehara, and Masami Ikeda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1993, Ser. No. 15,864

Claims priority, application Japan, Jun. 7, 1993, 5-17105  
The portion of the term of this patent subsequent to Jun. 27, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D18—56



360,896

COMBINED CALENDAR AND MAP

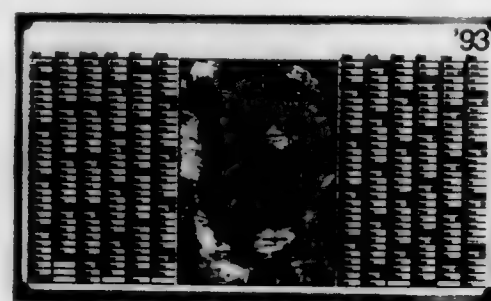
Manfred Bühner, Hochholzweg 26, D-7000 Stuttgart 75, Germany

Filed Nov. 30, 1992, Ser. No. 2,046

Claims priority, application Germany, May 30, 1992, M 92 04 069.1

Term of patent 14 years

U.S. Cl. D19—20



360,894

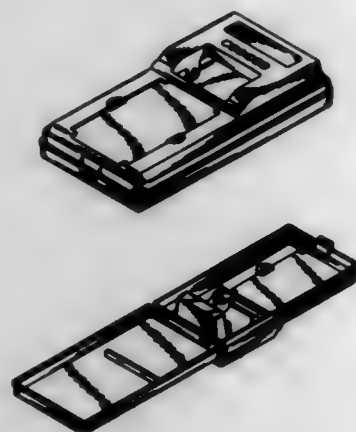
WRITING SURFACE AND ENCLOSURE FOR SUPPLIES

Robert S. Volk, Easton, Pa., and Joseph A. Marino, Whitehouse Station, N.J., assignors to Binney & Smith Inc., Easton, Pa.

Filed Jul. 28, 1994, Ser. No. 26,470

Term of patent 14 years

U.S. Cl. D19—36



360,897

Patent Not Issued For This Number

360,898

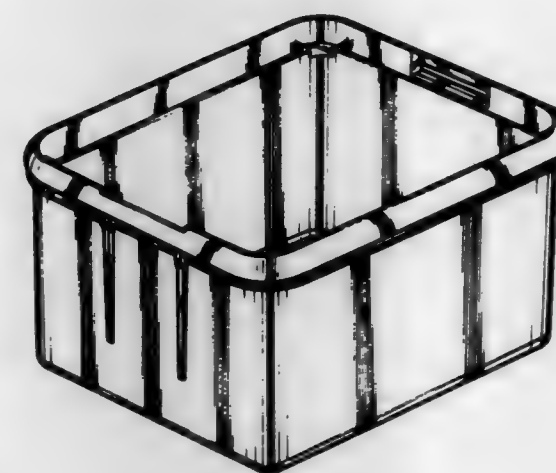
FILE STORAGE CONTAINER

Robert R. Huerto, Farragut, Tenn., and Jerry L. Sharber, Cypress, Calif., assignors to Rubbermaid Office Products Inc., Maryville, Tenn.

Filed Dec. 7, 1993, Ser. No. 16,098

Term of patent 14 years

U.S. Cl. D19—90



360,900

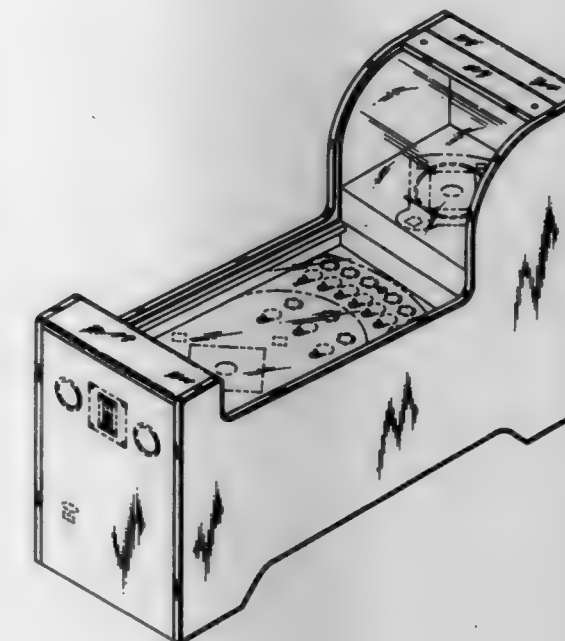
COIN OPERATED AMUSEMENT MACHINE

Jeffery R. Lankiewicz, Toms River, N.J., assignor to Coin Concepts, Inc., East Brunswick, N.J.

Filed Jun. 21, 1994, Ser. No. 24,806

Term of patent 14 years

U.S. Cl. D21—10



360,899  
RACKET

Chung-Hing Choi, Hong Kong, Hong Kong, assignor to Hing Fat Toys Manufacturer Ltd., Hong Kong, Hong Kong

Filed Jun. 21, 1994, Ser. No. 24,747

Term of patent 14 years

U.S. Cl. D21—212



360,901

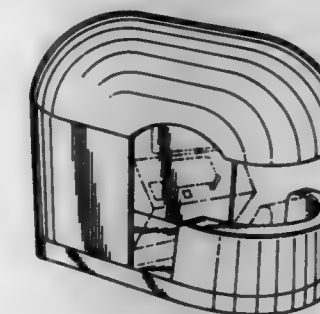
HOUSING FOR A VIDEO GAME CONSOLE

Daniel Slater, Hoffman Estates, Ill., assignor to International Laser Productions, Inc., Des Plaines, Ill.

Filed Jun. 28, 1993, Ser. No. 10,116

Term of patent 14 years

U.S. Cl. D21—13



360,902

## LOTTO NUMBER SELECTOR

Gary S. Lee, and Barbara M. Lee, both of 2742 Mimosa Dr.,  
Shreveport, La. 71108

Filed Jan. 6, 1994, Ser. No. 17,170

Term of patent 14 years

U.S. Cl. D21-37



360,903

## CONTROLLER FOR A VIDEO GAME MACHINE

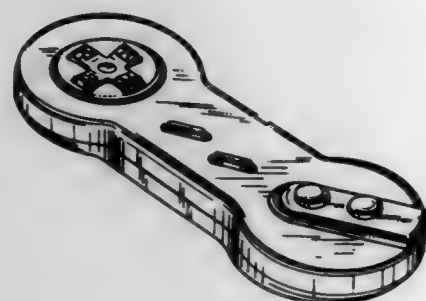
Lance Barr, Redmond, Wash., and Kenichiro Ashida, Kyoto,  
Japan, assignors to Nintendo Company, Ltd., Japan

Filed Nov. 30, 1993, Ser. No. 15,819

Claims priority, application Japan, Jun. 28, 1993, 5-19903

Term of patent 14 years

U.S. Cl. D21-48



360,904

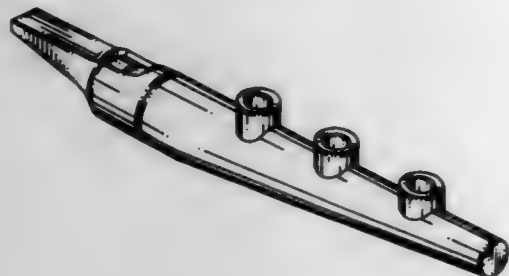
## TOY MUSICAL INSTRUMENT

Samuel D. Schilling, 8260 E. Vicksburg St., Tucson, Ariz.  
85710-2946

Filed Jan. 10, 1994, Ser. No. 17,302

Term of patent 14 years

U.S. Cl. D21-64



360,905

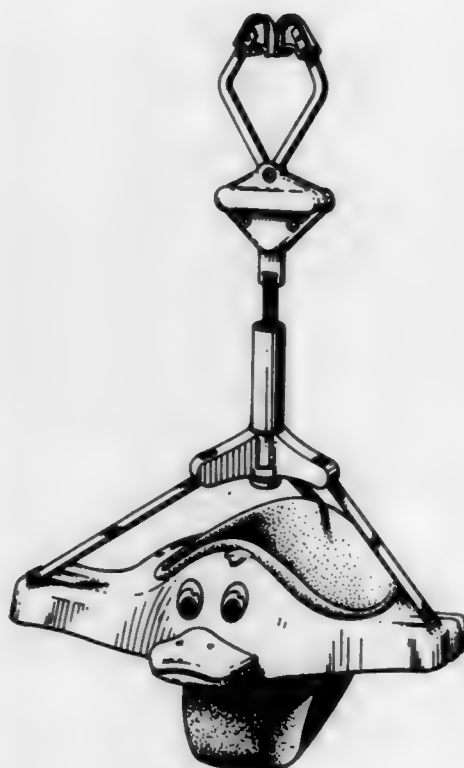
## DUCK NOVELTY JUMPER

Paul K. Meeker, Hiram, and William R. Gibson, Canton, both of  
Ohio, assignors to Lisco, Inc., Tampa, Fla.

Filed Aug. 13, 1993, Ser. No. 11,753

Term of patent 14 years

U.S. Cl. D21-71



360,906

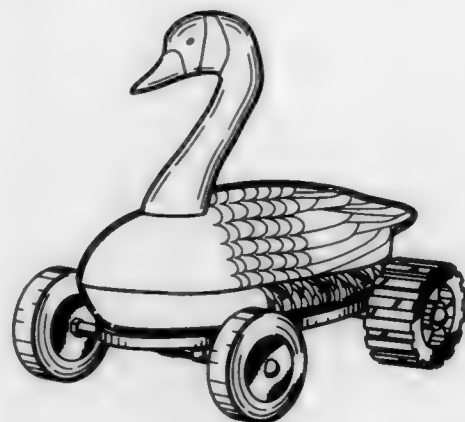
## NOVELTY WHEELED RIDING TOY

Thomas M. Hackett, 2607 Williams Pl., La Crosse, Wis. 54601

Filed Jan. 10, 1994, Ser. No. 17,263

Term of patent 14 years

U.S. Cl. D21-74



360,907

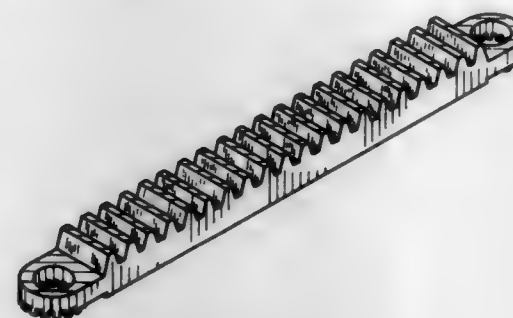
## RACK FOR A TOY BUILDING SET

Jan Hatting, Vejle, and Claus I. Madsen, Randbol, both of  
Denmark, assignors to Interlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,118

Term of patent 14 years

U.S. Cl. D21-108



360,908

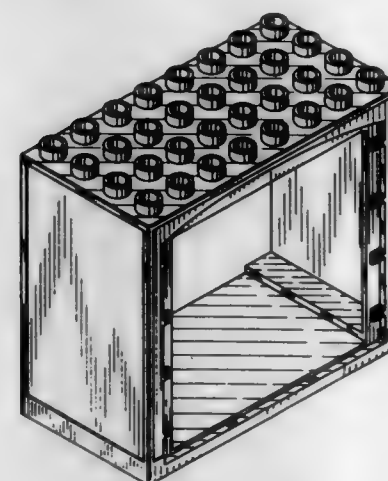
## TOY BUILDING ELEMENT

Ede F. Ruzsni, Copenhagen, Denmark, assignor to Interlego  
AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,133

Term of patent 14 years

U.S. Cl. D21-108



360,909

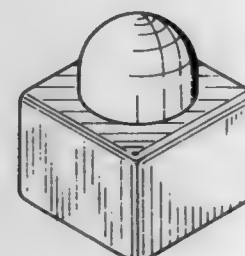
## TOY BUILDING ELEMENT

Jesper B. Frederiksen, Nykøbing F., Denmark, assignor to In-  
terlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,146

Term of patent 14 years

U.S. Cl. D21-108



360,910

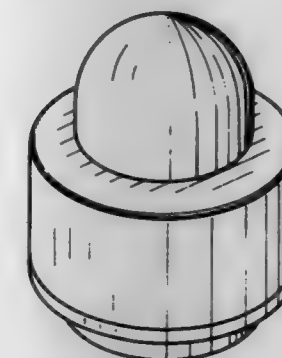
## TOY BUILDING ELEMENT

Jesper B. Frederiksen, Nykøbing F., Denmark, assignor to In-  
terlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,180

Term of patent 14 years

U.S. Cl. D21-108



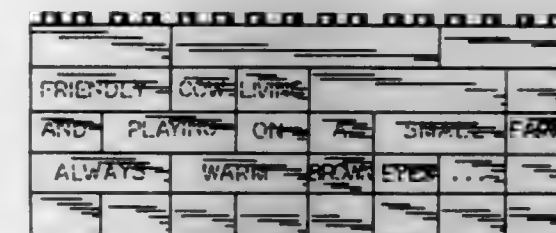
360,911

## WORD BRICK STRUCTURE

Anita J. DeZego, 2809 Waldwick Ct., St. Louis, Mo. 63129  
Division of Ser. No. 931,772, Aug. 18, 1992, Pat. No. Des.  
352,973. This application Apr. 1, 1994, Ser. No. 20,801

Term of patent 14 years

U.S. Cl. D21-108



360,912

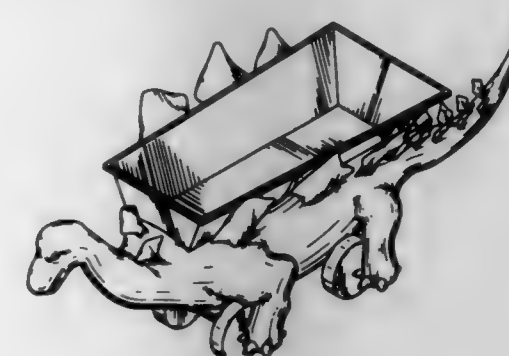
## TOY

Jeffrey G. Weemhoff, 8480 Lakeshore Dr., Chagrin Falls, Ohio  
44023

Filed Mar. 14, 1994, Ser. No. 19,858

Term of patent 14 years

U.S. Cl. D21-134





360,913  
TOY AXE

Chung-Hing Choi, Hong Kong, Hong Kong, assignor to Hing Fat Toys Manufacturer Limited, Hong Kong, Hong Kong

Filed Oct. 19, 1994, Ser. No. 29,942

Claims priority, application United Kingdom, Aug. 30, 1994, 2041364

Term of patent 14 years

U.S. Cl. D21-145



360,914

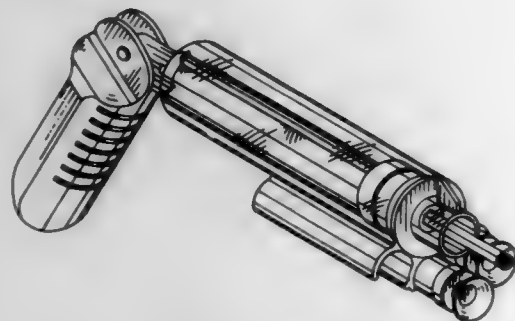
TOY PROJECTILE SHOOTER

Robert L. Brown, Cincinnati, Ohio, assignor to Tonka Corporation, Pawtucket, R.I.

Filed May 2, 1994, Ser. No. 22,262

Term of patent 14 years

U.S. Cl. D21-147



360,915

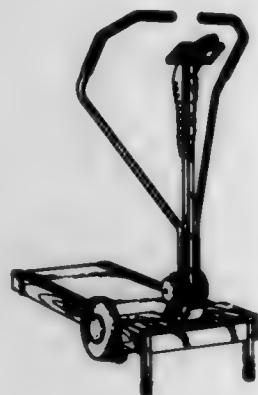
EXERCISE TREADMILL

James R. Bostic, Watertown; Alan E. Doop, Delano; Michael E. Heutmaker, Plymouth, and Stephen S. Peterson, Chanhassen, all of Minn., assignors to NordicTrack, Inc., Chaska, Minn.

Continuation-in-part of Ser. No. 73,202, Jun. 7, 1993. This application May 27, 1994, Ser. No. 23,606

Term of patent 14 years

U.S. Cl. D21-192



360,916  
ERGOMETER

Harukaze Koga, Tokyo, Japan, assignor to Combi Corporation, Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 24,549

Claims priority, application Japan, Dec. 16, 1993, 5-37870

Term of patent 14 years

U.S. Cl. D21-194



360,917

COVER SEGMENT FOR A SOCCER BALL

Fernandez Monso, Barcelona, Spain, assignor to Adidas Sarra-gan France, Landersheim, France

Filed May 6, 1992, Ser. No. 878,936

Claims priority, application Spain, Nov. 8, 1991, 126,215

Term of patent 14 years

U.S. Cl. D21-204



360,918

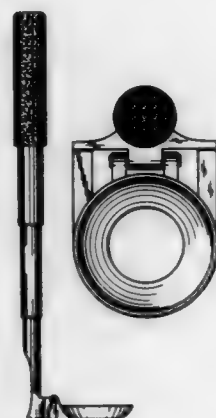
GOLF BALL RETRIEVER

Clarence J. Carlson, 415 Labian Dr., Flushing, Mich. 48433

Filed Jan. 21, 1994, Ser. No. 17,749

Term of patent 14 years

U.S. Cl. D21-206



360,919

WEDGE SHAPED GOLF TEE

Patrick J. O'Hara, 6407 Waring Ave., Los Angeles, Calif. 90038

Filed May 8, 1992, Ser. No. 880,342

Term of patent 14 years

U.S. Cl. D21-208



360,922

GOLF PUTTER HEAD

Boby Grace, Palm Harbor, Fla., assignor to Bobby Grace Golf Design, Inc., St. Petersburg, Fla.

Filed Nov. 1, 1994, Ser. No. 30,557

Term of patent 14 years

U.S. Cl. D21-217



360,923

IRON TYPE GOLF CLUB HEAD

Anthony J. Antonious, 7738 Calle Facil, Sarasota, Fla. 34238

Filed Jan. 25, 1994, Ser. No. 17,893

Term of patent 14 years

U.S. Cl. D21-220



360,920

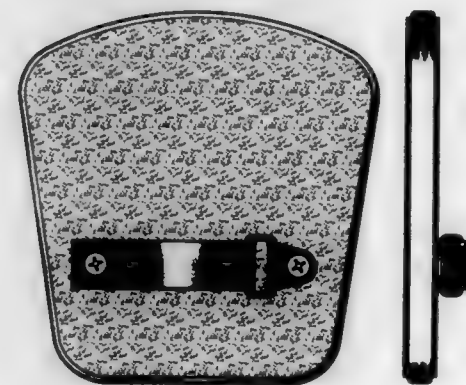
INFIELD TRAINING PADDLE

Paul D. Lessard, 167 Northern Ave., Augusta, Me. 04330

Filed Mar. 16, 1994, Ser. No. 20,004

Term of patent 14 years

U.S. Cl. D21-213



360,924

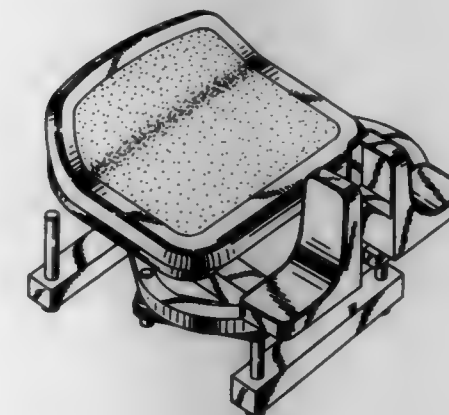
PHYSICAL EXERCISER

Gary L. Rockwell, Auburn, and Peter E. Simpson, Opelika, both of Ala., assignors to Diversified Products Corporation, Opelika, Ala.

Filed Sep. 28, 1993, Ser. No. 13,611

Term of patent 14 years

U.S. Cl. D21-195



360,921

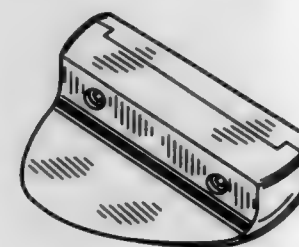
GOLF PUTTER HEAD

Martin A. Rigutto, 17735 105th Pl. SE., Renton, Wash. 98055-8408

Filed Jul. 20, 1993, Ser. No. 10,864

Term of patent 14 years

U.S. Cl. D21-217



360,925

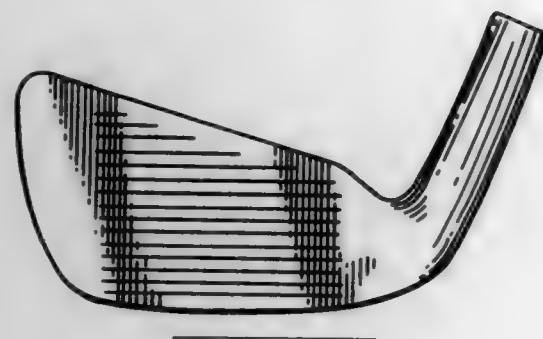
**IRON TYPE GOLF CLUB HEAD**

Anthony J. Antonious, 7738 Calle Facil, Sarasota, Fla. 34238

Filed Feb. 24, 1994, Ser. No. 19,188

Term of patent 14 years

U.S. Cl. D21—220



360,926

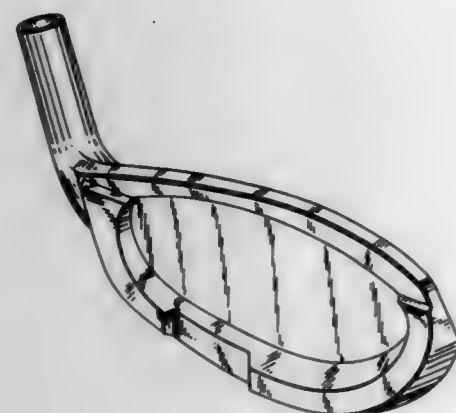
**GOLF CLUB IRON HEAD**

Larry Hildenbrand, 9462 Doug Fir Dr., Zeeland, Mich. 49464

Filed May 24, 1994, Ser. No. 23,394

Term of patent 14 years

U.S. Cl. D21—220



360,927

**DINOSAUR PLAYGROUND CLIMBER**

Gary VanDusen, Hillsdale, Mich., assignor to Quality Industries, Inc., Hillsdale, Mich.

Filed Feb. 7, 1994, Ser. No. 18,460

Term of patent 14 years

U.S. Cl. D21—245



360,928

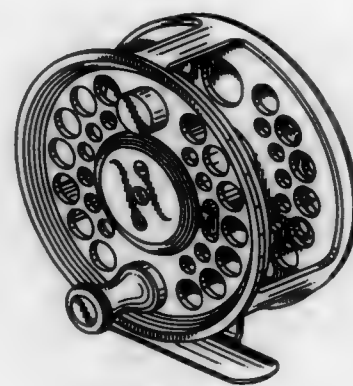
**FISHING REEL**

Peter K. Bogner, Eureka Springs, Ark., assignor to P/S Engineering and Manufacturing Co., Eureka Springs, Ark.

Filed Jul. 30, 1993, Ser. No. 11,243

Term of patent 14 years

U.S. Cl. D22—140



360,929

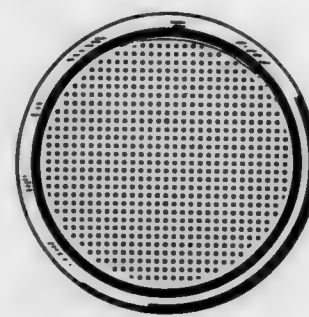
**WATER FILTER**

David V. Albertson, 3124 Brooks Ln., Wayzata, Minn. 55391

Filed Sep. 23, 1994, Ser. No. 28,846

Term of patent 14 years

U.S. Cl. D23—209



360,930

**THERMOSTATIC EXPANSION VALVE FOR REFRIGERATING PLANTS**

Anders Vestergaard, Sydals, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

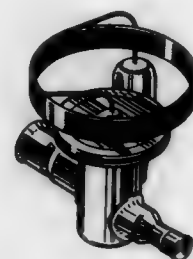
Filed Feb. 23, 1994, Ser. No. 19,105

Claims priority, application Germany, Aug. 23, 1993, M 93 06 710.0

The portion of the term of this patent subsequent to Jun. 6, 2008, has been disclaimed.

Term of patent 14 years

U.S. Cl. D23—233



360,931

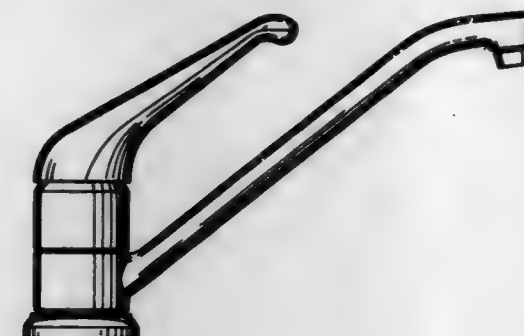
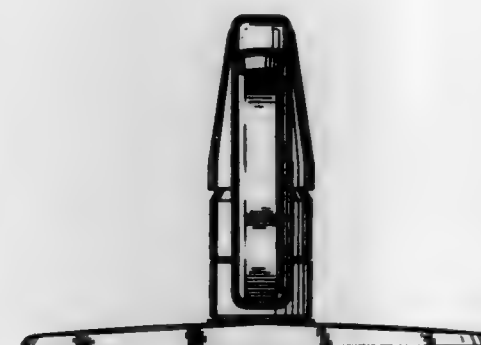
**KITCHEN FAUCET WITH LOOP HANDLE**

Darren M. Mark, Castaic, and Hollis K. Yost, Santa Monica, both of Calif., assignors to Emhart Inc., Newark, Del.

Continuation of Ser. No. 914,062, Jul. 16, 1992, abandoned. This application Aug. 17, 1994, Ser. No. 27,409

Term of patent 14 years

U.S. Cl. D23—238



360,933

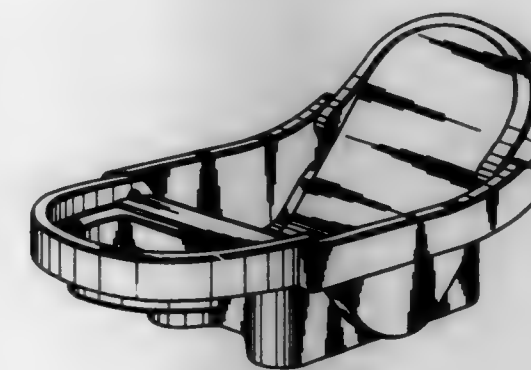
**INFANT BATHTUB**

David W. Crossley, Woonsocket, R.I.; Brian C. Sundberg, Stoughton, and Michael S. Bernstein, Natick, both of Mass., assignors to Safety 1st, Inc., Chestnut Hill, Mass.

Filed Sep. 23, 1994, Ser. No. 28,886

Term of patent 14 years

U.S. Cl. D23—278



360,934

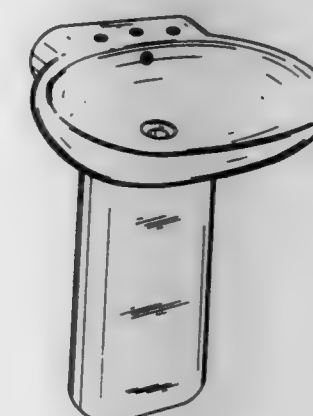
**LAVATORY**

Franco Bertoli, Piazza Napoli 15, 20146 Milano, Italy

Filed Oct. 14, 1993, Ser. No. 14,168

Term of patent 14 years

U.S. Cl. D23—292



360,932

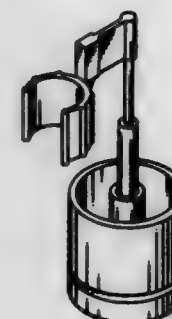
**TOILET VALVE EARLY CLOSURE CONTROLLER**

Brian A. Walter, 728 Kinau St., Apt. 9, Honolulu, HI. 96813, and Gene H. Walter, 601 Rhododendron Dr., Vancouver, Wash. 98661

Filed Apr. 14, 1993, Ser. No. 7,120

Term of patent 14 years

U.S. Cl. D23—258



360,935

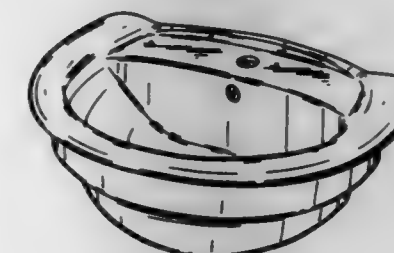
**LAVATORY**

Franz G. Hohenthauer, München, Germany, assignor to American Standard Inc., N.J.

Filed Sep. 20, 1993, Ser. No. 13,177

Term of patent 14 years

U.S. Cl. D23—293.1





360,936

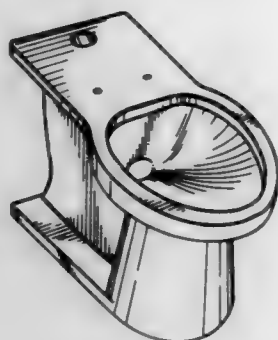
## TOILET BOWL

Jacob M. Liddicoat, 1471 Mettler Rd., Lodi, Calif. 95242

Filed Jul. 1, 1994, Ser. No. 25,463

Term of patent 14 years

U.S. Cl. D23—295



360,937

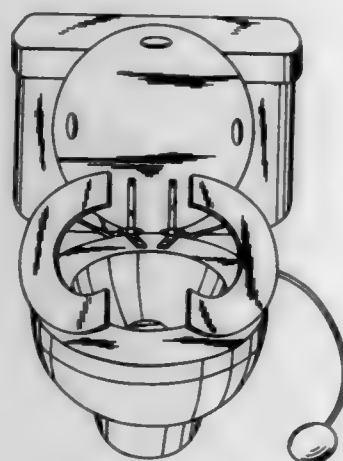
## COMBINED TOILET AND FLUID MOTOR SEAT LIFTER

Cory Bourgeois, 420 Berger St., Marrero, La. 70072-1128

Filed May 17, 1994, Ser. No. 23,069

Term of patent 14 years

U.S. Cl. D23—309



360,938

## COMBINED TOILET SEAT AND COVER

Marvin D. Maxwell, R.R. 1, Nabb, Ind. 47147

Filed Jun. 9, 1994, Ser. No. 24,014

Term of patent 14 years

U.S. Cl. D23—312



360,939

## COMBINED ELECTRIC CEILING FAN AND LIGHT

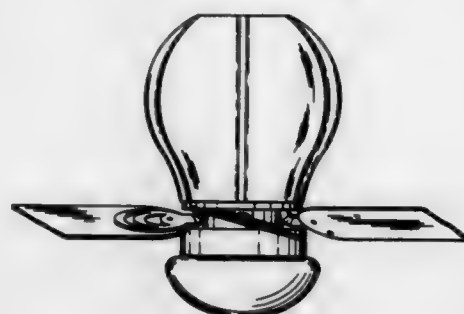
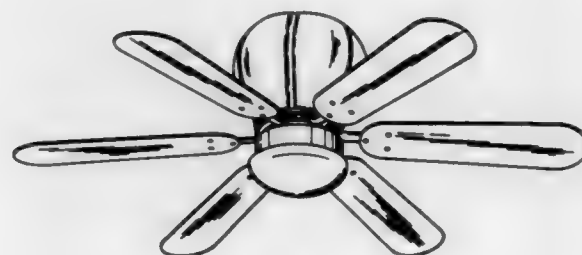
Pierce Wang, No. 46, Alley 26, Lane 667, Chung Shan Road,

Shing Kong Hsiang, Taichung Hsien, Taiwan

Filed Dec. 23, 1993, Ser. No. 16,733

Term of patent 14 years

U.S. Cl. D23—377



360,940

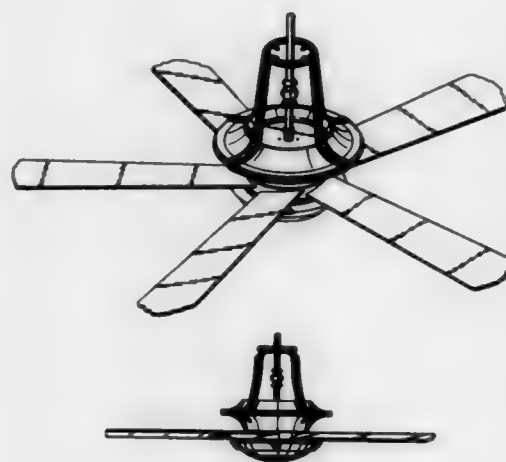
## COMBINED CEILING FAN AND LIGHT

Teddy P. Collmar, Corona, Calif., assignor to Great 2000 Enterprises, Inc., Corona, Calif.

Filed Oct. 28, 1994, Ser. No. 20,403

Term of patent 14 years

U.S. Cl. D23—377



360,941

## COVER FOR THE MOTOR OF A CEILING FAN

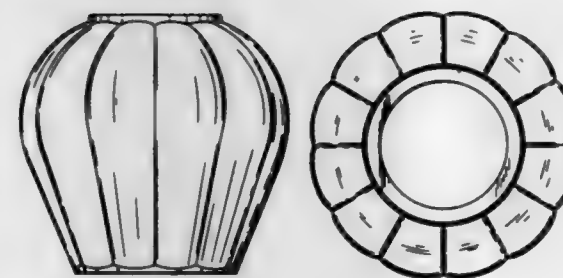
Pierce Wang, No. 46, Alley 26, Lane 667, Chung Shan Road,

Shing Kong Hsiang, Taichung Hsien, Taiwan

Filed Dec. 23, 1993, Ser. No. 16,747

Term of patent 14 years

U.S. Cl. D23—411



360,943

## CONTAINER

Lafond: André, 970 Chemin des Patriotes, St-Hilaire, Quebec,

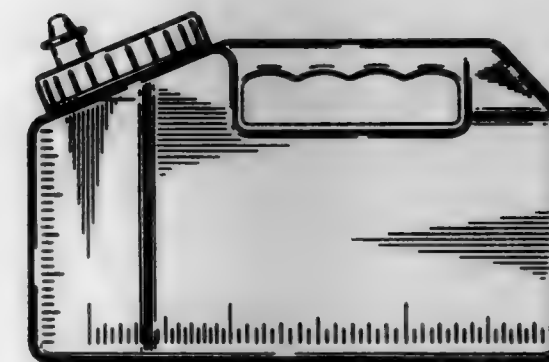
Canada J3G 4S5

Filed Feb. 14, 1994, Ser. No. 18,696

Claims priority, application Canada, Feb. 11, 1994, 1994-0266

Term of patent 14 years

U.S. Cl. D24—122



360,944

## FEMALE ANTI-INCONTINENCE APPLIANCE

Said Juma, 4389 Corte de la Fonda, San Diego, Calif. 92130

Filed Mar. 28, 1994, Ser. No. 20,538

Term of patent 14 years

U.S. Cl. D24—124



360,942

## COMBINED NEON CEILING FAN MOTOR HOUSING AND SUPPORT ROD

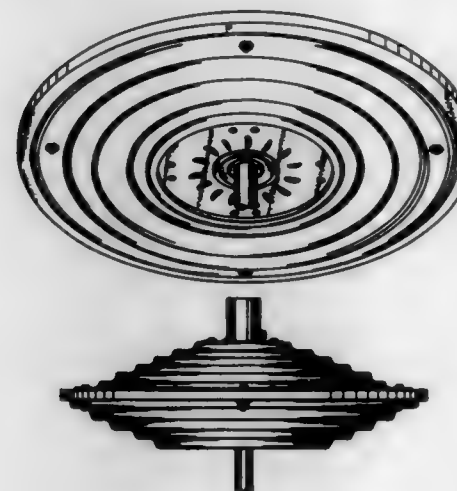
John C. Bucher, Coral Springs; Shih T. Wu, Lighthouse Point, both of Fla., and Ts-Yao Tao, Taipei, Taiwan, assignors to

Chien Luen Industries Company, Ltd., Inc., Fla.

Filed Jul. 18, 1994, Ser. No. 25,932

Term of patent 14 years

U.S. Cl. D23—411



360,945

## ALLERGY TESTING NEEDLES

Robert M. Baldwin, 1212 Langston Dr., Columbus, Ohio 43220

Filed Sep. 27, 1993, Ser. No. 13,495

Term of patent 14 years

U.S. Cl. D24—133



360,946

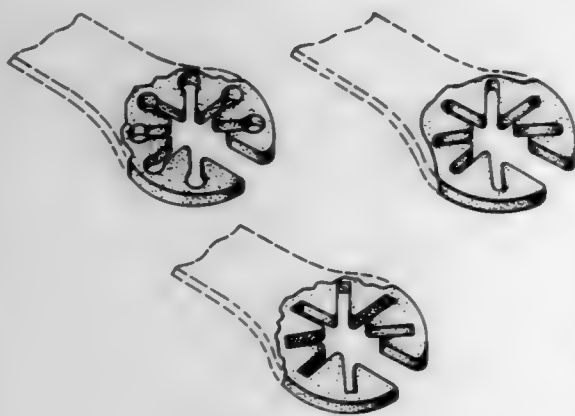
**SURGICAL SAW BLADE HUB**

Gregory A. Goris, Ojai, Calif., assignor to Hall Surgical, Carpinteria, Calif.

Filed Feb. 18, 1994, Ser. No. 18,951

Term of patent 14 years

U.S. Cl. D24—146



360,948

**HEARING AID RECEIVER**

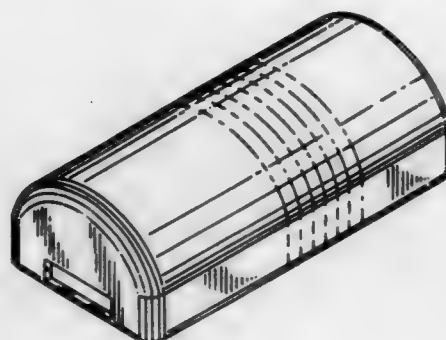
August F. Mostardo, Norridge, Ill., assignor to Knowles Electronics, Inc., Itasca, Ill.

Filed Sep. 1, 1993, Ser. No. 12,486

The portion of the term of this patent subsequent to Jul. 25, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—174



360,949

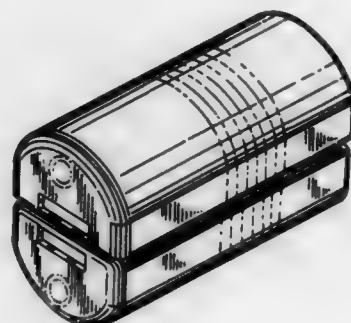
**HEARING AID RECEIVER**

August F. Mostardo, Norridge, Ill., assignor to Knowles Electronics, Inc., Itasca, Ill.

Filed Sep. 1, 1993, Ser. No. 12,488

Term of patent 14 years

U.S. Cl. D24—174



360,947

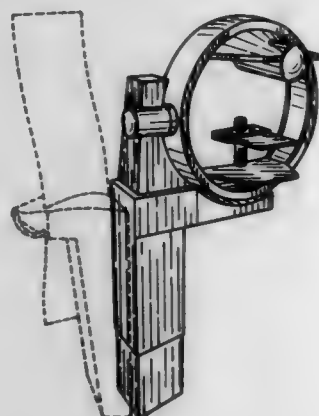
**MAMMOGRAPHY IMAGING MACHINE**

Jane Saks-Cohan, 7 The Cloisters, 11 Salem Road, London W2 4DL, Great Britain

Filed Dec. 6, 1993, Ser. No. 16,074

Term of patent 14 years

U.S. Cl. D24—158



360,950

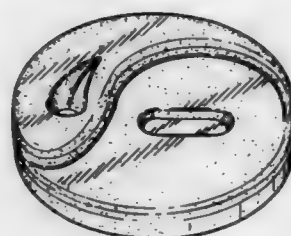
**PREGNANCY TEST VESSEL**

Martha Mazurek, 1620 Brooklyn, Ann Arbor, Mich. 48104

Filed Aug. 27, 1993, Ser. No. 12,229

Term of patent 14 years

U.S. Cl. D24—223



360,951

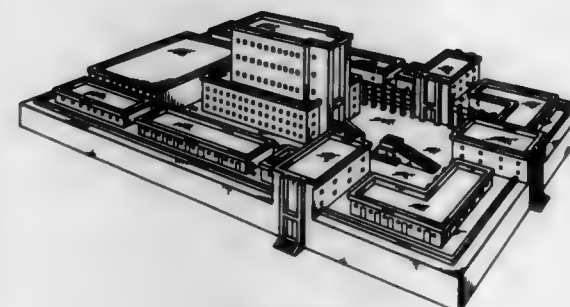
**HOUSE OF YAHWEH (YECHETZQYAH'S PROPHESED TEMPLE)**

Yisrayl B. Hawkins, 1025 T & P La.; Jay E. Martin, P.O. Box 2372, both of Abilene, Tex. 79602; David E. Mrotek, 4706 S. 10th St., Manitowoc, Wis. 54220, and David P. Heimerman, N. 1522 Schoenborn Rd., Chilton, Wis. 53014

Filed Nov. 22, 1993, Ser. No. 15,563

Term of patent 14 years

U.S. Cl. D25—1



360,953

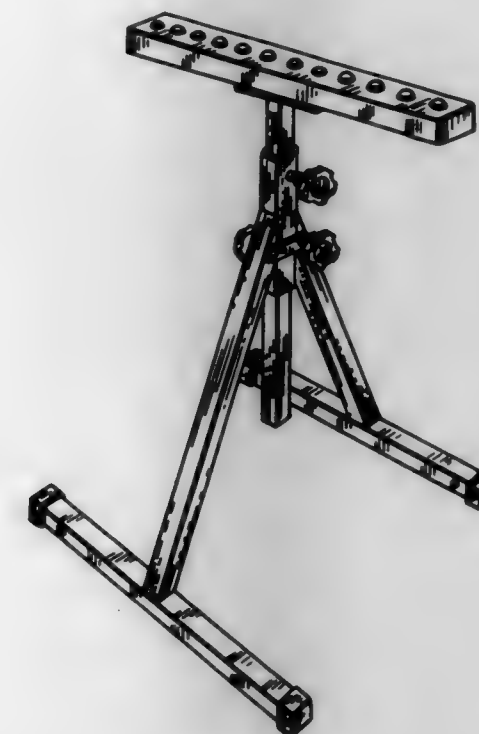
**ADJUSTABLE WORK MOVER**

Steven J. Sheftel, Marston Mills, Mass. 02648, assignor to American Manufacturing Company, Inc., Allentown, Pa.

Filed Feb. 3, 1994, Ser. No. 18,363

Term of patent 14 years

U.S. Cl. D25—67



360,952

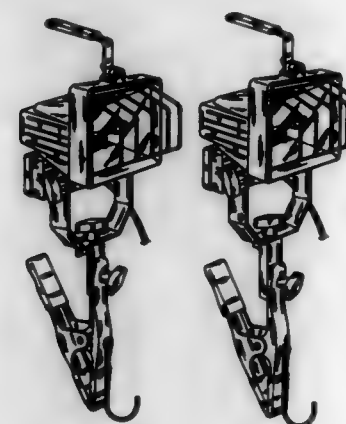
**UTILITY LIGHT WITH CLAMP AND HANGER**

Simeon T. Lee, Burlington, N.C., assignor to Regent Lighting Corporation, Burlington, N.C.

Filed Mar. 29, 1994, Ser. No. 20,623

Term of patent 14 years

U.S. Cl. D26—60



360,954

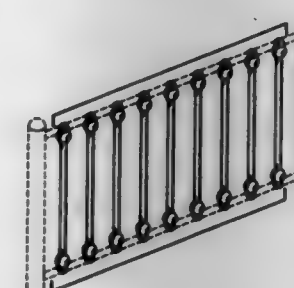
**HALUSTER UNIT**

Terry Von Parrish, Monett, Mo., assignor to Miracle Recreation Equipment Company, Monett, Mo.

Filed Jan. 14, 1994, Ser. No. 17,519

Term of patent 14 years

U.S. Cl. D25—128





360,955

**SUPPORT POST FOR PERIMETER GUIDELINE**

Lloyd Sandstrom, 1692 W. Platte Rd., St. George, Utah 84770; Todd Sandstrom, 80 N. Main, North Salt Lake, Utah 84054, and Robert Sandberg, 638 N. Sir Michael Dr., Salt Lake City, Utah 84116

Filed Sep. 7, 1994, Ser. No. 28,121

Term of patent 14 years

U.S. Cl. D25-131



360,956

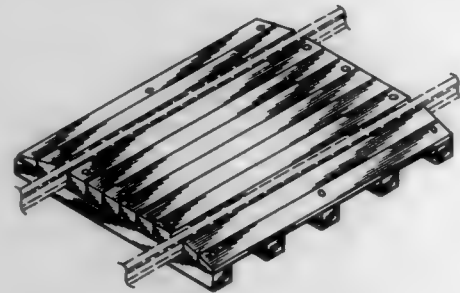
**SCOOTER CROSSING DESIGN**

Fred G. Sawtelle, P.O. Box 21122, Houston, Tex. 77026

Filed Sep. 19, 1994, Ser. No. 28,549

Term of patent 14 years

U.S. Cl. D25-138



360,957

**ILLUMINABLE LIGHT TUBE FOR BICYCLES**

Jerry Lerner, 436 Conkey St., Hammond, Ind. 46324, assignor to Jerry Lerner, Hammond, Ind.

Filed Jul. 16, 1993, Ser. No. 12,621

Term of patent 14 years

U.S. Cl. D26-28



360,958

**FLASHLIGHT**

Hing-Man Huen, Fo Tan Shatin, Hong Kong, assignor to Power Lite Metal Works manufactory Limited, Hong Kong, Hong Kong

Filed Dec. 22, 1993, Ser. No. 16,671

Term of patent 14 years

U.S. Cl. D26-49



360,959

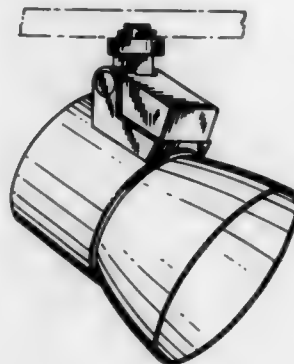
**TRACK LIGHT**

Anthony Donato, Westfield, N.J., and Alejandro Mier-Langner, New York, N.Y., assignors to Lightolier Division of the Genlyte Group Incorporated, Secaucus, N.J.

Filed Jan. 7, 1994, Ser. No. 17,206

Term of patent 14 years

U.S. Cl. D26-63



360,960

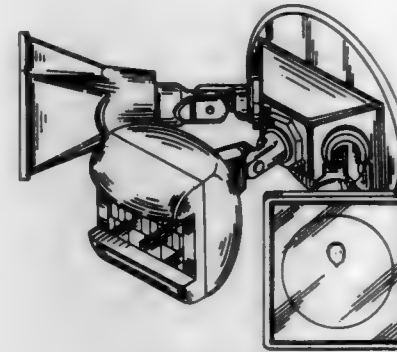
**COMBINED QUARTZ HALOGEN FLOOD LIGHT ASSEMBLY AND SENSOR HOUSING**

Mark T. Wedell, Germantown, Tenn., and J. D. McIngvale, Hernando, Miss., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Jul. 22, 1994, Ser. No. 26,256

Term of patent 14 years

U.S. Cl. D26-63



360,961

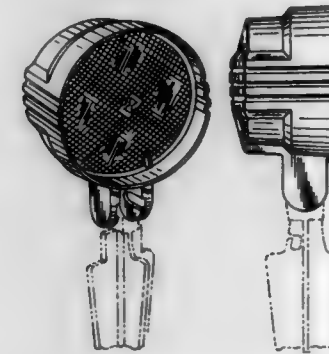
**OUTDOOR LIGHT FIXTURE**

John A. Czerlanis, Solon Mills, Ill., and Timothy B. Strandell, Racine, Wis., assignors to Intermatic Incorporated, Spring Grove, Ill.

Filed Jul. 27, 1994, Ser. No. 26,385

Term of patent 14 years

U.S. Cl. D26-67



360,962

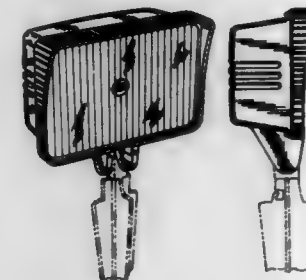
**OUTDOOR LIGHT FIXTURE**

Edward C. Cornell, Waukegan, Ill.; Daniel J. DeLay, Waterford, and Robert D. Giese, Kenosha, both of Wis., assignors to Intermatic Incorporated, Spring Grove, Ill.

Filed Jul. 27, 1994, Ser. No. 26,429

Term of patent 14 years

U.S. Cl. D26-67



360,963

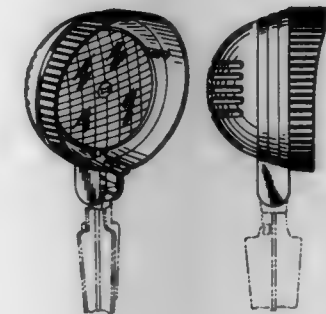
**OUTDOOR LIGHT FIXTURE**

John A. Czerlanis, Solon Mills, Ill.; Kent A. Solberg, Racine, Wis.; Robert D. Giese, Kenosha, Wis., and Daniel J. DeLay, Waterford, Wis., assignors to Intermatic Incorporated, Spring Grove, Ill.

Filed Jul. 27, 1994, Ser. No. 26,435

Term of patent 14 years

U.S. Cl. D26-67



360,964

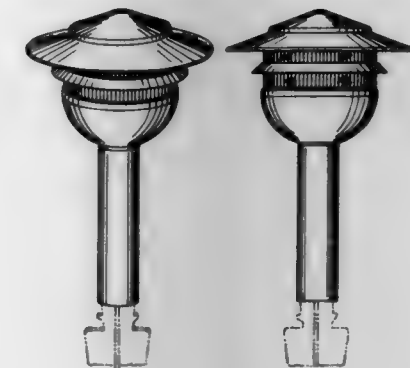
**OUTDOOR LIGHT FIXTURE**

Michael E. Cullen, Grayslake, Ill.; Daniel J. DeLay, Waterford, and Robert D. Giese, Kenosha, both of Wis., assignors to Intermatic Incorporated, Spring Grove, Ill.

Filed Jul. 27, 1994, Ser. No. 26,427

Term of patent 14 years

U.S. Cl. D26-68

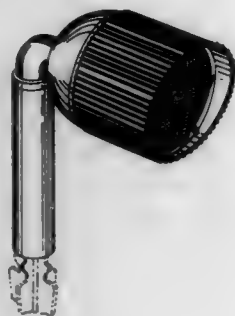


360,965

## OUTDOOR LIGHT FIXTURE

Michael E. Cullen, Grayslake, Ill.; Daniel J. DeLay, Waterford, and Robert D. Giese, Kenosha, both of Wis., assignors to Intermatic Incorporated, Spring Grove, Ill.  
Filed Jul. 27, 1994, Ser. No. 26,428  
Term of patent 14 years

U.S. Cl. D26—68

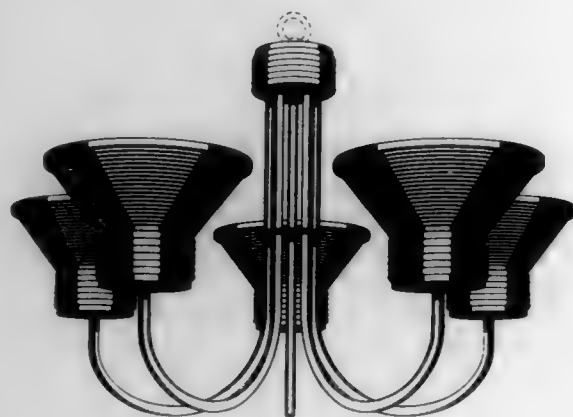


360,966

## CHANDELIER

Patrick Dolan, 1020 SW. Westwood Ct., Portland, Oreg. 97201  
Filed Jul. 6, 1994, Ser. No. 26,001  
Term of patent 14 years

U.S. Cl. D26—86



360,967

## TORCHIERE LAMP

Kevin von Kluck, Hudson, Ohio, assignor to The L. D. Kichler Co., Cleveland, Ohio  
Filed Jul. 28, 1994, Ser. No. 26,438  
Term of patent 14 years

U.S. Cl. D26—106

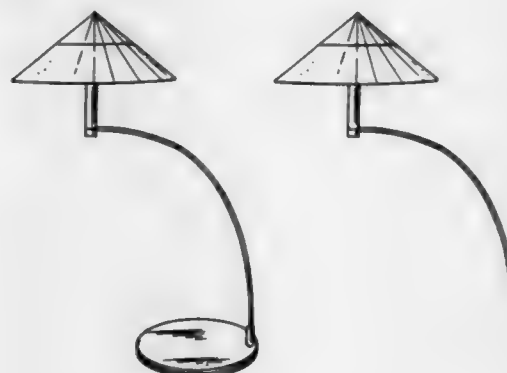


360,968

## LAMP

Robert A. Sonneman, Mamaroneck, N.Y., assignor to Sonneman Design Group, Inc., Larchmont, N.Y.  
Filed Jul. 29, 1994, Ser. No. 26,526  
Term of patent 14 years

U.S. Cl. D26—107



## LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF AUGUST, 1995

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- AAI Corporation: See—  
Hamilton, Stephen B.; Jaklitsch, James J.; Reed, Christopher J.; Sachulz, Charles E.; Schulze, Robert R.; Debelius, Leslie H.; and McNelis, Niall B., 5,438,404, Cl. 356-152.200.
- Aavid Engineering, Inc.: See—  
Earl, George F.; Churchill, Jack; Panek, Jeffrey J.; and Hillman, Allen F., Jr., 5,437,561, Cl. 439-567.000.
- ABB Management AG: See—  
Wanner, Ernst, 5,438,588, Cl. 373-108.000.
- ABB Patent GmbH: See—  
Margaritis, Basile; and Heinemann, Lothar, 5,438,501, Cl. 363-24.000.
- Abbott Laboratories: See—  
Larkin, Mark E.; Kramer, David E.; and Frederick, Warren P., 5,437,650, Cl. 604-283.000.
- Abboudi, Shalom Y.; and Adley, Robert. Multifunctional treadmill having a seat, 5,437,588, Cl. 482-54.000.
- Abe, Masato: See—  
Seki, Fusao; and Abe, Masato, 5,438,600, Cl. 377-47.000.
- Abe, Shinya: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,438,045, Cl. 514-81.000.
- Abe, Takashi: See—  
Itoh, Hiroshi; Abe, Takashi; Yamashita, Hitoshi; Yoshimura, Toshihiro; Hisanaga, Takeshi; Takebayashi, Takao; Nakata, Kunio; and Hashimoto, Chikara, 5,437,902, Cl. 428-68.000.
- Abouchar, Raif: See—  
Bruschke, Hartmut E. A.; Abouchar, Raif; Ganz, Hartmut; Huret, Joel; and Marggraff, Frank, 5,437,796, Cl. 210-640.000.
- Abraham, Ooriapadical C.: See—  
Cuthbert, Versie T.; and Abraham, Ooriapadical C., 5,437,783, Cl. 208-139.000.
- Abrams, Randy L.: See—  
Bernstein, Michael S.; Crossley, David W.; Abrams, Randy L.; and Johnson, Jerry E., 5,437,067, Cl. 5-426.000.
- Abushiki Kaisha Barudan: See—  
Satoh, Masaaki; Kuroda, Akinori; and Asai, Masashi, 5,438,520, Cl. 364-470.000.
- Achelpohl, Fritz; to Windmoller & Holscher. Flattening and removing device for a plastic tubular film web produced in a blowing process, 5,437,544, Cl. 425-72.100.
- ACO Severin Ahlmann GmbH & Co., KG: See—  
Sauerwein, Heinrich; Arm, Wolfgang; and Witt, Jan, 5,437,516, Cl. 404-2.000.
- Acosta, George M.: See—  
Cohen, Donald; Daw, Derek J.; Kick, George F.; and Acosta, George M., 5,437,664, Cl. 606-42.000.
- Actodyne General, Inc.: See—  
Lace, deceased; Donald A., Sr.; and Lace, Jeffrey J., 5,438,157, Cl. 84-726.000.
- Adachi, Kosai: See—  
Miyata, Masakazu; Adachi, Kosai; and Nagano, Tomoko, 5,437,443, Cl. 271-9.060.
- Adam, Daniel; Bech, Andre; Desmoucelles, Alain; and Vallier, Denis; to Thomson-CSF. Method of hardening transmissions, in particular between a control station and a transponder, and a device implementing the method, 5,438,332, Cl. 342-45.000.
- Adam, Harald: See—  
Feldkamp, Bernhard; Stelter, Peter; and Adam, Harald, 5,437,599, Cl. 494-82.000.
- Adams, Charles L.; and Adams, Richard C., to PVI Industries, Inc. Combination burner and flue gas collector for water heaters and boilers, 5,437,249, Cl. 122-17.000.
- Adams, Richard C.: See—  
Adams, Charles L.; and Adams, Richard C., 5,437,249, Cl. 122-17.000.
- Adams, Robert T.; Slyngstad, Vincent R.; and Unlu, Seckin; to Intel Corporation. Mutual exclusion for computer system, 5,438,677, Cl. 395-736.000.
- Adamson, Ronald B.; and Potts, Gerald A., to General Electric Company. Method of fabricating zircaloy tubing having high resistance to crack propagation, 5,437,747, Cl. 148-519.000.
- Adinolfi, Robert G.: See—  
Adinolfi, Robert G.; and Parkos, Joseph J., Jr., 5,437,724, Cl. 118-76.000.
- Adley, Robert: See—  
Abboudi, Shalom Y.; and Adley, Robert, 5,437,588, Cl. 482-54.000.
- Adolf Wurth GmbH & Co. KG: See—  
Humm, Siegfried; Palosi, Gabor; and Weidner, Karl, 5,438,523, Cl. 364-479.000.
- Advanced Cardiovascular Systems, Inc.: See—  
Williams, Michael S.; Lau, Lilip; Khosravi, Farhad; Hartigan, William; and Hernandez, Avegel, 5,437,083, Cl. 29-235.000.
- Advanced Interconnections Corporation: See—  
Murphy, James V.; and Murphy, Michael J., 5,438,481, Cl. 361-813.000.
- Advanced Micro Devices, Inc.: See—  
Sharpe-Geisler, Bradley A., 5,438,277, Cl. 326-27.000.
- Wong, Jack T.; Fontana, Fabiano; and Law, Henry, 5,438,278, Cl. 326-27.000.
- Advanced Surgical Products, Inc.: See—  
McVay, William P., 5,437,654, Cl. 604-403.000.
- Aebi, Jurg: See—  
Bouraly, Jean-Pierre; Aebi, Jurg; Beaufils, Philippe; de Lestang, Michel; Gaffuri, Jean-Gilles; Hourlier, Herve; Lallement, Jean-Jacques; Legroux, Philippe; Levai, Jean-Paul; Pondaven, Gerald; Schuster, Pierre; and Vergnat, Christian, 5,437,676, Cl. 606-88.000.
- AG fur industrielle Elektronik: See—  
Buhler, Ernst; Mazzolini, Livio; and D'Amario, Rino, 5,438,178, Cl. 219-69.120.
- Agam, Uri; and Nicholson, Gary, to AlliedSignal Inc. Thermal imaging apparatus with bias modulation, 5,438,199, Cl. 250-334.000.
- Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Method of and apparatus for recording an image in a first direction while the recording means is being relatively moved and the images being dispersed in a second direction which is substantially parallel to the first direction, 5,438,352, Cl. 347-183.000.
- Agency of Industrial Science Technology: See—  
Tenjinbayashi, Koji, 5,438,412, Cl. 356-359.000.
- Agfa-Gevaert AG: See—  
Schmuck, Arno; Draber, Edgar; and Missfeldt, Michael, 5,437,969, Cl. 430-508.000.
- Agfa-Gevaert, N.V.: See—  
Vanmaele, Luc; and Janssens, Wilhelmus, 5,438,030, Cl. 503-227.000.
- Vanmaele, Luc, 5,438,122, Cl. 534-551.000.
- Verburgh, Yves; and Leenders, Luc, 5,437,963, Cl. 430-262.000.
- AGIP S.p.A.: See—  
Del Bianco, Alberto; and Stroppa, Fabrizio, 5,438,039, Cl. 507-203.000.
- Agri-Engineering, Inc.: See—  
Van Gilst, Carl, 5,437,244, Cl. 119-73.000.
- Aguado, Morton M., to Northrop Grumman Corporation. Navigation system using re-transmitted GPS, 5,438,337, Cl. 342-357.000.
- Aguilar, Carlos L.: See—  
Walker, Roy G.; and Aguilar, Carlos L., 5,437,854, Cl. 423-492.000.
- Ahlen, Hans; and Ek, Leif, to Airport Technology In Scandinavia AB. Embedded light fitting for runways, 5,438,495, Cl. 362-153.100.
- Ahlfeld, Michael D.; and Froehlich, David C., to Schlegel Corporation. Rigid backbone enhancement for extruded profiles, 5,437,124, Cl. 49-479.100.
- Aikawa, Yukihiko: See—  
Kobayashi, Masahiko; Akashi, Masakatsu; Hirobe, Junichi; Sugaya, Tsutomu; Tanaka, Yoshihisa; Kusuda, Toshiaki; Makie, Ikuo; Aikawa, Yukihiko; Ishii, Satoshi; and Ohata, Yosuke, 5,438,390, Cl. 355-200.000.
- Air-Flo Mfg. Co. Inc.: See—  
Musso, Tom W., 5,437,499, Cl. 298-26.000.
- Airport Technology In Scandinavia AB: See—  
Ahlen, Hans; and Ek, Leif, 5,438,495, Cl. 362-153.100.
- Aizawa, Hidetoshi: See—  
Shishido, Kamichika; and Aizawa, Hidetoshi, 5,438,347, Cl. 347-218.000.
- Akagi, Takatoshi: See—  
Hikita, Mitsutaka; Sumioka, Atsushi; Akagi, Takatoshi; Tabuchi, Toyoji; and Shibagaki, Nobuhiko, 5,438,305, Cl. 333-32.000.
- Agagiri, Kenzo; Oikawa, Yoshiaki; and Tsutsui, Kyoya, to Sony Corporation. Compressed data recording and/or reproducing apparatus and signal processing method, 5,438,643, Cl. 395-2.100.
- Akamatsu, Masashi: See—  
Mizoguchi, Yoshimi; Ishii, Hiroshi; Kimura, Kiyoshi; Fukuchi, Masakazu; Takeda, Makoto; Maruyama, Hiroyuki; Yamaguchi, Yasuhiko; Taki, Kenji; Akamatsu, Masashi; and Kurohata, Takao, 5,438,437, Cl. 358-518.000.
- Akashi, Masakatsu: See—  
Kobayashi, Masahiko; Akashi, Masakatsu; Hirobe, Junichi; Sugaya, Tsutomu; Tanaka, Yoshihisa; Kusuda, Toshiaki; Makie, Ikuo;



- Aikawa, Yukihiko; Ishii, Satoshi; and Ohata, Yosuke, 5,438,390, Cl. 355-200.000.
- Akashi, Mitsuru; Itoh, Haruhiko; and Murakami, Mikio, to Hoechst Aktiengesellschaft, Liquid crystal display device, 5,437,813, Cl. 252-197.400.
- Akatsuka, Tsuneo; Motoki, Yoshihiro; Harada, Takashi; and Suzawa, Akira, to Somar Corporation, Golf club shaft and process of preparing same, 5,437,450, Cl. 273-80.00B.
- Akhavan-Tafti, Hashem: See—  
Schaap, Arthur P.; and Akhavan-Tafti, Hashem, 5,438,146, Cl. 545-110.000.
- Akiyama, Heiemon; and Sato, Minoru, to Toyko Automatic Machinery Works, Ltd. Method for packaging contents and packaging device, 5,437,142, Cl. 53-415.000.
- Akiyama, Heiemon; and Sato, Minoru, to Tokyo Automatic Machinery Works, Ltd. Packaging device, 5,437,144, Cl. 53-466.000.
- Akiyama, Tsuneharu: See—  
Hirano, Shinichi; and Akiyama, Tsuneharu, 5,437,751, Cl. 156-134.000.
- Akzo Nobel N.V.: See—  
Carmine, James L.; and Ryntz, Rose A., 5,437,718, Cl. 106-287.240.
- Albert, Richard: See—  
Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., 5,438,573, Cl. 371-10.300.
- Albrecht, Alan; Goody, Steven H.; Spratt, Michael P.; Curcio, Joseph A., Jr.; Dove, Daniel J.; Jedwab, Jonathan; and Crouch, Simon E., to Hewlett-Packard Company, High speed data transfer over twisted pair cabling, 5,438,571, Cl. 370-94.300.
- Alcatel N.V.: See—  
Masetti, Francesco; and Jacob, Jean-Baptiste, 5,438,566, Cl. 370-60.000.
- Alcorn, William R.: See—  
Retallick, William B.; and Alcorn, William R., 5,437,099, Cl. 29-890.000.
- Alexander, David V.: See—  
Toy, Stephen W.; and Alexander, David V., 5,438,238, Cl. 315-94.000.
- Ali, M. Zaki; Ali, Mahfuza B.; and Moren, Dean M., to Minnesota Mining and Manufacturing Company, High speed aqueous solvent developable photopolymer compositions, 5,437,932, Cl. 428-461.000.
- Ali, Mahfuza B.: See—  
Ali, M. Zaki; Ali, Mahfuza B.; and Moren, Dean M., 5,437,932, Cl. 428-461.000.
- Allen, James K., to Land and Seas Business Corp., Inc. Roof edge anchor, 5,437,137, Cl. 52-712.000.
- Allen, Paul: See—  
Zeytoonjian, Douglas; Zeytoonjian, Frederick, Sr.; Kramer, Harold; and Allen, Paul, 5,438,319, Cl. 340-571.000.
- Allen, Robert H.; and Stabler, Sally P., to University of Colorado Foundation, Inc., The Assays for sulphydryl amino acids and methyl-malonate acid and their application to diagnosis of cobalamin deficiency, 5,438,017, Cl. 436-89.000.
- Alleyne, Neville. Spinal cord protection device, 5,437,672, Cl. 606-61.000.
- Alliance Pharmaceutical Corp.: See—  
Fuhman, Bradley P., 5,437,272, Cl. 128-203.120.
- Allied-Signal Inc.: See—  
Lapin, Stephen C.; Snyder, James R.; Sitzmann, Eugene V.; Barnes, Darryl K.; and Green, George D., 5,437,964, Cl. 430-280.000.
- AlliedSignal Europe Services Techniques: See—  
Castel, Philippe; and Meynier, Guy, 5,437,217, Cl. 91-369.200.
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- White, Bradley E.; Parks, Robert A.; and Ritchie, Paul G., 5,438,271, Cl. 324-444.000.
- Boehringer Mannheim GmbH: See—  
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- Boenke, Marke; Clegg, Derek; Gittelsohn, Mike; Passaretti, Keith; and Seymour-Marks, Audrey, to Island Graphics Corporation. Method and system for color film separation preprocess using electronic object-based choking and spreading procedures including object combining operations. 5,438,653, Cl. 395-131.000.
- Bogdan, Vjekoslav; and Marcello, Steven W., to Pitney Bowes Inc. Compression plate assembly for a folder buckle chute. 5,437,596, Cl. 493-420.000.
- Bohme, Siegfried: See—  
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- Boland, Steven H.; and Weaver, James F., to BHK, Inc. Filament lamp infrared source. 5,438,233, Cl. 313-110.000.
- Bolger, Ann F.; and Tacklind, Chris, to Leland Stanford Jr. University, Board of Trustees of the. System and method for monitoring intraluminal device position. 5,437,290, Cl. 128-898.000.
- Bolmer, Berthold: See—  
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- Bolstad, Clifford R.: See—  
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- Bommaraju, Tilak V.: See—  
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- Bond, Malcolm L.: See—  
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- Bonnardel, Patrick; Jacquemet, Bernard; Broize, Jean-Charles; and Odier, Andre., to Merlin Gerin. Three-position switch actuating mechanism. 5,438,176, Cl. 200-400.000.
- Bonner, William H., to Pillar Technologies, Inc. Corona treater electrode cooling system. 5,437,844, Cl. 422-186.000.
- Bonnin, Christophe: See—  
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- Bonte, Anthony K.; and Nelson, Carl T., to Linear Technology Corp. Switching regulator circuit using magnetic flux-sensing. 5,438,499, Cl. 363-21.000.
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- Boppel, Wolfgang; Sermund, Gerald; and Wilharm, Michael, to Linto-type-Hell AG. Method and apparatus for manufacturing texture drums. 5,438,179, Cl. 219-121.190.
- Borchardt, Glenn R.; Swanson, Roy T.; and Barker, James W., Jr., to S&C Electric Company. Apparatus with interconnection arrangement. 5,438,161, Cl. 174-52.200.
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- Borg-Warner Automotive, Inc.: See—  
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- Borkowicz, Neil L.; Meir, David S.; Evans, John L.; and Johnson, Robert W., to Chrysler Corporation. Automotive electronics test system. 5,438,513, Cl. 364-424.030.
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- Boston Scientific Corporation: See—  
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- Boulanger, Roger; Plourde, Daniel; Brousseau, Andre; and Metta, Flavio, to Johnson & Johnson Inc. Low fluid pressure dual-sided fiber entanglement method, apparatus and resulting product. 5,437,904, Cl. 428-91.000.
- Boulet, Jean: See—  
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- Bouraly, Jean-Pierre; Aebi, Jurg; Beaufils, Philippe; de Lestang, Michel; Gaffuri, Jean-Gilles; Hourlier, Herve; Lallement, Jean-Jacques; Legroux, Philippe; Levai, Jean-Paul; Pondaven, Gerald; Schuster, Pierre; and Vergnat, Christian, to Developpement d'Implants Orthopediques et Medicaux; and Protek Synthes. Kneecap cutting device for the fitting of a total knee replacement. 5,437,676, Cl. 606-88.000.
- Bourgeois, Francois-Xavier: See—  
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- BP Chemicals (Additives) Limited: See—  
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- Boenke, Marke; Clegg, Derek; Gittelsohn, Mike; Passaretti, Keith; and Seymour-Marks, Audrey, to Island Graphics Corporation. Method and system for color film separation preprocess using electronic object-based choking and spreading procedures including object combining operations. 5,438,653, Cl. 395-131.000.
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- Bolger, Ann F.; and Tacklind, Chris, to Leland Stanford Jr. University, Board of Trustees of the. System and method for monitoring intraluminal device position. 5,437,290, Cl. 128-898.000.
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- Bonnardel, Patrick; Jacquemet, Bernard; Broize, Jean-Charles; and Odier, Andre., to Merlin Gerin. Three-position switch actuating mechanism. 5,438,176, Cl. 200-400.000.
- Bonner, William H., to Pillar Technologies, Inc. Corona treater electrode cooling system. 5,437,844, Cl. 422-186.000.
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- Boppel, Wolfgang; Sermund, Gerald; and Wilharm, Michael, to Linto-type-Hell AG. Method and apparatus for manufacturing texture drums. 5,438,179, Cl. 219-121.190.
- Borchardt, Glenn R.; Swanson, Roy T.; and Barker, James W., Jr., to S&C Electric Company. Apparatus with interconnection arrangement. 5,438,161, Cl. 174-52.200.
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- Boughton, Richard D.; DeFigueiredo, Carlos L.; and Rose, Helen, to Pitney Bowes Inc. Document inverter for buckle chute folder. 5,437,597, Cl. 493-420.000.
- Boulanger, Roger; Plourde, Daniel; Brousseau, Andre; and Metta, Flavio, to Johnson & Johnson Inc. Low fluid pressure dual-sided fiber entanglement method, apparatus and resulting product. 5,437,904, Cl. 428-91.000.
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- Brown, Clinton A.; Hellyer, William E.; Huston, John T.; and Dickman, Anthony W., to Babcock & Wilcox Company, The. Method and apparatus for constant progression of a cleaning jet across heated surfaces. 5,437,295, Cl. 134-37.000.
- Brown, Garry L.: See—  
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- Kuribayashi, Ikuo; and Saito, Rie, 5,438,400, Cl. 355-299.000.
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- Ohashi, Kazuhito, 5,438,558, Cl. 369-48.000.
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- Doan, Trung T.: See—  
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- Donaldson, Robert L.: See—  
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- Drouin, Jehan-Yves P.: See—  
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- Hoppener, Roderik H., 5,438,089, Cl. 524-487.000.
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- Duquesne, Simon, to Minnesota Mining and Manufacturing Company. Polyester/vinyl composite yarns and fabric material containing said yarns as flexible coated abrasive support. 5,437,700, Cl. 51-295.000.
- Durant, Todd J.: See—  
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- E. R. Squibb & Sons, Inc.: See—  
McClees, Nancy J.; Blum, John L.; and Lesko, Mark F., 5,437,623, Cl. 602-59.000.
- Eaholtz, Galen: See—  
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- Eakin, Lawrence L.: See—  
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- Earl, George F.; Churchill, Jack; Panek, Jeffrey J.; and Hillman, Allen F., Jr., to Aavid Engineering, Inc. Self-locking tab. 5,437,561, Cl. 439-567.000.
- Earle, Anthony, to Eastman Kodak Company. Photographic apparatus. 5,438,384, Cl. 354-329.000.
- Easterday, George, Jr.: See—  
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- Eastman Kodak Company: See—  
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- Earle, Anthony, 5,438,384, Cl. 354-329.000.
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- Ghadiri, Mohsen, 5,438,633, Cl. 382-270.000.
- Jackson, Todd A.; and Hibbard, Robert H., 5,438,366, Cl. 348-342.000.
- Jain, Rakesh; Jozefiak, Thomas H.; and Williamson, Hugh M., 5,437,962, Cl. 430-551.000.
- Lawniczak, Gary P., 5,438,435, Cl. 358-496.000.
- Moore, Christopher P.; Wear, Trevor J.; Stoddart, James F.; and Armspach, Dominique, 5,438,133, Cl. 536-103.000.
- Reele, Samuel, 5,438,581, Cl. 372-38.000.
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- Ebbets, John A., III; and Anderson, Dennis J., to LIR-USA Manufacturing Co., Inc. Compact with rotatable panel in base and/or cover. 5,437,294, Cl. 132-304.000.
- Eberhard, Hans J. Conveying system for stacked articles. 5,437,360, Cl. 198-460.200.
- Ebitani, Masuyuki; Tominaga, Toshifumi; and Kishi, Akihito, to Nichia Chemical Industries, Ltd. Infrared-to-visible converter. 5,438,198, Cl. 250-330.000.
- Ebortec Limited: See—  
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- ECIA - Equipment et Composants pour l'Industrie Automobile: See—  
Saliez, Jean-Philippe; Hoblingre, Andre; and Henique, Christian, 5,437,350, Cl. 180-287.000.
- Eckhardt, Claude: See—  
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- Ecolab Inc.: See—  
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- Eden Group Limited: See—  
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- France Telecom: See—  
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- Frey, Thomas: See—  
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- Fromm, Wayne G. Target game apparatus. 5,437,463, Cl. 273-310.000.
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- Kito, Eiichi; Kimura, Tsutomu; and Sugano, Junji, 5,438,389, Cl. 355-38.000.
- Morita, Satoshi, 5,438,382, Cl. 354-298.000.
- Muramatsu, Katsui, 5,438,380, Cl. 354-105.000.
- Nagaoka, Katsuro, 5,437,968, Cl. 430-505.000.
- Nagata, Hiroshi; Endo, Hiroya; and Miyata, Ken-ichi, 5,437,960, Cl. 430-256.000.
- Nakamura, Yoshisada; and Arakatsu, Hiroshi, 5,437,956, Cl. 430-207.000.
- Naruse, Hideaki; and Suzuki, Makoto, 5,437,967, Cl. 430-505.000.
- Shimizu, Makoto; Suzuki, Mituru; Sato, Susumu; Takahashi, Koichi; and Esaki, Toshiro, 5,437,828, Cl. 261-152.000.
- Shono, Akiko, 5,437,970, Cl. 430-522.000.
- Uchida, Minoru; Kawagishi, Toshio; and Tomita, Shunichi, 5,437,965, Cl. 430-504.000.
- Yamamoto, Masanaga; Kaneko, Kiyotaka; Arai, Minoru; and Soga, Takashi, 5,438,367, Cl. 348-371.000.
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- Koue, Toshiaki; and Matsui, Tsunehiro, 5,438,432, Cl. 358-467.000.
- Kunii, Yoshimasa, 5,438,447, Cl. 359-200.000.
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- Fuji Xerox Corporation: See—  
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- Fujieda, Shinetsu: See—  
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- Fujiyama, Takeji: See—  
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- Fujii, Hideo: See—  
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- Fujii, Hiroaki: See—  
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- Fujii, Hiromasa: See—  
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- Fujii, Toshiaki; and Sugiyama, Yasuhiko, to Seiko Instruments Inc. Focused ion beam apparatus. 5,438,197, Cl. 250-309.000.
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- Fujii, Yuichi: See—  
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- Fujikawa, Masaru, to Elephant Chain Block Company Limited. Hoist machine. 5,437,432, Cl. 254-362.000.
- Fujikawa, Osamu: See—  
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- Fujikawa, Tetsuzo; Hirata, Makizo; Ohama, Shigeharu; and Nishimura, Michio, to Kawasaki Jukogyo Kabushiki Kaisha. Edger. 5,437,334, Cl. 172-15.000.
- Fujiki, Hironao; Hara, Hiroyasu; Shiono, Mikio; and Ikeno, Masayuki, to Shin-Etsu Chemical Co., Ltd. Adhesive silicone compositions. 5,438,094, Cl. 524-730.000.
- Fujimoto, Hirohisa: See—  
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- Fujimoto, Hisayoshi, to Rohm Co., Ltd. Compatible thermal head having strobe signal converting member. 5,438,346, Cl. 347-211.000.
- Fujinaga, Kumiko: See—  
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- Fujino, Shigeo, to Kasei Optonix, Ltd. Fluorescent lamp. 5,438,234, Cl. 313-489.000.
- Fujioka, Shuntaro, to Fujitsu Limited. Initialization system for input/output processing units. 5,438,675, Cl. 395-182.070.
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- Fujita, Akira: See—  
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- Fujita, Shigeo; Matsumoto, Mansuke; Kumagai, Yojiro; Wada, Sayuri; and Hashimoto, Shuichi, to Yamamoto Chemicals, Inc. Crystal modifications of 2-m-toluidino-3-methyl-6-di-n-butylamino fluoran, process for preparing thereof, and recording materials containing said crystal modifications. 5,438,032, Cl. 503-221.000.
- Fujita, Shigeru: See—  
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- Fujitsu Isotec Limited: See—  
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- Makino, Takami, 5,438,544, Cl. 365-185.000.
- Mori, Toshihiko; and Sakuma, Yoshiki, 5,438,018, Cl. 437-89.000.
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- Ogawa, Tomoya, 5,438,661, Cl. 395-157.000.
- Sakuraba, Masahiko; Hara, Kouichi; Kuwabara, Kiyoshi; and Umematsu, Misao, 5,437,558, Cl. 439-140.000.
- Seki, Fusao; and Abe, Masato, 5,438,600, Cl. 377-47.000.
- Shimada, Toshiro; Kanai, Yasunori; and Watanabe, Yoshio, 5,438,299, Cl. 331-1.00A.
- Suzuki, Shoji; Kusunoki, Tadakazu; and Mori, Masahiro, 5,438,651, Cl. 395-131.000.
- Tanai, Takayoshi; Tanaka, Yasuhiro; and Saitoh, Tadashi, 5,438,665, Cl. 395-845.000.
- Ushiki, Kazumasa; Fukazawa, Mitsunori; and Wakamoto, Masaaki, 5,438,356, Cl. 348-12.000.
- Fujiwara, Yasuhiro: See—  
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- Fukanuma, Tetsuhiko: See—  
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- Fukatsu, Hiroshi: See—  
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- Fukazawa, Mitsunori: See—  
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- Fukuchi, Masakazu: See—  
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- Fukuda, Takumi: See—  
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- Fukuda, Yasutaka: See—  
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- Fukui, Yasuo: See—  
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- Fukui, Yutaka: See—  
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- Fukuyama, Masahiro: See—  
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- Fukuzawa, Keiji; and Yoshida, Yoshikazu, to Sony Corporation. Elliptical feedhorn and parabolic reflector with perpendicular major axes. 5,438,340, Cl. 343-781.00R.
- Fulop, Charles. Golf ball retriever. 5,437,487, Cl. 294-19.200.
- Fulton, Stanley E., to DD Stud, Inc. Draw stud poker-type card game. 5,437,451, Cl. 273-138.00A.
- Funae, Akihiro: See—  
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- Funaki, Hideyuki: See—  
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- Funk, Wolfgang: See—  
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- Furlan, Borut; Copar, Anton; and Jeriha, Alenka, to LEK, tovarna farmacevtskih in kemskih izdelkov. Process for the preparation of amlodipine benzenesulphonate. 5,438,145, Cl. 546-321.000.
- Furlenmeier, Andre: See—  
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- Furukawa, Sadaishi, to Yugen Kaisha Clean Up System. Particularly, a structured body for the drainage treatment for the preparation for tree-planting ground, and its impounding and flushing system. 5,437,698, Cl. 47-66.000.
- Furuta, Michihiro: See—  
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- Fusion Systems Corporation: See—  
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- Futakata, Takashi; Uchimura, Mitsuo; and Suzuki, Masashi, to Tokyo Electric Co., Ltd. Data communication apparatus and method including means for and step of adding dummy character as a new last character of data to be transmitted. 5,438,576, Cl. 371-53.000.
- Futrex, Inc.: See—  
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- Fyson, John R.; Glover, Martyn S.; and Henson, David M., to Eastman Kodak Company. Filtration technique. 5,437,790, Cl. 210-710.000.
- G & H Technology, Inc.: See—  
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- Gabling, Reemt-Holger: See—  
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- Gaffuri, Jean-Gilles: See—  
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- Gaillard, Douglas S. Nail splitter device for implementing a wedge resection procedure to remove an ingrown toenail. 5,437,679, Cl. 606-131.000.
- Gaines, Alfred L. Gift card with receipt. 5,437,478, Cl. 283-117.000.
- Galbraith, Richard L.: See—  
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- Gall, Richard C.: See—  
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- Gall, Yvon: See—  
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- Gambertoglio, Louis M., to Baker Hughes Incorporated. Liner cementing system and method. 5,437,330, Cl. 166-289.000.
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- Ganz, Hartmut: See—  
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- endosomal, which is expressed by tumor associated vascular endothelium. 5,437,865, Cl. 424-184.100.
- Garrett, James L., legal representative: See—  
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- Gastouniotis, C. S.; Bandeira, Nuno; Gray, Bruce E.; and Seehoffer, Scott H., to M & FC Holding Company, Inc. Duplex bi-directional multi-mode remote instrument reading and telemetry system. 5,438,329, Cl. 340-870.020.
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- Gebr. Goldschmidt Baubeschläge GmbH: See—  
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- GEC Alsthom T & D SA: See—  
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- GEC-Marconi Limited: See—  
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- Anthony, Thomas R.; Fleischer, James F.; and Ettinger, Robert H., 5,437,728, Cl. 118-724.000.
- Anthony, Thomas R.; Fleischer, James F.; and Slutz, David E., 5,437,891, Cl. 427-249.000.
- Baker, Phillip D.; and Blake, Claude L., 5,437,503, Cl. 312-404.000.
- Benkowski, Frank J.; Cordova, Morris; DelliGatti, E. Scott; and Holder, Timothy A., 5,437,760, Cl. 156-580.000.
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- Chang, Hsueh-Rong, 5,438,244, Cl. 315-248.000.
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- Graham, Thomas S.; Szczypiorski, Wojtek; Allyn, Jerome B.; Boozan, Dean A.; Desorcie, George; Bergeron, Norman; Hazelett, R. William; Pennucci, John; and Hazelett, S. Richard, to Hazelett Strip-Casting Corporation. Method and apparatus for continuous casting of metal. 5,437,326, Cl. 164-481.000.
- Gramke, Mark H., to Edw. C. Levy Co. Coatings for receptacles. 5,437,890, Cl. 427-236.000.
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- Greenleaf, David J.: See—  
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- Greiner, Leonard; Moard, David M.; and Bhatt, Bharat. Underoxidized burner utilizing improved injectors. 5,437,123, Cl. 48-107.000.
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- Grim, Tracy E., to Royce Medical Company. Soft-goods type, custom "in situ" formable back support. 5,437,614, Cl. 602-19.000.
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- Gupta, Vijay, to Dartmouth College, Trustees of. System and method for measuring the interface tensile strength of planar interfaces. 5,438,402, Cl. 356-35.500.
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- Haino, Kozo: See—  
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- Haisler, Walter E.: See—  
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- Halfman, Hazel L.: See—  
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- Halket, Andrew R.; Ware, Richard W.; and Sims, Charles R., to Esselte Dymo N.V. Tape printing apparatus. 5,437,511, Cl. 400-54.000.
- Hall, Dale G., to Motorola, Inc. Piezoelectric material detector. 5,438,230, Cl. 310-316.000.
- Hall, John L. Recirculating shredder. 5,437,414, Cl. 241-74.000.
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- Haloan, Scott F.: See—  
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- Halvatzis, George. Display lighting fixture and method of using same. 5,437,504, Cl. 362-125.000.
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- Hamaguchi, Melvin M. Protective cap apparatus. 5,437,064, Cl. 2-414.000.
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- Hara, Kouichi: See—  
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- Hara, Mitsuhiro: See—  
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- Harada, Kouichi: See—  
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- Harada, Naoki: See—  
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- Harada, Takashi: See—  
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- Haraga, Hideaki; Yagi, Toshihiko; Kon, Miki; Shimazaki, Hiroshi; Urakawa, Yoshihide; Yamada, Yoshitaka; Ezaki, Atsuo; and Matsuzaka, Syoji, to Konica Corporation. Silver halide color negative photographic light sensitive material. 5,437,966, Cl. 430-505.000.
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- Hardesty, Richard A.: See—  
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- Hardison, Leslie C., to ARI Technologies, Inc. Fluid contacting apparatus and methods of making the same. 5,437,819, Cl. 261-94.000.
- Hardy, Stephen N., to RTC Industries, Inc. Modular sign system. 5,437,116, Cl. 40-605.000.
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- Harris Corporation: See—  
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- Harris, Scott C. Facsimile machine apparatus. 5,438,436, Cl. 358-500.000.
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- Hartman, Davis H.; Leiby, Michael S.; Kuo, Shun-Meen; and Chun, Christopher K. Y., to Motorola, Inc. Method of making contact areas on an optical waveguide. 5,437,092, Cl. 29-600.000.
- Hartmann, John L.: See—  
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- Harwick, Warren J.; Sommer, Holger T.; and Girvin, Kenneth L., to Vickers, Incorporated; and Met One, Inc. Monitoring of fluid contamination level wherein the light energy is focused on the fluid passage means. 5,438,420, Cl. 356-440.000.
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- Hasegawa, Shinichi; and Uetake, Akihiro, to Sony Corporation. Rotary head drum having reduced exterior dimensions. 5,438,468, Cl. 360-107.000.
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- Hashimoto Forming Industry Co., Ltd.: See—  
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- Hashimoto, Masashi, to Texas Instruments Incorporated. Static random access memory for gate array devices. 5,438,538, Cl. 365-154.000.
- Hashimoto, Shuichi: See—  
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- Hashimoto, Takasuke, to NEC Corporation. Method of manufacturing semiconductor device. 5,438,014, Cl. 437-60.000.
- Hashizume, Hidehisa: See—  
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- Hashizume, Shuhei: See—  
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He, Jueling. Method of processing duck feet. 5,437,884, Cl. 426-253.000.

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Morrison, Robert D., 5,438,353, Cl. 347-250.000.

Notess, Mark H.; Warren, Scott J.; Heiserman, Tammy; and Kingdom, Michael A., 5,438,659, Cl. 395-155.000.

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Russell, Dale D.; and Bears, James C., 5,437,953, Cl. 430-106.000.

Seyed-Bolorforosh, Mir S.; Greenstein, Michael; Gururaja, Turuvekere R.; and Yoshida, Henry, 5,438,554, Cl. 367-140.000.

Heyke, Klaus: See—  
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Heylman, Thomas S.: See—  
Beaty, Keith D.; and Heylman, Thomas S., 5,437,550, Cl. 433-141.000.

Hibbard, Robert H.: See—  
Jackson, Todd A.; and Hibbard, Robert H., 5,438,366, Cl. 348-342.000.

Hibino, Masaru: See—  
Suzuki, Hiroyuki; Nagase, Yukio; Waki, Kenichiro; Kemmochi, Kazuhisa; and Hibino, Masaru, 5,438,394, Cl. 355-251.000.

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Higashi, Kazumi; Mochizuki, Amane; and Maeda, Masako, to Nitto Denko Corporation. Anisotropic electrically conductive adhesive film and connection structure using the same. 5,438,223, Cl. 257-774.000.

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Koudijs, Reijer; Mulder, Marcel M.; Purser, Kenneth H.; and Saris, Frans W., 5,438,194, Cl. 250-288.000.

Higuchi, Osamu: See—  
Miura, Tamotsu; Miura, Masatoshi; and Higuchi, Osamu, 5,437,248, Cl. 122-51.000.

Higuchi, Shigemitsu: See—  
Suga, Atsuo; Higuchi, Shigemitsu; Nishijima, Hideo; and Fujii, Hiromasa, 5,438,459, Cl. 360-38.100.

Hikita, Mitsutaka; Sumioka, Atsushi; Akagi, Takatoshi; Tabuchi, Toyoyi; and Shibagaki, Nobuhiko, to Hitachi, Ltd.; Hitachi Denshi Kabushiki Kaisha; and Hitachi Video & Information System, Inc. High frequency module including a flexible substrate. 5,438,305, Cl. 333-32.000.

Hill, Herbert: See—  
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Earl, George F.; Churchill, Jack; Panek, Jeffrey J.; and Hillman, Allen F., Jr., 5,437,561, Cl. 439-567.000.

Hilton, Michael D.; and Otto, Neil C., to Westinghouse Electric Corp. High power energy compression device. 5,437,940, Cl. 429-103.000.

Hineman, Derral. Game chair apparatus. 5,437,453, Cl. 273-148.000.

Hines, Sr.; Albert K. Means for backfilling multiple aeration holes. 5,437,335, Cl. 172-22.000.

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Kihira, Soji; Tanigawa, Fumiyoshi; and Hio, Masahide, 5,437,563, Cl. 439-607.000.

Hirai, Katsura; Kojima, Yasuo; and Goto, Kiyoshi, to Konica Corporation. Lithographic photosensitive printing plate comprising a photoconductor and a naphtho-quinone diazide sulfonic acid ester of a phenol resin. 5,437,952, Cl. 430-83.000.

Hirai, Seichi: See—  
Kurashiki, Hidenori; Iwasaki, Horishi; Hayakawa, Hideki; Nagai, Yuzo; and Hirai, Seichi, 5,437,349, Cl. 180-79.100.

Hirai, Yoshiaki, to Hitachi Powdered Metals Co., Ltd. Method and apparatus for extruding powdered material. 5,437,545, Cl. 425-79.000.

Hirama, Mitsuru: See—  
Oie, Yasunori; Hirma, Mitsuru; Fujii, Yasushi; and Tanaka, Hidekazu, 5,438,591, Cl. 375-261.000.

Hiramatsu, Soichi: See—  
Kawakami, Hideaki; Kiyohara, Takehiko; Suzuki, Tetsuo; Asano, Junichi; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Saikawa, Satoshi; and Kinoshita, Hiroyuki, 5,437,444, Cl. 271-22.000.

Hirano, Shinichi; and Akiyama, Tsuneharu, to Bridgestone Corporation. Method of producing pneumatic radial tires with a rubber sheet over overlapped carcass edge portions. 5,437,751, Cl. 156-134.000.

Hirasawa, Masahide: See—  
Kaneda, Naoya; Hirasawa, Masahide; Yamada, Kunihiko; Kaneda, Kitahiro; and Niida, Mitsuo, 5,438,190, Cl. 250-201.300.

Hirasawa, Yutaka: See—  
Saida, Muneco; Hirasawa, Yutaka; and Yoshimura, Katsuhiko, 5,437,914, Cl. 428-209.000.

Hirata, Makizo: See—  
Fujikawa, Tetsuzo; Hirata, Makizo; Ohama, Shigeharu; and Nishimura, Michio, 5,437,334, Cl. 172-15.000.

Hirayama, Takeshi: See—  
Oho, Shigeru; Hirayama, Takeshi; Matsumoto, Masahiro; Hasegawa, Akira; Hamano, Fumio; and Shibata, Takanori, 5,438,506, Cl. 364-138.000.

Hirobe, Junichi: See—  
Kobayashi, Masahiko; Akashi, Masakatsu; Hirobe, Junichi; Sugaya, Tautomu; Tanaka, Yoshihisa; Kusuda, Toshiaki; Makie, Ikuo; Aikawa, Yukihiko; Ishii, Satoshi; and Ohata, Yosuke, 5,438,390, Cl. 355-200.000.

Hirose Electric Co., Ltd.: See—  
Mizuguchi, Shinji, 5,437,560, Cl. 439-326.000.

Hirota, Shinya: See—  
Takeshima, Shinichi; Tanaka, Toshiaki; Iguchi, Satoshi; Araki, Yasushi; Hirota, Shinya; Oda, Tomohiro; and Murakami, Fumitada, 5,437,153, Cl. 60-276.000.

Hirt, Dieter: See—  
Vogele, Roland; and Hirt, Dieter, 5,437,465, Cl. 279-22.000.

Hisaaki, Kawano, to Kabushiki Kaisha Toshiba. Image forming apparatus for forming an image on a recording medium which can automatically adjust output levels from a recording medium sensor. 5,438,345, Cl. 347-218.000.

Hisaki, Takashi: See—  
Maruyama, Shigeru; Shimasaki, Yuichi; Kanehiro, Masaki; Ishioka, Takuji; Baba, Shigeki; and Hisaki, Takashi, 5,438,269, Cl. 324-402.000.

Hisanaga, Takeshi: See—  
Itoh, Hiroshi; Abe, Takashi; Yamashita, Hitoshi; Yoshimura, Toshihiro; Hisanaga, Takeshi; Takebayashi, Takao; Nakata, Kunio; and Hashimoto, Chikara, 5,437,902, Cl. 428-68.000.

Hisata, Nahoko: See—  
Eda, Yukio; Fujimoto, Hirohisa; Hisata, Nahoko; and Yukawa Hiroshi, 5,438,579, Cl. 372-34.000.

Hitachi Chemical Company: See—  
Tai, Seiji; Katayose, Mitsuo; and Watanabe, Hiroo, 5,438,135, Cl. 540-128.000.

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Hikita, Mitsutaka; Sumioka, Atsushi; Akagi, Takatoshi; Tabuchi, Toyoyi; and Shibagaki, Nobuhiko, 5,438,305, Cl. 333-32.000.

Hitachi, Ltd.: See—  
Hikita, Mitsutaka; Sumioka, Atsushi; Akagi, Takatoshi; Tabuchi, Toyoyi; and Shibagaki, Nobuhiko, 5,438,305, Cl. 333-32.000.

Itoh, Satoshi; and Ihara, Sigeo, 5,438,526, Cl. 364-578.000.

Nakano, Yukio, 5,438,445, Cl. 359-124.000.

Nakase, Junko; and Doi, Nobukazu, 5,438,577, Cl. 371-37.100.

Nakazawa, Kisaburo; Nakamura, Hiroshi; Imori, Hiromitsu; and Wada, Hideo, 5,438,669, Cl. 395-375.000.

Nishimura, Asao; Yaguchi, Akihiro; Haneda, Mitsuki; Anjoh, Ichiro; Arita, Junichi; Iwaya, Akihiko; and Ichitani, Masahiro, 5,437,915, Cl. 428-209.000.

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Orihashi, Ritsuro; Kendo, Kosuke; and Hayashi, Yoshihiko, 5,438,259, Cl. 324-158.100.

Ozaki, Yukihiko; and Moro, Eiji, 5,438,424, Cl. 358-336.000.

Siga, Masao; Kuriyama, Mitso; Mori, Takanobu; Fukui, Yutaka; and Ishizuka, Tatsuro, 5,437,742, Cl. 148-335.000.

Suga, Atsuo; Higuchi, Shigemitsu; Nishijima, Hideo; and Fujii, Hiromasa, 5,438,459, Cl. 360-38.100.

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Tayonaka, Takashi; Tsuji, Shinji; and Takeyari, Ryoji, 5,438,444, Cl. 359-123.000.

Hitachi, Ltd.: See—  
Murai, Fumio; Suzuki, Yasunori; Tomozawa, Hideki; Takashi, Ryuma; Saida, Yoshihiro; and Ikenoue, Yoshiaki, 5,437,893, Cl. 427-498.000.

Hitachi Maxell, Ltd.: See—  
Kita, Fusaji; and Kawakami, Akira, 5,437,944, Cl. 429-195.000.

Hitachi Medical Corporation: See—  
Takeshima, Hirotaka; Takeuchi, Hiroyuki; and Nakamura, Chikako, 5,438,264, Cl. 324-319.000.

Hitachi Powdered Metals Co., Ltd.: See—  
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Hitachi Techno Engineering Co., Ltd.: See—  
Yoneda, Tomio; Ishida, Shigeru; and Mishina, Haruo, 5,437,727, Cl. 118-669.000.

Hitachi Video & Information System, Inc.: See—  
Hikita, Mitsutaka; Sumioka, Atsushi; Akagi, Takatoshi; Tabuchi, Toyoyi; and Shibagaki, Nobuhiko, 5,438,305, Cl. 333-32.000.

Hitech A/S: See—  
McGill, John; and Eilertsen, Bjorn A., 5,437,527, Cl. 414-22.510.

HK Medical Technologies, Incorporated: See—  
Kulias, Andre A.; and Migachyov, Valery, 5,437,604, Cl. 600-30.000.

Ho, Edmond Y.; Yang, Fu-chin; and Lin, Jung-lung. Phase difference measuring device. 5,438,254, Cl. 324-76.820.

Ho, Fang-Chuan: See—  
Tsai, Rung-Ywan; Wei, Chaur-Tsang; Lee, Chii-Hua; Ho, Fang-Chuan; and Chuang, Gi-Hong, 5,437,931, Cl. 428-446.000.



- Hoblingre, Andre : See—  
Saliez, Jean-Philippe; Hoblingre, Andre ; and Henigue, Christian, 5,437,350, Cl. 180-287.000.
- Hoburg, Albrecht: See—  
Hungerbach, Heinz; Struzina, Werner; and Hoburg, Albrecht, 5,437,858, Cl. 424-53.000.
- Hocquaux, Michel: See—  
Dufetel, Didier; Estradier, Françoise; and Hocquaux, Michel, 5,438,058, Cl. 514-252.000.
- Hodson, Peter D.; and Greenleaf, David J., to Minnesota Mining and Manufacturing Company. Deagglomerators for dry powder inhalers. 5,437,271, Cl. 128-203.150.
- Hoechst AG: See—  
Jaekel, Frank; Reinhardt, Gerd; and Meller, Wolf-Dieter, 5,438,147, Cl. 548-210.000.
- Hoechst Aktiengesellschaft: See—  
Akashi, Mitsuru; Itoh, Haruhiko; and Murakami, Mikio, 5,437,813, Cl. 252-197.400.
- Helmer-Metzmann, Freddy; Osan, Frank; Schneller, Arnold; Ritter, Helmut; Ledjeff, Konstantin; Nolte, Roland; and Thorwirth, Ralf, 5,438,082, Cl. 522-149.000.
- Hoechst Celanese Corp.: See—  
Fritsch, John R.; Fruchey, Olan S.; Kuila, Debasiah; Kvakovsky, George; Murphy, Mark A.; Sheehan, Michael T.; Sounik, James R.; and Vicari, Richard, 5,438,142, Cl. 546-240.000.
- Hoepfl, Joseph R.: See—  
Thompson, Christopher D.; and Hoepfl, Joseph R., 5,437,212, Cl. 81-63.100.
- Hofer, Karl-Heinz: See—  
Dotsch, Lorenz; Hofer, Karl-Heinz; and Preyer, Helmut, 5,437,435, Cl. 266-220.000.
- Hoffco, Inc.: See—  
Lohr, Thomas H., 5,437,356, Cl. 192-105.0BA.
- Hoffman, Kevin: See—  
Younan, Kais; Wolf, David; Lycette, Mark; Glatfelter, Troy; Hoffman, Kevin; and Banerjee, Arindam, 5,437,735, Cl. 136-251.000.
- Hoffman, Larry D.: Adjustable window or door lock. 5,437,486, Cl. 292-339.000.
- Hoffmann-La Roche Inc.: See—  
Angehrn, Peter; Furlenmeier, Andre ; Hebeisen, Paul; Hofheinz, Werner; and Link, Helmut, 5,438,052, Cl. 514-202.000.
- Asakura, Akira; and Hoshino, Tatsuo, 5,437,989, Cl. 435-190.000.
- Balmer, Alfons, 5,437,841, Cl. 422-102.000.
- Hofheinz, Werner: See—  
Angehrn, Peter; Furlenmeier, Andre ; Hebeisen, Paul; Hofheinz, Werner; and Link, Helmut, 5,438,052, Cl. 514-202.000.
- Hofstetter, Christian; Berger, Walter; Bauer, Werner; and Mittelbach, Bernd, to Wacker-Chemtronik Gesellschaft fuer Elektronik-Grundstoffe mbH. Process and apparatus for controlling the melt level while pulling single crystals. 5,437,242, Cl. 117-14.000.
- Holden, Jeffery M.: Burglar deterrent decoy. 5,437,323, Cl. 160-178.100.
- Holder, Timothy A.: See—  
Benkowski, Frank J.; Cordova, Morris; DelliGatti, E. Scott; and Holder, Timothy A., 5,437,760, Cl. 156-580.000.
- Holler, Helge: See—  
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Barth, Wolfgang; Grell, Hans-Georg; Gresser, Marin; Moll, Hermann; Pollmann, Horst; and Schneider, Peter, 5,437,347, Cl. 187-264.000.
- Hollinger, John D., to Coulter Corporation. Liquid metering and transfer valve assembly particularly for flow cytometer. 5,437,200, Cl. 73-863.730.
- Holowko, Paul L.; Seitz, David R.; and Woods, Curtis, to Ohio Electronic Engravers, Inc. Error detection apparatus and method for use with engravers. 5,438,422, Cl. 358-299.000.
- Holston, John; and Waldecker, Frederick R., to Ni-Tech, Inc. Stand-alone gas spring. 5,437,436, Cl. 267-119.000.
- Holsten, John R.: See—  
Caldwell, Melvin A.; and Holsten, John R., 5,437,690, Cl. 8-590.000.
- Holton, Donald; and Gill, Antony, to Becker Group, Inc. Apparatus for injection molding. 5,437,547, Cl. 425-548.000.
- Holzgrafe, James R.: See—  
Ryan, John O.; Quan, Ronald; Holzgrafe, James R.; and Wonfor, Peter J., 5,438,620, Cl. 380-15.000.
- Homeostatics Design Group, Inc.: See—  
Sikes, W. David, 5,437,618, Cl. 602-19.000.
- Homma, Yasuhiro: See—  
Ohmori, Toshiyuki; Hatanaka, Shigemi; Homma, Yasuhiro; Saito, Eiichi; and Kamishioiri, Nobuyuki, 5,437,361, Cl. 198-465.100.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Kurashiki, Hidenori; Iwasaki, Horishi; Hayakawa, Hideki; Nagai, Yuzo; and Hirai, Seiichi, 5,437,349, Cl. 180-79.100.
- Mariyama, Shigeru; Shimazaki, Yuichi; Kanehiro, Masaki; Ishioka, Takuji; Baba, Shigeki; and Hisaki, Takashi, 5,438,269, Cl. 324-402.000.
- Sato, Toshihiko; Takizawa, Tsuyoshi; Iwata, Yoichi; Ito, Hiroshi; and Nakayama, Takayoshi, 5,437,154, Cl. 60-276.000.
- Shibahata, Yasuji; and Tokushima, Shoji, 5,437,583, Cl. 475-220.000.
- Honda, Minoru: See—  
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- Honda, Yasufumi: See—  
Ohama, Yoshifumi; Chihara, Yoshihide; Honda, Yasufumi; and Miyamoto, Yasuhiro, 5,438,080, Cl. 522-97.000.
- Honeywell Inc.: See—  
Ford, Carol M.; and Podgorski, Theodore J., 5,438,639, Cl. 385-30.000.
- Killpatrick, Joseph E.; and Berndt, Dale F., 5,438,410, Cl. 356-350.000.
- Norman, Ronald W., 5,437,091, Cl. 29-600.000.
- Sewell, Wesley C., 5,438,409, Cl. 356-350.000.
- Hong, Gary: See—  
Yang, Ming-Tzong; and Hong, Gary, 5,438,009, Cl. 437-52.000.
- Honjo, Ryoki, to Sony Corporation. Data reproducing apparatus that detects positional shifts of a control head. 5,438,458, Cl. 360-10.200.
- Hoover Universal, Inc.: See—  
Waelde, Todd W., 5,437,498, Cl. 297-452.340.
- Hoppener, Roderik H., to DSM N.V. Process for the manufacture of polymeric objects starting from a solution. 5,438,089, Cl. 524-487.000.
- Horbachek, Heinz, to Siemens Aktiengesellschaft. X-ray diagnostics installation for intermittent transillumination. 5,438,604, Cl. 378-98.200.
- Hori, Hidetoshi, to NEC Corporation. Amplifier having overshoot preventing circuit. 5,438,298, Cl. 330-289.000.
- Horiguchi, Tsuneo: See—  
Lee, Tekken; Takeuchi, Nobunari; Uchiyama, Haruyoshi; Shimizu, Kaoru; and Horiguchi, Tsuneo, 5,438,578, Cl. 372-32.000.
- Horio, Yasufumi: See—  
Yamanouchi, Kazuhiko; Tanaka, Mitsuhiro; and Horio, Yasufumi, 5,438,306, Cl. 333-195.000.
- Horioka, Keiji: See—  
Yano, Hiroyuki; Okano, Haruo; Watanabe, Tohru; and Horioka, Keiji, 5,437,961, Cl. 430-316.000.
- Horn, Jack; and Werth, Jerald. Multi-drill mounter. 5,437,341, Cl. 175-122.000.
- Hornak, Thomas; Petrou, Patrick; Walker, Richard C.; Lai, Benny W. H.; Yen, Chu-Sun; Stout, Cheryl L.; and Wu, Jieh-Tsorn, to Hewlett-Packard Company. DC-free line code and bit and frame synchronization for arbitrary data transmission. 5,438,621, Cl. 380-43.000.
- Horner, Charles B., Jr., to AlliedSignal Inc. Method of manufacturing vacuum brake booster. 5,437,098, Cl. 29-888.020.
- Horner, Joseph L., to United States of America, Air Force. Joint transform correlator using a 4-F lens system to achieve virtual displacement along the optical axis. 5,438,632, Cl. 382-278.000.
- Horodysky, Andrew G.: See—  
Farnig, Liehpao O.; Horodysky, Andrew G.; and Poole, Ronald J., 5,437,694, Cl. 44-340.000.
- Horsley, Scott W.; and Platz, Winfried, to Stormtreat Systems, Inc. Stormwater treatment system/apparatus. 5,437,786, Cl. 210-170.000.
- Horst Witte Entwicklungs und Vertriebs-KG: See—  
Witte, Horst, 5,437,135, Cl. 52-693.000.
- Hoshino, Hidekazu; and Haga, Hidemi, to NHK Spring Co., Ltd. Article identification system. 5,438,403, Cl. 356-71.000.
- Hoshino, Shunji; and Inaba, Naoto, to Nikon Corporation. Laser power monitor circuit used in a magneto-optical disk device. 5,438,582, Cl. 372-38.000.
- Hoshino, Tatsuo: See—  
Asakura, Akira; and Hoshino, Tatsuo, 5,437,989, Cl. 435-190.000.
- Hosseini, Samandar V.: See—  
Sorensen, Robert L.; Hosseini, Samandar V.; Habbaba, Faris S.; Bartling, Craig A.; and Garcia, Jorge L., 5,438,685, Cl. 455-90.000.
- Hotta, Masatoshi: See—  
Ikeda, Tsuyoshi; Iwai, Kiyoshi; Ohta, Koji; Hyuga, Satoshi; and Hotta, Masatoshi, 5,438,087, Cl. 524-272.000.
- Hou, Anchi, to Du Pont de Nemours, E. I., and Company. Protective coating for imaging elements. 5,437,959, Cl. 430-256.000.
- Hou, Chun H. Folding stand for an office chair. 5,437,425, Cl. 248-188.600.
- Hou, Yongsheng: See—  
Thimons, Thomas V.; Swisher, Robert G.; and Hou, Yongsheng, 5,437,928, Cl. 428-391.000.
- Houdayer, Christophe: See—  
Rigaux, Christian; Houdayer, Christophe; Bonnin, Christophe; and Caillaud, Claude, 5,438,260, Cl. 324-166.000.
- Hourlier, Herve : See—  
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- Houston, Theodore W., to Texas Instruments Incorporated. Synchronous memory with reduced power access mode. 5,438,548, Cl. 365-227.000.
- Howard, Adriann J.: See—  
Woodard, Daniel L.; Howard, Adriann J.; and Down, James A., 5,438,127, Cl. 536-25.400.
- Woodard, Daniel L.; Howard, Adriann J.; and Down, James A., 5,438,129, Cl. 536-25.400.
- Howard, Bradley J.: See—  
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- Howard, Mark S.: See—  
Cady, John B.; Howard, Mark S.; Fisher, Stephen A.; Lloyd, Robert C. W.; and Thomas, Alan V., 5,437,348, Cl. 180-69.210.
- Hrowatari, Toshio: See—  
Kawamoto, Takeshi; Hrowatari, Toshio; Tahara, Eiji; and Katayama, Hiromasa, 5,437,192, Cl. 73-826.000.

- Hsu, Lawrence T.: See—  
Court, Thomas L.; Hsu, Lawrence T.; and Rivers, Alan, 5,438,673, Cl. 395-500.000.
- Huang, Jin-Tarn. Torque-adjustment controller. 5,437,524, Cl. 408-139.000.
- Huang, Kuei-Wu, to SGS-Thomson Microelectronics, Inc. Method for formation of contact vias in integrated circuits. 5,437,763, Cl. 216-18.000.
- Huels Aktiengesellschaft: See—  
Luders, Harald; Kosswig, Kurt; and Steinhardt, Hauke, 5,437,801, Cl. 252-8.800.
- Huffman, William F.: See—  
Callahan, James F.; Huffman, William F.; Moore, Michael L.; and Newlander, Kenneth A., 5,438,118, Cl. 530-330.000.
- Huffmaster, Roger L.; and Robichaux, Jerry D., to Ford Motor Company. System and method for controlling the transient torque output of a variable displacement internal combustion engine. 5,437,253, Cl. 123-399.000.
- Hugel, Stefan: See—  
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Barth, Wolfgang; Grell, Hans-Georg; Gresser, Marin; Moll, Hermann; Pollmann, Horst; and Schneider, Peter, 5,437,347, Cl. 187-264.000.
- Hughes Aircraft Company: See—  
Coleman, Guy B., 5,438,361, Cl. 348-208.000.
- McClanahan, Robert F.; Washburn, Robert D.; Smith, Hal D.; and Shapiro, Andrew, 5,438,167, Cl. 174-264.000.
- Rosen, Harold A., 5,437,420, Cl. 244-165.000.
- Hughes, Leonard D.: See—  
Atkins, Anthony G.; Hughes, Leonard D.; Jeronimidis, George; Jolley, Paul; Purnlow, Peter; and Wilding, Peter, 5,437,886, Cl. 426-518.000.
- Hulin, Bernard, to Pfizer Inc. 3-aryl-2-hydroxypropionic acid derivatives and analogs as hypoglycemic agents. 5,438,074, Cl. 514-456.000.
- Huls Aktiengesellschaft: See—  
Dittrich, Wolfgang; Hill, Herbert; and Kinzel, Elke, 5,437,775, Cl. 204-186.000.
- Humm, Siegfried; Palosi, Gabor; and Weidner, Karl, to Adolf Wurth GmbH & Co. KG. Apparatus for storing and delivering sale units. 5,438,523, Cl. 364-479.000.
- Humphreys, Matthew F.: See—  
Witt, Alvin E.; Tomasko, Joseph E.; and Humphreys, Matthew F., 5,437,934, Cl. 428-537.100.
- Hungerbach, Heinz; Struzina, Werner; and Hoburg, Albrecht, to Ulrike Hungerbach. Oral hygiene agent containing hydrogen peroxide stabilized by colloidal silver. 5,437,858, Cl. 424-53.000.
- Hunt, Helena E.: See—  
Coupland, Duncan R.; and Hunt, Helena E., 5,437,933, Cl. 428-469.000.
- Hunt, Robert B.; and Schaefer, Robert W., to Apple Medical Corporation. Cannula reducer. 5,437,646, Cl. 604-167.000.
- Hunter, Frank R.: See—  
Graef, Peter A.; Elston, Colin; Olmstead, Fred E.; Bolstad, Clifford R.; Bowers, Mark W.; Hunter, Frank R.; and Carney, Allan R., 5,437,418, Cl. 241-65.000.
- Hunting MCS, Inc.: See—  
Lee, Richard B.; and Brandon, John W., 5,437,340, Cl. 175-61.000.
- Hur, Hun; and Lee, Jun S., to Goldstar Electron Co., Ltd. Phase shifting mask and method of manufacturing the same. 5,437,947, Cl. 430-5.000.
- Huret, Joel: See—  
Bruschke, Hartmut E. A.; Abouchar, Raif; Ganz, Hartmut; Huret, Joel; and Marggraff, Frank, 5,437,796, Cl. 210-640.000.
- Hussein, Hany M. G.: See—  
Johnson, Douglas E.; Hussein, Hany M. G.; and Loeb, Marvin P., 5,437,660, Cl. 606-15.000.
- Hussman, Karl L. Magnetic resonance breast localizer. 5,437,280, Cl. 128-653.200.
- Huston, John T.: See—  
Brown, Clinton A.; Hellyer, William E.; Huston, John T.; and Dickman, Anthony W., 5,437,295, Cl. 134-37.000.
- Hutchings, Michael G.: See—  
Clough, John M.; Godfrey, Christopher R. A.; de Fraine, Paul J.; Hutchings, Michael G.; and Anthony, Vivienne M., 5,438,059, Cl. 514-256.000.
- Hutchinson, James S.: See—  
Tuhro, Richard H.; and Hutchinson, James S., 5,437,441, Cl. 270-1.100.
- Hutchinson, Wilbur, to Moore Business Forms, Inc. Multipage bound booklet having pressure sealed binding. 5,437,476, Cl. 281-151.000.
- Huston, Kelly. Height adjustable wheelchair seat. 5,437,497, Cl. 297-338.000.
- Hutter, Ingo, to Deutsche Thomson-Brandt GmbH. System for the compatible processing of a progressively scanned image signal in line interlaced format. 5,438,368, Cl. 348-434.000.
- Huyck Licensco, Inc.: See—  
Ward, Kevin J., 5,437,315, Cl. 139-383.00A.
- HWE, Inc.: See—  
Taylor, Charles, 5,437,607, Cl. 601-49.000.
- Hydro-Quebec: See—  
Coature, Pierre; Francoeur, Bruno; Simard, Julien; Bourgeois, Francois-Xavier; and Harbec, Germain, 5,438,228, Cl. 310-67.000.
- Hyuck, Lee J., to Goldstar Telecommunication Co., Ltd. Method and apparatus for recognizing different types of batteries. 5,438,248, Cl. 320-15.000.
- Hyuga, Satoshi: See—  
Ikeda, Tsuyoshi; Iwai, Kiyoshi; Ohta, Koji; Hyuga, Satoshi; and Hotta, Masatoshi, 5,438,087, Cl. 524-272.000.
- Hyundai Electronics America: See—  
Allman, Derryl D. J.; Fuchs, Kenneth P.; Miller, Gayle W.; and Gioia, Samuel C., 5,438,022, Cl. 437-231.000.
- Hyundai Electronics Industries Co., Ltd.: See—  
Kim, Gyu S., 5,438,550, Cl. 365-233.500.
- Lee, Si H., 5,438,560, Cl. 369-58.000.
- Ibiden Co., Ltd.: See—  
Kondo, Mitsuhiro; Fujikawa, Osamu; and Sagisaka, Katsumi, 5,438,478, Cl. 361-704.000.
- Ichimori, Yuzo; Kondo, Koichi; Igarashi, Koichi; and Sando, Masaharu, to Takeda Chemical Industries, Ltd. Monoclonal antibody against an acidic FGF protein and hybridoma for its production. 5,437,995, Cl. 435-240.270.
- Ichitani, Masahiro: See—  
Nishimura, Asao; Yaguchi, Akihiro; Haneda, Mitsuaki; Anjoh, Ichiro; Arita, Junichi; Iwaya, Akihiko; and Ichitani, Masahiro, 5,437,915, Cl. 428-209.000.
- ICMA San Giorgio SPA: See—  
Martinello, Luciano; and Colombo, Giancarlo, 5,437,826, Cl. 264-102.000.
- ICOS Corporation: See—  
Gallatin, William M.; and Van der Vieren, Monica, 5,437,958, Cl. 435-240.200.
- Ide, Yoshihiro: See—  
Mitsui, Hidero; and Ide, Yoshihiro, 5,437,938, Cl. 429-1.000.
- Ideas for Medicine, Inc.: See—  
Grice, O. Drew; Benham, Thomas H.; and Buhler, Michael, 5,437,682, Cl. 606-148.000.
- Idelchik, Leonid B.: See—  
Salganik, Viktor M.; Starkov, Anatoly I.; Gun, Igor G.; Povarich, Alexandr V.; and Idelchik, Leonid B., 5,437,089, Cl. 29-527.700.
- Idemitsu Kosan Co., Ltd.: See—  
Endo, Hiroyuki; Moriaki, Fumio; and Hachiya, Satoshi, 5,437,816, Cl. 252-299.650.
- Idogawa, Hiroyuki; Wakata, Atsushi; Watanabe, Nobuatsu; and Chong, Yong-Bo, to Mitsubishi Pencil Kabushiki Kaisha. Recording material containing carbonaceous powder whose surface is modified with fluorine gas. 5,437,715, Cl. 106-20.00R.
- Igarashi, Koichi: See—  
Ichimori, Yuzo; Kondo, Koichi; Igarashi, Koichi; and Sando, Masaharu, 5,437,995, Cl. 435-240.270.
- Igarashi, Lawrence Y. Method of making a golf club that provides enhanced backspin and reduced sidespin. 5,437,088, Cl. 29-527.600.
- Igarashi, Yoshiaki; and Iida, Kosaku, to Precision Fukuhara Works, Ltd. Dust collector/remover in knitting machine and its controlling method. 5,437,732, Cl. 134-21.000.
- Iguchi, Satoshi: See—  
Takeshima, Shinichi; Tanaka, Toshiaki; Iguchi, Satoshi; Araki, Yasushi; Hirota, Shinya; Oda, Tomohiro; and Murakami, Fumitada, 5,437,153, Cl. 60-276.000.
- Ihara, Minoru: See—  
Demura, Takeshi; Uchiyama, Teruo; Aoki, Sadayuki; and Ihara, Minoru, 5,437,908, Cl. 428-154.000.
- Ihara, Sigeo: See—  
Itoh, Satoshi; and Ihara, Sigeo, 5,438,526, Cl. 364-578.000.
- Iida, Kosaku: See—  
Igarashi, Yoshiaki; and Iida, Kosaku, 5,437,732, Cl. 134-21.000.
- Iida, Wakashi: See—  
Kanbayashi, Makoto; Takiguchi, Tsuyoshi; and Iida, Wakashi, 5,437,949, Cl. 430-45.000.
- Iimuro, Shigeru: See—  
Taniguchi, Keiko; Washino, Masahiro; Moriya, Shinobu; Shinoda, Hosi; Ohtaguro, Masami; Funae, Akihiro; and Iimuro, Shigeru, 5,437,918, Cl. 428-224.000.
- Iizuka, Masanori; Taniguchi, Takao; Isobe, Kazuo; Tamaki, Sayuri; Yamashita, Tadakazu; and Satake, Shinichi, to Kao Corporation; and Nippon Oil Company, Limited. Heavy oil emulsion fuel composition. 5,437,693, Cl. 44-302.000.
- Ikari, Akira, to Yazaki Corporation. Fuse box. 5,438,310, Cl. 337-208.000.
- Ikeda, Chinatsu, to NEC Corporation. Packet switching apparatus. 5,438,567, Cl. 370-60.000.
- Ikeda, Kiyoshi: See—  
Yamamoto, Keisaku; Ikeda, Kiyoshi; and Fukuyama, Masahiro, 5,438,101, Cl. 525-274.000.
- Ikeda, Tsuyoshi; Iwai, Kiyoshi; Ohta, Koji; Hyuga, Satoshi; and Hotta, Masatoshi, to Nippon PMC Corporation. Paper sizing composition. 5,438,087, Cl. 524-272.000.
- Ikegawa, Akihiko; Kuramitsu, Masayuki; and Okazaki, Masaki, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,437,972, Cl. 430-574.000.
- Ikenaga, Yoshihiro: See—  
Kobata, Takeji; and Ikenaga, Yoshihiro, 5,438,029, Cl. 502-430.000.
- Ikeno, Masayuki: See—  
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- Ikenoue, Yoshiaki: See—  
Murai, Fumio; Suzuki, Yasunori; Tomozawa, Hideki; Takashi, Ryuma; Saida, Yoshihiro; and Ikenoue, Yoshiaki, 5,437,893, Cl. 427-498.000.



- Ikeou, Shinei: See—  
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Ikeou, Shinei; Omura, Takashi; and Harada, Naoki, 5,438,137, Cl. 544-76.000.
- Ikukawa, Shuji: See—  
Yamada, Shuhei; Ikukawa, Shuji; and Nakayama, Jitsuko, 5,437,815, Cl. 252-299.660.
- Illinois Institute of Technology: See—  
Zheng, Shuming; Beissinger, Richard L.; Wasan, Darah T.; Sehgal, Lakshman R.; and Rosen, Arthur L., 5,438,041, Cl. 514-6.000.
- Illinois Tool Works Inc.: See—  
Broskow, James A., 5,437,364, Cl. 206-150.000.  
Marco, Leslie S., 5,437,370, Cl. 206-430.000.  
Nedbal, Ralph G.; and Nelson, John F., 5,437,491, Cl. 296-97.220.  
Pimpl, Frank V., 5,437,133, Cl. 52-456.000.  
Shkolnikov, Yury, 5,437,404, Cl. 227-109.000.
- Imada, Katsumi: See—  
Ohtsuchi, Tetsuro; Sumihara, Masanori; Kawasaki, Osamu; Nishikura, Takahiro; Takeda, Katsu; Nojima, Takashi; and Imada, Katsumi, 5,438,229, Cl. 310-316.000.
- Imahashi, Takeshi, to Kyowa Chemical Industry Co., Ltd. Flame-retardant polyamide-containing resin composition and flame retardant, 5,438,084, Cl. 523-440.000.
- Imai, Akihiro; Fukui, Yasuo; and Taguchi, Nobuyoshi, to Matsushita Electric Industrial Co., Ltd. Thermal transfer printing method and intermediate sheets therefor, 5,438,348, Cl. 346-135.100.
- Imamura, Masato; Nakajima, Kiichi; and Yanagisawa, Akira, to Sintokogio, Ltd. Process for preparing a ceramic porous body, 5,437,832, Cl. 419-2.000.
- IMI Cornelius Inc.: See—  
Bull, Ronald E.; and Davis, Harlan R., 5,437,395, Cl. 222-129.100.
- Immersion Human Interface Corporation: See—  
Rosenberg, Louis B.; and Jackson, Bernard G., 5,438,529, Cl. 364-709.100.
- Imori, Hiromitsu: See—  
Nakazawa, Kisaburo; Nakamura, Hiroshi; Imori, Hiromitsu; and Wada, Hideo, 5,438,669, Cl. 395-375.000.
- Implant Innovations, Inc.: See—  
Beatty, Keith D.; and Heylman, Thomas S., 5,437,550, Cl. 433-141.000.
- Inaba, Naoto: See—  
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- Inaba, Yutaka: See—  
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- Indresco Inc.: See—  
Slusser, William G., 5,438,026, Cl. 501-100.000.
- Industrial Technology Research Institute: See—  
Chao, Zu-Wen, 5,438,386, Cl. 354-402.000.
- Industrial Technology Research Institute: See—  
Tsai, Rung-Yuan; Wei, Chaur-Tsang; Lee, Chii-Hua; Ho, Fang-Chuan; and Chuang, Gi-Hong, 5,437,931, Cl. 428-446.000.
- Ing. C. Olivetti & C., S.p.A.: See—  
Bettini, Francesco, 5,438,530, Cl. 364-709.110.
- Ing. Erich Pfeiffer GmbH & Co. KG: See—  
Fuchs, Karl-Heinz, 5,437,397, Cl. 222-321.900.
- Ing. Erich Pfeiffer GmbH & Co. KG: See—  
Ritsche, Stefan, 5,437,398, Cl. 222-321.800.
- Ingemi, Michael J., to Raytheon Company. Series resonant converter having a resonant snubber, 5,438,498, Cl. 363-17.000.
- Innocent, Kenneth L.: See—  
McPherson, Mac E.; McPherson, Michael G.; Innocent, Kenneth L.; Parks, Gary A.; and Noskas, Roger D., 5,437,333, Cl. 171-19.000.
- Innovata Biomed Limited: See—  
Braithwaite, Philip W., 5,437,270, Cl. 128-203.150.
- Innovative Achievements, Inc.: See—  
Wolfe, James P., 5,437,211, Cl. 76-114.000.
- Innovative Orthopaedics, Manufacturing, Inc.: See—  
Papierski, Paul E.; and Hauptmann, Frank J., 5,437,667, Cl. 606-55.000.
- Inomata, Shinichi; Nakazawa, Eiji; Miyata, Hisashi; and Magihira, Toru, to Casio Computer Co., Ltd. Data storage apparatus having volatile memory and nonvolatile memory and data indication means for indicating memory storing data, 5,438,679, Cl. 395-800.000.
- Inoue, Jiro; Tabata, Jun; Makino, Shiro; Morikawa, Atsushi; and Eimori, Takeshi, to Murata Manufacturing Co., Ltd. Piezoelectric lamination actuator, 5,438,232, Cl. 310-328.000.
- Instantaneous Thermal Systems, Inc.: See—  
Posen, Alan, 5,438,642, Cl. 392-485.000.
- Institut Francais Du Petrole: See—  
Glover, Stephen, 5,437,252, Cl. 123-190.200.  
Morin, Pierre; Bardin, Christian; and Boulet, Jean, 5,437,308, Cl. 138-46.000.
- Intel Corporation: See—  
Adams, Robert T.; Slynstad, Vincent R.; and Unlu, Seckin, 5,438,677, Cl. 395-736.000.  
Ishac, Michel I.; Talreja, Sanjay S.; and Bauer, Mark E., 5,438,546, Cl. 365-200.000.  
Levy, Markus A., 5,438,549, Cl. 365-229.000.  
Rahal-Arabi, Tawfik; Pomerleau, Real; Rausch, Martin; and Schreyer, Tim, 5,438,297, Cl. 327-565.000.
- Intellectual Properties and Technology, Inc.: See—  
Sullivan, Herbert W., 5,438,680, Cl. 395-650.000.
- Intermec Corporation: See—  
Fox, Duane M.; and Schoen, Joel A., 5,438,349, Cl. 346-136.000.
- International Business Machines: See—  
Best, John S.; and Hetzler, Steven R., 5,438,559, Cl. 369-54.000.
- International Business Machines Corporation: See—  
Coker, Jonathan D.; and Galbraith, Richard L., 5,438,460, Cl. 360-46.000.  
Craig, Jeffrey A.; and Woo, Ka-Chiu, 5,438,272, Cl. 324-537.000.  
Dorius, Lee K.; Harker, John M.; and Samuelson, Laurence S., 5,438,467, Cl. 360-103.000.  
Fitzpatrick, Greg P.; Johnson, William J.; and Williams, Marvin L., 5,438,658, Cl. 395-153.000.  
Kobayashi, Masaki; Kataoka, Rieko; and Naitoh, Masahiro, 5,438,341, Cl. 345-20.000.  
Kuchta, Douglas A., 5,438,226, Cl. 307-125.000.  
Lee, Raymond E.; and Torres, Robert J., 5,438,660, Cl. 395-155.000.  
Simons, Robert E., 5,437,328, Cl. 165-146.000.  
Yamaguchi, Hidefumi, 5,438,342, Cl. 345-58.000.
- International Business Machines Inc.: See—  
Fado, Francis; Wong, Tin-Lup; Verrier, Guy F.; Donaldson, Robert L.; and Kowalewski, Paul D., 5,438,275, Cl. 324-662.000.
- International Paper: See—  
Gordon, Robert L.; Swenson, Katherine A.; Stier, David E.; and Bronk, Teresa A., 5,437,406, Cl. 229-193.000.
- International Paper Company: See—  
Decker, William C., III; and Wittosch, William A., Jr., 5,437,924, Cl. 428-318.400.
- Intex Recreation Corp.: See—  
Fisher, David R., 5,437,068, Cl. 5-449.000.
- Iowa State University Research Foundation, Inc.: See—  
Ellis, Timothy W.; and Schmidt, Frederick A., 5,437,709, Cl. 75-581.000.  
Verkade, John G.; Mohan, Thyagarajan; and Angelici, Robert J., 5,437,696, Cl. 44-622.000.
- Ippon Denpa Co., Ltd.: See—  
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- Isaka, Kumiko: See—  
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- ISC, Inc.: See—  
Babasade, Wolfgang, 5,437,410, Cl. 239-55.000.
- Iscar Ltd.: See—  
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- Ishac, Michel I.; Talreja, Sanjay S.; and Bauer, Mark E., to Intel Corporation. Programmable redundancy scheme suitable for single-bit state and multibit state nonvolatile memories, 5,438,546, Cl. 365-200.000.
- Ishaque, Ahmad N.; and Castleberry, Donald E., to General Electric Company. Planar avalanche photodiode array with sidewall segment, 5,438,217, Cl. 257-438.000.
- Ishibashi, Hitoshi: See—  
Murayama, Hisao; and Ishibashi, Hitoshi, 5,438,401, Cl. 355-326.000.
- Ishida, Hiroshi; Izumi, Kiyoshi; and Matsumura, Shuzo, to Kubota Corporation, a part interest. Adsorption/reaction equipment, 5,437,787, Cl. 210-189.000.
- Ishida, Shigeru: See—  
Yoneda, Tomio; Ishida, Shigeru; and Mishina, Haruo, 5,437,727, Cl. 118-669.000.
- Ishii, Hiroshi: See—  
Mizoguchi, Yoshimi; Ishii, Hiroshi; Kimura, Kiyoshi; Fukuchi, Masakazu; Takeda, Makoto; Maruyama, Hiroyuki; Yamaguchi, Yasuhiko; Taki, Kenji; Akamatsu, Masashi; and Kurohata, Takao, 5,438,437, Cl. 358-518.000.
- Ishii, Kanjiyu: See—  
Nishiumi, Hiroshi; Ishii, Kanjiyu; and Hara, Mitsuhiko, 5,438,463, Cl. 360-57.000.
- Ishii, Satoshi; Nishimura, Tetsuharu; Ishizuka, Koh; and Kondo, Hiroshi, to Canon Kabushiki Kaisha. Apparatus with light-emitting element and method for producing it, 5,438,586, Cl. 372-50.000.
- Ishii, Satoshi: See—  
Kobayashi, Masahiko; Akashi, Masakatsu; Hirobe, Junichi; Sugaya, Tsutomu; Tanaka, Yoshihisa; Kusuda, Toshiaki; Makie, Ikuo; Aikawa, Yukihiko; Ishii, Satoshi; and Ohata, Yosuke, 5,438,390, Cl. 355-200.000.
- Ishikawa, Makoto: See—  
Asou, Yoshio; Hayashi, Bunya; Sato, Hideharu; Matsumoto, Takumi; Ishikawa, Makoto; Kaneko, Ryushirou; Shimauchi, Keisuke; and Yoshimura, Shinichi, 5,437,306, Cl. 137-625.640.
- Ishikawa, Shinji: See—  
Sasaoka, Eisuke; Kanamori, Hiroo; Suganuma, Hiroshi; Ishikawa, Shinji; and Saito, Tatsuhiko, 5,438,640, Cl. 385-43.000.
- Ishikawa, Toshio: See—  
Van, Kazuo; Ohta, Kenji; and Ishikawa, Toshio, 5,438,561, Cl. 369-100.000.
- Ishimaru, Naoshi; Kioka, Mamoru; and Toyota, Akinori, to Mitsui Petrochemical Industries, Ltd. Process for polymerizing olefins and polymerization catalyst therefor, 5,438,110, Cl. 526-125.000.
- Ishioka, Takuji: See—  
Maruyama, Shigeru; Shimasaki, Yuichi; Kanehiro, Masaki; Ishioka, Takuji; Baba, Shigeki; and Hisaki, Takashi, 5,438,269, Cl. 324-402.000.
- Ishitaka, Yoshihiko: See—  
Sugawara, Kiyomi; Ishitaka, Yoshihiko; Yamagami, Hiroshi; Yamaguchi, Masahiko; Kano, Mitsuru; and Hebiguchi, Hiroyuki, 5,438,421, Cl. 359-75.000.

- Ishizuka, Koh: See—  
Ishii, Satoshi; Nishimura, Tetsuharu; Ishizuka, Koh; and Kondo, Hiroshi, 5,438,586, Cl. 372-50.000.
- Ishizuka, Tatsuro: See—  
Siga, Masao; Kuriyama, Mitso; Mori, Takanobu; Fukui, Yutaka; and Ishizuka, Tatsuro, 5,437,742, Cl. 148-335.000.
- Island Graphics Corporation: See—  
Boenke, Mark; Clegg, Derek; Gittelsohn, Mike; Passaretti, Keith; and Seymour-Marks, Audrey, 5,438,653, Cl. 395-131.000.
- Isobe, Kazuo: See—  
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- Isuzu Motors Limited: See—  
Yanagawa, Hiroshi, 5,437,097, Cl. 29-888.100.
- Itaya, Noriko: See—  
Doi, Takao; Itaya, Noriko; and Yamashita, Masami, 5,438,107, Cl. 525-456.000.
- Ito, Hiroshi: See—  
Sato, Toshihiko; Takizawa, Tsuyoshi; Iwata, Yoichi; Ito, Hiroshi; and Nakayama, Takayoshi, 5,437,154, Cl. 60-276.000.
- Ito, Makoto: See—  
Ohsawa, Kenji; Ito, Makoto; and Nagano, Mutsumi, 5,437,764, Cl. 216-14.000.
- Ito, Osamu; Yoshimoto, Kyosuke; Kiyose, Yoshihiro; Nakane, Kazuhiko; Mashimo, Akira; Onda, Hiroyuki; Yamana, Koji; and Nagata, Takuya, to Mitsubishi Electric Corporation; and TEAC Corporation. Optical disk storage which provides pull-in of focus servo and pull-in of tracking servo, 5,438,557, Cl. 369-44.320.
- Ito, Takefumi: See—  
Kogo, Yasuo; Ito, Takefumi; Okumura, Mitsuhiro; Yoshizaki, Kiyoshi; Fujiwara, Takeji; and Yamashita, Hirofumi, 5,437,921, Cl. 428-288.000.
- Itoh, Haruhiko: See—  
Akashi, Mitsuru; Itoh, Haruhiko; and Murakami, Mikio, 5,437,813, Cl. 252-197.400.
- Itoh, Hiroshi; Abe, Takashi; Yamashita, Hitoshi; Yoshimura, Toshihiro; Hisanaga, Takeshi; Takebayashi, Takao; Nakata, Kunio; and Hashimoto, Chikara, to Mitsui Toatsu Chemicals, Incorporated; and Central Glass Company, Limited. Fire-resistant glass and process for production thereof, 5,437,902, Cl. 428-68.000.
- Itoh, Katsuyuki; and Yamashita, Hiroshi, to NEC Corporation. Electron beam direct writing system for ULSI lithography with facilitated rotation and gain corrections of shot patterns and electron beam direct writing method for same, 5,438,207, Cl. 250-492.230.
- Itoh, Keizou: See—  
Koden, Mitsuhiro; Kaneko, Takashi; Takeda, Hitoshi; Itoh, Keizou; and Takeda, Mitsunori, 5,437,814, Cl. 252-299.610.
- Itoh, Kenichiro: See—  
Ohe, Tomio; Katayama, Shigeru; and Itoh, Kenichiro, 5,437,917, Cl. 428-211.000.
- Itoh, Ryoh; Yokoyama, Yukio; and Ono, Takao, to NEC Corporation. Antenna for a radio communication apparatus, 5,438,339, Cl. 343-702.000.
- Itoh, Satoshi; and Ihara, Sigeo, to Hitachi, Ltd. Program generation method for particles simulation, 5,438,526, Cl. 364-578.000.
- Itoh, Shingo, to Brother Kogyo Kabushiki Kaisha. Data storage device with selectable type data storages, 5,438,428, Cl. 358-436.000.
- Itozaki, Hideo: See—  
Matsura, Takashi; and Itozaki, Hideo, 5,438,036, Cl. 505-162.000.
- Iwai, Hisayuki: See—  
Saito, Yoshiharu; Sakaizawa, Masao; Iwanami, Kunio; Kitano, Kitsuho; Tasaka, Michihisa; Kawazu, Kenji; Miyazaki, Shizuo; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, 5,438,091, Cl. 524-505.000.
- Iwai, Kiyoshi: See—  
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- Iwai, Tatsuo: See—  
Umamura, Toshikazu; Watanabe, Takayuki; Iwai, Tatsuo; and Sugiura, Motoyuki, 5,438,108, Cl. 525-467.000.
- Iwanami, Kunio: See—  
Saito, Yoshiharu; Sakaizawa, Masao; Iwanami, Kunio; Kitano, Kitsuho; Tasaka, Michihisa; Kawazu, Kenji; Miyazaki, Shizuo; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, 5,438,091, Cl. 524-505.000.
- Iwasaki, Horishi: See—  
Kurahashi, Hidenori; Iwasaki, Horishi; Hayakawa, Hideki; Nagai, Yuzo; and Hirai, Seiichi, 5,437,349, Cl. 180-79.100.
- Iwata, Hiroshi: See—  
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- Iwata, Yoichi: See—  
Sato, Toshihiko; Takizawa, Tsuyoshi; Iwata, Yoichi; Ito, Hiroshi; and Nakayama, Takayoshi, 5,437,154, Cl. 60-276.000.
- Iwaya, Akihiko: See—  
Nishimura, Asao; Yaguchi, Akihiro; Haneda, Mitsuaki; Anjoh, Ichiro; Arita, Junichi; Iwaya, Akihiko; and Ichitani, Masahiro, 5,437,915, Cl. 428-209.000.
- Izuchi, Syuichi: See—  
Murata, Kazuo; Yoshihisa, Youetsu; Takeda, Kazunari; and Izuchi, Syuichi, 5,437,942, Cl. 429-192.000.
- Izumi, Kiyoshi: See—  
Ishida, Hiroshi; Izumi, Kiyoshi; and Matsumura, Shuzo, 5,437,787, Cl. 210-189.000.
- Izumi, Minao: See—  
Takimoto, Masaaki; Izumi, Minao; and Yamamoto, Hisataka, 5,438,083, Cl. 523-401.000.
- J. M. Voith GmbH: See—  
Meinecke, Albrecht; Trefz, Michael; and Heinzmann, Helmut, 5,437,784, Cl. 209-170.000.
- J. Muller International: See—  
Dinis, Antonio; and Sauvageot, Gerard, 5,437,072, Cl. 14-73.000.
- J. R. Simplot Company: See—  
Jensen, Richard B.; and Kronenberg, H. Jeff, 5,437,842, Cl. 422-106.000.
- Jackson, Bernard G.: See—  
Rosenberg, Louis B.; and Jackson, Bernard G., 5,438,529, Cl. 364-709.100.
- Jackson, Fred L.; McHugh, Kevin P.; and Robertson, John S., to Schuller International, Inc. Fibrous, non-woven polymeric insulation, 5,437,922, Cl. 428-288.000.
- Jackson, Reed B. Bicycle helmet communication device, 5,438,702, Cl. 455-89.000.
- Jackson, Todd A.; and Hibbard, Robert H., to Eastman Kodak Company. Aspherical blur filter for reducing artifacts in imaging apparatus, 5,438,366, Cl. 348-342.000.
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- Jacobs Brake Technology Corporation: See—  
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- Jacobs, James K.: See—  
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- Jacobsen, Jeffrey: See—  
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- Jacquart, Jean-Louis: See—  
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- Jacquemet, Bernard: See—  
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- Jacques, Neil W.; Thomas, Brian J.; Sykes, David; and Boardman, James, to Pilkington Glass Limited. Bending glass sheets, 5,437,703, Cl. 65-106.000.
- Jaekel, Frank; Reinhardt, Gerd; and Meller, Wolf-Dieter, to Hoechst AG. Imidocarboxylic acid activators and sulfimidocarboxylic acid activators, processes for their preparation and their use, 5,438,147, Cl. 548-210.000.
- Jaguar Cars Limited: See—  
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- Jahnke, Joel C.: See—  
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- Jain, Praveen K., to Northern Telecom Limited. Tertiary side resonant DC/DC converter, 5,438,497, Cl. 363-17.000.
- Jain, Rakesh; Jozefiak, Thomas H.; and Williamson, Hugh M., to Eastman Kodak Company. Photographic elements containing particular color couplers in combination with particular stabilizers, 5,437,962, Cl. 430-551.000.
- Jain, Rakesh K.: See—  
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- Jaklitsch, James J.: See—  
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- Jalonen, Harry; and Karjalainen, Arto, to Orion-tyhtymä Oy. Medetomidine preparations for transdermal administration, 5,438,067, Cl. 514-396.000.
- Janda, Dennis J.: See—  
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- Jang, Wen-Yueh, to Winbond Electronics Corp. Deep collection guard ring, 5,438,005, Cl. 437-34.000.
- Janicki, Peter W.: See—  
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- Janssens, Wilhelmus: See—  
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- Jantzi, C. Earl; and Gall, Richard C., to Mytech Systems Corporation. Vocal frequency suppression apparatus and method, 5,438,618, Cl. 379-387.000.
- Janulis, Eugene P.; Johnson, Gilbert C.; Savu, Patricia M.; Spawn, Terence D.; and Radcliffe, Marc D., to Minnesota Mining and Manufacturing Company. Liquid crystal compounds having perfluoroether terminal portions, 5,437,812, Cl. 252-299.010.
- Janzen, Ernst, to Datascope Investment Corp. Percutaneous introducer set and method for sealing puncture wounds, 5,437,631, Cl. 604-49.000.
- Janzen, Paul; Suhling, Winfried; and Schilling, Gerhard, to Durkopp Adler Aktiengesellschaft. Overhead conveyor system having a



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- Jarvis, David P.; de la Guardia, Mario J.; and Jones, Joseph, Jr., to Aminco, Inc. Skin and scalp barrier for use with hair treatment products. 5,437,860, Cl. 424-70.200.
- Jay Roberts Company: See—  
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- JB Research, Inc.: See—  
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- JBL, Incorporated: See—  
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- Jeannin, Bernard, to Nestec S.A. Package for food products. 5,437,881, Cl. 426-122.000.
- Jedwab, Jonathan: See—  
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- Jelalian, Albert V.: See—  
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- Jenapharm GmbH: See—  
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- Jeng, Jin-Chyr. Fixing device of bicycle pedal axle. 5,437,510, Cl. 384-538.000.
- Jeng, Nanseng: See—  
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- Jenmar Corporation: See—  
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- Jennings, Peter R. Automatically tuned notch filter for providing bandpass and band reject signals. 5,438,304, Cl. 333-17.100.
- Jennings, Uel D.: See—  
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- Jensen, James A., to Lanxide Technology Company, L.P. Polymer precursor for silicon carbide/aluminum nitride ceramics. 5,437,825, Cl. 264-56.000.
- Jensen, Richard B.; and Kronenberg, H. Jeff, to J. R. Simplot Company. Foam control system. 5,437,842, Cl. 422-106.000.
- Jeol Ltd.: See—  
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- Jeriha, Alenka: See—  
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- Jerome Group, The: See—  
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- Jeronimidis, George: See—  
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- Jeutter, Dean C.: See—  
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- Jirkovsky, Ivo: See—  
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- John, Walter. Universal impactor for particle collection within sampling criteria. 5,437,198, Cl. 73-863.220.
- Johns Hopkins University, The: See—  
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- Johnson, Addison M. Apparatus for containing fluid leaks and overflows from appliances. 5,437,303, Cl. 137-312.000.
- Johnson, Douglas E.; Hussein, Hany M. G.; and Loeb, Marvin P., to Trimedyne, Inc. Tissue ablation and a lateral-lasing fiber optic device therefor. 5,437,660, Cl. 606-15.000.
- Johnson, Gilbert C.: See—  
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- Johnson, Graham: See—  
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- Johnson, Jerry E.: See—  
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- Johnson, John R.: See—  
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- Johnson & Johnson Inc.: See—  
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- Johnson Matthey Public Limited Company: See—  
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- Johnson, Paul D.: See—  
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- Johnson, Peter D. Binocular mounting assembly for astronomical observations. 5,437,427, Cl. 248-286.000.
- Johnson, Robert W.: See—  
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- Johnson, Stephen G.: See—  
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- Johnson, Walter A. L.: See—  
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- Johnson, William B.: See—  
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- Johnston, Craig, to Zermatt Holdings Ltd. Sports shoe for activities which involve kicking a ball. 5,437,112, Cl. 36-128.000.
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- Jones, Daniel K. Snow plow trip cutting edge. 5,437,113, Cl. 37-233.000.
- Jones, David M., to Glatt Air Techniques, Inc. Fluidized bed with spray nozzle shielding. 5,437,889, Cl. 427-185.000.
- Jones, Joseph, Jr.: See—  
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- Jones, Lawrence J.: See—  
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- Jonlet, Genevieve: See—  
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- Joubert, Francois D.: See—  
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- Jozefiak, Thomas H.: See—  
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- Jujo Kimberly K.K.: See—  
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- Juknelis, Andrew J.: See—  
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- Jurewicz, Romuald M.; and Anderson, Arthur A., to Thermo King Corporation. Method of logging data in a transport refrigeration unit. 5,437,163, Cl. 62-126.000.
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- Juskey, Frank J.: See—  
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- Kabata, Toshiyuki: See—  
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- Kabse, Kishop; and Hager, Walter J., to Warner-Lambert Company. Layered chewing gum confection. 5,437,879, Cl. 426-5.000.
- Kabushiki Kaisha Kawai Gakki Seisakusho: See—  
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- Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, 5,437,835, Cl. 420-421.000.
- Usui, Eiki; and Kawaguchi, Masahiro, 5,437,746, Cl. 148-439.000.
- Kabushiki Kaisha Sega Enterprises: See—  
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- Hisaaki, Kawano, 5,438,345, Cl. 347-218.000.
- Maruyama, Ryoji, 5,438,258, Cl. 324-142.000.
- Matsumoto, John F.; and Ando, Motoaki, 5,438,663, Cl. 395-162.000.
- Nakagawa, Akio; Yasuhara, Norio; Matsudai, Tomoko; Yamaguchi, Yoshihiro; Omura, Ichiro; and Funaki, Hideyuki, 5,438,220, Cl. 257-487.000.
- Nakamura, Nobuo; Matsunaga, Yoshiyuki; Koya, Yoshihito; and Endo, Yukio, 5,438,211, Cl. 257-239.000.
- Nakamura, Yutaka; and Koike, Noboru, 5,438,482, Cl. 361-816.000.
- Oie, Yasunori; Hirama, Mitsuru; Fujii, Yasushi; and Tanaka, Hidekazu, 5,438,591, Cl. 375-261.000.

- Okano, Yoshiaki; and Nakamura, Tetsuya, 5,438,397, Cl. 355-269.000.
- Okumura, Katsuya, 5,437,733, Cl. 134-34.000.
- Oyanagi, Shigeru, 5,438,645, Cl. 395-24.000.
- Shimozawa, Hiroshi; Fujieda, Shinetsu; Hayase, Shuzi; Nakano, Yoshihiko; Yoshizumi, Akira; and Uchida, Ken, 5,438,113, Cl. 528-25.000.
- Takada, Youichi, 5,437,276, Cl. 128-653.100.
- Yano, Hiroyuki; Okano, Haruo; Watanabe, Tohru; and Horioka, Keiji, 5,437,961, Cl. 430-316.000.
- Zenda, Hiroki, 5,438,652, Cl. 395-131.000.
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- Kabushiki Kaisha Toyota Chuo Kenkyusho: See—  
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- Kaczmarczyk, Edward T.; and Noyes, Roger A., to Deere & Company. Control system for latch that secures loader yoke member to tractor front-end weight bracket or bumper. 5,437,532, Cl. 414-686.000.
- Kadokawa, Yuichi: See—  
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- Kaesser, Jurgen: See—  
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- Kai, Nobuto: See—  
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- Kakida, Takuya; Okada, Shoitai; Nakamura, Yoshiaki; Mikami, Akira; Kimura, Akiyoshi; and Watanabe, Yuji, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Conveying system. 5,437,529, Cl. 414-225.000.
- Kakizaki, Shinobu; and Kimura, Makoto, to Atsugi Unisia Corporation. Apparatus for controlling damping coefficient for vehicular shock absorber. 5,438,514, Cl. 364-424.050.
- Kali-Chemie Pharma: See—  
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- Kalkanoglu, Husnu M., to GS Roofing Products Company, Inc. Halogen-free flame-retardant bitumen roofing composition. 5,437,923, Cl. 428-291.000.
- Kaloo, Anthony N.: See—  
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- Kalloy Industrial Co., Ltd.: See—  
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- Kalwiz, George A.: See—  
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- Kamei, Kenji: See—  
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- Kamen, Dean: See—  
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- Kamishioiri, Nobuyuki: See—  
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- Kamiyama, Satoshi, to NEC Corporation. Method of fabricating capacitor element in super-LSI. 5,438,012, Cl. 437-60.000.
- Kamiyashiki, Hiroshi: See—  
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- Kammann, Rolf, to Windmoller & Holscher. Device for winding a web. 5,437,417, Cl. 242-541.100.
- Kan, Rikiya; and Shimomura, Yasuo, to Toko, Inc. Comparator circuit. 5,438,289, Cl. 327-97.000.
- Kanai, Yasunori: See—  
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- Kanamori, Akihiko: See—  
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- Kanamori, Hiroo: See—  
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- Kanamori, Toshinori: See—  
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- Kanbayashi, Makoto; Takiguchi, Tsuyoshi; and Iida, Wakashi, to Canon Kabushiki Kaisha. Color toner and process for its production. 5,437,949, Cl. 430-45.000.
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- Kaneda, Kitahiro: See—  
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- Kaneko, Kiyotaka: See—  
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- Kaneko, Ryushiro: See—  
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- Kaneko, Takashi: See—  
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- Kanna, Les J.: See—  
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- Kano, Mitsuru: See—  
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- Kao Corporation: See—  
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- Ohmori, Toshiyuki; Hatanaka, Shigemi; Homma, Yasuhiro; Saito, Eiichi; and Kamishioiri, Nobuyuki, 5,437,361, Cl. 198-465.100.
- Kaonpaa, Arto: See—  
Yli-Vakkuri, Erkki; Kaonpaa, Arto; Salonen, Tapio; and Nikkanen, Jukka, 5,437,704, Cl. 65-107.000.
- Kapadia, Mayank; Johnson, Graham; and King, Barry M., to Motorola, Inc. Transcoder. 5,438,569, Cl. 370-79.000.
- Kaplan, David L.; Samuelson, Lynne A.; Wiley, Bonnie J.; Marx, Kenneth A.; Kumar, Jayant; Tripathy, Sukant K.; Sengupta, Sandip K.; and Cazeca, Mario J., to United States of America, Army. Photodynamic protein-based photodetector and photodetector system for image detection and processing. 5,438,192, Cl. 250-214.100.
- Kaplan, Larry. Sampling kit for compressed air/gas sources. 5,437,199, Cl. 73-863.230.
- Kaplan, Ronald M.: See—  
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- Kaplin, Ronald B.; Chen, Chao-Peng; and Bommaraju, Tilak V., to Occidental Chemical Corporation. Method of purifying chlorine-containing gases. 5,437,711, Cl. 95-182.000.
- Kappelmayer, Janos: See—  
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- Kapravy, Andrew: See—  
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- Karbach, Bernhard; Patzke, Ottokar; and Prause, Reinhard, to Krautkramer GmbH & Co., Firma. Ultrasound test apparatus for elongated test specimens having cross sections that are constant throughout their length, in particular pipes and rods. 5,437,187, Cl. 73-635.000.
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- Karp, Gary M.: See—  
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- Karp, Stefan. Improvement in roller chains. 5,437,148, Cl. 59-78.000.
- Karpati, Varda: See—  
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- Karras, Ernest; Chiodras, Peter; and Hatlak, Michael, to Tekno Industries, Inc. Service observing equipment for signalling system seven telephone network. 5,438,570, Cl. 370-94.200.
- Karsten Manufacturing Corporation: See—  
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- Kasahara, Iwao. Valgus big toe rectifying supporter. 5,437,616, Cl. 602-30.000.
- Kasei Optonix, Ltd.: See—  
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- Kashima Oil Co., Ltd.: See—  
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- Kashiwagi, Keiji, to Mazda Motor Corporation. Restrictive control system for differential. 5,437,586, Cl. 477-35.000.
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- Katayama, Hiromasa: See—  
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- Katayama, Kouichi: See—  
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- Katayama, Satoshi: See—  
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- Katayose, Mitsu: See—  
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- Kato, Yoshio: See—  
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- Kaufman, Richard H.; Kovacic, Theodore J.; Okita, Hideyoshi; Bostwick, Martin M.; Kostanek, Andrew T.; Brainard, Robert H.; and Nolan, Patrick B., to Kraft Foods, Inc. Beverage container. 5,437,389, Cl. 220-710.000.
- Kauker, Barry J.: See—  
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- Kavoulakis, Alexandra M.: See—  
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- Kawada, Norihiko: See—  
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- Kawagishi, Toshio: See—  
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- Kawaguchi, Masahiro: See—  
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- Kawahara, Tetsuya: See—  
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- Kawai, Tadashi: See—  
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- Kawakami, Akira: See—  
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- Kawakami, Hideaki; Kiyohara, Takehiko; Suzuki, Tetsuo; Asano, Junichi; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Saikawa, Satoshi; and Kinoshita, Hiroyuki, to Canon Kabushiki Kaisha. Sheet supplying apparatus. 5,437,444, Cl. 271-22.000.
- Kawamoto, Takeshi; Hrowatari, Toshio; Tahara, Eiji; and Katayama, Hiromasa, to Mitsubishi Chemical Corporation. Physical property measuring device. 5,437,192, Cl. 73-826.000.
- Kawamura, Kazuhiro: See—  
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- Kawamura, Nobuaki: See—  
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- Kawasaki, Junji: See—  
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- Kawasaki, Osamu: See—  
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- Kawasaki Steel Corporation: See—  
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- Kawasaki, Takayoshi: See—  
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- Kawase, Masao: See—  
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- Kawazu, Yukio: See—  
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- Kay-Ray/Sensall, Inc.: See—  
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- Kazama, Akira; Oshige, Takahiko; Yamada, Yoshiro; Yamada, Takeo; Yamazaki, Takeshi; Takayama, Takamitsu; and Nomura, Shuichiro, to NKK Corporation. Ellipsometer and method of controlling coating thickness therewith. 5,438,415, Cl. 356-369.000.
- Kazuhiro Yamanouchi: See—  
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- KDI/Triangle Electronics, Inc.: See—  
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- Keaton, Rickley L., to Compact Air Products, Inc. Swing apparatus. 5,437,440, Cl. 269-24.000.
- Keele, Richard V.; Mautner, Craig D.; Thorpe, Tracy J.; Thompson, Sidney R.; and Goodsell, Michael C., to Data/Ware Development, Inc. Optical disk system emulating magnetic tape units. 5,438,674, Cl. 395-404.000.
- Keene, Wayne H.: See—  
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- Keller, Ernst. Key and rotary lock cylinder for safety lock. 5,437,176, Cl. 70-358.000.
- Keller, Randy C.: See—  
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- Kelley, Donald W. Pest control system. 5,437,869, Cl. 424-406.000.
- Kelly, Stephen R.: See—  
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- Kemmochi, Kazuhisa: See—  
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- Kendo, Kosuke: See—  
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- Kenner, Michael. Protective garment-type cover for use with child users and carriages therefor. 5,437,061, Cl. 2-69.000.
- Kenney, Malcom E.; and Clark, Terri R., to Edison Polymer Innovation Corp. Germanium phthalocyanine films. 5,437,929, Cl. 428-411.100.
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- Kerby, Michael C.; Bearden, Roby, Jr.; and Davis, Stephen M., to Exxon Research and Engineering Company. Integrated fluid coking-/paraffinhydrogenation process. 5,437,782, Cl. 208-53.000.
- Kerek, Leslie: See—  
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- Kernaghan, David: See—  
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- Kerr, Charles E.: See—  
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- Kerry, Nicholas J., to XAAR Limited. Method of operating multi-channel array droplet deposition apparatus. 5,438,350, Cl. 347-12.000.
- Kersey, Alan D., to United States of America, Navy. Electronic phase-tracking open-loop fiber optic gyroscope. 5,438,411, Cl. 356-350.000.
- Kettering, Timothy J.: See—  
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- Key Tronic Corporation: See—  
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- Khan, Babar A.; Cammack, David A.; Pinker, Ronald D.; and Kramer, Jerry M., to Philips Electronics North America Corporation. Gas discharge displays and methodology for fabricating same by micromachining technology. 5,438,343, Cl. 313-493.000.

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- Khosravi, Farhad: See—  
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- Kidwell, Huw: See—  
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- Kieselburg, Mark K.: See—  
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- Kim, Cheon-seob, to Samsung Electronics Co., Ltd. Frequency drop out detector circuit and method thereof. 5,438,425, Cl. 358-336.000.
- Kim, Do Wook, to Dae Young Packing Co., Ltd. Detergent packing paper box. 5,437,407, Cl. 229-225.000.
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- Kim, Ho C. Multi-purpose key ring. 5,438,555, Cl. 368-10.000.
- Kim, Hyung S.: See—  
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- Kim, Tae-Sig; and Yu, Jang-Hyun, to Samsung Electronics Co., Ltd. Ultrasonic sensor scanning apparatus and method for detecting objects by use of the scanning apparatus. 5,438,247, Cl. 318-696.000.
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- Kim, Yun-gi; and Lee, Jeung-gil, to Samsung Electronics Co., Ltd. Method of making a semiconductor memory device having a capacitor. 5,438,013, Cl. 437-60.000.
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- Gilman, Thomas H.; and Mitchler, Patricia A., 5,437,653, Cl. 604-378.000.
- Kimm, Rith N.: See—  
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- Kimura, Akiyoshi: See—  
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- Kimura, Makoto: See—  
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- Kimura, Okitoshi: See—  
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- King, Barry M.: See—  
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- King, Franklin H. Cross bow. 5,437,260, Cl. 124-25.000.
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- Kinoshita, Hiroyuki: See—  
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- Kinzel, Elke: See—  
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- Shinozaki, Tetsunori; and Kioka, Mamoru, 5,438,100, Cl. 525-240.000.
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- Kirby, Gerald. Horse racing games with board, pieces, cards and dice. 5,437,459, Cl. 273-246.000.
- Kirnbauer, Reinhard: See—  
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- Kishi, Akihito: See—  
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- Kishi, Hajime; Tokunoh, Masazumi; and Odagiri, Nobuyuki, to Toray Industries, Inc. Maleimide composition, prepreg and fiber-reinforced plastic. 5,438,104, Cl. 525-426.000.
- Kishi, Shuji, to NEC Corporation. Apparatus for forming a metal wiring pattern of semiconductor devices. 5,437,777, Cl. 204-224.00R.
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- Kitano, Yoko: See—  
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- Kleinschroth, Jürgen; Hartenstein, Johannes; Barth, Hubert; Schachte, Christoph; Rudolph, Claus; Weinheimer, Günter; and Oswald, Hartmut, to Godecke Aktiengesellschaft. Indolocarbazole derivatives, processes for their preparation and compositions containing them. 5,438,050, Cl. 514-183.000.
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- Klockner-Humboldt-Deutz AG: See—  
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- Kloosterboer, Johan G.; and Touwslager, Fredericus J., to U.S. Philips corporation. Method of preparing a composite material of silica network and chains of a polyhydroxy compound and a liquid crystal display device incorporating such composite material. 5,437,896, Cl. 428-1.000.
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- Knudsen, Craig A.: See—  
Olivera, Alison J.; Olivera, Hector J.; and Knudsen, Craig A., 5,437,477, Cl. 283-81.000.
- Kobata, Takeji; and Ikenaga, Yoshihiro, to Social Welfare Foundation Hokkaido Rehabili. The Activated carbon and production thereof. 5,438,029, Cl. 502-430.000.
- Kobayashi, Kazumi: See—  
Goldin, Stanley; Fisher, James; Kobayashi, Kazumi; Reddy, Laxma; Knapp, Andy; Margolin, Lee; and McCormick, Kevin D., 5,438,130, Cl. 536-27.810.
- Kobayashi, Masahiko; Akashi, Masakatsu; Hirobe, Junichi; Sugaya, Tsutomu; Tanaka, Yoshihisa; Kusuda, Toshiaki; Makie, Ikuo; Aikawa, Yukihiko; Ishii, Satoshi; and Ohata, Yosuke, to Mita Industrial Co., Ltd. Image forming apparatus having monocoque housing structure including unitary toner collecting vessel. 5,438,390, Cl. 355-200.000.
- Kobayashi, Masaki; Katsoka, Rieko; and Naitoh, Masahiro, to International Business Machines Corporation. Monitor interface architecture for black level transfer. 5,438,341, Cl. 345-20.000.
- Kobayashi, Noboru, to Yamada Hatsudoki Kabushiki Kaisha. Water jet propulsion unit. 5,437,568, Cl. 440-38.000.
- Kobayashi, Shigetada: See—  
Takaoka, Makoto; and Kobayashi, Shigetada, 5,438,648, Cl. 395-106.000.
- Kobayashi, Shohei; Miyazaki, Yasuhiro; and Fujiwara, Yasuhiro, to Olympus Optical Co., Ltd. Optical head for recording and/or reproducing information on and/or from opto-magnetic record medium. 5,438,562, Cl. 369-110.000.
- Kobayashi, Takashi: See—  
Asaka, Kazuo; Harada, Katsumi; Kobayashi, Takashi; and Tani, Yoshio, 5,437,913, Cl. 428-195.000.
- Koch, Dieter; Menne, Gerd; Krafft, Alfred; Weiss, Gerhard; and Spudich, Rainer, to Bruker-Franzen Analytik GmbH. Sampling device comprising a revolvable sampling wheel with a metal wheel rim. 5,437,203, Cl. 73-864.710.
- Koch, Mark B.: See—  
Johnson, Russell W.; DeFeo, Brent S.; Lupton, Francis S.; and Koch, Mark B., 5,437,853, Cl. 423-352.000.
- Kockerling, Ferdinand: See—  
Neumann, Martin; and Kockerling, Ferdinand, 5,437,683, Cl. 606-151.000.
- Kodali, Satyanarayana: See—  
Stevenson, Donald R.; and Kodali, Satyanarayana, 5,438,086, Cl. 524-120.000.
- Kodama, Akira; Watabe, Yoshimi; and Ueda, Masashi, to Anelva Corporation. Plasma CVD process for forming amorphous silicon thin film. 5,437,895, Cl. 427-578.000.
- Koden, Mitsuhiro; Kaneko, Takashi; Takeda, Hitoshi; Itoh, Keizou; and Takeda, Mitsuhiro, to Sharp Kabushiki Kaisha; and Kashima Oil Co., Ltd. Ferroelectric liquid crystal mixture and liquid crystal device using the same. 5,437,814, Cl. 252-299.610.
- Koenig, Hartmann: See—  
Eicken, Karl; Koenig, Hartmann; Ammermann, Eberhard; and Lorenz, Gisela, 5,438,070, Cl. 514-403.000.
- Koga, Toshikuni: See—  
Komiya, Katsuo; Koga, Toshikuni; and Kato, Yoshio, 5,438,077, Cl. 521-37.000.
- Koga, Yoshiro; and Kunugi, Masanao, to Seiko Epson Corporation. Development process. 5,438,395, Cl. 355-253.000.
- Koger, James D.; Kapravy, Andrew; Heath, Kevin R.; and Crowley, Robert J., to Boston Scientific Corporation. Drive shaft for acoustic imaging catheters and flexible catheters. 5,437,282, Cl. 128-662.060.
- Kogo, Yasuo; Ito, Takefumi; Okumura, Mitsuhiro; Yoshizaki, Kiyoshi; Fujihara, Takeji; and Yamashita, Hirofumi, to Mitsubishi Denki Kabushiki Kaisha. Electronic components mounting base material. 5,437,921, Cl. 428-288.000.
- Koguchi, Toshinari; Yamazaki, Toshiyuki; and Matsumura, Mitsunori, to Sony Corporation. Recording and/or reproducing apparatus tape having traveling reversal arrangement which attenuates tape slippage and slack generation. 5,438,466, Cl. 360-96.400.
- Kohara, Teiji: See—  
Takahashi, Nobukazu; Kohara, Teiji; and Natsume, Tadao, 5,437,926, Cl. 428-337.000.
- Kohno, Teruhisa; and Segawa, Taro, to Sumitomo Electric Industries, Ltd. Antilock modulator. 5,437,501, Cl. 303-116.200.
- Koide, Akira, to Nihon Kesho Kogaku Co., Ltd. Lithium niobate crystal wafer, process for the preparation of the same, and method for the evaluation thereof. 5,437,761, Cl. 216-85.000.
- Koide, Kazuo: See—  
Takahashi, Toshiro; and Koide, Kazuo, 5,438,281, Cl. 326-86.000.
- Koike, Noboru: See—  
Nakamura, Yutaka; and Koike, Noboru, 5,438,482, Cl. 361-816.000.
- Koike, Tsuyoshi: See—  
Matsuda, Eiji; Matsuda, Toshinori; and Koike, Tsuyoshi, 5,438,155, Cl. 84-653.000.
- Koito Manufacturing Co., Ltd.: See—  
Yamashita, Masayasu, 5,438,480, Cl. 361-760.000.
- Kojima, Akiyoshi: See—  
Naniyo, Atsushi; and Kojima, Akiyoshi, 5,438,262, Cl. 324-238.000.
- Kojima, Hiroshi: See—  
Takano, Kazuya; Kojima, Hiroshi; and Ushijima, Takao, 5,437,437, Cl. 267-140.140.
- Takano, Kazuya; Kojima, Hiroshi; and Ushijima, Takao, 5,437,438, Cl. 267-140.140.
- Kojima, Susumu, to NEC Corporation. Mobile radio communication system having base stations and radio terminals each having tenant identification data storage for storing tenant ID data. 5,438,608, Cl. 379-58.000.
- Kojima, Takayuki: See—  
Ota, Michihiro; and Kojima, Takayuki, 5,437,357, Cl. 194-206.000.
- Kojima, Yasuo: See—  
Hirai, Katsura; Kojima, Yasuo; and Goto, Kiyoshi, 5,437,952, Cl. 430-83.000.
- Kojiri, Katsuhisa; Suzuki, Hajime; Kondo, Hisao; and Suda, Hiroyuki, to Banyu Pharmaceutical Co., Ltd. Microtetraspora strain for preparation of indolopyrrolo-carbazole derivatives. 5,437,996, Cl. 435-252.100.
- Kolb, Hartmut: See—  
Wolletz, Wolfgang; Schroter, Hans; Schust, Klaus; and Kolb, Hartmut, 5,437,256, Cl. 123-519.000.
- Koljonen, Marja: See—  
Bodie, Elizabeth A.; Cuevas, William A.; and Koljonen, Marja, 5,437,992, Cl. 435-200.000.
- Kolpak, Miroslav M., to Atlantic Richfield Company. Multiphase fluid flow splitting and measurement. 5,437,299, Cl. 137-1.000.
- Komatsu, Katsuaki; Yamamoto, Kazunori; and Nishi, Shinichi, to Konica Corporation. Powder fluidity detecting apparatus which includes a piezoelectric element. 5,438,393, Cl. 355-246.000.
- Komiya, Katsuo; Koga, Toshikuni; and Kato, Yoshio, to Toson Corporation. Ion exchange resins containing glycidyl ether spacer groups. 5,438,077, Cl. 521-37.000.
- Komoda, Michio, to Mitsubishi Denki Kabushiki Kaisha. Logic synthesizer. 5,438,524, Cl. 364-489.000.
- Komori, Akito: See—  
Yamauchi, Yasuhiro; and Komori, Akito, 5,437,265, Cl. 126-657.000.
- Kon, Miki: See—  
Haraga, Hideaki; Yagi, Toshihiko; Kon, Miki; Shimazaki, Hiroshi; Urakawa, Yoshihide; Yamada, Yoshitaka; Ezaki, Atsuo; and Matsuzaka, Syoji, 5,437,966, Cl. 430-505.000.
- Kondo, Hiroshi: See—  
Ishii, Satoshi; Nishimura, Tetsuharu; Ishizuka, Koh; and Kondo, Hiroshi, 5,438,586, Cl. 372-50.000.
- Kondo, Hisao: See—  
Kojiri, Katsuhisa; Suzuki, Hajime; Kondo, Hisao; and Suda, Hiroyuki, 5,437,996, Cl. 435-252.100.
- Kondo, Koichi: See—  
Ichimori, Yuzo; Kondo, Koichi; Igarashi, Koichi; and Sando, Masaharu, 5,437,995, Cl. 435-240.270.
- Kondo, Mitsuhiro; Fujikawa, Osamu; and Sagisaka, Katsumi, to Iiden Co., Ltd. Electronic component carriers and method of producing the same as well as electronic devices. 5,438,478, Cl. 361-704.000.
- Kondou, Takashi; Yamaya, Masaaki; Yoshioka, Hiroshi; Ohtsuka, Yasuhiro; Tojima, Kazuo; Shibata, Yasufumi; Ohkuwa, Naomi; and Okayama, Shinobu, to Shin-Etsu Chemical Company, Limited; and

- Toyota Jidosha Kabushiki Kaisha. Liquid crystalline organopolysiloxanes and liquid crystal compositions. 5,437,817, Cl. 252-299.670.
- Kong, Oin. Electronic ballast for instant start gas discharge lamps. 5,438,243, Cl. 315-219.000.
- Konica Corporation: See—  
Haraga, Hideaki; Yagi, Toshihiko; Kon, Miki; Shimazaki, Hiroshi; Urakawa, Yoshihide; Yamada, Yoshitaka; Ezaki, Atsuo; and Matsuzaka, Syoji, 5,437,966, Cl. 430-505.000.
- Hirai, Katsura; Kojima, Yasuo; and Goto, Kiyoshi, 5,437,952, Cl. 430-83.000.
- Komatsu, Katsuaki; Yamamoto, Kazunori; and Nishi, Shinichi, 5,438,393, Cl. 355-246.000.
- Mizoguchi, Yoshimi; Ishii, Hiroshi; Kimura, Kiyoshi; Fukuchi, Masakazu; Takeda, Makoto; Maruyama, Hiroyuki; Yamaguchi, Yasuhiko; Taki, Kenji; Akamatsu, Masashi; and Kurohata, Takao, 5,438,437, Cl. 358-518.000.
- Konishi, Chizuko: See—  
Hayami, Katsuaki; Fujii, Hideo; Wada, Yoshihiro; Omori, Yoshiharu; Kubo, Kuniyasu; Konishi, Chizuko; and Takada, Yoshit-sugu, 5,438,183, Cl. 219-748.000.
- Konno, Mark A.: See—  
Lieber, Clement E.; Taimisto, Miriam H.; and Konno, Mark A., 5,437,637, Cl. 604-96.000.
- Konrad Doppelmayer & Sohn Maschinenfabrik Gesellschaft m.b.H. & Co. KG: See—  
Duer, Herbert, 5,437,234, Cl. 105-149.100.
- Konstantin, Benny: See—  
Baror, Gigi; Beck, Moti; Biran, Dan; Cohen, Elliot; Hadas, Yair; Konstantin, Benny; Levy, Jonathan; Marko, Reuven; Ostrer, Aharon; Saban, Rami; Shackam, Alon; and Shahar, Boaz, 5,438,670, Cl. 395-403.000.
- Konstantin, Moshe, to Clear Plastics International, Inc. Fire resistant skylight structure. 5,437,129, Cl. 52-200.000.
- Kopin Corporation: See—  
Zavracky, Paul M.; Fan, John C. C.; McClelland, Robert; Jacobsen, Jeffrey; Dingle, Brenda; and Spitzer, Mark B., 5,438,241, Cl. 315-169.300.
- Kordal, Richard J.: See—  
Diebold, Eric R.; Kordal, Richard J.; Surridge, Nigel A.; and Wilsey, Christopher D., 5,437,999, Cl. 435-288.000.
- Korenaga, Takaharu; and Momoyama, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Igniting apparatus for an internal combustion engine. 5,437,254, Cl. 123-416.000.
- Kosswig, Kurt: See—  
Luders, Harald; Kosswig, Kurt; and Steinhardt, Hauke, 5,437,801, Cl. 252-8.800.
- Kostanecki, Andrew T.: See—  
Kaufman, Richard H.; Kovacic, Theodore J.; Okita, Hideyoshi; Bostwick, Martin M.; Kostanecki, Andrew T.; Brainard, Robert H.; and Nolan, Patrick B., 5,437,389, Cl. 220-710.000.
- Kosuge, Shouji, to Sony Corporation. Image signal conversion system. 5,438,358, Cl. 348-96.000.
- Kottwitz, Dietmar: See—  
Beuerle, Ralph; and Kottwitz, Dietmar, 5,438,246, Cl. 318-638.000.
- Kotzan, Mark E.; and Knecht, Thomas A., to Motorola, Inc. Doubled-sided oscillator package and method of coupling components thereto. 5,438,219, Cl. 257-469.000.
- Koudijs, Reijer; Mulder, Marcel M.; Purser, Kenneth H.; and Saris, Frans W., to High Voltage Engineering Europa B.V. Ultra-sensitive molecular identifier. 5,438,194, Cl. 250-288.000.
- Koue, Toshiaki; and Matsui, Tsunehiro, to Fuji Xerox Co., Ltd. Data transmitting apparatus. 5,438,432, Cl. 358-467.000.
- Kouga, Takahiko: See—  
Kurashiki, Ryuro; Kouga, Takahiko; Shirata, Masataka; Sakakibara, Masayoshi; and Kamiyashiki, Hiroshi, 5,437,802, Cl. 252-18.000.
- Kousaka, Mitsuko: See—  
Kousaka, Sachiko; Kousaka, Mitsuko; and Isaka, Kumiko, 5,437,111, Cl. 36-81.000.
- Kousaka, Sachiko; Kousaka, Mitsuko; and Isaka, Kumiko, to Yuugen Kaisha Frontier. Elevating shoe provided with a deceptive inner member. 5,437,111, Cl. 36-81.000.
- Kovacic, Theodore J.: See—  
Kaufman, Richard H.; Kovacic, Theodore J.; Okita, Hideyoshi; Bostwick, Martin M.; Kostanecki, Andrew T.; Brainard, Robert H.; and Nolan, Patrick B., 5,437,389, Cl. 220-710.000.
- Kovacs, Eric: See—  
Worcel, Alexandre; and Kovacs, Eric, 5,437,674, Cl. 606-73.000.
- Kovacs, James E.: See—  
Sweet, Robert P.; Rosa, Mark R.; Vigdorovich, Alexander; Kovacs, James E.; and Geraghty, Patrick J., 5,437,537, Cl. 414-400.000.
- Kowalewski, Paul D.: See—  
Fado, Francis; Wong, Tin-Lup; Verrier, Guy F.; Donaldson, Robert L.; and Kowalewski, Paul D., 5,438,275, Cl. 324-662.000.
- Koya, Yoshihito: See—  
Nakamura, Nobuo; Matsunaga, Yoshiyuki; Koya, Yoshihito; and Endo, Yukio, 5,438,211, Cl. 257-239.000.
- Koyama, Masaharu: See—  
Tanaka, Toshinori; Nishiyama, Satoru; and Koyama, Masaharu, 5,437,897, Cl. 428-29.000.
- Koyo Seiko Co., Ltd.: See—  
Takahata, Ryoichi; and Eguchi, Shoji, 5,438,038, Cl. 310-90.500.
- Kozlovski, A. David: See—  
Fowler, Wayne D.; Guimond, Ronald E.; Andrikowich, Thomas G.; Kozlovski, A. David; Foster, Neil E.; and DesRoche, Scott A., 5,438,697, Cl. 455-347.000.
- Kozulic, Branko; and Heimgartner, Urs, to Elchrom, Ltd. Hydrophilic and amphiphatic monomers, their polymers and gels and hydrophobic electrophoresis. 5,438,092, Cl. 524-555.000.
- Krafft, Alfred: See—  
Koch, Dieter; Menne, Gerd; Krafft, Alfred; Weiss, Gerhard; and Spudich, Rainer, 5,437,203, Cl. 73-864.710.
- Kraft Foods, Inc.: See—  
Kaufman, Richard H.; Kovacic, Theodore J.; Okita, Hideyoshi; Bostwick, Martin M.; Kostanecki, Andrew T.; Brainard, Robert H.; and Nolan, Patrick B., 5,437,389, Cl. 220-710.000.
- Kramer, Alan: See—  
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- Kramer, David E.: See—  
Larkin, Mark E.; Kramer, David E.; and Frederick, Warren P., 5,437,650, Cl. 604-283.000.
- Kramer, Harold: See—  
Zeytoonjian, Douglas; Zeytoonjian, Frederick, Sr.; Kramer, Harold; and Allen, Paul, 5,438,319, Cl. 340-571.000.
- Kramer, Herbert J.: See—  
Peil, Fred G.; and Kramer, Herbert J., 5,437,907, Cl. 428-143.000.
- Kramer, Jerry M.: See—  
Khan, Babar A.; Cammack, David A.; Pinker, Ronald D.; and Kramer, Jerry M., 5,438,343, Cl. 313-493.000.
- Krautkramer GmbH & Co., Firma: See—  
Karbach, Bernhard; Patzke, Ottokar; and Prause, Reinhard, 5,437,187, Cl. 73-635.000.
- Krebs, Walter: See—  
Plaschy, Martin; and Krebs, Walter, 5,437,182, Cl. 73-160.000.
- Kremer, Robert: See—  
Frantom, Richard; Bishop, Robert J.; Kremer, Robert; Ocker, Klaus F.; McGarry, Stephen P.; and Rogers, Will E., 5,437,188, Cl. 73-709.000.
- Kremer, Rudolf: See—  
Schuermann, Josef H.; Heinecke, Guenter; and Kremer, Rudolf, 5,438,335, Cl. 342-51.000.
- Kress Corporation: See—  
Kress, Edward S., 5,437,531, Cl. 414-555.000.
- Kress, Edward S., to Kress Corporation. Vehicle for reaching, lifting, retracting, stacking and carrying loads. 5,437,531, Cl. 414-555.000.
- Kroehl, Paul; and Lindner, Heiko, to Sulzer-Escher Wyss GmbH. Method for calcining moist gypsum. 5,437,850, Cl. 423-171.000.
- Kronenberg, H. Jeff: See—  
Jensen, Richard B.; and Kronenberg, H. Jeff, 5,437,842, Cl. 422-106.000.
- Krueger, Dennis C., to Shell Oil Company. Negative pressure gas sampling device. 5,437,201, Cl. 73-864.350.
- Krumme, John F. Over-current/over-temperature protection device. 5,438,309, Cl. 337-140.000.
- Krupp Polysius AG: See—  
Kupper, Detlev; and Rother, Wolfgang, 5,437,721, Cl. 106-739.000.
- Kuan, Yu-hung. Ozonizer. 5,437,843, Cl. 422-186.070.
- Kubo, Kuniyasu: See—  
Hayami, Katsuaki; Fujii, Hideo; Wada, Yoshihiro; Omori, Yoshiharu; Kubo, Kuniyasu; Konishi, Chizuko; and Takada, Yoshit-sugu, 5,438,183, Cl. 219-748.000.
- Kubota Corporation: See—  
Ishida, Hiroshi; Izumi, Kiyoshi; and Matsumura, Shuzo, 5,437,787, Cl. 210-189.000.
- Takagi, Masao; Machida, Satoshi; and Hattori, Akio, 5,437,355, Cl. 192-18.00A.
- Kuchta, Douglas A., to International Business Machines Corporation. Apparatus for redundant cooling of electronic devices. 5,438,226, Cl. 307-125.000.
- Kuga, Kaeko, to Rohm Co., Ltd. Light source for flat-panel display. 5,438,453, Cl. 359-636.000.
- Kuila, Debasish: See—  
Fritsch, John R.; Fruchey, Olan S.; Kuila, Debasish; Kvakovsky, George; Murphy, Mark A.; Sheehan, Michael T.; Sounik, James R.; and Vicari, Richard, 5,438,142, Cl. 546-240.000.
- Kuipers, Gerardus H. M., to AMKO International B.V. Apparatus for receiving and passing through laundry. 5,437,114, Cl. 38-143.000.
- Kuka Schweissanlagen & Roboter GmbH: See—  
Zimmer, Ernst, 5,437,207, Cl. 74-490.020.
- Kulisz, Andre A.; and Migachyov, Valery, to HK Medical Technologies, Incorporated. Nonsurgical intraurethral bladder control device. 5,437,604, Cl. 600-30.000.
- Kumagai, Yojiro: See—  
Fujita, Shigeo; Matsumoto, Mansuke; Kumagai, Yojiro; Wada, Sayuri; and Hashimoto, Shuichi, 5,438,032, Cl. 503-221.000.
- Kumagai, Ryohei, to Ezel Inc. Dither processing method. 5,438,634, Cl. 382-169.000.
- Kumagai, Ryohei, to Yozan Inc. Data processing system for rewriting parallel processor output data using a sequential processor. 5,438,682, Cl. 395-800.000.
- Kumar, Jayant: See—  
Kaplan, David L.; Samuelson, Lynne A.; Wiley, Bonnie J.; Marx, Kenneth A.; Kumar, Jayant; Tripathy, Sukant K.; Sengupta, Sandip K.; and Cazeza, Mario J., 5,438,192, Cl. 250-214.100.
- Kumm, Lance: See—  
Cohen, Donald; Kumm, Lance; Aoki, John; Kimm, Rith N.; and Bassett, Shea, 5,437,626, Cl. 604-8.000.



- Kunii, Yoshimasa; to Fuji Xerox Co., Ltd. Optical deflector. 5,438,447, Cl. 359-200.000.
- Kunimoto, Toshifumi: See—  
Masuda, Hideyuki; and Kunimoto, Toshifumi, 5,438,156, Cl. 84-439.000.
- Kunugi, Masanao: See—  
Koga, Yoshiro; and Kunugi, Masanao, 5,438,395, Cl. 355-253.000.
- Kuo, James R., to National Semiconductor Corporation. CMOS BTL compatible bus and transmission line driver. 5,438,282, Cl. 326-86.000.
- Kuo, Shun-Meen: See—  
Hartman, Davis H.; Lebby, Michael S.; Kuo, Shun-Meen; and Chun, Christopher K. Y., 5,437,092, Cl. 29-600.000.
- Kupper, Detlev; and Rother, Wolfgang, to Krupp Polysius AG. Method of producing cement clinker. 5,437,721, Cl. 106-739.000.
- Kurahashi, Hidenori; Iwasaki, Horiaki; Hayakawa, Hideki; Nagai, Yuzo; and Hirai, Seichi, to Honda Giken Kogyo Kabushiki Kaisha. Electrically operated power steering apparatus. 5,437,349, Cl. 180-79.100.
- Kurahashi, Ryuro; Kouga, Takahiko; Shirata, Masataka; Sakakibara, Masayoshi; and Kamiyashiki, Hiroshi, to Nippon Steel Corporation; and Kyodo Yushi Co., Ltd. Lubricating composition for hot-rolling steel. 5,437,802, Cl. 252-18.000.
- Kuramitsu, Masayuki: See—  
Ikegawa, Akihiko; Kuramitsu, Masayuki; and Okazaki, Masaki, 5,437,972, Cl. 430-574.000.
- Kuramoto, Kikuro; and Suzuki, Yoshiyuki, to Nisso Sangyo Co., Ltd. Connecting pin. 5,437,515, Cl. 403-154.000.
- Kurematsu, Katsumi, to Canon Kabushiki Kaisha. Image projection apparatus. 5,438,379, Cl. 353-98.000.
- Kuretake, Masato; Zushi, Takayasu; Kitagawa, Motonobu; Yamakawa, Kazuhiko; Okamoto, Yoshimi; and Uda, Sawayo, to Takata Corporation. Inflator and air bag device for driver. 5,437,472, Cl. 280-737.000.
- Kuriyashi, Ikuo; and Saito, Rie, to Canon Kabushiki Kaisha. Image forming apparatus having cleaning blade with surface coated layer at a tip end thereof. 5,438,400, Cl. 355-299.000.
- Kurihashi, Katsuaki. Apparatus for intubation of lacrimal drainage pathway. 5,437,625, Cl. 604-8.000.
- Kuriyama, Mitsuo: See—  
Siga, Masao; Kuriyama, Mitsuo; Mori, Takanobu; Fukui, Yutaka; and Ishizuka, Tatsuro, 5,437,742, Cl. 148-335.000.
- Kuroda, Akinori: See—  
Sato, Masashi; Kuroda, Akinori; and Asai, Masashi, 5,438,520, Cl. 364-470.000.
- Kurohata, Takao: See—  
Mizoguchi, Yoshimi; Ishii, Hiroshi; Kimura, Kiyoshi; Fukuchi, Masakazu; Takeda, Makoto; Maruyama, Hiroyuki; Yamaguchi, Yasuhiko; Taki, Kenji; Akamatsu, Masashi; and Kurohata, Takao, 5,438,437, Cl. 358-518.000.
- Kusaka, Takuya: See—  
Kawata, Yutaka; Kusaka, Takuya; Hashizume, Hidehisa; and Ojima, Futoshi, 5,438,276, Cl. 324-765.000.
- Kusuda, Toshiaki: See—  
Kobayashi, Masahiko; Akashi, Masakatsu; Hirobe, Junichi; Sugaya, Tsutomu; Tanaka, Yoshihisa; Kusuda, Toshiaki; Makie, Ikuo; Aikawa, Yukihiro; Ishii, Satoshi; and Ohata, Yosuke, 5,438,390, Cl. 355-200.000.
- Kusunoki, Tadakazu: See—  
Suzuki, Shoji; Kusunoki, Tadakazu; and Mori, Masahiro, 5,438,651, Cl. 395-131.000.
- Kuwabara, Kiyoshi: See—  
Sakurao, Masahiko; Hara, Kouichi; Kuwabara, Kiyoshi; and Umematsu, Misao, 5,437,558, Cl. 439-140.000.
- Kuzowski, Stanislaw L., to W. L. Gore & Associates, Inc. Surface modified porous expanded polytetrafluoroethylene and process for making. 5,437,900, Cl. 428-36.100.
- Kvaerner Pulping Technologies AB: See—  
Nilsson, Mikael; and Wilke, Bo, 5,437,170, Cl. 68-181.00R.
- Kvakovszky, George: See—  
Fritsch, John R.; Fruchey, Olan S.; Kuila, Debasiah; Kvakovszky, George; Murphy, Mark A.; Sheehan, Michael T.; Soulik, James R.; and Vicari, Richard, 5,438,142, Cl. 546-240.000.
- Kvamme, Candis: See—  
Schmidt, Mary K.; and Kvamme, Candis, 5,438,042, Cl. 514-21.000.
- Kweon, Sun-don, to Samsung Electronics Co., Ltd. Circuit for measuring pulse width of remote control signal. 5,438,328, Cl. 340-825.630.
- Kwilecki, Dale: See—  
Gooch, Loro W., 5,437,269, Cl. 128-202.280.
- Kyocera Corporation: See—  
Okimatsu, Hideaki; and Tamura, Yasunori, 5,437,834, Cl. 419-24.000.
- Kyodo Yushi Co., Ltd.: See—  
Kurahashi, Ryuro; Kouga, Takahiko; Shirata, Masataka; Sakakibara, Masayoshi; and Kamiyashiki, Hiroshi, 5,437,802, Cl. 252-18.000.
- Kyowa Chemical Industry Co., Ltd.: See—  
Imahashi, Takeshi, 5,438,084, Cl. 523-440.000.
- Kyrtos, Christos T.: See—  
Sennott, James W.; Kyrtos, Christos T.; Gudat, Adam J.; Christensen, Dana A.; Friedrich, Douglas W.; and Stafford, Darrell E., 5,438,517, Cl. 364-449.000.
- L.A. Gear, Inc.: See—  
Goldston, Mark R.; Bemis, Jon; and Crawford, Alan, 5,437,110, Cl. 36-38.000.
- LaBell, Marc; LeBlanc, Yves; Belley, Michel; Grimm, Erich L.; Guay, Daniel; and Xiang, Yi B., to Merck Frost Canada, Inc. Heteroaryl

- and haloaryl quinoline derivatives of cyclopropanecetic acid as leukotriene antagonists. 5,438,141, Cl. 546-176.000.
- Laboratoire Hydrex (SA): See—  
Carion, Jean-Pierre, 5,437,622, Cl. 602-57.000.
- Laboratoires UPSA: See—  
Bru, Nicole; Cordoliani, Jean-Francois S.; Poly, Pierre-Andre; and Drouin, Jehan-Yves P., 5,437,874, Cl. 424-466.000.
- Lace, deceased; Donald A., Sr.; and Lace, Jeffrey J., to Actodyne General, Inc. Acoustic pick-up assembly for a stringed musical instrument. 5,438,157, Cl. 84-726.000.
- Lace, Jeffrey J.: See—  
Lace, deceased; Donald A., Sr.; and Lace, Jeffrey J., 5,438,157, Cl. 84-726.000.
- Ladewski, Theodore B.: See—  
Busch, Garland F.; Downward, James G.; Gottschalk, Paul G.; Ladewski, Theodore B.; and Lysogorski, Charles D., 5,438,417, Cl. 356-394.000.
- Lai, Benny W. H.: See—  
Hornak, Thomas; Petruno, Patrick; Walker, Richard C.; Lai, Benny W. H.; Yen, Chu-Sun; Stout, Cheryl L.; and Wu, Jieh-Tsorn, 5,438,621, Cl. 380-43.000.
- L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—  
Mallard de la Varenne, Jean; and Crisinel, Pascal, 5,438,002, Cl. 436-55.000.
- L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—  
Chretien, Denis, 5,437,161, Cl. 62-37.000.
- Darredeau, Bernard; Lehman, Jean-Yves; and Peyron, Jean-Marc, 5,437,160, Cl. 62-24.000.
- Lal, Kasturi: See—  
Bryant, Charles P.; Lal, Kasturi; and Piolet, Joseph W., 5,437,806, Cl. 252-77.000.
- Lallement, Jean-Jacques: See—  
Bouraly, Jean-Pierre; Aebi, Jurg; Beaufils, Philippe; de Lestang, Michel; Gaffuri, Jean-Gilles; Hourlier, Herve; Lallement, Jean-Jacques; Legroux, Philippe; Levai, Jean-Paul; Pondaven, Gerald; Schuster, Pierre; and Vergnat, Christian, 5,437,676, Cl. 606-88.000.
- Lam, Wayne W.: See—  
Lee, Paul S. C.; Chow, Pei-Ming D.; Berenz, John J.; Pearlman, Jay S.; and Lam, Wayne W., 5,438,336, Cl. 342-174.000.
- Lambda Electronics, Inc.: See—  
Cohen, Isaac, 5,438,505, Cl. 363-95.000.
- Lambert, Duane L.: See—  
Orcutt, Eric D.; Easterday, George, Jr.; Lambert, Duane L.; and Meredith, Marlin D., 5,437,177, Cl. 72-402.000.
- LaMi Products, Inc.: See—  
Dion, Larry, 5,438,488, Cl. 362-103.000.
- Lamy, Patrick; and Mazzucchi, Arnaldo, to Plasti-Max SpA. Anti-theft device for eyeglasses. 5,437,172, Cl. 70-57.100.
- Land and Seas Business Corp., Inc.: See—  
Allen, James K., 5,437,137, Cl. 52-712.000.
- Landers, Jerry L.; Pfeiffer, Thomas J.; and Brandon, Harvey R., to Servend International, Inc. Ice dispenser controlling rocking chute. 5,437,391, Cl. 222-1.000.
- Landfors, Johan: See—  
Goransson, Gunnar; Sundblad, Birgitta; Landfors, Johan; and Bultsen, Hans A., 5,437,791, Cl. 210-712.000.
- Landhuis, Jan J., to ALMI Machinefabriek BV. Apparatus for making cutouts in the ends of tubular workpieces. 5,437,570, Cl. 451-296.000.
- Landstrom, D. Karl: See—  
George, Paul E., II; Landstrom, D. Karl; and Raghavan, Jemba K., 5,437,262, Cl. 126-39.00H.
- Lane, Donald W., Sr. Anti-carjacking device triggered by a switch in the seat belt latch. 5,438,311, Cl. 340-426.000.
- Lang, Robert A., to Lin Pac Inc. Method of applying a finishing layer in a corrugating line. 5,437,752, Cl. 156-210.000.
- Lang, William: See—  
Brooks, Fred; Daves, Thomas W.; and Lang, William, 5,437,329, Cl. 166-250.000.
- Langballe, Logan: See—  
Blicher, Steen; and Langballe, Logan, 5,437,393, Cl. 222-77.000.
- Langley, Robert W., to Cobe Laboratories, Inc. Single needle recirculation system for harvesting blood components. 5,437,624, Cl. 604-4.000.
- Lanigan, Richard: See—  
Bryant, Robert J.; Finkelstein, Jeffrey; Kamen, Dean; Lanigan, Richard; Miller, Bradley D.; and Spencer, Geoffrey P., 5,438,510, Cl. 364-413.110.
- Lanxide Technology Company, LP: See—  
Claar, Terry D.; Schiroky, Gerhard H.; and Johnson, William B., 5,437,833, Cl. 419-2.000.
- Jensen, James A., 5,437,825, Cl. 264-56.000.
- Laplot, Moshe; Liran, Samuel; and Stelkel, Amit, to Optomic Technologies Corporation, LTD. Device and method for testing optical elements. 5,438,405, Cl. 356-239.000.
- Lapin, Stephen C.; Snyder, James R.; Sitzmann, Eugene V.; Barnes, Darryl K.; and Green, George D., to Allied-Signal Inc. Stereolithography using vinyl ether-epoxide polymers. 5,437,964, Cl. 430-280.000.
- Larkin, Mark E.; Kramer, David E.; and Frederick, Warren P., to Abbott Laboratories. Securing collar for cannula connector. 5,437,650, Cl. 604-283.000.
- LaRoche, Hans L.; Weber, Markus; and Zehnder, Beat, to Sulzer Chemtech AG. Purification of salt-charges waste water by wet oxidation under super-critical conditions. 5,437,798, Cl. 210-761.000.

- Larsen, Tommy, to Tommy Larsen ApS. Holder for flat articles, such as CD cassettes, CD-ROM cassettes, program diskettes and the like. 5,437,376, Cl. 211-40.000.
- Lataix, Gilbert, to Merck & Co., Inc. Child resistant blister package. 5,437,371, Cl. 206-539.000.
- Latham, Paul M.; and Lavin, John T., to BOC Group, plc. The Fluid production method and apparatus. 5,437,150, Cl. 60-39.020.
- Latman, Neal S.; Kishore, Vimal; Bruot, Brent C.; and Flanders, Harold H. 16-epiatriol to prevent, inhibit, or reduce inflammation without glycolytic effects. 5,438,049, Cl. 514-182.000.
- Latorre, Jack; and Espinadel, Gerald, to Electro-Univers-Diffusion. Movement detector for detecting movement within a predetermined space. 5,438,318, Cl. 340-554.000.
- Lattibeaudiere, Derrick P., to Panasonic Technologies, Inc. Content addressable memory system. 5,438,535, Cl. 365-49.000.
- Lau, Lilip: See—  
Williams, Michael S.; Lau, Lilip; Khosravi, Farhad; Hartigan, William; and Hernandez, Avegel, 5,437,083, Cl. 29-235.000.
- Laughlin, Kenneth W.: See—  
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- Lauren, Leena: See—  
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- Laustsen, Mads, to Zymogenetics, Inc. High molecular weight electro-dialysis. 5,437,774, Cl. 204-182.300.
- Lauterbach, Armin, to Chilean Nitrate Corporation. Production of spherical shaped products of subliming substances. 5,437,691, Cl. 23-295.00R.
- Lavi Industries, Inc.: See—  
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- Lavin, John T.: See—  
Latham, Paul M.; and Lavin, John T., 5,437,150, Cl. 60-39.020.
- Lavorel, Pierre-Yves; and Grenetier, Alain, to Salomon S.A. Process for decorating the top portion of the ski. 5,437,755, Cl. 156-240.000.
- Law, Henry: See—  
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- Lawnczak, Gary P., to Eastman Kodak Company. Duplex document handler and image forming apparatus. 5,438,435, Cl. 358-496.000.
- Lebby, Michael S.: See—  
Hartman, Davis H.; Lebby, Michael S.; Kuo, Shun-Meen; and Chun, Christopher K. Y., 5,437,092, Cl. 29-600.000.
- LeBlanc, Jeffrey T.: See—  
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- LeBlanc, Yves: See—  
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- Leckrone, Michael E., to Eli Lilly and Company. Angioplasty catheter and method of use thereof. 5,437,659, Cl. 606-7.000.
- Lecuyer, Alain, to Cordis Corporation. Implantable valve for the treatment of hydrocephaly. 5,437,627, Cl. 604-9.000.
- Ledjeff, Konstantin: See—  
Helmer-Metzmann, Freddy; Osan, Frank; Schneller, Arnold; Ritter, Helmut; Ledjeff, Konstantin; Nolte, Roland; and Thorwirth, Ralf, 5,438,082, Cl. 522-149.000.
- Ledvina, Timothy J.; and Mott, Philip J., to Borg-Warner Automotive, Inc. Phased chain assemblies. 5,437,581, Cl. 474-85.000.
- Lee, Byoung H.: See—  
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- Lee, Chih-Ping: See—  
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- Lee, Chih-Hua: See—  
Tsai, Rung-Ywan; Wei, Chaur-Tsang; Lee, Chih-Hua; Ho, Fang-Chuan; and Chuang, Gi-Hong, 5,437,931, Cl. 428-446.000.
- Lee, Jeung-gil: See—  
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- Lee, Jonghyun; Kim, Yountae; and Kim, Bowoo, to Electronics and Telecommunications Research Institute. Precision wafer driving device by utilizing solid type actuator. 5,438,419, Cl. 356-399.000.
- Lee, Jun S.: See—  
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- Lee, Kenneth M.: See—  
Liles, Donald T.; Lee, Kenneth M.; Romensko, David J.; White, James W.; and Murray, David L., 5,438,097, Cl. 525-63.000.
- Lee, Kuo-Hua: See—  
Chang, Chong-Ping; Lee, Kuo-Hua; Liu, Chun-Ting; and Liu, Ruichen, 5,438,006, Cl. 437-40.000.
- Lee, Kwang Y., to Goldstar Co., Ltd. Apparatus for synthesizing videos. 5,438,438, Cl. 358-537.000.
- Lee, Paul S. C.; Chow, Pei-Ming D.; Berenz, John J.; Pearlman, Jay S.; and Lam, Wayne W., to TRW Inc. Focal plane imaging array with internal calibration source. 5,438,336, Cl. 342-174.000.
- Lee, Raymond E.; and Torres, Robert J., to International Business Machines Corporation. Method and apparatus for inputting electronic mail. 5,438,660, Cl. 395-155.000.
- Lee, Richard B.; and Brandon, John W., to Hunting MCS, Inc. Millout whipstock apparatus and method. 5,437,340, Cl. 175-61.000.
- Lee, Rudolf: See—  
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- Lee, Si H., to Hyundai Electronics Industries Co., Ltd. Apparatus and method for recording/reproducing optical information and optical disk-shaped recording medium. 5,438,560, Cl. 369-58.000.
- Lee, Tekken; Takeuchi, Nobunari; Uchiyama, Haruyoshi; Shimizu, Kaoru; and Horiguchi, Tsuneo, to Ando Electric Co., Ltd.; and Nippon Telegraph and Telephone Corporation. Light-frequency control apparatus. 5,438,578, Cl. 372-32.000.
- Lee, William H., to Bioglan Laboratories Ltd. Pharmaceutical compositions and a device for administering the same. 5,437,872, Cl. 424-464.000.
- Leeds, Harry D.; Fisher, Thomas M.; and Fann, Paula S., to Artech Brick debacker. 5,437,535, Cl. 414-798.300.
- Leenders, Luc: See—  
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- Legario, Ronald; Nakamura, Toshiomi; and Shibata, Toshiro, to Nippon Paint Co., Ltd. Serum separation sealant. 5,438,000, Cl. 436-17.000.
- Legrand, Hugues; and Mazodier, Francois, to Usinor Sncilor; and Thyssen Stahl Aktiengesellschaft. Device for rapidly changing and maintaining a lateral wall of a machine for the continuous casting of a metal product between rolls. 5,437,325, Cl. 164-428.000.
- Legroux, Philippe: See—  
Bouraly, Jean-Pierre; Aebi, Jurg; Beaufils, Philippe; de Lestang, Michel; Gaffuri, Jean-Gilles; Hourlier, Herve; Lallement, Jean-Jacques; Legroux, Philippe; Levai, Jean-Paul; Pondaven, Gerald; Schuster, Pierre; and Vergnat, Christian, 5,437,676, Cl. 606-88.000.
- Lehman, Jean-Yves: See—  
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- Lehmann, Gebhard; Heerssen, Rolf; and Herrenknecht, Martin, to Herrenknecht GmbH. Tunneling machine with center cutter and debris removing means. 5,437,500, Cl. 29-60.000.
- Lehnert, Robert A.; Quinn, Robert D.; Sisley, Steven E.; and Thomas, Brandon D., to Vectra Technologies, Inc. Containers for transportation and storage of spent nuclear fuel. 5,438,597, Cl. 376-272.000.
- Leibrock, Joachim: See—  
Barde, Yves-Alain; Leibrock, Joachim; Lottspeich, Friedrich; Edgar, David; Yancopoulos, George; and Thoenen, Hans, 5,438,121, Cl. 530-399.000.
- Leica Heerbrugg AG: See—  
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- Leigh Aerosystems Corporation: See—  
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- Leinen, Chris M., to Forward Spin Technologies, Inc. Flow control valve. 5,437,305, Cl. 137-625.320.
- Leiras Oy: See—  
Nikander, Hannu; Heikkila-Hoikka, Marjaana; Pohjala, Esko; Hanhijarvi, Hannu; and Lauren, Leena, 5,438,048, Cl. 514-108.000.
- LEK, tovarna farmacevtskih in kemskih izdelkov: See—  
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- Leland Stanford Jr. University, Board of Trustees of the: See—  
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- von Bunau, Rudolf M.; and Pease, Roger F. W., 5,438,204, Cl. 250-492.200.
- Leland Stanford Junior University, The Board of Trustees of the: See—  
Burg, James L.; Pouletty, Philippe J.; and Boothroyd, John C., 5,437,990, Cl. 435-91.200.
- Tens, Nelson N. H.; Bieber, Marcia; and Bhat, Neelima M., 5,437,987, Cl. 435-7.250.
- Lemanski, Gerald, II. Travel pack worn on the person. 5,437,403, Cl. 224-208.000.
- Lemeorder Metallwaren AG: See—  
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- Leo Corporation: See—  
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- Leonard, David K.; and Bland, John B. Chiropractic articulating traction chair. 5,437,609, Cl. 601-91.000.
- Leonard Studio Equipment, Inc.: See—  
Chapman, Leonard T., 5,437,216, Cl. 91-446.000.
- Lesko, Mark F.: See—  
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- Letchworth, William A. Adjustable body opening dilator. 5,437,649, Cl. 604-278.000.
- Lett, Renee M.: See—  
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- Leung, Roger Yu-Kwan; Nebo, Jon F.; and Gonczy, Stephen T., to AlliedSignal Inc. Silicon oxycarbonitride by pyrolysis of polycyclosiloxanes in ammonia. 5,438,025, Cl. 501-87.000.
- Leupold, Herbert A.; and Potenzi, Ernest, II, to United States of America, Army. Yokeless permanent magnet solenoids. 5,438,308, Cl. 335-306.000.
- Levi, Lavi A., to Sun Microsystems, Inc. Fast static cascode logic gate. 5,438,283, Cl. 326-108.000.
- Levai, Jean-Paul: See—  
Bouraly, Jean-Pierre; Aebi, Jurg; Beaufils, Philippe; de Lestang, Michel; Gaffuri, Jean-Gilles; Hourlier, Herve; Lallement, Jean-Jacques; Legroux, Philippe; Levai, Jean-Paul; Pondaven, Gerald; Schuster, Pierre; and Vergnat, Christian, 5,437,676, Cl. 606-88.000.



- Levinson, Lionel M.: See—  
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- Levitt, Michael; and Gelman, Gregory. Device for holding writing instruments. 5,437,399, Cl. 224-247.000.
- Levy, Jonathan: See—  
Baror, Gigi; Beck, Moti; Biran, Dan; Cohen, Elliot; Hadas, Yair; Konstantin, Benny; Levy, Jonathan; Marko, Reuven; Ostrer, Aharon; Saban, Rami; Shackam, Alon; and Shahr, Boaz, 5,438,670, Cl. 395-403.000.
- Levy, Markus A., to Intel Corporation. Nonvolatile memory with volatile memory buffer and a backup power supply system. 5,438,549, Cl. 365-229.000.
- Levy, Neil A.: See—  
Harris, Gordon L.; Harris, Stephen L.; and Levy, Neil A., 5,437,230, Cl. 102-302.000.
- Lewiner, Jacques; and Fink, Mathias, to Decaux, Jean-Claude. Processes and devices for protecting a given volume, preferably arranged inside a room, from outside noises. 5,438,624, Cl. 381-71.000.
- Lewis, James. Anti-lockout system. 5,438,312, Cl. 340-457.000.
- Lewis, Larry N.; Schultz, William N.; Levinson, Lionel M.; Sumpster, Chris A.; and Stein, Judith, to General Electric Company. Microwave-activated preparation of silicone foams, and compositions useful therein. 5,438,081, Cl. 522-99.000.
- Lewis, William D.; and Even, William F., to Quantum Corporation. Synchronization of multiple disk drive spindles. 5,438,464, Cl. 360-73.030.
- Leychik, David: See—  
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- Li, Hsin-Yu S.: See—  
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- Li, John X.; Erion, Jeffrey A.; and Fallahi, Amir, to Ford Motor Company. Illuminator for use with a remote light source. 5,438,485, Cl. 362-32.000.
- Liang, Shih-Kang: See—  
Cariapi, Vikram; Jeutter, Dean C.; and Liang, Shih-Kang, 5,437,610, Cl. 601-152.000.
- Liao, Hans H.; Medwid, Richard D.; Heefner, Donald L.; Sniff, Kathleen S.; Hassler, Randall A.; and Yarus, Michael J., to Universal Foods Corporation. Carotenoid producing culture using *Nesporiococcus excrucians*. 5,437,997, Cl. 435-257.100.
- Liao, Pen-Lin: See—  
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- Liboff, Abraham R.; McLeod, Bruce R.; and Smith, Stephen D., to Life Resonances, Inc. Method and apparatus for the treatment of cancer. 5,437,600, Cl. 600-9.000.
- Lichty, Maynard E.: See—  
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- Lieber, Clement E.; Taimisto, Miriam H.; and Konno, Mark A., to Baxter International Inc. Transport catheter. 5,437,637, Cl. 604-96.000.
- Life Force Associates, L.P.: See—  
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- Life Resonances, Inc.: See—  
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- Lignelet, Jacky, to Eurocopter France. Electrical connector provided with a plurality of connection modules. 5,437,564, Cl. 439-701.000.
- Ligon, Woodfin V., Jr., to General Electric Company. Wire apparatus for pyrolysis. 5,437,839, Cl. 422-78.000.
- Liles, Donald T.; and Shephard, Nick E., to Dow Corning Corporation. Precured silicone emulsion. 5,438,095, Cl. 524-785.000.
- Liles, Donald T.; Lee, Kenneth M.; Romensko, David J.; White, James W.; and Murray, David L. Polystyrene modified with silicone rubber powder. 5,438,097, Cl. 525-63.000.
- Lin, Abraham T.: See—  
Okarma, Thomas B.; Blankenship, John; Lin, Abraham T.; and Elkay, Mohammad A., 5,437,861, Cl. 424-78.080.
- Lin, Chen Y. Sunshade arrangement. 5,437,298, Cl. 135-117.000.
- Lin, Jea-Sen: See—  
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- Lin, Jen-Wei: See—  
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- Lin, Jung-lung: See—  
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- Lin Pac Inc.: See—  
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- Lin, Sheng-Tz; and Scheib, John P., to Dasonics Ultrasound, Inc. Direct demodulation in ultrasound instruments. 5,437,281, Cl. 128-660.070.
- Lincoln, Daniel J., to LSI Logic Corporation. Self-calibration timing circuit. 5,438,599, Cl. 377-20.000.
- Lincoln, David G.: See—  
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- Lindblom, Kenneth A.: See—  
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- Lindner, Bernard J., to Resnord Corporation. Friction disk brake mechanism for electric motor. 5,437,351, Cl. 188-18.00A.
- Lindner, Heiko: See—  
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- Lindstrom, Mikko, to Finn-Power International, Inc. Apparatus and method for measuring and compensating the length of a punch tool. 5,438,521, Cl. 364-474.170.
- Linear Technology Corp.: See—  
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- Link, Helmut: See—  
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- Lino, Antonio Carlos F.: See—  
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- Lir France: See—  
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- LIR-USA Manufacturing Co., Inc.: See—  
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- Liran, Samuel: See—  
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- Liston, Max D.: See—  
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- Litchfield, Paul E.: See—  
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- Liu, Chun-Ting: See—  
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- Liu, Ruichen: See—  
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- Liu, Yang-Ting. Hand portable riveter. 5,437,085, Cl. 29-243.521.
- Liverance, Howard L.; and Spademan, Richard G. Interactive sports equipment teaching device. 5,437,289, Cl. 128-779.000.
- Liverton, Nigel: See—  
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- Lloyd, Robert C. W.: See—  
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- Locke, Robert D.: See—  
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- Lockheed Corporation: See—  
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- Loeb, Marvin P.: See—  
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- Malenchek, Robert. Needle protective sheath device. 5,437,639, Cl. 604-110.000.
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- Mallard de la Varenne, Jean; and Crisinel, Pascal, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés George Claude. Colorimetric processes for the determination and control of the peracid content in a solution, in the presence of hydrogen peroxide. 5,438,002, Cl. 436-55.000.
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- Manning, James E., to University of North Carolina at Chapel Hill. The selective aortic arch perfusion. 5,437,633, Cl. 604-53.000.
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- Mantha, Suryanarayana M.; Brown, Allen L., Jr.; and Wakayama, Toshiro, to Xerox Corporation. Method and apparatus for specifying layout processing of structured documents. 5,438,512, Cl. 364-419.100.
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- Marco, Leslie S., to Illinois Tool Works Inc. Package comprising containers in unitized upper and lower tiers. 5,437,370, Cl. 206-430.000.
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- Marquip, Inc. See—  
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- Martin, James M.; Barker, Kenton H.; and DiRaimo, Salvatore D., to General Railway Signal Corporation. Thermal sensor for detection of potential mechanical failures and transmission of temperature warning signals. 5,438,322, Cl. 340-584.000.
- Martin, Louis; and Hager, Ulrich, to Poclain Hydraulics. Hydraulic drive unit for driving a drilling tool. 5,437,338, Cl. 173-47.000.
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- Martin, Mitchell L. Carrying case for electronic components. 5,437,367, Cl. 206-320.000.
- Martin, Wendell S., to Anderson-Martin Machine Co. Capping machine head with cap aligning chuck. 5,437,139, Cl. 53-317.000.
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- Maruyama, Shigeaki; and Kawazu, Yukio, to Sony Corporation. Parts insertion machine. 5,437,359, Cl. 198-341.000.
- Maruyama, Shigeru; Shimazaki, Yuichi; Kanehiro, Masaki; Ishioka, Takuji; Baba, Shigeaki; and Hisaki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Sparking voltage detecting device having an embedded conductive member. 5,438,269, Cl. 324-402.000.
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- Marx, Kenneth A. See—  
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- Masetti, Francesco; and Jacob, Jean-Baptiste, to Alcatel N.V. Photonic switching network with broadcast facility. 5,438,566, Cl. 370-60.000.
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- Mason, Wenda M. See—  
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- Massachusetts Institute of Technology. See—  
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- Masumoto, Hiroaki, to Rohm Co., Ltd. Option setting circuit for interface circuit. 5,438,279, Cl. 326-38.000.
- Matanzon, Alex; Berlad, Gideon; Maop, Dov; Shrem, Yigal; and Sott, Adrian, to Elscint Ltd. Stabilized scatter free gamma camera images. 5,438,202, Cl. 250-363.070.
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- Matsubara, Saburo; and Goushi, Yoshihiro, to Nippon Oil Company, Ltd. Masterbatch composition for thermoplastic resin modification and method for preparing said masterbatch composition. 5,438,090, Cl. 524-490.000.
- Matsuda, Eiji; Matsuda, Toshinori; and Koike, Tsuyoshi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument with numeric inputting function. 5,438,155, Cl. 84-653.000.
- Matsuda, Osamu. See—  
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- Matsui, Tsunehiro. See—  
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- Matsumoto Heavy Industry Co. Ltd. See—  
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- Matsumoto, John F.; and Ando, Motoaki, to Toshiba America Information Systems; and Kabushiki Kaisha Toshiba. External interface for a high performance graphics adapter allowing for graphics compatibility. 5,438,663, Cl. 395-162.000.

- Matsumoto, Mansuke. See—  
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- Matsumura, Mitsunori. See—  
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- Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—  
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- Miichi, Yoshiki; Tanaka, Tadao; and Harara, Mitsuhiro, 5,438,515, Cl. 364-424.050.
- Mitsubishi Jukogyo Kabushiki Kaisha: See—  
Bando, Takashi; Sakamoto, Kazuhide; Masuda, Hiromu; and Iwata, Hiroshi, 5,437,769, Cl. 162-301.000.
- Yamauchi, Yasuhiro; and Komori, Akito, 5,437,265, Cl. 126-657.000.
- Mitsubishi Kasei Corporation: See—  
Sano, Hideo; Yoneyama, Tomio; Murata, Yukichi; and Yamada, Masahiro, 5,437,716, Cl. 106-22.00K.
- Mitsubishi Paper Mills Limited: See—  
Yamano, Motozo; Haino, Kozo; Yoshida, Akio; and Miura, Hidetoshi, 5,437,957, Cl. 430-232.000.
- Mitsubishi Pencil Kabushiki Kaisha: See—  
Idogawa, Hiroyuki; Wakata, Atsushi; Watanabe, Nobuatsu; and Chong, Yong-Bo, 5,437,715, Cl. 106-20.00R.
- Mitsui, Hidero; and Ide, Yoshihiro, to Sony Corporation. Battery pack. 5,437,938, Cl. 429-1.000.
- Mitsui Mining & Smelting Co., Ltd.: See—  
Saida, Muneco; Hirasawa, Yutaka; and Yoshimura, Katsuhiro, 5,437,914, Cl. 428-209.000.
- Mitsui Petrochemical Industries, Ltd.: See—  
Ishimaru, Naoshi; Kioka, Mamoru; and Toyota, Akinori, 5,438,110, Cl. 526-125.000.
- Shinozaki, Tetsunori; and Kioka, Mamoru, 5,438,100, Cl. 525-240.000.
- Mitsui Toatsu Chemicals, Incorporated: See—  
Itoh, Hiroshi; Abe, Takashi; Yamashita, Hitoshi; Yoshimura, Toshihiro; Hisanaga, Takechi; Takebayashi, Takao; Nakata, Kunio; and Hashimoto, Chikara, 5,437,902, Cl. 428-68.000.
- Taniguchi, Keiko; Washino, Masahiro; Moriya, Shinobu; Shinoda, Hisei; Ohtaguro, Masami; Funae, Akihiro; and Iimuro, Shigeru, 5,437,918, Cl. 428-224.000.
- Mittelbach, Bernd: See—  
Hofstetter, Christian; Berger, Walter; Bauer, Werner; and Mittelbach, Bernd, 5,437,242, Cl. 117-14.000.
- Miura Co., Ltd.: See—  
Miura, Tamotsu; Miura, Masatoshi; and Higuchi, Osamu, 5,437,248, Cl. 122-51.000.
- Miura, Hidetoshi: See—  
Yamano, Motozo; Haino, Kozo; Yoshida, Akio; and Miura, Hidetoshi, 5,437,957, Cl. 430-232.000.
- Miura, Masatoshi: See—  
Miura, Tamotsu; Miura, Masatoshi; and Higuchi, Osamu, 5,437,248, Cl. 122-51.000.
- Miura, Tamotsu; Miura, Masatoshi; and Higuchi, Osamu, to Miura Co., Ltd. Fire tube boiler. 5,437,248, Cl. 122-51.000.
- Miura, Tatsu: See—  
Yamauchi, Noriaki; Kawamura, Nobuaki; Miura, Tatsu; Hashizume, Shuhei; Nakamae, Isao; Yoshigoe, Kazumi; Suzuki, Hiroyuki; and Minami, Iwao, 5,437,688, Cl. 8-526.000.
- Miya, Kazuyuki: See—  
Yamada, Daisuke; Kato, Osamu; Miya, Kazuyuki; and Nagase, Taku, 5,438,701, Cl. 455-89.000.
- Miyamoto, Mitsuaki: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,438,045, Cl. 514-81.000.
- Miyamoto, Tetsuya; Takahashi, Miyo; Fujisaki, Takahiko; Ikeou, Shinei; Omura, Takashi; and Harada, Naoki, to Sumitomo Chemical Company, Limited. Fiber reactive asymmetric dioxazine compounds and their use as fiber reactive dyes. 5,438,137, Cl. 544-76.000.
- Miyamoto, Yasuhiro: See—  
Ohama, Yoshifumi; Chihara, Yoshihide; Honda, Yasufumi; and Miyamoto, Yasuhiro, 5,438,080, Cl. 522-97.000.
- Miyata, Hisashi: See—  
Inomata, Shinichi; Nakazawa, Eiji; Miyata, Hisashi; and Magihira, Toru, 5,438,679, Cl. 395-800.000.
- Miyata, Ken-ichi: See—  
Nagate, Hiroshi; Endo, Hiroya; and Miyata, Ken-ichi, 5,437,960, Cl. 430-256.000.
- Miyata, Masakazu; Adachi, Kosai; and Nagano, Tomoko, to Riso Kagaku Corporation. Cut sheet feeder for image forming apparatus. 5,437,443, Cl. 271-9.060.
- Miyatani, Takao: See—  
Nagamatsu, Shigetaka; Miyatani, Takao; and Sugiura, Yisaki, 5,438,647, Cl. 395-82.000.
- Miyayama, Yoshiyuki: See—  
Coon, Brett; Miyayama, Yoshiyuki; Nguyen, Le Trong; and Wang, Johannes, 5,438,668, Cl. 395-375.000.
- Miyazaki, Hirohisa; Fujinaga, Kumiko; and Tanaka, Hitoshi, to Rohto Pharmaceutical Co., Ltd. Method of reducing elevated intraocular pressure. 5,438,060, Cl. 514-258.000.
- Miyazaki, Shizuo: See—  
Saito, Yoshiharu; Sakaizawa, Masao; Iwanami, Kunio; Kitano, Kitsusho; Tasaka, Michihisa; Kawazu, Kenji; Miyazaki, Shizuo; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, 5,438,091, Cl. 524-505.000.
- Miyazaki, Yasuhiro: See—  
Kobayashi, Shouhei; Miyazaki, Yasuhiro; and Fujiwara, Yasuhiro, 5,438,562, Cl. 369-110.000.
- Miyazawa, Shuhei: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,438,045, Cl. 514-81.000.
- Mizoguchi, Yoshimi; Ishii, Hiroshi; Kimura, Kiyoshi; Fukuchi, Masakazu; Takeda, Makoto; Maruyama, Hiroyuki; Yamaguchi, Yasuhiko; Taki, Kenji; Akamatsu, Masashi; and Kurohata, Takao, to Konica Corporation. Image forming apparatus with exposure, size, and position correction for pixels. 5,438,437, Cl. 358-518.000.
- Mizuguchi, Shinji, to Hirose Electric Co., Ltd. Circuit board electrical connector with a double cantilevered latch. 5,437,560, Cl. 439-326.000.



MKS Instruments, Inc.: See—  
Ewing, James H., 5,437,542, Cl. 417-258.000.  
Moard, David M.: See—  
Greiner, Leonard; Moard, David M.; and Bhatt, Bharat, 5,437,123, Cl. 48-107.000.  
Mobil Oil Corporation: See—  
Brandes, Ellen B.; and Loveless, Frederick C., 5,438,102, Cl. 525-314.000.  
Fang, Lieh-pao O.; Horodysky, Andrew G.; and Poole, Ronald J., 5,437,694, Cl. 44-340.000.  
Valyocik, Ernest W., 5,437,855, Cl. 423-706.000.  
Mobile Telecommunication Technologies: See—  
Bhagat, Jai P.; Hays, William D.; and Oswalt, Ernest A., 5,438,610, Cl. 379-58.000.  
Mobilio, Dominick; and Molinari, Albert J., to American Home Products Corporation. Derivatives of 4-anilinoquinoline-3-carboxamide as analgesic agents. 5,438,064, Cl. 514-313.000.  
Mochida Pharmaceutical Co., Ltd.: See—  
Sato, Naofumi; Mochizuki, Hiroshi; and Kanamori, Toshinori, 5,438,139, Cl. 546-102.000.  
Mochizuki, Amane: See—  
Higashi, Kazumi; Mochizuki, Amane; and Maeda, Masako, 5,438,223, Cl. 257-774.000.  
Mochizuki, Hiroshi: See—  
Sato, Naofumi; Mochizuki, Hiroshi; and Kanamori, Toshinori, 5,438,139, Cl. 546-102.000.  
Moczygemba, George A.: See—  
DePorter, Craig D.; Farrar, Ralph C., Jr.; Stacy, Nathan E.; and Moczygemba, George A., 5,438,103, Cl. 525-314.000.  
Moed, Michael C.; and Lee, Chih-Ping, to United Parcel Service of America, Inc. Method and apparatus for input classification using non-spherical neurons. 5,438,629, Cl. 382-156.000.  
Moen, Arthur J., to Teleco Incorporated. Method of providing message service for pines limited access telecommunications. 5,438,615, Cl. 379-144.000.  
Mogamiya, Makoto; and Morisawa, Tahei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Device for driving photographing lens and finder device of camera having zoom lens. 5,438,381, Cl. 354-199.000.  
Moghan Medical Corp.: See—  
Carlsale, Daniel A.; Waybright, Richard S.; and Guillen, Blanca, 5,437,824, Cl. 264-50.000.  
Mohan, Arthur G.; and Blum, David M., to American Cyanamid Company. Process for the synthesis [R-(R\*, R\*)]-5-(3-chlorophenyl)-3-[2-(3,4-dihydroxyphenyl)-1-methylethyl]-2-oxazolidinone. 5,438,148, Cl. 548-229.000.  
Mohan, Thyagarajan: See—  
Verkade, John G.; Mohan, Thyagarajan; and Angelici, Robert J., 5,437,696, Cl. 44-622.000.  
Mohindra, Rishi, to U.S. Philips Corporation. Direct conversion receiver. 5,438,692, Cl. 455-324.000.  
Mohn, Jon: See—  
Rice, Michael; and Mohn, Jon, 5,437,757, Cl. 156-345.000.  
Mohr, Juergen; Oppenlaender, Knut; Pander, Hans J.; Schneider, Rolf; Thomas, Juergen; and Schreyer, Peter, to BASF Aktiengesellschaft. Fuels and lubricants containing n-alkylcarboxamides. 5,437,695, Cl. 44-418.000.  
Mok, Fai; Psaltis, Demetri; and Li, Hsin-Yu S. Non-destructive readout mechanism for volume holograms using two wavelengths. 5,438,439, Cl. 359-10.000.  
Molecular Probes, Inc.: See—  
Haugland, Richard P., 5,437,980, Cl. 435-6.000.  
Molex Incorporated: See—  
Peterson, Bruce A., 5,437,567, Cl. 439-851.000.  
Molinari, Albert J.: See—  
Mobilio, Dominick; and Molinari, Albert J., 5,438,064, Cl. 514-313.000.  
Molinaro, Luca, to Portola Packaging, Inc. Auto rotation capping chuck improvement. 5,437,140, Cl. 53-331.500.  
Moll, Hermann: See—  
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Barth, Wolfgang; Grell, Hans-Georg; Grosser, Martin; Moll, Hermann; Pollmann, Horst; and Schneider, Peter, 5,437,347, Cl. 187-264.000.  
Momoyama, Tsutomu: See—  
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Monden, Katsunori, to Mazda Motor Corporation. Reinforced foldable airbag lid. 5,437,469, Cl. 280-728.300.  
Mong, William K.: See—  
Scott, Daniel G.; Mong, William K.; and Spalding, Willard P., 5,437,219, Cl. 92-96.000.  
Monsanto Company: See—  
Morgan, Albert W.; Brozek, James P.; Capistran, James D.; and O'Connor, Michael T., Jr., 5,437,916, Cl. 428-209.000.  
Monsees, Claude E.: See—  
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Montgomery, Robert K.: See—  
Havens, Joseph H.; and Montgomery, Robert K., 5,438,301, Cl. 351-45.000.  
Moore Business Forms, Inc.: See—  
Hutchinson, Wilbur, 5,437,476, Cl. 281-151.000.  
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Moore, Carl J.: See—  
Tuohey, Michael E.; and Moore, Carl J., 5,437,138, Cl. 52-741.100.  
Moore, Christopher P.; Wear, Trevor J.; Stoddart, James F.; and Armspach, Dominique, to Eastman Kodak Company. Cyclodextrin catenane compounds capable of forming inclusion complexes. 5,438,133, Cl. 536-103.000.  
Moore, George E.; and Tweardy, Lisa A. G., to Jerome Group, The. Antidubitus immobilization cervical collar. 5,437,612, Cl. 602-18.000.  
Moore, Mark A.: See—  
Phillips, Richard E.; Moore, Mark A.; Russell, Ruth L.; and Cheung, David, 5,437,287, Cl. 128-898.000.  
Moore, Michael L.: See—  
Callahan, James F.; Huffman, William F.; Moore, Michael L.; and Newlander, Kenneth A., 5,438,118, Cl. 530-330.000.  
Moore, Phillip H. Obstruction eliminator. 5,438,457, Cl. 359-855.000.  
Moren, Dean M.: See—  
Ali, M. Zaki; Ali, Mahfuza B.; and Moren, Dean M., 5,437,932, Cl. 428-461.000.  
Morey, Stephen J.: See—  
Judy, Steven W.; Morey, Stephen J.; Ohlson, April D.; and Phelps, Weldon L., 5,438,489, Cl. 361-191.000.  
Morgan, Alan R.; and Selman, Steven H., to University of Toledo and Medical College of Ohio. Compositions of porphyrin derivatives. 5,438,051, Cl. 514-185.000.  
Morgan, Albert W.; Brozek, James P.; Capistran, James D.; and O'Connor, Michael T., Jr., to Monsanto Company. Flexible printed circuits. 5,437,916, Cl. 428-209.000.  
Morgan, Arthur I. Apparatus for adding, removing, and exchanging marbling fat within raw meat. 5,437,224, Cl. 99-533.000.  
Morgan, Denny E.: See—  
Bitar, Ali A.; Morgan, Denny E.; and Bowman, Charles W., 5,438,274, Cl. 324-636.000.  
Mori, Hideo: See—  
Kanda, Toshiyuki; Tajima, Hisao; Takabayashi, Hiroshi; Yamamoto, Takashi; and Mori, Hideo, 5,438,484, Cl. 362-31.000.  
Mori, Masahiro: See—  
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Mori, Takanobu: See—  
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Mori, Toshihiko; and Sakuma, Yoshiki, to Fujitsu Limited. Method of making semiconductor device by selective epitaxial growth. 5,438,018, Cl. 437-89.000.  
Mori, Toshihiko, to Fujitsu Limited. Memory device, method for reading information from the memory device, method for writing information into the memory device, and method for producing the memory device. 5,438,539, Cl. 365-159.000.  
Morikawa, Atsushi: See—  
Inoue, Jiro; Tabota, Jun; Makino, Shiro; Morikawa, Atsushi; and Eimori, Takeshi, 5,438,232, Cl. 310-328.000.  
Morimura, Kazuo; and Fujii, Yuichi, to Matsushita Electric Industrial Co., Ltd. Radio-link continuity keeping equipment in cellular telephone mobile station. 5,438,695, Cl. 455-343.000.  
Morin, Pierre; Bardin, Christian; and Boulet, Jean, to Institut Francais du Petrole. Device for remotely actuating equipment comprising a bean-needle system. 5,437,308, Cl. 138-46.000.  
Morisawa, Tahei: See—  
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Morita, Satoshi, to Fuji Photo Film Co., Ltd. Photographic processing apparatus. 5,438,382, Cl. 354-298.000.  
Morita, Shinji: See—  
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Moriwaki, Fumio: See—  
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Moriya, Shinobu: See—  
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Morrison, Robert A.; and Evans, David A., to DNA Plant Technology Corporation. High pigment, reduced blossom end scar size, disease resistant tomato varieties. 5,438,152, Cl. 800-200.000.  
Morrison, Robert D., to Hewlett-Packard Company. Clock signal generator for electrophotographic printers. 5,438,353, Cl. 347-250.000.  
Morton International, Inc.: See—  
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Motamedi, Manouchehr E.: See—  
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Motiska, Neil: See—  
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Motoki, Yoshihiro: See—  
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Brown, Clem H.; and Wallace, Daniel J., 5,437,189, Cl. 73-721.000.

Feldbaumer, David W.; and Maass, Eric, 5,438,527, Cl. 364-578.000.  
Gorden, William; and Breeden, Robert L., 5,438,326, Cl. 340-825.440.  
Hall, Dale G., 5,438,230, Cl. 310-316.000.  
Hartman, Davis H.; Leiby, Michael S.; Kuo, Shun-Meen; and Chun, Christopher K. Y., 5,437,092, Cl. 29-600.000.  
Juskey, Frank J.; Suppelsa, Anthony B.; and Dorinski, Dale W., 5,438,216, Cl. 257-434.000.  
Kapadia, Mayank; Johnson, Graham; and King, Barry M., 5,438,569, Cl. 370-79.000.  
Kotzan, Mark E.; and Knecht, Thomas A., 5,438,219, Cl. 257-469.000.  
Muri, David L.; and Stengel, Robert E., 5,438,694, Cl. 455-341.000.  
Napoles, Adrian, 5,438,696, Cl. 455-343.000.  
Ng, Christine S. K.; and Chong, Eng M., 5,438,703, Cl. 455-127.000.  
Papageorge, Marc V.; Freyman, Bruce J.; Juskey, Frank J.; and Thome, John R., 5,438,224, Cl. 257-777.000.  
Schwent, Dale G.; Osmani, Rashid M.; and Weissappel, Robert N., 5,438,684, Cl. 455-89.000.  
Sorensen, Robert L.; Hosseini, Samandar V.; Habbaba, Faris S.; Bartling, Craig A.; and Garcia, Jorge L., 5,438,685, Cl. 455-90.000.  
Motoyama, Tetsuo; and Tsay, Donny, to Ricoh Company, Ltd.; and Ricoh Corporation. Method and system to recognize encoding type in document processing language. 5,438,650, Cl. 395-114.000.  
Motsinger, James V.; and Coppo, Michael P., to Detek Security Systems, Inc. Fence alarm system with swiveling posts. 5,438,316, Cl. 340-541.000.  
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Mount Sinai School of Medicine of the City University of New York: See—  
Colella, Gregory M.; Ben-David, Daniel; Cupo, Albert; Fan, Sophie S.; Fischer, Gena; Martin, Grace E.; and Ornstein, Leonard, 5,438,003, Cl. 436-63.000.  
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Muller, Gerd: See—  
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Mullins, Patrick S.; Cordiano, Victor C.; and Benedict, Charles E., to Autosmart Light Switches, Inc. Automatic daytime running light system. 5,438,237, Cl. 315-82.000.  
Multicolor Specialties, Inc.: See—  
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Munro, Malcolm G. Electrosurgical loop electrode instrument for laparoscopic surgery. 5,437,665, Cl. 606-47.000.  
Murai, Fumio; Suzuki, Yasunori; Tomozawa, Hideki; Takashi, Ryuma; Saida, Yoshihiro; and Ikenoue, Yoshiaki, to Hitachi, Ltd.; and Showa Denko K. K. Method for suppression of electrification. 5,437,893, Cl. 427-498.000.  
Murakami, Daisuke; Yoshida, Hideki; and Terao, Takao, to Sony Corporation. Pulse with modulation apparatus with plural independently controllable variable delay devices. 5,438,303, Cl. 332-109.000.  
Murakami, Fumitada: See—  
Takeshima, Shinichi; Tanaka, Toshiaki; Iguchi, Satoshi; Araki, Yasushi; Hirota, Shinya; Oda, Tomohiro; and Murakami, Fumitada, 5,437,153, Cl. 60-276.000.  
Murakami, Mikio: See—  
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Murakami, Takashi: See—  
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Muramoto, Kenzo: See—  
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Murata, Kazuo; Yoshihisa, Youetsu; Takeda, Kazunari; and Izuchi, Syuichi, to Yuasa Corporation. Lithium secondary battery. 5,437,942, Cl. 429-192.000.  
Murata Manufacturing Co., Ltd.: See—  
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Murayama, Hisao; and Ishibashi, Hitoshi, to Ricoh Company, Ltd. Multicolor image forming method and apparatus therefor. 5,438,401, Cl. 355-326.00R.  
Muri, David L.; and Stengel, Robert E., to Motorola, Inc. Distortion compensation for a pulsedwidth-modulated circuit. 5,438,694, Cl. 455-341.000.  
Murphree, Pat D. Method of fabricating a bi-metal pipe section. 5,437,086, Cl. 29-402.130.  
Murphy, James V.; and Murphy, Michael J., to Advanced Interconnections Corporation. Molded-in lead frames. 5,438,481, Cl. 361-813.000.  
Murphy Management Inc.: See—  
Berger, Walter R., 5,438,225, Cl. 307-66.000.  
Murphy, Mark A.: See—  
Fritsch, John R.; Fruchey, Olan S.; Kuila, Debasish; Kvakovsky, George; Murphy, Mark A.; Sheehan, Michael T.; Sounik, James R.; and Vicari, Richard, 5,438,142, Cl. 546-240.000.  
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White, William; and White, Julie, 5,437,074, Cl. 15-105.000.  
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Jantzi, C. Earl; and Gall, Richard C., 5,438,618, Cl. 379-387.000.  
Nabisco, Inc.: See—  
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Nagamatsu, Shigetaka; Miyatani, Takao; and Sugiura, Yisaki, to Toyota Jidosha Kabushiki Kaisha. Multi-manipulator robot apparatus. 5,438,647, Cl. 395-82.000.  
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- Nair, Ajith N.: See—  
Primiano, Guy A.; and Nair, Ajith N., 5,438,370, Cl. 348-476.000.
- Nair, Parameswaran B.; Evans, John C.; Price, James F.; Choudhuri, Kumar S.; Stills, James T.; and Goulding, Victor V., to MicroBilt Corporation. Multi-reader transaction terminal. 5,438,186, Cl. 235-449.000.
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- Nakagami, Satoru: See—  
Ubukata, Kimiko; Nakagami, Satoru; and Yamane, Akio, 5,437,978, Cl. 435-6.000.
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- Nakai, Akira: See—  
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- Nakajima, Kiichi: See—  
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- Nakajima, Yasuo: See—  
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- Nakamae, Isao: See—  
Yamachi, Noriaki; Kawamura, Nobuaki; Miura, Tatsu; Hashizume, Shuhei; Nakamae, Isao; Yoshigoe, Kazumi; Suzuki, Hiroyuki; and Minami, Iwao, 5,437,688, Cl. 8-526.000.
- Nakamatsu, Shuji: See—  
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- Nakamichi Corporation: See—  
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- Nakamura, Chikako: See—  
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- Nakamura, Hiroshi: See—  
Nakazawa, Kisaburo; Nakamura, Hiroshi; Imori, Hiromitsu; and Wada, Hideo, 5,438,669, Cl. 395-375.000.
- Nakamura, Masaru, to Ricoh Company, Ltd. Spread spectrum communication system. 5,438,589, Cl. 375-200.000.
- Nakamura, Nobuo; Matsunaga, Yoshiyuki; Koya, Yoshihiro; and Endo, Yukio, to Kabushiki Kaisha Toshiba. Charge-transfer device having an improved charge-sensing section. 5,438,211, Cl. 257-239.000.
- Nakamura, Satoshi: See—  
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- Nakamura, Tetsuya: See—  
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- Nakamura, Toshiomi: See—  
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- Nakamura, Yoshiki: See—  
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- Nakamura, Yoshinori: See—  
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- Nakamura, Yoshio; Kikuchi, Shin; and Nishimura, Shigeru. Semiconductor device with Schottky junction. 5,438,218, Cl. 257-452.000.
- Nakamura, Yoshisada; and Arakatsu, Hiroshi, to Fuji Photo Film Co., Ltd. Dye fixing element. 5,437,956, Cl. 430-207.000.
- Nakamura, Yutaka; and Koike, Noboru, to Kabushiki Kaisha Toshiba. Electronic apparatus having a shield structure. 5,438,482, Cl. 361-816.000.
- Nakane, Kazuhiko: See—  
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- Nakano, Fumio: See—  
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- Nakano, Yoshihiko: See—  
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- Nakano, Yukio, to Hitachi, Ltd. Optical wavelength multiplexing communication system. 5,438,445, Cl. 359-124.000.
- Nakase, Junko; and Doi, Nobukazu, to Hitachi, Ltd. Error correcting system. 5,438,577, Cl. 371-37.100.
- Nakashima, Yoshihiko, to Noritsu Koki Co., Ltd. Automatic developing machine for photosensitive materials. 5,438,383, Cl. 354-324.000.
- Nakata, Kunio: See—  
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- Nakatani, Eisaku, to Casio Computer Co., Ltd. Document processing apparatus for extracting a format from one document and using the extracted format to automatically edit another document. 5,438,657, Cl. 395-148.000.
- Nakatsuji, Masahiro; and Sato, Susumu, to Nikon Corporation. Internal focus telephoto lens for an auto focus camera. 5,438,455, Cl. 359-748.000.
- Nakayama, Jitsuko: See—  
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- Nakayama, Takayoshi: See—  
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- Nakazawa, Eiji: See—  
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- Nalco Chemical Company: See—  
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- Nanataki, Hideo: See—  
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- Nanjyo, Atsushi; and Kojima, Akiyoshi, to Nippon Oil Co. Limited. Method and apparatus for the nondestructive determination of torsional breakage torque of tubular carbon fiber reinforced composite materials. 5,438,262, Cl. 324-238.000.
- Nankou, Yuichi: See—  
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- Nanni, Edward J.: See—  
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- Napiorkowski, John J.: See—  
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- Napoles, Adrian, to Motorola, Inc. Method and apparatus for controlling radio frequency interference generated by a voltage multiplier. 5,438,696, Cl. 455-343.000.
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- Narui, Hironobu; Doi, Masato; Sahara, Kenji; and Matsuda, Osamu, to Sony Corporation. Semiconductor laser with optimum resonator. 5,438,583, Cl. 372-45.000.
- Narukawa, Toshiki, to Brother Kogyo Kabushiki Kaisha. IC card apparatus for connecting a reference potential terminal of a card connector to a main frame without a data transfer control portion being connected therebetween. 5,438,185, Cl. 235-441.000.
- Naruoka, Shinji: See—  
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- Naruse, Hideaki; and Suzuki, Makoto, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 5,437,967, Cl. 430-505.000.
- Nashville Wire Products Co.: See—  
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- Nasser, Karim W., to University of Saskatchewan. Concrete slump testing. 5,437,181, Cl. 73-54.030.
- Nater, Charles. Laser dual wavelength selection system. 5,438,416, Cl. 356-373.000.
- National Computer Systems, Inc.: See—  
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- National Electrostatics Corp.: See—  
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- National Semiconductor Corporation: See—  
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- Baror, Gigi; Beck, Moti; Biran, Dan; Cohen, Elliot; Hadas, Yair; Konstantin, Benny; Levy, Jonathan; Marko, Reuven; Ostrer, Aharon; Saban, Rami; Shackam, Alon; and Shahar, Boaz, 5,438,670, Cl. 395-403.000.
- Delano, Cary L., 5,438,288, Cl. 327-65.000.
- Dey, Shankar, 5,438,672, Cl. 395-500.000.
- Harper, Jonathan P.; and Utz, Hubert, 5,438,270, Cl. 324-429.000.
- Kuo, James R., 5,438,282, Cl. 326-86.000.
- Nguyen, Luu T.; and Takiar, Hem P., 5,437,095, Cl. 29-827.000.
- Saban, Rami; Efendovich, Avner; and Karpati, Varda, 5,438,300, Cl. 331-16.000.
- Natsuume, Tadao: See—  
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- Naveros, Francisco: See—  
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- Nayak, Umesh P.: See—  
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- Nearing, Bruce D.: See—  
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- Nebo, Jon F.: See—  
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- NEC Corporation: See—  
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- Hori, Hidetoshi, 5,438,298, Cl. 330-289.000.
- Ikeda, Chinatsu, 5,438,567, Cl. 370-60.000.
- Itoh, Katsuyuki; and Yamashita, Hiroshi, 5,438,207, Cl. 250-492.230.
- Itoh, Ryo; Yokoyama, Yukio; and Ono, Takao, 5,438,339, Cl. 343-702.000.
- Kamiyama, Satoshi, 5,438,012, Cl. 437-60.000.
- Kimura, Katsuji, 5,438,296, Cl. 327-560.000.
- Kishi, Shuji, 5,437,777, Cl. 204-224.00R.
- Kojima, Susumu, 5,438,608, Cl. 379-58.000.
- Muto, Hiroyasu, 5,438,691, Cl. 455-309.000.
- Norimatsu, Noriko, 5,438,612, Cl. 379-58.000.
- Saeki, Takanori, 5,438,010, Cl. 437-52.000.
- Sugawara, Mitsutoshi, 5,438,280, Cl. 326-71.000.
- Tanaka, Akio, 5,438,290, Cl. 327-108.000.
- Yahagi, Masahiko, 5,438,609, Cl. 379-58.000.
- NEC Electronics, Inc.: See—  
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- Toy, Stephen W.; and Alexander, David V., 5,438,238, Cl. 315-94.000.
- Nedbal, Ralph G.; and Nelson, John F., to Illinois Tool Works Inc. Fuel door housing. 5,437,491, Cl. 296-97.220.
- Neddermeyer, Melissa P.: See—  
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- Nelle, Ulrich: See—  
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- Nelson, Carl T.: See—  
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- Nelson, John; and Rolando, Emil, to Endeco Corporation. Device for bending coaxial cable. 5,437,175, Cl. 72-215.000.
- Nelson, John F.: See—  
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- Nelson, Thomas G.: See—  
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- Nemazi, John E.: See—  
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- Neomedix Corporation: See—  
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- Nestec S.A.: See—  
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- Nesvadba, Peter: See—  
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- Netz, John H., Sr. Septic pipe field drain holders. 5,437,424, Cl. 248-49.000.
- Neubauer, Keith A.; Byler, Jay D.; and Brown, Kathleen K., to Williams Controls, Inc. Integrated vehicle brake control device position sensor with precalibrated multiple sensor outputs. 5,438,516, Cl. 364-426.010.
- Neuman, Bernard; and Neuman, Sandra J. Collapsible hearing device. 5,438,626, Cl. 381-183.000.
- Neuman, Sandra J.: See—  
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- Neumann, Martin; and Kockerling, Ferdinand. Surgical closure. 5,437,683, Cl. 606-151.000.
- Neurgaonkar, Ratnakar R.: See—  
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- Neuro Navigational Corporation: See—  
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- New Holland North America, Inc.: See—  
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- Newell Operating Company: See—  
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- Newlander, Kenneth A.: See—  
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- Newman, Gregory D., to Westinghouse Brake and Signal Holdings Limited. Railway signalling system. 5,437,422, Cl. 246-5.000.
- Newsome, Michael R.: See—  
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- Ng, Christine S. K.; and Chong, Eng M., to Motorola, Inc. Radio with reduced frequency pull. 5,438,703, Cl. 455-127.000.
- NGK Insulators, Ltd.: See—  
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- Ni-Tech, Inc.: See—  
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- Nichia Chemical Industries, Ltd.: See—  
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- Nichols, Ruthann: See—  
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- Nicholson, Gary: See—  
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- Niederst, Ken W.: See—  
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- Nieuwerkerk, Yolanda; Barry, Robert J.; Pluskal, Malcolm G.; and Hamilton, Richard A., to Millipore Corporation. Method for rapid purification of nucleic acids using layered ion-exchange membranes. 5,438,128, Cl. 536-25.400.
- Nihon Kessho Kogaku Co., Ltd.: See—  
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- Nikkanen, Jukka: See—  
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- Nikolychik, Victor: See—  
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- Nikon Corporation: See—  
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- Shiokama, Yoshiharu; and Yamano, Shozo, 5,438,387, Cl. 354-402.000.
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- Nikon Precision Inc.: See—  
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- Nilssen, Ole K. Fluorescent lamp ballast with light output control. 5,438,239, Cl. 315-151.000.
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- Nilsson, Mikael; and Wilke, Bo, to Kvaerner Pulping Technologies AB. Washing apparatus. 5,437,170, Cl. 68-181.00R.
- Ninomi, Mitsuyoshi: See—  
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- Nippon Conlux Co., Ltd.: See—  
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- Nippon Oil Company, Limited: See—  
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- Nanjyo, Atsushi; and Kojima, Akiyoshi, 5,438,262, Cl. 324-238.000.
- Nippon Oil and Fats Co., Ltd.: See—  
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- Orikasa, Yuichi; and Sakazume, Suehiro, 5,438,098, Cl. 525-63.000.
- Nippon Paint Co., Ltd.: See—  
Legario, Ronald; Nakamura, Toshiomi; and Shibata, Toshiko, 5,438,000, Cl. 436-17.000.
- Takimoto, Masaaki; Izumi, Minao; and Yamamoto, Hisataka, 5,438,083, Cl. 523-401.000.
- Nippon Petrochemicals Co., Ltd.: See—  
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- Nippon PMC Corporation: See—  
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- Nippon Steel Corporation: See—  
Ao, Yoji; Tokuda, Isao; and Honda, Minoru, 5,437,434, Cl. 266-44.000.
- Egawa, Yuichi; and Sato, Yasuo, 5,438,214, Cl. 257-388.000.
- Kurahashi, Ryuro; Kouga, Takahiko; Shirata, Masataka; Sakakibara, Masayoshi; and Kamiyashiki, Hiroshi, 5,437,802, Cl. 252-18.000.
- Nippon Steel Semiconductor Corp.: See—  
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- Nippon Telegraph and Telephone Corporation: See—  
Lee, Tekken; Takeuchi, Nobunari; Uchiyama, Haruyoshi; Shimizu, Kaoru; and Horiguchi, Tsuneo, 5,438,578, Cl. 372-32.000.
- Nippon Zeon Co., Ltd.: See—  
Takahashi, Nobukazu; Kohara, Teiji; and Natsuume, Tadao, 5,437,926, Cl. 428-337.000.
- Nippon Zoki Pharmaceutical Co., Ltd.: See—  
Okamoto, Kaoru; and Morita, Shinji, 5,438,125, Cl. 536-4.100.
- Nishi, Shinichi: See—  
Komatsu, Katsuaki; Yamamoto, Kazunori; and Nishi, Shinichi, 5,438,393, Cl. 355-246.000.
- Nishigaki, Tetsuo; Ota, Kiyoshi; and Nagano, Kae, to Sony Corporation. Remote controller apparatus and an audio-video combination system using the same, 5,438,325, Cl. 340-825.240.
- Nishijima, Hideo: See—  
Suga, Atsuo; Higuchi, Shigemitsu; Nishijima, Hideo; and Fujii, Hiromasa, 5,438,459, Cl. 360-38.100.
- Nishiki, Yoshinori: See—  
Shimamune, Takayuki; Nakajima, Yasuo; Nakamatsu, Shuji; Nishiki, Yoshinori; and Wakita, Shuhei, 5,437,771, Cl. 204-84.000.
- Nishikura, Takahiro: See—  
Ohtsuchi, Tetsuro; Sumihara, Masanori; Kawasaki, Osamu; Nishikura, Takahiro; Takeda, Katsu; Nojima, Takashi; and Imada, Katsumi, 5,438,229, Cl. 310-316.000.
- Nishimoto, Hidetoshi: See—  
Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, 5,437,835, Cl. 420-421.000.
- Nishimura, Asao; Yaguchi, Akihiro; Haneda, Mitsuki; Anjoh, Ichiro; Arita, Junichi; Iwaya, Akihiko; and Ichitani, Masahiro, to Hitachi, Ltd. Semiconductor leadframe and its production method and plastic encapsulated semiconductor device, 5,437,915, Cl. 428-209.000.
- Nishimura, Michio: See—  
Fujikawa, Tetsuzo; Hirata, Makizo; Ohama, Shigeharu; and Nishimura, Michio, 5,437,334, Cl. 172-15.000.
- Nishimura, Shigeru: See—  
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- Nishimura, Tetsuharu: See—  
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- Nishimura, Tomoko; Sakano, Tomiaki; and Murano, Katsuhiro, to Matsushita Electric Industrial Co., Ltd. Turning mirror and method of manufacture, 5,438,448, Cl. 359-214.000.
- Nishio, Takeyoshi: See—  
Saito, Yoshiharu; Sakaizawa, Masao; Iwanami, Kunio; Kitano, Katsusho; Takasa, Michihisa; Kawazu, Kenji; Miyazaki, Shizuo; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, 5,438,091, Cl. 524-505.000.
- Nishiumi, Hiroshi; Ishii, Kanji; and Hara, Mitsuhiro, to Teac Corporation. Magnetic video and audio recording and/or reproducing apparatus for simultaneously recording input video and audio signals, 5,438,463, Cl. 360-57.000.
- Nishiyama, Satoru: See—  
Tanaka, Toshinori; Nishiyama, Satoru; and Koyama, Masaharu, 5,437,897, Cl. 428-29.000.
- Nissan Motor Co., Ltd.: See—  
Terai, Takehiro; and Tatsumi, Shigeki, 5,437,470, Cl. 280-728.300.
- Nissin Electric Company: See—  
Glavish, Hilton F.; Guerra, Michael A.; Kawai, Tadashi; Naito, Masao; and Nagai, Nobuo, 5,438,203, Cl. 250-396.0ML.
- Nisso Sangyo Co., Ltd.: See—  
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- Nitto Denko Corporation: See—  
Higashi, Kazumi; Mochizuki, Amame; and Maeda, Masako, 5,438,223, Cl. 257-774.000.
- Ohe, Tomio; Katayama, Shigeru; and Itoh, Kenichiro, 5,437,917, Cl. 428-211.000.
- University of California, Regents of the: See—  
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- Nix Company Ltd.: See—  
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- Nix, Ronald D. Security alarm system, 5,438,315, Cl. 340-539.000.
- NKK Corporation: See—  
Kazama, Akira; Oshige, Takahiko; Yamada, Yoshiro; Yamada, Takeo; Yamazaki, Takeshi; Takayama, Takamitsu; and Nomura, Shuichiro, 5,438,415, Cl. 356-369.000.
- Nobles, Anthony A., to Visioneering, Inc. Method and apparatus for replacing a cannula, 5,437,644, Cl. 604-165.000.
- Noda, Masayuki, to Sony Corporation. Recording/reproducing apparatus for a disc, 5,438,465, Cl. 360-75.000.
- NOF Corporation: See—  
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- Nojima, Takashi: See—  
Kawakami, Hideaki; Kiyohara, Takehiko; Suzuki, Tetsuo; Asano, Junichi; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Saikawa, Satoshi; and Kinoshita, Hiroyuki, 5,437,444, Cl. 271-22.000.
- Ohtsuchi, Tetsuro; Sumihara, Masanori; Kawasaki, Osamu; Nishikura, Takahiro; Takeda, Katsu; Nojima, Takashi; and Imada, Katsumi, 5,438,229, Cl. 310-316.000.
- Nolan, Patrick B.: See—  
Kaufman, Richard H.; Kovacic, Theodore J.; Okita, Hideyoshi; Bostwick, Martin M.; Kostanecki, Andrew T.; Brainard, Robert H.; and Nolan, Patrick B., 5,437,389, Cl. 220-710.000.
- Noles, Larry J. Corner turning free-run animal trolley system, 5,437,246, Cl. 119-785.000.
- Nolte, Roland: See—  
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- Nomura, Shuichiro: See—  
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- Nomura, Takao: See—  
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- Norcini, Gabriele; and Santangelo, Francesco, to Zambon Group S.p.A. N-heteroaryl substituted derivatives of propanamide useful in the treatment of cardiovascular diseases, 5,438,046, Cl. 514-89.000.
- Norcini, Gabriele: See—  
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- Norimatsu, Noriko, to NEC Corporation. Radio telephone apparatus having call limiting function, 5,438,612, Cl. 379-58.000.
- Noritsu Koki Co., Ltd.: See—  
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- Nakashima, Yoshihiko, 5,438,383, Cl. 354-324.000.
- Norman, Robert D.: See—  
Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., 5,438,573, Cl. 371-10.300.
- Norman, Ronald W., to Honeywell Inc. High curvature antenna forming process, 5,437,091, Cl. 29-600.000.
- Normile, James O.; and Chu, Ke-Chiang, to Apple Computer, Inc. Method and apparatus for improving the security of an electronic codebook encryption scheme utilizing an offset in the pseudorandom sequence, 5,438,622, Cl. 380-46.000.
- Northern Telecom Limited: See—  
Jain, Praveen K., 5,438,497, Cl. 363-17.000.
- Northfield Laboratories, Inc.: See—  
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- Northrop Grumman Corporation: See—  
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- Nosenchuk, Daniel M.; and Brown, Garry L., to British Technology Group USA, Inc. Multiple electromagnetic tiles for boundary layer control, 5,437,421, Cl. 244-205.000.
- Noskas, Roger D.: See—  
McPherson, Mac E.; McPherson, Michael G.; Innocent, Kenneth L.; Parkos, Gary A.; and Noskas, Roger D., 5,437,333, Cl. 171-19.000.
- Notess, Mark H.; Warren, Scott J.; Heiserman, Tammy; and Kingdom, Michael A., to Hewlett-Packard Company. Object-action user interface management system, 5,438,639, Cl. 395-155.000.
- Novak, Richard E.: See—  
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- Novatel Communications, Ltd.: See—  
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- Novo-Invest Development Aktiengesellschaft: See—  
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- Novotny, Pavel, to Burroughs Wellcome Co. Antigenic preparation and isolation of such preparations, 5,438,120, Cl. 530-350.000.
- Noyes, Roger A.: See—  
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- NTP Incorporated: See—  
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- Nugent, Richard M., Jr.; Niederst, Ken W.; and Seiner, Jerome A., to PPG Industries, Inc. Gas barrier coatings of polyepoxide/polyamine products, 5,438,109, Cl. 525-526.000.
- NutraSweet Company, The: See—  
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- Nyman, Mark: See—  
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- O.E.T. Calusco S.r.l.: See—  
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- Oakes, Thomas R.; and Boufford, Thomas G., to Ecolab Inc. Peroxyacid antimicrobial composition, 5,437,868, Cl. 424-405.000.
- Oakley, Clyde G.: See—  
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- Obaishi, Hiroshi: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,438,045, Cl. 514-81.000.

- Oberloier, Nicole A.: See—  
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- Oberloier, Robert J.; and Oberloier, Nicole A. Adjustable clay cutter, 5,437,100, Cl. 30-116.000.
- Obrea, Andrei: See—  
Chang, Sung S.; Gilbertie, Mark A.; and Obrea, Andrei, 5,437,445, Cl. 271-263.000.
- Occidental Chemical Corporation: See—  
Kaplin, Ronald B.; Chen, Chao-Peng; and Bommaraju, Tilak V., 5,437,711, Cl. 95-182.000.
- Ochiai, Akihiko; Hashimoto, Makoto; Matsushita, Takeshi; Yamagishi, Machio; Sato, Hiroshi; and Shimano, Muneharu, to Siemens Aktiengesellschaft. Method and apparatus for semiconductor memory, 5,437,762, Cl. 216-20.000.
- Ocker, Klaus F.: See—  
Frantom, Richard; Bishop, Robert J.; Kremer, Robert; Ocker, Klaus F.; McGarry, Stephen P.; and Rogers, Will E., 5,437,188, Cl. 73-709.000.
- O'Connor, Michael T., Jr.: See—  
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- O'Connor, Sean P.: See—  
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- Oda, Tomohiro: See—  
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- Odagiri, Nobuyuki: See—  
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- Odier, Andre: See—  
Bonnardel, Patrick; Jacquemet, Bernard; Broize, Jean-Charles; and Odier, Andre, 5,438,176, Cl. 200-400.000.
- O'Donnell, Lester R. Windshield wiper assembly including an arm and pivotally mounted blade, 5,437,077, Cl. 15-250.330.
- Oetiker, Hans, to Hans Oetiker AG Maschinen-und Apparate-Fabrik. Hose clamp, 5,437,081, Cl. 24-20.000.
- Oftring, Alfred; Burkhardt, Bernd; Schwendemann, Volker; and Glaser, Klaus, to BASF Aktiengesellschaft. Production of nickelized shaped articles, 5,438,140, Cl. 546-147.000.
- Ogawa, Kazufumi; and Soga, Mamoru, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing a water- and oil-repelling film having surface irregularities, 5,437,894, Cl. 427-535.000.
- Ogawa, Kiyoshi: See—  
Tsumori, Koki; and Ogawa, Kiyoshi, 5,438,372, Cl. 348-365.000.
- Ogawa, Tomoya, to Fujitsu Limited. Version management method and apparatus in multi-window environment, 5,438,661, Cl. 395-157.000.
- Oh, Ju-Yeol, to SKC Limited. Magnetic tape cassette with an improved reel spring, 5,438,472, Cl. 360-132.000.
- Ohama, Shigeharu: See—  
Fujikawa, Tetsuzo; Hirata, Makizo; Ohama, Shigeharu; and Nishimura, Michio, 5,437,334, Cl. 172-15.000.
- Ohama, Yoshifumi; Chihara, Yoshihide; Honda, Yasufumi; and Miyamoto, Yasuhiro, to Nippon Oil and Fats Co., Ltd. Ultraviolet-curable coating composition, 5,438,080, Cl. 522-97.000.
- Ohashi, Kazuhito, to Canon Kabushiki Kaisha. Image signal apparatus including clamping processing of image signal, 5,438,558, Cl. 369-48.000.
- Ohata, Yosuke: See—  
Kobayashi, Masahiko; Akashi, Masakatsu; Hirobe, Junichi; Sugaya, Tautomu; Tanaka, Yoshihisa; Kusuda, Toshiaki; Makie, Ikuo; Aikawa, Yukihiko; Ishii, Satoshi; and Ohata, Yosuke, 5,438,390, Cl. 355-200.000.
- Ohe, Tomio; Katayama, Shigeru; and Itoh, Kenichiro, to Nitto Denko Corporation. Image-receiving paper, 5,437,917, Cl. 428-211.000.
- Ohio Electronic Engravers, Inc.: See—  
Holowko, Paul L.; Seitz, David R.; and Woods, Curtis, 5,438,422, Cl. 358-299.000.
- Ohio University: See—  
Butcher, Jared A., Jr.; and Kidwell, Huw, 5,438,078, Cl. 521-41.000.
- Ohkuwa, Naomi: See—  
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- Ohlson, April D.: See—  
Judy, Steven W.; Morey, Stephen J.; Ohlson, April D.; and Phelps, Weldon L., 5,438,489, Cl. 361-191.000.
- Ohmi, Tadashi. Method and device for measuring variation in decomposition rate of special material gas, 5,438,001, Cl. 436-34.000.
- Ohmori, Toshiyuki; Hatanaka, Shigemitsu; Homma, Yasuhiro; Saito, Eiichi; and Kamishioiri, Nobuyuki, to KAO Corporation. Article conveyor unit, 5,437,361, Cl. 198-465.100.
- Ohms, Franz, to ANT Nachrichtentechnik GmbH. Switching regulator with a push-pull resonance converter, 5,438,500, Cl. 363-24.000.
- Ohno, Koh: See—  
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- Oho, Shigeru; Hirayama, Takeshi; Matsumoto, Masahiro; Hasegawa, Akira; Hamano, Fumio; and Shibata, Takanori, to Hitachi, Ltd. Collective wiring system and method of control thereof, 5,438,506, Cl. 364-138.000.
- Ohsawa, Kenji; Ito, Makoto; and Nagano, Mutsumi, to Sony Corporation. Lead frame and manufacturing method therefor, 5,437,764, Cl. 216-14.000.
- Ohsawa, Toshiyuki: See—  
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- Ohsugi, Nobuyuki: See—  
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- Ohta, Kenji: See—  
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- Ohta, Koji: See—  
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- Ohtaguro, Masami: See—  
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- Ohtake, Norikazu: See—  
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- Ohtsuchi, Tetsuro; Sumihara, Masanori; Kawasaki, Osamu; Nishikura, Takahiro; Takeda, Katsu; Nojima, Takashi; and Imada, Katsumi, to Matsushita Electric Industrial Co., Ltd. Ultrasonic motor and ultrasonic motor control method, 5,438,229, Cl. 310-316.000.
- Ohtsuka, Yasuhiro: See—  
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- Oie, Yasunori; Hiramatsu, Mitsuru; Fujii, Yasushi; and Tanaka, Hidekazu, to Kabushiki Kaisha Toshiba. Quadrature amplitude modulation type digital radio communication device and method for preventing abnormal synchronization in demodulation system, 5,438,591, Cl. 375-261.000.
- Oikawa, Yoshiaki: See—  
Akagiri, Kenzo; Oikawa, Yoshiaki; and Tsutsui, Kyoya, 5,438,643, Cl. 395-2.100.
- Ojima, Futoshi: See—  
Kawata, Yutaka; Kusaka, Takuya; Hashizume, Hidehisa; and Ojima, Futoshi, 5,438,276, Cl. 324-765.000.
- Okada, Kazuhiro. Detector for force/acceleration/magnetism with respect to components in multi-dimensional directions, 5,437,196, Cl. 73-862.043.
- Okada, Shinjiro: See—  
Taniguchi, Osamu; Okada, Shinjiro; Inaba, Yutaka; Shindo, Hitoshi; and Shibata, Hirofumi, 5,438,443, Cl. 359-81.000.
- Okada, Shoji: See—  
Kakida, Takuya; Okada, Shoji; Nakamura, Yoshiaki; Mikami, Akira; Kimura, Akiyoshi; and Watanabe, Yuji, 5,437,529, Cl. 414-225.000.
- Okada, Tamotsu, to Canon Kabushiki Kaisha. Image fixing apparatus with energy cut-off, 5,438,392, Cl. 355-206.000.
- Okamoto, Kaoru; and Morita, Shinji, to Nippon Zoki Pharmaceutical Co., Ltd. Sialic acid derivatives, 5,438,125, Cl. 536-4.100.
- Okamoto, Toshihiko: See—  
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- Okamoto, Yoshiaki: See—  
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- Okaniwa, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device with heat dissipation structure, 5,438,212, Cl. 257-275.000.
- Okano, Haruo: See—  
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- Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, to Eisai Co., Ltd. 1,4-diazepine derivative and its pharmaceutical use, 5,438,045, Cl. 514-81.000.
- Okano, Yoshiaki; and Nakamura, Tetsuya, to Kabushiki Kaisha Toshiba. Image forming apparatus, 5,438,397, Cl. 355-269.000.
- Okarma, Thomas B.; Blankenship, John; Lin, Abraham T.; and Elkay, Mohammad A., to Applied Immune Sciences, Inc. Removal of selected factors from whole blood or its components; and prevention and treatment of septic shock syndrome, 5,437,861, Cl. 424-78.080.
- Okauchi, Tetsuo: See—  
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- Okayama, Shinobu: See—  
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- Okazaki, Masaki: See—  
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- Oki Electric Industry Co., Ltd.: See—  
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- Tadokoro, Kenji, 5,438,292, Cl. 327-206.000.
- Okimatsu, Hideaki; and Tamura, Yasunori, to Kyocera Corporation. Porous living body repairing member, and a method of imparting elasticity to it, 5,437,834, Cl. 419-24.000.



Okita, Hideyoshi: See—  
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Okonogi, Kenji: See—  
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Okumura, Hitoshi; and Nankou, Yuichi, to Sumitomo Wiring Systems, Ltd. Electrical connector assembly with an improved operating lever, 5,437,559, Cl. 439-310.000.

Okumura, Katsuya, to Kabushiki Kaisha Toshiba. Method and apparatus for treating a substrate, 5,437,733, Cl. 134-34.000.

Okumura, Mitsuhiro: See—  
Kogo, Yasuo; Ito, Takefumi; Okumura, Mitsuhiro; Yoshizaki, Kiyoshi; Fujihara, Takeji; and Yamashita, Hirofumi, 5,437,921, Cl. 428-288.000.

Old, Lloyd J.: See—  
Garin-Chesa, Pilar; Rettig, Wolfgang J.; and Old, Lloyd J., 5,437,865, Cl. 424-184.100.

Oldsen, John G.: See—  
Calandra, Frank, Jr.; Stankus, John C.; and Oldsen, John G., 5,437,830, Cl. 264-296.000.

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Culpepper, Will L.; and Oliff, James R., 5,437,143, Cl. 53-445.000.

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Olivera, Hector J.: See—  
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Ollivier, Jean-Francois: See—  
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Olmstead, Fred E.: See—  
Graef, Peter A.; Elston, Colin; Olmstead, Fred E.; Bolstad, Clifford R.; Bowns, Mark W.; Hunter, Frank R.; and Carney, Allan R., 5,437,418, Cl. 241-65.000.

Olsen, Ritchie: See—  
Taylor, Robert D.; Smith, Gary L.; and Olsen, Ritchie, 5,437,229, Cl. 102-288.000.

Olson, Robert J.; Liston, Max D.; and Harrison, Todd L., to Prolong Systems, Inc. Controlled atmosphere storage container, 5,437,837, Cl. 422-3.000.

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Eda, Yukio; Fujimoto, Hirohisa; Hisata, Nahoko; and Yukawa Hiroshi, 5,438,579, Cl. 372-34.000.

Kobayashi, Shohei; Miyazaki, Yasuhiro; and Fujiwara, Yasuhiro, 5,438,562, Cl. 369-110.000.

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Takatsuka, Seichi; Tsugita, Yukihiro; and Sato, Kyokuichi, 5,437,317, Cl. 141-312.000.

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Hayami, Katsuaki; Fujii, Hideo; Wada, Yoshihiro; Omori, Yoshiharu; Kubo, Kuniyasu; Konishi, Chizuko; and Takada, Yoshit-sugu, 5,438,183, Cl. 219-748.000.

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Omura, Takashi: See—  
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Ikeou, Shinei; Omura, Takashi; and Harada, Naoki, 5,438,137, Cl. 544-76.000.

Onda, Hiroyuki: See—  
Ito, Osamu; Yoshimoto, Kyosuke; Kiyose, Yoshihiro; Nakane, Kazuhiko; Mashimo, Akira; Onda, Hiroyuki; Yamana, Koji; and Nagata, Takuya, 5,438,557, Cl. 369-44.320.

Ong, Beng S.: See—  
Yu, Robert C. U.; and Ong, Beng S., 5,437,950, Cl. 430-58.000.

Onik, Gary: See—  
Baust, John G.; Chang, Zhao H.; Cohen, Jeffrey; Onik, Gary; and Reyes, George, 5,437,673, Cl. 606-23.000.

Ono, Kazuaki: See—  
Tanigawa, Koichi; Nakahata, Kimio; Takeuchi, Akihiko; Nanataki, Hideo; and Ono, Kazuaki, 5,438,398, Cl. 355-271.000.

Ono, Takao: See—  
Itoh, Ryoh; Yokoyama, Yukio; and Ono, Takao, 5,438,339, Cl. 343-702.000.

Oppenlaender, Knut: See—  
Mohr, Juergen; Oppenlaender, Knut; Pander, Hans J.; Schneider, Rolf; Thomas, Juergen; and Schreyer, Peter, 5,437,695, Cl. 44-418.000.

Opto Power Corporation: See—  
Patel, Rushikesh M.; and Ung, Michael M., 5,438,580, Cl. 372-36.000.

Optomic Technologies Corporation, LTD: See—  
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Orbanes, Philip E.: See—  
Baer, Ralph H.; and Orbanes, Philip E., 5,437,552, Cl. 434-317.000.

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Oriental Motor Co., Ltd.: See—  
Satomi, Hirobumi, 5,438,227, Cl. 310-14.000.

Orihashi, Ritsuro; Kendo, Kosuke; and Hayashi, Yoshihiko, to Hitachi, Ltd. Digital circuitry apparatus, 5,438,259, Cl. 324-158.100.

Orikasa, Yuichi; and Sakazume, Suehiro, to Nippon Petrochemicals Co., Ltd.; and Nippon Oil & Fats Co., Ltd. Thermoplastic resin composition, 5,438,098, Cl. 525-63.000.

Orion-yhtymä Oy: See—  
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Ormat Industries Ltd.: See—  
Bronicki, Lucien, 5,437,157, Cl. 60-655.000.

Ornstein, Leonard: See—  
Colella, Gregory M.; Ben-David, Daniel; Cupo, Albert; Fan, Sophie S.; Fischer, Gena; Martin, Grace E.; and Ornstein, Leonard, 5,438,003, Cl. 436-63.000.

OroAmerica, Inc.: See—  
Strobel, Kalman, 5,437,149, Cl. 59-80.000.

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Stern, Elliot L., 5,437,611, Cl. 602-16.000.

Ortlieb, Hartmut. Method for continuously manufacturing a waterproof zip closure, 5,437,888, Cl. 427-172.000.

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Yoshida, Ryouichi; Fujii, Hiroaki; Tsuji, Atsushi; Shimizu, Tomoko; Osada, Nobuya; and Yamanishi, Takahiro, 5,437,471, Cl. 280-730.200.

Osan, Frank: See—  
Helmer-Metzmann, Freddy; Osan, Frank; Schneller, Arnold; Ritter, Helmut; Ledjeff, Konstantin; Nolte, Roland; and Thorwirth, Ralf, 5,438,082, Cl. 522-149.000.

Osborn Engineering, Inc.: See—  
Bills, Marlin D.; and Chandler, Ron, 5,437,374, Cl. 209-288.000.

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Oshige, Takahiko: See—  
Kazama, Akira; Oshige, Takahiko; Yamada, Yoshiro; Yamada, Takeo; Yamazaki, Takeshi; Takayama, Takamitsu; and Nomura, Shuichiro, 5,438,415, Cl. 356-369.000.

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Carlos, Joseph M.; Carstensen, Thomas A.; Hall, William J.; and Osiecki, Larry J., 5,437,756, Cl. 156-245.000.

Osmani, Rashid M.: See—  
Schwent, Dale G.; Osmani, Rashid M.; and Weissappel, Robert N., 5,438,684, Cl. 455-89.000.

Osswald, Hartmut: See—  
Kleinschroth, Jurgen; Hartenstein, Johannes; Barth, Hubert; Schachte, Christoph; Rudolph, Claus; Weinheimer, Gunter; and Osswald, Hartmut, 5,438,050, Cl. 514-183.000.

Osswald, Mathias; Mederski, Werner; Dorsch, Dieter; Schelling, Pierre; Beier, Norbert; Lues, Ingeborg; and Minck, Klaus-Otto, to Merck Patent Gesellschaft Mit Beschränkter Haftung. Imidazopyridines as angiotensin II antagonists, 5,438,063, Cl. 514-303.000.

Ostendorf, Ward W.: See—  
Van Phan, Dean; Trokhan, Paul D.; Kelly, Stephen R.; Ostendorf, Ward W.; and Hersko, Bart S., 5,437,766, Cl. 162-127.000.

Ostrer, Aharon: See—  
Baror, Gigi; Beck, Moti; Biran, Dan; Cohen, Elliot; Hadas, Yair; Konstantin, Benny; Levy, Jonathan; Marko, Reuven; Ostrer, Aharon; Saban, Rami; Shackam, Alon; and Shahar, Boaz, 5,438,670, Cl. 395-403.000.

Ostromoukhov, Victor B. Method and apparatus for generating digital halftone images using a rotated dispersed dither matrix, 5,438,431, Cl. 358-457.000.

Oswalt, Ernest A.: See—  
Bhagat, Jai P.; Hays, William D.; and Oswalt, Ernest A., 5,438,610, Cl. 379-58.000.

Ota, Kiyoshi: See—  
Nishigaki, Tetsuo; Ota, Kiyoshi; and Nagano, Kae, 5,438,325, Cl. 340-825.240.

Ota, Michihiro; and Kojima, Takayuki, to Nippon Conlux Co., Ltd. Bill identification apparatus, 5,437,357, Cl. 194-206.000.

Ota, Shuichi: See—  
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Otsuka, Ichiro: See—  
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Otto, Neil C.: See—  
Hilston, Michael D.; and Otto, Neil C., 5,437,940, Cl. 429-103.000.

Ouellette, Joseph F., to Ouellette Machinery Systems, Inc. Air conveyor for bottles, 5,437,521, Cl. 406-88.000.

Ouellette Machinery Systems, Inc.: See—  
Ouellette, Joseph F., 5,437,521, Cl. 406-88.000.

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Towner, Stephen J.; Jahnke, Joel C.; Pierman, John A.; and Turk, Robert L., 5,437,155, Cl. 60-313.000.

Owen, Joseph L. Device for preventing free rotation of a wheel of a stationary vehicle, 5,437,171, Cl. 70-14.000.

Owens, Dana J.: See—  
Fields, Antony; Branson, Terry; Harrison, David J.; Owens, Dana J.; Raines, Aaron T.; and Rasmussen, Edward G., 5,437,635, Cl. 604-65.000.

Oyanagi, Shigeru, to Kabushiki Kaisha Toshiba. Neural network which uses a monitor, 5,438,645, Cl. 395-24.000.

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Bansal, Rekha P.; Gooding, Owen W.; Muehldorf, Alexander V.; and O-Yang, Counde, 5,438,150, Cl. 548-324.500.

Ozaki, Yukihiro; and Moro, Eiji, to Hitachi, Ltd. Video signal processing apparatus with image quality adjustment, 5,438,424, Cl. 358-336.000.

Ozaki, Yukiko; Shimotomai, Michio; Fukuda, Yasutaka; Fujita, Akira; Kitano, Yoko; and Shimomura, Junichi, to Kawasaki Steel Corporation. Corrosion-resistant rare earth metal-transition metal-boron permanent magnets, 5,437,741, Cl. 148-302.000.

Paek, Eung G.; and Salehi, Jawad A., to Bell Communications Research, Inc. Holographic code division multiple access, 5,438,440, Cl. 359-11.000.

Pafford, John A.: See—  
Sherman, Michael C.; Pafford, John A.; and Ashman, Richard B., 5,437,670, Cl. 606-61.000.

Pak, Sung S.; and Tolley, Archie N., to Babcock & Wilcox Company, The. Water-soluble pre-ceramic polymers and methods of their production, 5,437,852, Cl. 423-263.000.

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Geibel, Stephen A.; and Bhanot, Ashok K., 5,437,788, Cl. 210-333.010.

Rosenberg, Gary C.; and Gossett, Frank, 5,437,241, Cl. 116-268.000.

Palmer, Shelton L. Interactive system for processing viewer responses to television programming, 5,438,355, Cl. 348-1.000.

Palosi, Gabor: See—  
Humm, Siegfried; Palosi, Gabor; and Weidner, Karl, 5,438,523, Cl. 364-479.000.

Palsom, Bernhard O.: See—  
Emerson, Stephen G.; Clarke, Michael F.; and Palsom, Bernhard O., 5,437,994, Cl. 435-240.200.

Panometrics, Inc.: See—  
Lynnworth, Lawrence C., 5,437,194, Cl. 73-861.270.

Panasonic Technologies, Inc.: See—  
Lattibeaudiere, Derrick P., 5,438,535, Cl. 365-49.000.

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Mohr, Juergen; Oppenlaender, Knut; Pander, Hans J.; Schneider, Rolf; Thomas, Juergen; and Schreyer, Peter, 5,437,695, Cl. 44-418.000.

Panek, Jeffrey J.: See—  
Earl, George F.; Churchill, Jack; Panek, Jeffrey J.; and Hillman, Allen F., Jr., 5,437,561, Cl. 439-567.000.

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Panster, Peter; Gradl, Robert; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Formed, polymeric transition-metal complex catalysts with organosiloxane diphenylphosphine ligands, 5,438,111, Cl. 528-9.000.

Pantaleone, David P.: See—  
Kittleton, Jeanine R.; and Pantaleone, David P., 5,437,991, Cl. 435-128.000.

Panzica, Ignatius J., to Custom Chrome, Inc. Motorcycle speedometer-tachometer, 5,437,185, Cl. 73-493.000.

Paoli, Thomas L.; and Bour, David P., to Xerox Corporation. Dual polarization laser diode with quaternary material system, 5,438,584, Cl. 372-45.000.

Papageorge, Marc V.; Freyman, Bruce J.; Juskey, Frank J.; and Thome, John R., to Motorola, Inc. Integrated circuit package having a face-to-face IC chip arrangement, 5,438,224, Cl. 257-777.000.

Papierski, Paul E.; and Hauptmann, Frank J., to Innovative Orthopaedics, Manufacturing, Inc. Dynamic external fixator for the wrist, 5,437,667, Cl. 606-55.000.

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Pardoe, Fred W. Clothes dryer utilizing air conditioning waste heat, 5,437,106, Cl. 34-90.000.

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Park, Andrew D. Ballistic laminate structure in sheet form, 5,437,905, Cl. 428-105.000.

Park, Kabil. Door hinge, 5,437,079, Cl. 16-54.000.

Parker, Robert M.: See—  
Freese, T. Brent; and Parker, Robert M., 5,437,115, Cl. 49-465.000.

Parkos, Gary A.: See—  
McPherson, Mac E.; McPherson, Michael G.; Innocent, Kenneth L.; Parkos, Gary A.; and Niskas, Roger D., 5,437,333, Cl. 171-19.000.

Parkos, Joseph J., Jr.: See—  
Dansereau, Richard J.; Adinolfi, Robert G.; and Parkos, Joseph J., Jr., 5,437,724, Cl. 118-76.000.

Parks, Robert A.: See—  
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Parris, John R.: See—  
Wiegand, Patrick M.; Fisher, John F.; Parris, John R.; Ballard, Elizabeth S.; Sears, Courtland P., III; Schwarz, George W., Jr.; and Smith, Cloyd R., III, 5,437,179, Cl. 73-23.350.

Parsons, Christopher F.: See—  
MacPherson, Hugh; McNaughton, David; Croxford, Neal; and Parsons, Christopher F., 5,438,474, Cl. 361-158.000.

Partridge, John J.: See—  
Bray, Brian L.; Lichty, Maynard E.; Partridge, John J.; and Turnbull, John P., 5,438,132, Cl. 536-55.300.

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Passaretti, Keith: See—  
Boenke, Marke; Clegg, Derek; Gittelsohn, Mike; Passaretti, Keith; and Seymour-Marks, Audrey, 5,438,653, Cl. 395-131.000.

Pastel, Michael J.: See—  
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Patzke, Ottokar: See—  
Karbach, Bernhard; Patzke, Ottokar; and Prause, Reinhard, 5,437,187, Cl. 73-635.000.

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Quintana, Jorge A.; Russell, Thomas R.; Paul, Ronald D.; and Fischer, Timothy J., 5,437,985, Cl. 435-7.240.

Paulson, Kerry K.; Kerr, Charles E.; and Heinsch, Paul A., to Jugs, Inc. Ball pitching device, 5,437,261, Cl. 124-78.000.

Pavlin, Antoine; and Sicaudeau, Jean-Louis, to SGS-Thomson Micro-electronics S.A. Circuit for detecting and open load, 5,438,286, Cl. 327-50.000.

PCM Pumps: See—  
Papin, Jean-Paul, 5,437,218, Cl. 92-13.200.

Peake, Charles D., to PVM Enterprises, L.L.C. Self-storing shoe cleaning brush, 5,437,075, Cl. 15-161.000.

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Lee, Paul S. C.; Chow, Pei-Ming D.; Berenz, John J.; Pearlman, Jay S.; and Lam, Wayne W., 5,438,336, Cl. 342-174.000.

Pease, Roger F. W.: See—  
von Bunau, Rudolf M.; and Pease, Roger F. W., 5,438,204, Cl. 250-492.200.

Peay, Thomas H.; and Schrader, Donald E., to Nashville Wire Products Co. System for dividing a wire deck, 5,437,380, Cl. 211-184.000.

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Farr, Robert A.; and Peet, Norton P., 5,438,069, Cl. 514-1.000.

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Pennucci, John: See—  
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Per-Lee, Myra S. Applicator device, 5,437,372, Cl. 206-581.000.

Pereira, Joseph: See—  
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Perez, Anthony R.: See—  
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Performance Contracting, Inc.: See—  
Gumangan, Marcelino A.; Bleigh, James M.; and Dwyer, Paul M., 5,437,312, Cl. 138-149.000.

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Burton, Steven C.; Perilli, Richard A.; and Perilli, Kenneth T., 5,438,698, Cl. 455-351.000.

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Witt, Alvin E.; Tomasko, Joseph E.; and Humphreys, Matthew F., 5,437,934, Cl. 428-537.100.

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Shimamune, Takayuki; Nakajima, Yasuo; Nakamatsu, Shuji; Nishiki, Yoshinori; and Wakita, Shuhei, 5,437,771, Cl. 204-84.000.

Person, Dennis W., to Ford Motor Company. System for selecting the operating ranges of an automatic transmission, 5,437,204, Cl. 74-335.000.

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- Peterson, Bruce A., to Molex Incorporated. Female electrical terminal. 5,437,567, Cl. 439-851.000.
- Peterson, Gary: See—  
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- Peterson, John R.: See—  
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- Peterson, Steven H.: See—  
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- Petroleo Brasileiro S.A. - PETROBRAS: See—  
Da Silva, Jose Eduardo M.; Lino, Antonio Carlos F.; Machado Filho, Zephyrino L.; and Teixeira, Marcelo Jose B., 5,437,302, Cl. 137-242.000.
- Petruno, Patrick: See—  
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- Peyman, Gholam A.: See—  
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- Peyron, Jean-Marc: See—  
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- Pfefferle, William C. Catalytic method. 5,437,152, Cl. 60-274.000.
- Pfeifer, Thomas J.: See—  
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- Pfizer Inc.: See—  
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- Phadke, Deepak S.; and Neddermeyer, Melissa P., to Merrell Dow Pharmaceuticals Inc. Superior tasting pharmaceutical composition having porous particles and the process of preparing such pharmaceutical composition. 5,437,873, Cl. 424-465.000.
- Phelps, Weldon L.: See—  
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- Philips Electronics North America Corporation: See—  
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- Phillips Petroleum Company: See—  
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- Fahey, Darrell R.; Decker, Owen H.; Ash, Carlton E.; Geibel, Jon F.; Vidaurri, Fernando C., Jr.; Scoggins, Lacey E.; Hensley, Harvey D.; Shang, Wei-Teh W.; Straw, Jimmie J.; and DesLauriers, Paul J., 5,438,115, Cl. 528-388.000.
- Reagen, William K.; and McDaniel, Max P., 5,438,027, Cl. 502-117.000.
- Phillips, Richard E.; Moore, Mark A.; Russell, Ruth L.; and Cheung, David, to Carbomedica, Inc. Sterilization of tissue implants using iodine. 5,437,287, Cl. 128-898.000.
- Phillips, Tony L.: See—  
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- Pialet, Joseph W.: See—  
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- Picker International, Inc.: See—  
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- Pierce Manufacturing Inc.: See—  
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- Pierman, John A.: See—  
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- Piet, Gerard: See—  
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- Pietruska, Norman: See—  
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- Pike-Bieganski, Maciej J. Process for fabricating diamond by supercritical electrical current. 5,437,243, Cl. 117-49.000.
- Pilkington Glass Limited: See—  
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- Pillar Technologies, Inc.: See—  
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- Ring, Patrick S. Child carrier. 5,437,402, Cl. 224-159.000.
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- Risley, John: See—  
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- Rist, Pamela J. Method of forming a three-dimensional decorative item. 5,437,829, Cl. 264-153.000.
- Ritchie, Cameron J.: See—  
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- Ritchie, Paul G.: See—  
White, Bradley E.; Parks, Robert A.; and Ritchie, Paul G., 5,438,271, Cl. 324-444.000.
- Ritsche, Stefan, to Ing. Erich Pfeiffer GmbH & Co. KG. Media dispenser with isolated pump restoring system. 5,437,398, Cl. 222-321.800.
- Ritter, Helmut: See—  
Helmer-Metzmann, Freddy; Osan, Frank; Schneller, Arnold; Ritter, Helmut; Ledjeff, Konstantin; Nolte, Roland; and Thorwirth, Ralf, 5,438,082, Cl. 522-149.000.
- Riverie, Jean: See—  
Bargain, Raymond; Riverie, Jean; and Ollivier, Jean-Francois, 5,437,556, Cl. 439-66.000.
- Rivers, Alan: See—  
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- Robert Bosch GmbH: See—  
Schleupen, Richard; Bentel, Ulrich; Heyke, Klaus; and Nelle, Ulrich, 5,438,268, Cl. 324-399.000.
- Schmid, Heinrich; and Von Ohr, Margret S., 5,438,487, Cl. 362-61.000.

- Suchowerskyj, Wadym; Kaesser, Jurgen; and Braegs, Peter, 5,438,687, Cl. 455-158.400.
- Roberts, Alan B.; and Arakaki, James S., to Verifone Inc. Method and apparatus for electronic cash transactions. 5,438,184, Cl. 235-380.000.
- Roberts, John T.: See—  
Mattson, Larry J.; Roberts, John T.; Monsees, Claude E.; and Kanna, Les J., 5,437,594, Cl. 493-88.000.
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- Roberts, Victor D.: See—  
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- Robertshaw Controls Company: See—  
Katchka, Jay R., 5,437,548, Cl. 431-66.000.
- Robertson, John S.: See—  
Jackson, Fred L.; McHugh, Kevin P.; and Robertson, John S., 5,437,922, Cl. 428-288.000.
- Robichaux, Jerry D.: See—  
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- Rochling Haren KG: See—  
Herbst, Thomas; Bolmer, Berthold; von Grolman, Hartmut; Luger, Anton; and Schnitzler, Lorenz, 5,437,526, Cl. 411-366.000.
- Rockstroh, Todd J.; and Mannava, Seetharamaiah, to General Electric Company. Method and apparatus for material processing with a laser controlled by a holographic element. 5,438,441, Cl. 359-15.000.
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Hays, Kenneth M., 5,437,739, Cl. 148-33.300.
- Khoshnevisan, Mohsen; Motamedi, Manouchehr E.; and Neurgonkar, Ratnakar R., 5,438,231, Cl. 310-321.000.
- Rodriguezferre, Jose M. Structure for children's games. 5,437,573, Cl. 472-116.000.
- Roger Bullivant of Texas, Inc.: See—  
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- Rogers, Will E.: See—  
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- Roh, Young H.: See—  
Kim, Jung H.; Kim, Hyung S.; Lee, Byeong H.; Roh, Young H.; and Chung, Hae Y., 5,438,507, Cl. 364-140.000.
- Rohm Co., Ltd.: See—  
Fujimoto, Hisayoshi, 5,438,346, Cl. 347-211.000.
- Kuga, Kaeko, 5,438,453, Cl. 359-636.000.
- Masumoto, Hiroaki, 5,438,279, Cl. 326-38.000.
- Rohrka, Heinz-Werner; Sieben, Lothar; Mueller, Rolf; and Funk, Wolfgang, to Wolff Walrode AG. Coated film for packaging sliced foodstuffs. 5,437,911, Cl. 428-195.000.
- Rohto Pharmaceutical Co., Ltd.: See—  
Miyazaki, Hirohisa; Fujinaga, Kumiko; and Tanaka, Hitoshi, 5,438,060, Cl. 514-258.000.
- Rokutan, Takao: See—  
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- Rolando, Emil: See—  
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- Rolfson, J. Brett: See—  
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- Romana, Laurence J.: See—  
Boatner, Lynn A.; Rankin, Janet; Thevenard, Paul; and Romana, Laurence J., 5,437,729, Cl. 134-1.000.
- Romano, Antonio, to Campagnolo S.r.l. Sprocket assembly for bicycles. 5,437,582, Cl. 474-156.000.
- Romano, Ellen R.: See—  
Halout, Nowaf; Kavoulakis, Alexandra M.; and Romano, Ellen R., 5,437,767, Cl. 162-145.000.
- Romenesko, David J.: See—  
Liles, Donald T.; Lee, Kenneth M.; Romenesko, David J.; White, James W.; and Murray, David L., 5,438,097, Cl. 525-63.000.
- Romick, Jerome M. Medication control and dispensing package assembly. 5,437,390, Cl. 220-768.000.
- Romine, H. Ernest: See—  
Southard, W. Mark; Romine, H. Ernest; Nanni, Edward J.; and Carel, Mark W., 5,437,780, Cl. 208-45.000.
- Romy, Neil J.: See—  
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- Roose, Lars D., to United States of America. Energy. Process of modifying a cable end. 5,437,831, Cl. 264-322.000.
- Rorer, Morris P.: See—  
Drumm, Joseph E.; Lett, Renee M.; Rayner, Dennis R.; Rorer, Morris P.; and Tseng, Chi-Ping, 5,438,033, Cl. 504-130.000.
- Rosa, Mark R.: See—  
Sweet, Robert P.; Rosa, Mark R.; Vigdorovich, Alexander; Kovacs, James E.; and Geraghty, Patrick J., 5,437,537, Cl. 414-400.000.
- Rose, Helen: See—  
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- Rose, Richard S.: See—  
Wang, Jin-liang; Favstitsky, Nicolai A.; and Rose, Richard S., 5,438,096, Cl. 524-832.000.
- Rosen, Arthur L.: See—  
Zheng, Shuming; Beissinger, Richard L.; Wasan, Darsh T.; Sehgal, Lakshman R.; and Rosen, Arthur L., 5,438,041, Cl. 514-6.000.
- Rosen, Harold A., to Hughes Aircraft Company. High torque double gimbal control moment gyro. 5,437,420, Cl. 244-165.000.
- Rosenberg, Gary C.; and Gossett, Frank, to Pall Corporation. Differential pressure indicator. 5,437,241, Cl. 116-268.000.
- Rosenberg, Louis B.; and Jackson, Bernard G., to Immersion Human Interface Corporation. Percussion input device for personal computer systems. 5,438,529, Cl. 364-709.100.
- Rosenthal, Robert D.; and Yabe, Ryoichi, to Futrex, Inc. Method and apparatus for restraining finger motion in blood analyte optical measurement. 5,438,201, Cl. 250-341.100.
- Roshanravan, Mel, to Darling International. Apparatus for dissolved gas flotation in anaerobic wastewater treatment. 5,437,785, Cl. 210-95.000.
- Ross, Roger A.; and Jennings, Uel D., to Conoco Inc. Pitch carbon fiber spinning process. 5,437,927, Cl. 428-367.000.
- Rosselson, Boris: See—  
Esin, Alex; Jones, Lawrence J.; Rosselson, Boris; and Sorenson, Martin N., 5,437,178, Cl. 73-1.0DV.
- Rother, Wolfgang: See—  
Kupper, Detlev; and Rother, Wolfgang, 5,437,721, Cl. 106-739.000.
- Roumagnac, Jean-Patrick; Naveros, Francisco; and Timmermans, Jacques, to Barriquand Steriflow. System for supporting objects inside a rotating drum. 5,437,846, Cl. 422-297.000.
- Rowley, David S.: See—  
Snoke, Phillip J.; Rowley, David S.; Lincoln, David G.; and Charles, Kirk W., 5,437,636, Cl. 604-95.000.
- Royce Medical Company: See—  
Grim, Tracy E., 5,437,614, Cl. 602-19.000.
- Rozman, Christopher J.; and Salzman, Scott W., to U.S. Robotics, Inc. Modem management techniques. 5,438,614, Cl. 379-93.000.
- Rozman, Gregory I.; and Risley, John. VSCF system with voltage estimation. 5,438,502, Cl. 363-35.000.
- RTC Industries, Inc.: See—  
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- Ruck, Wolf E. Viscous liquid dispenser. 5,437,394, Cl. 222-96.000.
- Rudi, Guttorm, to Tandberg Data A/S. Method and apparatus for coarse and fine positioning a magnetic head with three piezoelectric elements arranged in a tripod arrangement. 5,438,469, Cl. 360-109.000.
- Rudolph, Claus: See—  
Kleinschroth, Jurgen; Hartenstein, Johannes; Barth, Hubert; Schachtele, Christoph; Rudolph, Claus; Weinheimer, Gunter; and Osswald, Hartmut, 5,438,050, Cl. 514-183.000.
- Rudoy, Edward; and Kerek, Leslie, to G & H Technology, Inc. Cell bypass switch. 5,438,173, Cl. 200-52.00R.
- Ruetz, Brigitte, to Canon Information Systems, Inc. Color printing method and apparatus which compensates for Abney effect. 5,438,649, Cl. 395-109.000.
- Runge, Thomas M. Blood conduit and pulsatile cardiopulmonary bypass pump system. 5,437,601, Cl. 600-16.000.
- Russell, Dale D.; and Bears, James C., to Hewlett-Packard Company. Dye-polymer toners for electrophotography. 5,437,953, Cl. 430-106.000.
- Russell, Larry R.: See—  
Sanders, Jesse R.; and Russell, Larry R., 5,437,489, Cl. 294-88.000.
- Russell, Ruth L.: See—  
Phillips, Richard E.; Moore, Mark A.; Russell, Ruth L.; and Cheung, David, 5,437,287, Cl. 128-898.000.
- Russell, Thomas R.: See—  
Quintana, Jorge A.; Russell, Thomas R.; Paul, Ronald D.; and Fischer, Timothy J., 5,437,985, Cl. 435-7.240.
- Russell, William C.: See—  
Emerson, H. Brad; Kalwitz, George A.; Takahashi, Natsuko; Russell, William C.; and Luther, Willis J., 5,438,528, Cl. 364-580.000.
- Russillo, Donald: See—  
Russillo, Rhonda L.; and Russillo, Donald, 5,437,396, Cl. 222-185.100.
- Russillo, Rhonda L.; and Russillo, Donald. Dispenser apparatus. 5,437,396, Cl. 222-185.100.
- Rust, David M., to Johns Hopkins University. The integrated dual imaging detector. 5,438,414, Cl. 356-364.000.
- Rutter, William J.; and Santi, Daniel V., to University of California. The Regents of The. Method of obtaining a peptide with desired target property. 5,438,119, Cl. 530-333.000.
- RXS Schrupftechnik Garnituren GmbH: See—  
Richardt, Uwe, 5,438,163, Cl. 174-76.000.
- Ryan, John O.; Quan, Ronald; Holzgrafe, James R.; and Wonfor, Peter J., to Macrovision Corporation. Method and apparatus for scrambling and descrambling of video signal with edge fill. 5,438,620, Cl. 380-15.000.
- Ryan, Terence E.; Saeed, Badr; Kieselburg, Mark K.; Byrne, Robert E.; Stevens, Priscilla W.; Arima, Terukatsu; and Todd, John, to Dade International Inc. DNA sequence and encoded polypeptide useful in the diagnosis of hepatitis disease. 5,437,974, Cl. 435-5.000.
- Ryntz, Rose A.: See—  
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- Ryobi North America, Corp.: See—  
Everts, Robert G.; Kai, Nobuto; and Nemazi, John E., 5,437,571, Cl. 451-344.000.
- S.A.I.A. S.p.A.: See—  
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S&C Electric Company: See—  
Borchardt, Glenn R.; Swanson, Roy T.; and Barker, James W., Jr., 5,438,161, Cl. 174-52.200.

S.T. Technologies, Inc.: See—  
Townsend, David M., 5,437,701, Cl. 55-486.000.

Saban, Rami; Efendovich, Avner; and Karpati, Varda, to National Semiconductor Corporation. Digital frequency multiplier utilizing digital controlled oscillator. 5,438,300, Cl. 331-16.000.

Saban, Rami: See—  
Baror, Giti; Beck, Moti; Biran, Dan; Cohen, Elliot; Hadas, Yair; Konstantin, Benny; Levy, Jonathan; Marko, Reuven; Ostrer, Aharon; Saban, Rami; Shackam, Alon; and Shahar, Boaz, 5,438,670, Cl. 395-403.000.

Sabo, Darrick Karl; and Sabo, Susan Jane. Washing machine lint strainer. 5,437,789, Cl. 210-357.000.

Sabo, Susan Jane: See—  
Sabo, Darrick Karl; and Sabo, Susan Jane, 5,437,789, Cl. 210-357.000.

Sacharoff, Alex C.: See—  
Muller, David F.; and Sacharoff, Alex C., 5,437,658, Cl. 606-5.000.

Sachulz, Charles E.: See—  
Hamilton, Stephen B.; Jakitsch, James J.; Reed, Christopher J.; Sachulz, Charles E.; Schulze, Robert R.; Debelius, Leslie H.; and McNeis, Niall B., 5,438,404, Cl. 356-152.200.

Sadley, Mark L.; and Dean, David A. Fuel injection sytem employing solid-state injectors for liquid fueled combustion engines. 5,437,255, Cl. 123-472.000.

Saeed, Badr: See—  
Ryan, Terence E.; Saeed, Badr; Kieselburg, Mark K.; Byrne, Robert E.; Stevens, Priscilla W.; Arima, Terukatsu; and Todd, John, 5,437,974, Cl. 435-5.000.

Saeki, Takanori, to NEC Corporation. Method of reliably and readily manufacturing a semiconductor device having a cylindrical electrode. 5,438,010, Cl. 437-52.000.

Safety Syringes, Inc.: See—  
Firth, John R.; and Perez, Anthony R., 5,437,647, Cl. 604-110.000.

Safety 1st, Inc.: See—  
Bernstein, Michael S.; Crossley, David W.; Abrams, Randy L.; and Johnson, Jerry E., 5,437,067, Cl. 5-426.000.

Sagano, Hideki, to Yamaichi Electronics Co., Ltd. IC socket. 5,437,557, Cl. 439-72.000.

Sage Products, Inc.: See—  
Bates, David A.; and Skiba, Barbara T., 5,437,273, Cl. 128-207.170.

Sagisaka, Katsumi: See—  
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Sahara, Kenji: See—  
Narui, Hironobu; Doi, Masato; Sahara, Kenji; and Matsuda, Osamu, 5,438,583, Cl. 372-45.000.

Saida, Muneco; Hirasawa, Yutaka; and Yoshimura, Katsuhiro, to Mitsui Mining & Smelting Co., Ltd. Copper-clad laminate and printed wiring board. 5,437,914, Cl. 428-209.000.

Saida, Yoshihiro: See—  
Murai, Fumio; Suzuki, Yasunori; Tomozawa, Hideki; Takashi, Ryuma; Saida, Yoshihiro; and Ikenoue, Yoshiaki, 5,437,893, Cl. 427-498.000.

Saijo, Eiji: See—  
Atsumi, Keigo; and Saijo, Eiji, 5,437,565, Cl. 439-752.000.

Saikawa, Satoshi: See—  
Kawakami, Hideaki; Kiyohara, Takehiko; Suzuki, Tetsuo; Asano, Junichi; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Saikawa, Satoshi; and Kinoshita, Hiroyuki, 5,437,444, Cl. 271-22.000.

Sainen, Tsutomu, to Tsudakoma Kogyo Kabushiki Kaisha. Warp feed controller having tension detectors for use in twin beam weaving machine. 5,437,314, Cl. 139-103.000.

St. Martin, Marty. Method of washing produce. 5,437,731, Cl. 134-10.000.

Saito, Eiichi: See—  
Ohmori, Toshiyuki; Hatanaka, Shigemi; Homma, Yasuhiro; Saito, Eiichi; and Kamishioiri, Nobuyuki, 5,437,361, Cl. 198-465.100.

Saito, Hiroshi, to Canon Kabushiki Kaisha. Optical scanning apparatus. 5,438,450, Cl. 359-216.000.

Saito, Hiroyuki: See—  
Kawakami, Hideaki; Kiyohara, Takehiko; Suzuki, Tetsuo; Asano, Junichi; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Saikawa, Satoshi; and Kinoshita, Hiroyuki, 5,437,444, Cl. 271-22.000.

Saito, Masaki, to Tokai Corporation. Gas lighter with safety device. 5,437,549, Cl. 431-153.000.

Saito, Rie: See—  
Kuriyayashi, Ikuro; and Saito, Rie, 5,438,400, Cl. 355-299.000.

Saito, Susumu, to Fuji Xerox Co., Ltd. Toner composition for electrophotography with zinc oxide additive. 5,437,954, Cl. 430-110.000.

Saito, Tatsuhiro: See—  
Sasaoka, Eisuke; Kanamori, Hiroo; Suganuma, Hiroshi; Ishikawa, Shinji; and Saito, Tatsuhiro, 5,438,640, Cl. 385-43.000.

Saito, Yoshiharu; Sakaizawa, Masao; Iwanami, Kunio; Kitano, Kitsusho; Tasaka, Michihisa; Kawazu, Kenji; Miyazaki, Shizuo; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, to Tonen Chemical Corporation; and Toyota Jidosha Kabushiki Kaisha. Resin composition having excellent paint coatibility. 5,438,091, Cl. 524-505.000.

Saitoh, Tadashi: See—  
Taniai, Takayoshi; Tanaka, Yasuhiro; and Saitoh, Tadashi, 5,438,665, Cl. 395-845.000.

Saitoh, Toshihide, to Sony Corporation. Portable apparatus for printing an image on film and displaying the image on a screen. 5,438,434, Cl. 358-487.000.

Sakaizawa, Masao: See—  
Saito, Yoshiharu; Sakaizawa, Masao; Iwanami, Kunio; Kitano, Kitsusho; Tasaka, Michihisa; Kawazu, Kenji; Miyazaki, Shizuo; Nomura, Takao; Nishio, Takeyoshi; and Iwai, Hisayuki, 5,438,091, Cl. 524-505.000.

Sakakibara, Masayoshi: See—  
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Sakamoto, Kazuhide: See—  
Bando, Takashi; Sakamoto, Kazuhide; Masuda, Hiromu; and Iwata, Hiroshi, 5,437,769, Cl. 162-301.000.

Sakane, Yukio; and Kitamura, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Method of making a rotor of an inductor type alternating current generator. 5,437,090, Cl. 29-598.000.

Sakano, Tomiaki: See—  
Nishimura, Tomoko; Sakano, Tomiaki; and Murano, Katsuhiro, 5,438,448, Cl. 359-214.000.

Sakata, Toshikazu, to Oki Electric Industry Co., Ltd. Semiconductor integrated circuit device. 5,438,551, Cl. 365-233.500.

Sakawa Co., Ltd.: See—  
Sakawa, Katsuki, 5,437,065, Cl. 4-342.000.

Sakawa, Katsuki, to Sakawa Co., Ltd. Booths for toilets. 5,437,065, Cl. 4-342.000.

Sakazume, Suehiro: See—  
Orikasa, Yuichi; and Sakazume, Suehiro, 5,438,098, Cl. 525-63.000.

Sakiyama, Kazuhiro, to Nakamichi Corporation. Disc player with disc storage and sensing apparatus. 5,438,534, Cl. 369-36.000.

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Sakuma, Yoshimori: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,438,045, Cl. 514-81.000.

Sakurada, Takefumi: See—  
Oshiba, Mitsu; Sakurada, Takefumi; Tani, Naoki; Sugaya, Takumi; and Rokutan, Takao, 5,438,563, Cl. 369-124.000.

Sakuraoka, Masahiko; Hara, Kouichi; Kuwabara, Kiyoshi; and Umematsu, Misao, to Fujitsu Limited. Connector having skirt with holes to receive plug pins and alignment pin. 5,437,558, Cl. 439-140.000.

Salehi, Jawad A.: See—  
Paek, Eung G.; and Salehi, Jawad A., 5,438,440, Cl. 359-11.000.

Salganik, Viktor M.; Starkov, Anatoly I.; Gun, Igor G.; Povariich, Alexandr V.; and Idelchik, Leonid B., to Magnitogorsky Metallurgichesky Kombinat Imeni V.I. Lenina. Method and apparatus for continuous production hot-rolled strips. 5,437,089, Cl. 29-527.700.

Saliez, Jean-Philippe; Hoblingre, Andre; and Henique, Christian, to ECIA - Equipment et Composants pour l'Industrie Automobile. Steering column assembly, in particular for motor vehicles. 5,437,350, Cl. 180-287.000.

Salomon S.A.: See—  
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Salonen, Tapio: See—  
Yli-Vakkuri, Erkki; Kaonpaa, Arto; Salonen, Tapio; and Nikkanen, Jukka, 5,437,704, Cl. 65-107.000.

Salvino, Carmen M. Spin axis weighted bowling ball. 5,437,579, Cl. 473-126.000.

Salzman, Scot W., to U.S. Robotics, Inc. Flash memory module. 5,438,536, Cl. 365-52.000.

Salzman, Scot W.: See—  
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Sam, Huy: See—  
Shinohara, Satoru; Nakamura, Yoshinori; and Sam, Huy, 5,438,031, Cl. 503-227.000.

SamSung Electronics Co., Ltd.: See—  
Chang, Shi H., 5,438,377, Cl. 348-731.000.

Kim, Cheon-seob, 5,438,425, Cl. 358-336.000.

Kim, Han-soo, 5,438,540, Cl. 365-174.000.

Kim, Tae-Sig; and Yu, Jang-Hyun, 5,438,247, Cl. 318-696.000.

Kim, Yun-gi; and Lee, Jeung-gil, 5,438,013, Cl. 437-60.000.

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Samuelson, Laurence S.: See—  
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Samuelson, Lynne A.: See—  
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Sanchem, Inc.: See—  
Bibber, John W., 5,437,740, Cl. 148-273.000.

Sandbagger Corp. The: See—  
Kanzler, Estacia; and Eiler, Jack D., 5,437,318, Cl. 141-313.000.

Sanders, Brian C.; and Cram, Peter F., to Ultrablend Systems, Inc. Spring-compensated ball retaining device. 5,437,505, Cl. 366-209.000.

Sanders, Jesse R.; and Russell, Larry R. Fluid-operated pipe clamp. 5,437,489, Cl. 294-88.000.

Sandhu, Gurtej S., to Micron Semiconductor, Inc. Large area thin film growing method. 5,438,019, Cl. 437-101.000.

Sandoz Nutrition Ltd.: See—  
Schmidl, Mary K.; and Kvamme, Candis, 5,438,042, Cl. 514-21.000.

Sano, Hideo; Yoneyama, Tomio; Murata, Yukichi; and Yamada, Masahiro, to Mitsubishi Kasei Corporation. Recording liquid. 5,437,716, Cl. 106-22.00K.

Santa Barbara Research Center: See—  
Thornton, Donald D., 5,438,200, Cl. 250-338.400.

Santangelo, Francesco; Casagrande, Cesare; and Norcini, Gabriele, to Zambon Group S.p.A. Diphosphates of catecholamines and pharmaceutical compositions containing them. 5,438,047, Cl. 514-104.000.

Santangelo, Francesco: See—  
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Santi, Daniel V.: See—  
Rutter, William J.; and Santi, Daniel V., 5,438,119, Cl. 530-333.000.

Santor, Robert V., to Torrington Company, The. Rocker arm assembly. 5,437,209, Cl. 74-559.000.

Sanyo Electric Co., Ltd.: See—  
Hayami, Katsuki; Fujii, Hideo; Wada, Yoshihiro; Omori, Yoshiharu; Kubo, Kuniyasu; Konishi, Chizuko; and Takada, Yoshitsugu, 5,438,183, Cl. 219-748.000.

Nagao, Fumiaki; and Takano, Koji, 5,438,532, Cl. 364-724.160.

Tabuchi, Junichiro, 5,438,362, Cl. 348-211.000.

Saris, Frans W.: See—  
Koudijs, Reijer; Mulder, Marcel M.; Purser, Kenneth H.; and Saris, Frans W., 5,438,194, Cl. 250-288.000.

Sasabe, Toru; and Sumi, Emiko, to Matsushita Electric Industrial Co., Ltd. Video switching circuit and television receiver incorporating thereof. 5,438,375, Cl. 438-706.000.

Sasaki, Katsuhiko; Ninnomi, Mitsuyoshi; and Shibata, Yoshinori, to Makita Corporation. Miter saw. 5,437,214, Cl. 83-471.300.

Sasaki, Masayoshi, to Sony Corporation. Static random access memory which has a pair of thin film transistors and wherein the capacitance and resistance between the gate electrodes and the conductor layers are increased so as to reduce the time constant between them. 5,438,537, Cl. 365-154.000.

Sasaoka, Eisuke; Kanamori, Hiroo; Suganuma, Hiroshi; Ishikawa, Shinji; and Saito, Tatsuhiro, to Sumitomo Electric Industries, Ltd. Optical waveguide device for receiving functional component. 5,438,640, Cl. 385-43.000.

SAT (Societe) Anonyme de Telecommunications: See—  
Karam, Georges; and Jacquart, Jean-Louis, 5,438,593, Cl. 375-317.000.

Satake, Shinichi: See—  
Iizuka, Masanori; Taniguchi, Takao; Isobe, Kazuo; Tamaki, Sayuri; Yamashita, Tadakazu; and Satake, Shinichi, 5,437,693, Cl. 44-302.000.

Sato, Hideharu: See—  
Asou, Yoshio; Hayashi, Bunya; Sato, Hideharu; Matsumoto, Takumi; Ishikawa, Makoto; Kaneko, Ryushiro; Shimauchi, Keisuke; and Yoshimura, Shinichi, 5,437,306, Cl. 137-625.640.

Sato, Hiroshi: See—  
Ochiai, Akihiko; Hashimoto, Makoto; Matsushita, Takeshi; Yamagishi, Machio; Sato, Hiroshi; and Shimanoe, Muneharu, 5,437,762, Cl. 216-20.000.

Sato, Kyokuichi: See—  
Takatsuka, Seiichi; Tsugita, Yukihiro; and Sato, Kyokuichi, 5,437,317, Cl. 141-312.000.

Sato, Minoru: See—  
Akiyama, Heiemon; and Sato, Minoru, 5,437,142, Cl. 53-415.000.

Akiyama, Heiemon; and Sato, Minoru, 5,437,144, Cl. 53-466.000.

Sato, Naofumi; Mochizuki, Hiroshi; and Kanamori, Toshinori, to Mochida Pharmaceutical Co., Ltd. Acridinium compounds and conjugates thereof. 5,438,139, Cl. 546-102.000.

Sato, Susumu: See—  
Nakatsuji, Masahiro; and Sato, Susumu, 5,438,455, Cl. 359-748.000.

Shimizu, Makoto; Suzuki, Mituru; Sato, Susumu; Takahashi, Koichi; and Esaki, Toshiro, 5,437,828, Cl. 261-152.000.

Sato, Toshihiko; Takizawa, Tsuyoshi; Iwata, Yoichi; Ito, Hiroshi; and Nakayama, Takayoshi, to Honda Giken Kogyo Kabushiki Kaisha. Misfire-detecting system for internal combustion engines. 5,437,154, Cl. 60-276.000.

Sato, Yasuo: See—  
Egawa, Yuichi; and Sato, Yasuo, 5,438,214, Cl. 257-388.000.

Satoh, Hiroshi: See—  
Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, 5,437,835, Cl. 420-421.000.

Satoh, Masaaki; Kuroda, Akinori; and Asai, Masashi, to Abushiki Kaisha Barudan; and Ippon Denpa Co., Ltd. Method of creating applique data. 5,438,520, Cl. 364-470.000.

Satomi, Hirobumi, to Oriental Motor Co., Ltd. Linear pulse motor. 5,438,227, Cl. 310-14.000.

Satran, Amir; and Smilovici, Carol, to Iscar Ltd. Milling cutter with overlapping edge insert. 5,437,522, Cl. 407-42.000.

Sauerwein, Heinrich; Arm, Wolfgang; and Witt, Jan, to ACO Severin Ahlmann GmbH & Co., KG. Surface drainage apparatus. 5,437,516, Cl. 404-2.000.

Saum, Gerhard: See—  
Dripke, Manfred; and Saum, Gerhard, 5,437,191, Cl. 73-816.000.

Saurat, Jean-Hilaire; Siegenthaler, Georges; Cousse, Henri; Mouzin, Gilbert; and Gall, Yvon, to Pierre Fabre Cosmetique. Dermatological and/or cosmetological composition containing retinoids. 5,438,073, Cl. 514-452.000.

Saurer, Eric: See—  
Dinger, Rudolf; Saurer, Eric; and Graetzel, Michael, 5,438,556, Cl. 368-205.000.

Sauvageot, Gerard: See—  
Dinis, Antonio; and Sauvageot, Gerard, 5,437,072, Cl. 14-73.000.

Savu, Patricia M.: See—  
Janulis, Eugene P.; Johnson, Gilbert C.; Savu, Patricia M.; Spaw, Terence D.; and Radcliffe, Marc D., 5,437,812, Cl. 252-299.010.

Sawada, Takashi; and Ota, Shuichi, to Sony Corporation. Tape cassette having a pivotably movable main lid and a guidably movable top lid. 5,438,471, Cl. 360-132.000.

Saye, William B.: See—  
McPherson, William; Saye, William B.; and Reddick, Eddie J., 5,437,266, Cl. 600-217.000.

Schaap, Arthur P.; and Akhavan-Tafti, Hashem, to Board of Governors of Wayne State University. Enhanced chemiluminescence from 1,2-dioxetanes through energy transfer to tethered fluorescers. 5,438,146, Cl. 548-110.000.

Schachtele, Christoph: See—  
Kleinschroth, Jurgen; Hartenstein, Johannes; Barth, Hubert; Schachtele, Christoph; Rudolph, Claus; Weinheimer, Gunter; and Osswald, Hartmut, 5,438,050, Cl. 514-183.000.

Schaefer, Robert W.: See—  
Hunt, Robert B.; and Schaefer, Robert W., 5,437,646, Cl. 604-167.000.

Scheib, John P.: See—  
Lin, Sheng-Tz; and Scheib, John P., 5,437,281, Cl. 128-660.070.

Schelling, Pierre: See—  
Osswald, Mathias; Mederski, Werner; Dorsch, Dieter; Schelling, Pierre; Beier, Norbert; Lues, Ingeborg; and Minck, Klaus-Otto, 5,438,063, Cl. 514-303.000.

Schenk, Roland: See—  
Deger, Arno; Schenk, Roland; and Bienhaus, Gerhard, 5,437,981, Cl. 435-7.100.

Schneider, Franz, to Blizzard Ges.m.b.H. Ski. 5,437,468, Cl. 280-602.000.

Schering Corporation: See—  
Alroy, Yair; Zhu, Jingdong; and Condon, Russell, 5,437,986, Cl. 435-71.200.

Piowski, John J.; Ganguly, Ashit K.; Green, Michael J.; Villani, Frank J.; and Wong, Jesse, 5,438,062, Cl. 514-290.000.

Scheub, Volker: See—  
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Barth, Wolfgang; Grell, Hans-Georg; Grosser, Marin; Moll, Hermann; Pollmann, Horst; and Schneider, Peter, 5,437,347, Cl. 187-264.000.

Schibel, Robert: See—  
Paris, Franklin A., 5,438,079, Cl. 521-146.000.

Schiess Kopp Werkzeugmaschinen GmbH: See—  
Klicpera, Udo; and Schlieter, Bernd, 5,437,592, Cl. 483-40.000.

Schiffelholz, Max. Device for checking the marking of a cup in cup return automats. 5,437,358, Cl. 194-212.000.

Schiller, John T.: See—  
Lowy, Douglas R.; Schiller, John T.; and Kirnbauer, Reinhard, 5,437,951, Cl. 435-69.100.

Schilling, Gerhard: See—  
Janzen, Paul; Suhling, Winfried; and Schilling, Gerhard, 5,437,231, Cl. 104-172.400.

Schiroky, Gerhard H.: See—  
Claar, Terry D.; Schiroky, Gerhard H.; and Johnson, William B., 5,437,833, Cl. 419-2.000.

Schlegel Corporation: See—  
Ahlfeld, Michael D.; and Froehlich, David C., 5,437,124, Cl. 49-479.100.

Schleitweiler, Patrick M.; and Merten, Charles W., Jr., to United States of America, Energy. Method and apparatus for testing microfilaments. 5,437,193, Cl. 73-830.000.

Schleupen, Richard; Bentel, Ulrich; Heyke, Klaus; and Nelle, Ulrich, to Robert Bosch GmbH. Ignition system for detecting arc voltage of spark plug. 5,438,268, Cl. 324-399.000.

Schlieter, Bernd: See—  
Klicpera, Udo; and Schlieter, Bernd, 5,437,592, Cl. 483-40.000.

Schlumberger Industries: See—  
Janssen, Sylvain; and Campain, Jean-Pierre, 5,437,183, Cl. 73-201.000.

Schmanski, Donald W., to Carsonite International Corporation. Composite sound wall. 5,438,171, Cl. 181-210.000.

Schmid, Heinrich; and Von Ohr, Margret S., to Robert Bosch GmbH. Light device for vehicles. 5,438,487, Cl. 362-61.000.

Schmidl, Mary K.; and Kvamme, Candis, to Sandoz Nutrition Ltd. Enteral nutritional composition having balanced amino acid profile. 5,438,042, Cl. 514-21.000.

Schmidt, Frances E.; Zimmer, Randy W.; and Schultz, Wendy L., to Pierce Manufacturing Inc. Pinnable waterway. 5,437,345, Cl. 182-129.000.

Schmidt, Frederick A.: See—  
Ellis, Timothy W.; and Schmidt, Frederick A., 5,437,709, Cl. 75-581.000.

Schmidt, Glenn H.; and Helmsatter, Richard C., to Callaway Golf Company. Iron golf club head with dual intersecting recesses and associated slots. 5,437,456, Cl. 273-169.000.

Schmitter, Edward P.: See—  
Sniezak, Gary A.; and Schmitter, Edward P., 5,437,118, Cl. 42-7.000.



- Schmitz, Frederic H., to United States of America, National Aeronautics and Space Administration. Rotorcraft blade-vortex interaction controller. 5,437,419, Cl. 244-17.110.
- Schmuck, Arno; Draber, Edgar; and Missfeldt, Michael, to Agfa-Gevaert AG. Color photographic recoding material. 5,437,969, Cl. 430-508.000.
- Schneider, Peter: See—  
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Barth, Wolfgang; Grell, Hans-Georg; Grosser, Martin; Moll, Hermann; Pollmann, Horst; and Schneider, Peter, 5,437,347, Cl. 187-264.000.
- Schneider, Rolf: See—  
Mohr, Juergen; Oppenlaender, Knut; Pander, Hans J.; Schneider, Rolf; Thomas, Juergen; and Schreyer, Peter, 5,437,695, Cl. 44-418.000.
- Schnell, Philip G.: See—  
Synosky, Steven P.; McGrew, Gordon N.; and Schnell, Philip G., 5,437,875, Cl. 426-3.000.
- Schneller, Arnold: See—  
Helmer-Metzmann, Freddy; Osan, Frank; Schneller, Arnold; Ritter, Helmut; Ledjeff, Konstantin; Nolte, Roland; and Thorwirth, Ralf, 5,438,082, Cl. 522-149.000.
- Schnitzler, Lorenz: See—  
Herbst, Thomas; Bolmer, Berthold; von Grolman, Hartmut; Luger, Anton; and Schnitzler, Lorenz, 5,437,526, Cl. 411-366.000.
- Schoen, Joel A.: See—  
Fox, Duane M.; and Schoen, Joel A., 5,438,349, Cl. 346-136.000.
- Schoen, William R.: See—  
Devita, Robert J.; Schoen, William R.; Frontier, Alison J.; and Wyvrat, Matthew J., Jr., 5,438,136, Cl. 540-456.000.
- Schonartz, Norbert, to Mannesmann Aktiengesellschaft. Device for radiography without the use of film. 5,438,603, Cl. 378-39.000.
- Schrader, Donald E.: See—  
Peay, Thomas H.; and Schrader, Donald E., 5,437,380, Cl. 211-184.000.
- Schreyer, Peter: See—  
Mohr, Juergen; Oppenlaender, Knut; Pander, Hans J.; Schneider, Rolf; Thomas, Juergen; and Schreyer, Peter, 5,437,695, Cl. 44-418.000.
- Schreyer, Tim: See—  
Rahal-Arabi, Tawfik; Pomerleau, Real; Rauch, Martin; and Schreyer, Tim, 5,438,297, Cl. 327-565.000.
- Schroeder, James B., to National Electrostatics Corp. Ion source gaseous discharge initiation impulse valve. 5,438,205, Cl. 250-423.00R.
- Schroter, Hans: See—  
Wolletz, Wolfgang; Schroter, Hans; Schust, Klaus; and Kolb, Hartmut, 5,437,256, Cl. 123-519.000.
- Schuco International KG: See—  
Goldschmidt, Hans-Gerd, 5,437,485, Cl. 292-142.000.
- Schuermann, Josef H.; Heinecke, Guenter; and Kremer, Rudolf, to Texas Instruments Deutschland, GmbH. Responder unit for transponder arrangement. 5,438,335, Cl. 342-51.000.
- Schuld, Mary M.: See—  
Colon, Edward; Schuld, Mary M.; and Pereira, Joseph, 5,437,293, Cl. 132-120.000.
- Schuller International, Inc.: See—  
Jackson, Fred L.; McHugh, Kevin P.; and Robertson, John S., 5,437,922, Cl. 428-288.000.
- Schultz, Wendy L.: See—  
Schmidt, Frances E.; Zimmer, Randy W.; and Schultz, Wendy L., 5,437,345, Cl. 182-129.000.
- Schultz, William N.: See—  
Lewis, Larry N.; Schultz, William N.; Levinson, Lionel M.; Sumpster, Chris A.; and Stein, Judith, 5,438,081, Cl. 522-99.000.
- Schulz, Helmut, to Grapha-Holding AG. Device for manufacturing uniform sheets from material panels. 5,437,213, Cl. 83-98.000.
- Schulz, Kurt W.: See—  
Collins, Cecil A.; Butchko, Tammy M.; Schulz, Kurt W.; and Durbin, Gerald F., 5,438,492, Cl. 362-108.000.
- Schulze, Robert R.: See—  
Hamilton, Stephen B.; Jaklitsch, James J.; Reed, Christopher J.; Sachulz, Charles E.; Schulze, Robert R.; Debelius, Leslie H.; and McNelis, Niall B., 5,438,404, Cl. 356-152.200.
- Schust, Klaus: See—  
Wolletz, Wolfgang; Schroter, Hans; Schust, Klaus; and Kolb, Hartmut, 5,437,256, Cl. 123-519.000.
- Schuster, Frederic; and Piet, Gerard, to SOLLAC, Societe anonyme. Device for the continuous coating of a metallic material in motion with a polymer deposition having a composition gradient. 5,437,725, Cl. 118-718.000.
- Schuster, Pierre: See—  
Bouraly, Jean-Pierre; Aebi, Jurg; Beaufils, Philippe; de Lestang, Michel; Gaffuri, Jean-Gilles; Hourlier, Herve; Lallement, Jean-Jacques; Legroux, Philippe; Levai, Jean-Paul; Pondaven, Gerald; Schuster, Pierre; and Vergnat, Christian, 5,437,676, Cl. 606-88.000.
- Schwab, Louis. Apparatus and method for inserting hypodermic, tuberculin and other needles and for administering Mantoux tuberculin tests. 5,437,640, Cl. 604-116.000.
- Schwabegger, Johann; and Lumetzberger, Rudolf. Process for reducing the phosphorus content of waste water. 5,437,776, Cl. 204-149.000.
- Schwanke, Robert W., to Siemens Corporate Research, Inc. Method for adapting a similarity function for identifying misclassified software objects. 5,438,676, Cl. 395-650.000.
- Schwartz, Eric: See—  
Minghetti, Blandine; Tissier, Annie; Prola, Alain; and Schwartz, Eric, 5,437,948, Cl. 430-30.000.
- Schwartz, Mayer D.: See—  
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- Schwartz, Robert S.; Berry, David; Halverson, Frederick S.; and Donadio, James V., III, to Mayo Foundation for Medical Education and research. Flexible catheter guidewire. 5,437,288, Cl. 128-772.000.
- Schwarz, George W., Jr.: See—  
Wiegand, Patrick M.; Fisher, John F.; Parris, John R.; Ballard, Elizabeth S.; Sears, Courtland P., III; Schwarz, George W., Jr.; and Smith, Cloyd R., III, 5,437,179, Cl. 73-23.350.
- Schwarz, Ray P.; and Archibald, Frederick A., III, to Synthecon, Inc. Gas permeable bioreactor and method of use. 5,437,998, Cl. 435-286.000.
- Schweizer, Bruno. Linearly fine-adjustable stage. 5,438,451, Cl. 359-393.000.
- Schwendemann, Volker: See—  
Oftring, Alfred; Burkhardt, Bernd; Schwendemann, Volker; and Glaser, Klaus, 5,438,140, Cl. 546-147.000.
- Schwent, Dale G.; Osmani, Rashid M.; and Weissappel, Robert N., to Motorola, Inc. Radio frequency signal power amplifier combining network. 5,438,684, Cl. 455-89.000.
- Schwod, Kurt. Grate for a grill. 5,437,221, Cl. 99-449.000.
- Scientific Atlanta: See—  
Primiano, Guy A.; and Nair, Ajith N., 5,438,370, Cl. 348-476.000.
- Scoggins, Lacey E.: See—  
Fahey, Darryl R.; Decker, Owen H.; Ash, Carlton E.; Geibel, Jon F.; Vidaurri, Fernando C., Jr.; Scoggins, Lacey E.; Hensley, Harvey D.; Shang, Wei-Teh W.; Straw, Jimmie J.; and DesLauriers, Paul J., 5,438,115, Cl. 528-388.000.
- Scott, Daniel G.; Mong, William K.; and Spalding, Willard P., to Westinghouse Air Brake Company. Low stress conical type diaphragm. 5,437,219, Cl. 92-96.000.
- Scripps Research Institute, The: See—  
Edgington, Thomas S.; Colman, Robert W.; Kappelmayer, Janos; Edmunds, L. Henry, Jr.; and Bernabei, Alvise, 5,437,864, Cl. 424-145.100.
- Scully Signal Company: See—  
Shea, Arthur W., 5,438,323, Cl. 340-620.000.
- Sears, Courtland P., III: See—  
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- Sebastian, Scott A.: See—  
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- Seehoffer, Scott H.: See—  
Gastouniotis, C. S.; Bandeira, Nuno; Gray, Bruce E.; and Seehoffer, Scott H., 5,438,329, Cl. 340-870.020.
- Segan, Marc H.; Newsome, Michael R.; and Strauss, Gary, to M. H. Segan Limited Partnership. Holiday action and musical display. 5,438,154, Cl. 84-600.000.
- Segawa, Taro: See—  
Kohno, Teruhisa; and Segawa, Taro, 5,437,501, Cl. 303-116.200.
- Segev, David, to Segev, David. DNA probe signal amplification. 5,437,977, Cl. 435-6.000.
- Seher, Jens-Peter: See—  
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- Sehgal, Lakshman R.: See—  
Zheng, Shuming; Beissinger, Richard L.; Wasan, Darsh T.; Sehgal, Lakshman R.; and Rosen, Arthur L., 5,438,041, Cl. 514-6.000.
- Seiko Epson Corporation: See—  
Coon, Brett; Miyayama, Yoshiyuki; Nguyen, Le Trong; and Wang, Johannes, 5,438,668, Cl. 395-375.000.
- Koga, Yoshiro; and Kunugi, Masanao, 5,438,395, Cl. 355-253.000.
- Yamada, Shuhei; Ikukawa, Shuji; and Nakayama, Jitsuko, 5,437,815, Cl. 252-299.660.
- Seiko Instruments Inc.: See—  
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- Harada, Yoichi, 5,438,407, Cl. 356-328.000.
- Seiner, Jerome A.: See—  
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- Seitz, David R.: See—  
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- Seki, Fusao; and Abe, Masato, to Fujitsu Limited. Odd-number frequency divider and method of constituting the same. 5,438,600, Cl. 377-47.000.
- Sellers, Thomas F.: See—  
Eslambolchi, Hossein; and Sellers, Thomas F., 5,438,265, Cl. 324-326.000.
- Selman, Steven H.: See—  
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- Selnick, Harold G.: See—  
Baldwin, John J.; Elliott, Jason M.; Claremon, David A.; Liverton, Nigel; Remy, David C.; and Selnick, Harold G., 5,438,055, Cl. 514-221.000.
- Seltzer, Richard. Personal harness for carrying articles. 5,437,401, Cl. 224-151.000.

- Semanek, Mary S.: See—  
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- Semiconductor Energy Laboratory Co., Ltd.: See—  
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- Sendai, Michiyuki; and Okonogi, Kenji, to Takeda Chemical Industries, Ltd. Cephem compounds compositions and method. 5,438,053, Cl. 514-206.000.
- Sendo, Masaharu: See—  
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- Sengupta, Sandip K.: See—  
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- Sennott, James W.; Kyrtos, Christos T.; Gudat, Adam J.; Christensen, Dana A.; Friedrich, Douglas W.; and Stafford, Darrell E., to Caterpillar Inc. Vehicle position determination system and method. 5,438,517, Cl. 364-449.000.
- Ser, Jean-Claude; and Miguel, Dolores, to L'Oreal. Process for the preparation of a solid dispersion of at least one polyhydric alcohol in a fatty body and the resulting dispersion for cosmetic and pharmaceutical use. 5,437,859, Cl. 424-59.000.
- Serafin, Daniel J., Jr.: See—  
Przygoda, Chester T., Jr.; and Serafin, Daniel J., Jr., 5,438,607, Cl. 379-38.000.
- Sermund, Gerald: See—  
Boppel, Wolfgang; Sermund, Gerald; and Wilham, Michael, 5,438,179, Cl. 219-121.190.
- Servend International, Inc.: See—  
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- Sewell, Donald G.: See—  
Cook, Raymond; and Sewell, Donald G., 5,437,714, Cl. 96-201.000.
- Sewell, Wesley C., to Honeywell Inc. Readout for a ring laser angular rate sensor. 5,438,409, Cl. 356-350.000.
- Sexton, Walter, to Lyemance International, Inc. Top sealing chimney cap. 5,437,574, Cl. 454-4.000.
- Seyed-Bolorforosh, Mir S.; Greenstein, Michael; Gururaja, Turuvekere R.; and Yoshida, Henry, to Hewlett-Packard Company. Tunable acoustic resonator for clinical ultrasonic transducers. 5,438,554, Cl. 367-140.000.
- Seymour-Marks, Audrey: See—  
Boenke, Mark; Clegg, Derek; Gittelsohn, Mike; Passaretti, Keith; and Seymour-Marks, Audrey, 5,438,653, Cl. 395-131.000.
- SGS-Thomson Microelectronics, Inc.: See—  
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- Menegoli, Paolo, 5,438,504, Cl. 363-60.000.
- SGS-Thomson Microelectronics S.A.: See—  
Debaty, Pascal, 5,438,285, Cl. 327-3.000.
- Pavlin, Antoine; and Siaudeau, Jean-Louis, 5,438,286, Cl. 327-50.000.
- Tailliet, Francois, 5,438,213, Cl. 257-360.000.
- Shackam, Alon: See—  
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- Shahar, Boaz: See—  
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- Shang, Wei-Teh W.: See—  
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- Shank, Gordon W., to Tektronix, Inc. Zero dead time acquisition for a digital storage oscilloscope. 5,438,531, Cl. 364-724.100.
- Shannon, William J.; Napiorkowski, John J.; and Kidd, Dan, to Siecor Puerto Rico, Inc. Solid state primary telephone protector. 5,438,619, Cl. 379-412.000.
- Shapiro, Andrew: See—  
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- Sharp, Brenner M.: See—  
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- Sharp Kabushiki Kaisha: See—  
Koden, Mitsuhiko; Kaneko, Takashi; Takeda, Hitoshi; Itoh, Keizou; and Takeda, Mitsunori, 5,437,814, Cl. 252-299.610.
- Miake, Michiyori; and Soga, Ai, 5,438,426, Cl. 358-403.000.
- Van, Kazuo; Ohta, Kenji; and Ishikawa, Toshiro, 5,438,561, Cl. 369-100.000.
- Yoshida, Yukihiro, 5,438,533, Cl. 364-746.200.
- Sharpe-Geisler, Bradley A., to Advanced Micro Devices, Inc. Ground bounce isolated output buffer. 5,438,277, Cl. 326-27.000.
- Shea, Arthur W., to Scully Signal Company. Fail safe fluid level detection circuit. 5,438,323, Cl. 340-620.000.
- Shearer, John R.; and Shelley, Philip, to Minnesota Mining and Manufacturing Company. Glenoid alignment guide. 5,437,677, Cl. 606-96.000.
- Sheehan, Michael T.: See—  
Fritsch, John R.; Fruchey, Olan S.; Kuila, Debasiah; Kvakovszky, George; Murphy, Mark A.; Sheehan, Michael T.; Sounik, James R.; and Vicari, Richard, 5,438,142, Cl. 546-240.000.
- Shell Oil Company: See—  
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- Shell, Ronald G.: See—  
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- Shelley, Philip: See—  
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- Shelly, Randy L., to Bio Tex Ltd., Inc. Wrist splint. 5,437,620, Cl. 602-21.000.
- Shen, Jingming J.; and Warner, Vernon R., to Siemens Automotive L.P. Multiple disk air assist atomizer for fuel injection. 5,437,413, Cl. 239-424.500.
- Shen, Yong: See—  
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- Shepherd, Nick E.: See—  
Liles, Donald T.; and Shepherd, Nick E., 5,438,095, Cl. 524-785.000.
- Sherman, Michael C.; Pafford, John A.; and Ashman, Richard B., to Danek Medical, Inc. Attachment plate for top-tightening clamp assembly in a spinal fixation system. 5,437,670, Cl. 606-61.000.
- Shibagaki, Nobuhiko: See—  
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- Shibahata, Yasuji; and Tokushima, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Torque distributing mechanism for differential. 5,437,583, Cl. 475-220.000.
- Shibata, Hirofumi: See—  
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- Shibata, Motohiko: See—  
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- Shibata, Takanori: See—  
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- Shibata, Toshiko: See—  
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- Shibata, Yasufumi: See—  
Kondou, Takashi; Yamaya, Masaki; Yoshioka, Hiroshi; Ohtsuka, Yasuhiro; Tojima, Kazuo; Shibata, Yasufumi; Ohkuwa, Naomi; and Okayama, Shinobu, 5,437,817, Cl. 252-299.670.
- Shibata, Yoshinori: See—  
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- Shibuya, Yoshiyuki: See—  
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- Shigemori, Toshihiro: See—  
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- Shikani, Alain H.; and Domb, Abraham J., to Bloom, Leonard, a part interest. Method and device for inhibiting H.I.V. hepatitis B and other viruses and germs when using a needle, scalpel and other sharp instrument in a medical environment. 5,437,656, Cl. 604-89.100.
- Shillady, Robert W., to KDI/Triangle Electronics, Inc. Capacitive liquid level sensor having phase detecting circuitry. 5,437,184, Cl. 73-304.00C.
- Shimada, Toshizi; Kanai, Yasunori; and Watanabe, Yoshio, to Shinko Electric Industries, Co., Ltd.; and Fujitsu Limited. Phase-locked loop circuit. 5,438,299, Cl. 331-1.00A.
- Shimamune, Takayuki; Nakajima, Yasuo; Nakamatsu, Shuji; Nishiki, Yoshinori; and Wakita, Shuhei, to Permelec Electrode Ltd. Electrolytic cell and processes for producing alkali hydronide and hydrogen peroxide. 5,437,771, Cl. 204-84.000.
- Shimano, Muneharu: See—  
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- Shimasaki, Yuichi: See—  
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- Shimauchi, Keisuke: See—  
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- Shimazaki, Hiroshi: See—  
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- Shimbara, Yoshima, to Mazda Motor Corporation. System and method for the detection of defects of a coating. 5,438,525, Cl. 364-507.000.
- Shimizu, Kaoru: See—  
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- Shimomura, Junichi: See—  
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- Shimomura, Naoyuki: See—  
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- Shimomura, Yasuo: See—  
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- Shimotomai, Michio: See—  
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- Shin-Etsu Chemical Co., Ltd.: See—  
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- Kondou, Takashi; Yamaya, Masaaki; Yoshioka, Hiroshi; Ohtsuka, Yasuhiro; Tojima, Kazuo; Shibata, Yasufumi; Ohkuwa, Naomi; and Okayama, Shinobu, 5,437,817, Cl. 252-299.670.
- Shindo, Hitoshi: See—  
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- Shinko Electric Industries Co., Ltd.: See—  
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- Shinoda, Hisei: See—  
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- Shinohara, Satoru; Nakamura, Yoshinori; and Sam, Huy, to Sony Corporation. Printing sheet having a dye receiving layer. 5,438,031, Cl. 503-227.000.
- Shinozaki, Tetsunori; and Kioka, Mamoru, to Mitsui Petrochemical Industries, Ltd. Olefin polymer composition. 5,438,100, Cl. 525-240.000.
- Shintom Co., Ltd.: See—  
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- Shiokama, Yoshiharu; and Yamano, Shozo, to Nikon Corporation. Automatic focusing camera with control of focusing optical system position and driving power source velocity. 5,438,387, Cl. 354-402.000.
- Shiono, Mikio: See—  
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- Shirata, Masataka: See—  
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- Shishido, Kamichika; and Aizawa, Hidetoshi, to Ricoh Company, Ltd. Master making device for a stencil printer. 5,438,347, Cl. 347-218.000.
- Shkolnikov, Yuri, to Illinois Tool Works Inc. Adjustable shear block assembly. 5,437,404, Cl. 227-109.000.
- Shono, Akiko, to Fuji Photo Film Co., Ltd. Silver halide color photographic material and method for forming an image. 5,437,970, Cl. 430-522.000.
- Showa Denko K. K.: See—  
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- Shrem, Yigal: See—  
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- Shuffle Master, Inc.: See—  
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- Siaudeau, Jean-Louis: See—  
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- Sibert, William P.: See—  
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- Sieben, Lothar: See—  
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- Siecor Puerto Rico, Inc.: See—  
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- Siegenthaler, Georges: See—  
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- Siemens Aktiengesellschaft: See—  
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- Ochiai, Akihiko; Hashimoto, Makoto; Matsushita, Takeshi; Yamagishi, Machio; Sato, Hiroshi; and Shimanoe, Muneharu, 5,437,762, Cl. 216-20.000.
- Tihanyi, Jenoe, 5,438,215, Cl. 257-401.000.
- Siemens Automotive L.P.: See—  
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- Siemens Corporate Research, Inc.: See—  
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- Siemens Nixdorf Informationssysteme AG: See—  
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- Siemens Nixdorf Informationssysteme Aktiengesellschaft: See—  
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- Siemer, Hubert: See—  
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- Siga, Masao; Kuriyama, Mituo; Mori, Takanobu; Fukui, Yutaka; and Ishizuka, Tatsuhiro, to Hitachi, Ltd. Steel rotor shafts for electric machines. 5,437,742, Cl. 148-335.000.
- Sikes, W. David, to Homeostatics Design Group, Inc. Device and method for hip protection and stabilization. 5,437,618, Cl. 602-19.000.
- Silicon Graphics, Inc.: See—  
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- Haeberli, Paul E.; and Flory, Leonard J., 5,438,429, Cl. 358-445.000.
- Sim, Jae K., to Goldstar Electron Co., Ltd. Data output buffer of semiconductor memory device for preventing noises. 5,438,545, Cl. 365-189.050.
- Simard, Julien: See—  
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- Simkowski, Donald J.: See—  
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- Simon, Jonathan S.: See—  
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- Simons, Robert E., to International Business Machines Corporation. Multi-stage heat sink. 5,437,328, Cl. 165-146.000.
- Simonton, Thomas C.: See—  
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- Simpatco Industries Co., Ltd.: See—  
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- Simpson, James E., to Fusion Systems Corporation. Apparatus for controlling the brightness of a magnetron-excited lamp. 5,438,242, Cl. 315-219.000.
- Sims, Charles R.: See—  
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- Sinclair, Richard C. Golf bag support assembly with retractable spike. 5,437,423, Cl. 248-96.000.
- Sinn, Hans-Jurgen F., to United States Surgical Corporation. Retainer package for resilient surgical sutures. 5,437,362, Cl. 206-63.300.
- Sintokogio, Ltd.: See—  
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- Sintov, Amnon: See—  
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- Siranovich, Stanley F.; Bock, Manfred; Venham, Lanny D.; and Potter, Terry A., to Miles Inc. Free radical-cured coating compositions. 5,438,106, Cl. 525-440.000.
- Sisley, Steven E.: See—  
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- Sitzmann, Eugene V.: See—  
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- SKC Limited: See—  
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- SKF France: See—  
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- Skiba, Barbara T.: See—  
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- Skinfill, Donald R.: See—  
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- Skubitz, Keith M.; and Anderson, Peter M. Oral glutamine to reduce stomatitis. 5,438,075, Cl. 514-563.000.
- Slade, Paul G., to Eaton Corporation. Vacuum interrupter with a radial magnetic field. 5,438,174, Cl. 218-118.000.
- Sluder, Don W.: See—  
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- Slusser, William G., to Indresco Inc. Magnesite-carbon refractories and shapes made therefrom with improved thermal stress tolerance. 5,438,026, Cl. 501-100.000.
- Slutz, David E.: See—  
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- Slyngstad, Vincent R.: See—  
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- SMC Corporation: See—  
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- Smilovici, Carol: See—  
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- Smith, Cloyd R., III: See—  
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- Smith, David A., to Astec International, Ltd. Gate drive circuit. 5,438,294, Cl. 327-384.000.
- Smith, Gary L.: See—  
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- Smith, Graham H. Tube cleaner. 5,437,073, Cl. 15-104.061.
- Smith, Hal D.: See—  
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- Smith, J. William; Blue, Jerry D.; Crofut, Stan; Gayhart, Ed; and Barna, Joan, to Babcock & Wilcox Company, The. Non-baffled low pressure drop vacuum cooled inserted smelt spout. 5,437,768, Cl. 162-239.000.
- Smith, Olly V., to W. R. Grace & Co. Method and apparatus for producing medical pouches. 5,437,595, Cl. 493-213.000.
- Smith, Peter L. Self-powered computer accessory device for power extraction from attached data signals and method of operating thereof. 5,438,678, Cl. 395-750.000.
- Smith, Redd H.: See—  
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- Smith, Stephen D.: See—  
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- Smith, Steven F.: See—  
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- Smith, Stewart G. Tilt control apparatus for vehicles. 5,437,354, Cl. 188-299.000.
- Smith, Thomas E.; Terpay, Gregory W.; and Zipfel, George G., Jr., to AT&T Corp. Reactance-mass actuator. 5,438,627, Cl. 381-199.000.
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- SmithKline Beechman Corp.: See—  
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- Snamprogetti S.p.A.: See—  
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- Snap-on Incorporated: See—  
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- Snoke, Phillip J.; Rowley, David S.; Lincoln, David G.; and Charles, Kirk W., to Catheter Imaging Systems. Steerable catheter with fiberoptic scope inserting means. 5,437,636, Cl. 604-95.000.
- Snuggs, Stuart E. Sanitary toilet seat covers. 5,437,906, Cl. 428-131.000.
- Snyder, James R.: See—  
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- Snyder, Thomas S.; Peterson, Steven H.; Nayak, Umesh P.; and Beleski, Richard J., to Westinghouse Electric Corporation. Chromatographic separation of erbium isotopes. 5,437,795, Cl. 210-635.000.
- Social Welfare Foundation Hokkaido Rehabil. The: See—  
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- Societe Anonyme dite Alcatel Telspace: See—  
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- Societe Anonyme Dite: Neopost Industrie: See—  
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- Societe Anonyme Dite: Saft: See—  
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- Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.): See—  
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- Soga, Mamoru: See—  
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- Sollich, Helmut, to Sollich GmbH & Co. KG. Coating machine for the processing of chocolate and similar masses. 5,437,723, Cl. 118-21.000.
- Somar Corporation: See—  
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- Sommer, Holger T.: See—  
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- Sommerer, Timothy J.; Chang, Hsueh-Rong; Klein, Arthur, III; Roberts, Victor D.; Witting, Harald L.; and Farrall, George A., to General Electric Company. Electrostatic shield to reduce wall damage in an electrodeless high intensity discharge lamp. 5,438,235, Cl. 313-489.000.
- Sommese, Anthony G.; and Nagarajan, R., to Nalco Chemical Company. Settling stabilization of polymer containing particle dispersions in oil. 5,438,088, Cl. 524-310.000.
- Sony Corporation: See—  
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- Fukuzawa, Keiji; and Yoshida, Yoshikazu, 5,438,340, Cl. 343-781.00R.
- Hasegawa, Shinichi; and Uetake, Akihiro, 5,438,468, Cl. 360-107.000.
- Honjo, Ryoki, 5,438,458, Cl. 360-10.200.
- Kii, Kazuo; Suzuki, Manabu; and Takasu, Shigeru, 5,438,245, Cl. 315-408.000.
- Koguchi, Toshinari; Yamazaki, Toshiyuki; and Matsumura, Mitsunori, 5,438,466, Cl. 360-96.400.
- Kosuge, Shouji, 5,438,358, Cl. 348-96.000.
- Maruyama, Shigeaki; and Kawazu, Yukio, 5,437,359, Cl. 198-341.000.
- Matsushita, Takeshi; Gosain, Dharam P.; Westwater, Jonathan; Usui, Setsuo; and Hane, Kunio, 5,437,734, Cl. 136-249.000.
- Mitsui, Hideto; and Ide, Yoshihiro, 5,437,938, Cl. 429-1.000.
- Murakami, Daisuke; Yoshida, Hideki; and Terao, Takao, 5,438,303, Cl. 332-109.000.
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- Nishigaki, Tetsuo; Ota, Kiyoshi; and Nagano, Kae, 5,438,325, Cl. 340-825.240.
- Noda, Masayuki, 5,438,465, Cl. 360-75.000.
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- Sorensen, John T., to Neomedix Corporation. Ophthalmic lens removal method and apparatus. 5,437,678, Cl. 606-107.000.
- Sorensen, Robert L.; Hosseini, Samandar V.; Habbaba, Faris S.; Bartling, Craig A.; and Garcia, Jorge L., to Motorola, Inc. Vehicular adapter pocket and handle assembly. 5,438,685, Cl. 455-90.000.
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- Sortore, Eric W.: See—  
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- Springer, A. L. Golf putting training device, 5,437,458, Cl. 273-192.000.
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- Stafford, Darrell E.: See—  
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- Stanley, Gerald R., to Crown International, Inc. Slew rate control in a multi-level switch, 5,438,503, Cl. 363-43.000.
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- Steelcase Inc.: See—  
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- Steffes, Karl, to Dell USA, L.P. Apparatus for upgrading a personal computer, 5,438,476, Cl. 361-683.000.
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- Steinbeis Gessner GmbH: See—  
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- Steinhardt, Hauke: See—  
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- Stekel, Amit: See—  
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- Steltenkamp, Robert J.: See—  
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- Stelter, Peter: See—  
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- Stengel, Robert E.: See—  
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- Stern, Elliot L., to Orthotic Rehabilitation Products, Inc. Dynamic brace joint, 5,437,611, Cl. 602-16.000.
- Sterling, Charles V. Apparatus for preventing slag tap blockage, 5,437,699, Cl. 48-62.00R.
- Sternquist, Alan R., to Newell Operating Company, Shade with variable load braking and lift assist, 5,437,324, Cl. 160-299.000.
- Stevens, Jimmy L.: See—  
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- Stevens, Priscilla W.: See—  
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- Stills, James T.: See—  
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- Stoddart, James F.: See—  
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- Stormtreat Systems, Inc.: See—  
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- Stout, Cheryl L.: See—  
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- Strabra AG: See—  
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- Stratton, Alexander K. Instant-on, U-shaped condom holder package, 5,437,286, Cl. 128-844.000.
- Straubinger, Werner, to U. E. Sebald Druck und Verlag GmbH, Doctor band displaceable parallel to cylinder's axis of rotation, 5,437,227, Cl. 101-169.000.
- Strauss, Gary: See—  
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- Straw, Jimmie J.: See—  
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- Strichartz, Paul T.; Minchak, Robert J.; Kettering, Timothy J.; Janda, Dennis J.; and Gribble, Glen R., Jr., to B. F. Goodrich Company, Modified polycycloolefins, 5,438,093, Cl. 524-708.000.
- Strobel, Kalman, to OroAmerica, Inc. Hollow diamond cut rope chain with multi-faceted surfaces, 5,437,149, Cl. 59-80.000.
- Stroppa, Fabrizio: See—  
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- Struble, Kent R.: See—  
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- Struzina, Werner: See—  
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- Stryker Corporation: See—  
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- Stull, Gene. Snap-hinge closure cap with full circumferential seal, 5,437,383, Cl. 215-235.000.
- Stummer, Josef. Device for opening flocculent fibrous material, 5,437,080, Cl. 19-26.000.
- Submicron Systems Inc.: See—  
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- Subramanian, Ravi: See—  
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- Suchowerskyj, Wadym; Kaesser, Jurgen; and Braegas, Peter, to Robert Bosch GmbH, System for selecting route-relevant information when using the radio data system (RDS), 5,438,687, Cl. 455-158.400.
- Suda, Hiroyuki: See—  
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- Suga, Atsuo; Higuchi, Shigemitsu; Nishijima, Hideo; and Fujii, Hiromasa, to Hitachi, Ltd. Method of processing and recording data while reproducing the same and apparatus for the method, 5,438,459, Cl. 360-38.100.
- Sugano, Junji: See—  
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- Suganuma, Hiroshi: See—  
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- Sugawara, Kiyomi; Ishitaka, Yoshihiko; Yamagami, Hiroshi; Yamaguchi, Masahiko; Kano, Mitsuru; and Hebiguchi, Hiroyuki, to Alps Electric Co., Ltd. Orientation film of liquid crystal having bilaterally asymmetric ridges separated by grooves, 5,438,421, Cl. 359-75.000.
- Sugawara, Mitsutoshi, to NEC Corporation, Input circuit receiving input signal of TTL level, 5,438,280, Cl. 326-71.000.

- Sugaya, Takumi: See—  
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- Sugaya, Tsutomu: See—  
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- Sugita, Takehiro, to Sony Corporation, Method and apparatus for generating diffusion code, 5,438,596, Cl. 375-200.000.
- Sugiura, Motoyuki: See—  
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- Sugiyama, Yasuhiko: See—  
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- Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, to Kabushiki Kaisha Kobe Seiko Sho, Corrosion resistant Ti alloy containing Cu, Si, and a platinum group metal, 5,437,835, Cl. 420-421.000.
- Suhling, Winfried: See—  
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- Sullivan, Herbert W., to Intellectual Properties and Technology, Inc. Method and apparatus for enhancing concurrency in a parallel digital computer, 5,438,680, Cl. 395-650.000.
- Sulzer Chemtech AG: See—  
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- Sulzer-Escher Wyss GmbH: See—  
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- Sulzer Rueti AG: See—  
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- Sumi, Emiko: See—  
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- Sumihara, Masanori: See—  
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- Sumioka, Atsushi: See—  
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- Sumitomo Chemical Company, Limited: See—  
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- Yamamoto, Keisaku; Ikeda, Kiyoshi; and Fukuyama, Masahiro, 5,438,101, Cl. 525-274.000.
- Yamauchi, Noriaki; Kawamura, Nobuaki; Miura, Tatsu; Hashizume, Shuhei; Nakamae, Isao; Yoshigoe, Kazumi; Suzuki, Hiroyuki; and Minami, Iwao, 5,437,688, Cl. 8-526.000.
- Sumitomo Electric Industries, Ltd.: See—  
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- Matsuura, Takashi; and Itozaki, Hideo, 5,438,036, Cl. 505-162.000.
- Sasaoka, Eisuke; Kanamori, Hiroo; Suganuma, Hiroshi; Ishikawa, Shinji; and Saito, Tsutsumi, 5,438,640, Cl. 385-43.000.
- Tanaka, So, 5,438,037, Cl. 505-329.000.
- Sumitomo Wiring Systems: See—  
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- Sumitomo Wiring Systems, Ltd.: See—  
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- Okumura, Hitoshi; and Nankou, Yuichi, 5,437,559, Cl. 439-310.000.
- Summer Time Products, Inc.: See—  
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- Summit Technology, Incorporated: See—  
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- Sumpster, Chris A.: See—  
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- Sun, Alexander S. Herbal treatment of malignancy, 5,437,866, Cl. 424-195.100.
- Sun Microsystems, Inc.: See—  
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- Sunbeam Corporation: See—  
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- Sundblad, Birgitta: See—  
Goransson, Gunnar; Sundblad, Birgitta; Landfors, Johan; and Baltzen, Hans A., 5,437,791, Cl. 210-712.000.
- SunDisk Corporation: See—  
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- Sundseth, J., to Electro Pneumatic International GmbH, Roller drive assembly having the input to a sun gear passing through a hollow axle formed by a carrier, 5,437,585, Cl. 475-331.000.
- Sung, Henry. Golf club protector, 5,437,320, Cl. 150-160.000.
- Sunrise Arkansas, Inc.: See—  
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- Suppelsa, Anthony B.: See—  
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- Surka, Stefan, to United Parcel Service of America, Inc. Method and apparatus for decoding bar code images using information from previous scan lines, 5,438,188, Cl. 235-462.000.
- Surka, Stefan, to United Parcel Service of America, Inc. Apparatus for simultaneously convolving multiple digital binary images using a single convolver with a binary mask to determine pixel densities, 5,438,636, Cl. 382-279.000.
- Surridge, Nigel A.: See—  
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- SuturTek Inc.: See—  
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- Suzawa, Akira: See—  
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- Suzuki Hajime: See—  
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- Suzuki, Hiroyuki; Nagase, Yukio; Waki, Kenichiro; Kemmochi, Kazuhisa; and Hibino, Masaru, to Canon Kabushiki Kaisha, Image forming apparatus usable with a carrier having magnetization controlled in relation to recording density, 5,438,394, Cl. 355-251.000.
- Suzuki, Hiroyuki: See—  
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- Suzuki, Makoto: See—  
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- Suzuki, Manabu: See—  
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- Suzuki, Masahiro: See—  
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- Suzuki, Masaki: See—  
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- Suzuki, Masashi: See—  
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- Suzuki, Mituru: See—  
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- Suzuki, Shoji; Kusunoki, Tadakazu; and Mori, Masahiro, to Fujitsu Limited, Color adjustment for smoothing a boundary between color images, 5,438,651, Cl. 395-131.000.
- Suzuki, Tetsuo: See—  
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- Suzuki, Yasunori: See—  
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- Suzuki, Yoshiyuki: See—  
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- Swanson, Roy T.: See—  
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- Sweat Accessories, Inc.: See—  
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- Sweeney, Niall: See—  
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- Sweet, Robert P.; Rosa, Mark R.; Vigdorovich, Alexander; Kovacs, James E.; and Geraghty, Patrick J., to Cannon Equipment Company, Cart loading machine, 5,437,537, Cl. 414-400.000.
- Swenson, Katherine A.: See—  
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- Swirbel, Thomas J.: See—  
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- Swisher, Robert G.: See—  
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- Sykes, David: See—  
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- Symbiotec, Inc.: See—  
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- Symonds, Darrell C. Method and apparatus for creating an advantageous growing zone in a soilbed having a topsoil stratum and a hardpan stratum, 5,437,336, Cl. 172-176.000.
- Symons, James I.: See—  
Polyakov, Gregory M.; Symons, James I.; Bain, Allen I.; and Walker, Michael J. A., 5,437,602, Cl. 600-21.000.



- Sympatec GmbH System-Partikel-Technik: See—  
Weichert, Reiner; and Witt, Wolfgang, 5,438,408, Cl. 356-336.000.
- Synosky, Steven P.; McGrew, Gordon N.; and Schnell, Philip G., to Wm. Wrigley, Jr. Company. Wax-free low moisture chewing gum. 5,437,875, Cl. 426-3.000.
- Synosky, Steven P.; and Greenberg, Michael J., to Wm. Wrigley Jr. Company. Wax-free chewing gums with controlled sweetener release. 5,437,876, Cl. 426-3.000.
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Bansal, Rekha P.; Gooding, Owen W.; Muehldorf, Alexander V.; and O-Yang, Counde, 5,438,150, Cl. 548-324.500.
- Watts, Richard P.; Ericson, Mary C.; Kirakossian, Hrair; and Chang, Chiu C., 5,437,983, Cl. 435-7.500.
- Syntheon, Inc.: See—  
Schwarz, Ray P.; and Archibald, Frederick A., III, 5,437,998, Cl. 435-286.000.
- Synthes (U.S.A.): See—  
Tepic, Slobodan; and Goslings, Carel, 5,437,666, Cl. 606-55.000.
- System Feed Inc.: See—  
Blicher, Steen; and Langballe, Logan, 5,437,393, Cl. 222-77.000.
- Szczypiorski, Wojtek: See—  
Graham, Thomas S.; Szczypiorski, Wojtek; Allyn, Jerome B.; Boozan, Dean A.; Desorcie, George; Bergeron, Norman; Hazlett, R. William; Pennucci, John; and Hazelett, S. Richard, 5,437,326, Cl. 164-481.000.
- Szembrot, Albert R.; and Christ, Charles S., Jr., to Eastman Kodak Company. Process of recovering silver from photographic solutions. 5,437,792, Cl. 210-727.000.
- T.D. Preece & Co. Pty. Ltd.: See—  
Preece, Kim, 5,437,268, Cl. 128-205.240.
- Ta, Thien Q. Spiral tie rack. 5,437,378, Cl. 211-115.000.
- Tabata, Jun: See—  
Inoue, Jiro; Tabata, Jun; Makino, Shiro; Morikawa, Atsushi; and Eimori, Takeshi, 5,438,232, Cl. 310-328.000.
- Tabuchi, Junichiro, to Sanyo Electric Co., Ltd. Remote control system. 5,438,362, Cl. 348-211.000.
- Tabuchi, Toyoyi: See—  
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- Tacklind, Chris: See—  
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- Tadokoro, Kenji, to Oki Electric Industry, Co., Ltd. Schmitt trigger circuit with CMOS inverters and filtering means. 5,438,292, Cl. 327-206.000.
- Tagawa, Tomohide; Takahashi, Takashi; and Kawasaki, Takayoshi, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a multiple-chip semiconductor device with different leadframes. 5,438,021, Cl. 437-207.000.
- Taguchi, Nobuyoshi: See—  
Imai, Akihiro; Fukui, Yasuo; and Taguchi, Nobuyoshi, 5,438,348, Cl. 346-135.100.
- Tahara, Eiji: See—  
Kawamoto, Takeshi; Hrowatari, Toshio; Tahara, Eiji; and Katayama, Hiromasa, 5,437,192, Cl. 73-826.000.
- Tai, Seiji; Katayose, Mitsuo; and Watanabe, Hiroo, to Hitachi Chemical Company. Water-soluble tetraazaporphins and fluorochrome for labeling. 5,438,135, Cl. 540-128.000.
- Tailliet, Francois, to SGS-Thomson Microelectronics, S.A. General protection of an integrated circuit against permanent overloads and electrostatic discharges. 5,438,213, Cl. 257-360.000.
- Taimisto, Miriam H.: See—  
Lieber, Clement E.; Taimisto, Miriam H.; and Konno, Mark A., 5,437,637, Cl. 604-96.000.
- Tajima, Hisao: See—  
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- Takabayashi, Hiroshi: See—  
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- Takada, Yoshitsugu: See—  
Hayami, Katsuaki; Fujii, Hideo; Wada, Yoshihiro; Omori, Yoshiharu; Kubo, Kuniyasu; Konishi, Chizuko; and Takada, Yoshitsugu, 5,438,183, Cl. 219-748.000.
- Takada, Youichi, to Kabushiki Kaisha Toshiba. Apparatus for measuring magnetic sources. 5,437,276, Cl. 128-653.100.
- Takagi, Masaaki; and Fukuda, Takumi, to Copan Company Limited. Absolute rotary encoder with slit patterns having bit-coded tracks ranging from higher to lower order. 5,438,193, Cl. 250-231.180.
- Takagi, Masao; Machida, Satoshi; and Hattori, Akio, to Kubota Corporation. Friction clutch having a brake mechanism. 5,437,355, Cl. 192-18.00A.
- Takahashi, Akira: See—  
Mackawa, Takashi; and Takahashi, Akira, 5,438,391, Cl. 355-200.000.
- Takahashi, Kenji, to Sony Corporation. Magneto-optical disk hub in which the inner peripheral edge portion of the spindle opening is strengthened and made abrasion resistant. 5,438,564, Cl. 369-290.000.
- Takahashi, Koichi: See—  
Shimizu, Makoto; Suzuki, Mituru; Sato, Susumu; Takahashi, Koichi; and Esaki, Toshiro, 5,437,828, Cl. 261-152.000.
- Takahashi, Miyao: See—  
Miyamoto, Tetsuya; Takahashi, Miyao; Fujisaki, Takahiko; Ikeou, Shinei; Omura, Takashi; and Harada, Naoki, 5,438,137, Cl. 544-76.000.
- Takahashi, Natsuko: See—  
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- Takahashi, Nobukazu; Kohara, Teiji; and Natsuume, Tadao, to Nippon Zeon Co., Ltd. Molded articles having hard coat layer. 5,437,926, Cl. 428-337.000.
- Takahashi, Takashi: See—  
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- Takahashi, Takeshi: See—  
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- Takahashi, Toshiro; and Koide, Kazuo, to Hitachi, Ltd. Semiconductor integrated circuit device and data processing system having an interface with reduced parasitic capacitance. 5,438,281, Cl. 326-86.000.
- Takahata, Ryoichi; and Eguchi, Shoji, to Koyo Seiko Co., Ltd. Superconducting bearing device stabilized by trapped flux. 5,438,038, Cl. 310-90.500.
- Takaichi, Akihisa; Okamoto, Toshihiko; Otsuka, Ichiro; and Hatai, Ryuichi, to Otsuka Pharmaceutical Co. Ltd. Health drink composition. 5,437,880, Cl. 426-73.000.
- Takano, Kazuya; Kojima, Hiroshi; and Ushijima, Takao, to Bridgestone Corporation. Vibration isolator with diaphragms in each side wall. 5,437,437, Cl. 267-140.140.
- Takano, Kazuya; Kojima, Hiroshi; and Ushijima, Takao, to Bridgestone Corporation. Vibration isolator with diaphragm and air chamber in a side wall and connected to an air tank. 5,437,438, Cl. 267-140.140.
- Takano, Koji: See—  
Nagao, Fumiaki; and Takano, Koji, 5,438,532, Cl. 364-724.160.
- Takaoka, Makoto; and Kobayashi, Shigetada, to Canon Kabushiki Kaisha. Image interface device. 5,438,648, Cl. 395-106.000.
- Takashi, Ryuma: See—  
Murai, Fumio; Suzuki, Yasunori; Tomozawa, Hideki; Takashi, Ryuma; Saida, Yoshihiro; and Ikenoue, Yoshiaki, 5,437,893, Cl. 427-498.000.
- Takasu, Shigeru: See—  
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- Takata Corporation: See—  
Kuretake, Masato; Zushi, Takayasu; Kitagawa, Motonobu; Yamakawa, Kazuhiko; Okamoto, Yoshimi; and Uda, Sawayo, 5,437,472, Cl. 280-737.000.
- Yoshida, Ryouichi; Fujii, Hiroaki; Tsuji, Atsushi; Shimizu, Tomoko; Osada, Nobuya; and Yamanishi, Takahiro, 5,437,471, Cl. 280-730.200.
- Takatsu, Motomu, to Fujitsu Limited. Basic logic circuit having multi-emitter transistor. 5,438,284, Cl. 326-124.000.
- Takatsuka, Seiichi; Tsugita, Yukihiko; and Sato, Kyokuichi, to Om Corporation. Ventilation line opening/closing means of fuel tank. 5,437,317, Cl. 141-312.000.
- Takayama, Takamitsu: See—  
Kazama, Akira; Oshige, Takahiko; Yamada, Yoshiro; Yamada, Takeo; Yamazaki, Takeshi; Takayama, Takamitsu; and Nomura, Shuichiro, 5,438,415, Cl. 356-369.000.
- Takebayashi, Takao: See—  
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- Takeda, Atsushi: See—  
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- Takeda Chemical Industries: See—  
Uneme, Hideki; Minamide, Isao; and Okauchi, Tetsuo, 5,438,065, Cl. 514-353.000.
- Takeda Chemical Industries, Ltd.: See—  
Ichimori, Yuzo; Kondo, Koichi; Igarashi, Koichi; and Sando, Masaharu, 5,437,995, Cl. 435-240.270.
- Sendai, Michiyuki; and Okonogi, Kenji, 5,438,053, Cl. 514-206.000.
- Takeda, Hitoshi: See—  
Koden, Mitsuhiro; Kaneko, Takashi; Takeda, Hitoshi; Itoh, Keizou; and Takeda, Mitsuhiro, 5,437,814, Cl. 252-299.610.
- Takeda, Katsu: See—  
Ohtsuchi, Tetsuro; Sumihara, Masanori; Kawasaki, Osamu; Nishikura, Takahiro; Takeda, Katsu; Nojima, Takashi; and Imada, Katsumi, 5,438,229, Cl. 310-316.000.
- Takeda, Kazunari: See—  
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- Takeda, Makoto: See—  
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- Takeda, Mitsuhiro: See—  
Koden, Mitsuhiro; Kaneko, Takashi; Takeda, Hitoshi; Itoh, Keizou; and Takeda, Mitsuhiro, 5,437,814, Cl. 252-299.610.
- Takemoto, Akira, to Mitsubishi Denki Kabushiki Kaisha. Mirror coupled monolithic laser diode and photodetector. 5,438,208, Cl. 250-551.000.

- Takeshima, Hirotsuka; Takeuchi, Hiroyuki; and Nakamura, Chikako, to Hitachi Medical Corporation. Magnetic field generating apparatus. 5,438,264, Cl. 324-319.000.
- Takeshima, Shinichi; Tanaka, Toshiaki; Iguchi, Satoshi; Araki, Yasushi; Hirota, Shinya; Oda, Tomohiro; and Murakami, Fumitada, to Toyota Jidosha Kabushiki Kaisha. Exhaust purification device of internal combustion engine. 5,437,153, Cl. 60-276.000.
- Takeuchi, Akihiko: See—  
Tanigawa, Koichi; Nakahata, Kimio; Takeuchi, Akihiko; Nanataki, Hideo; and Ono, Kazuaki, 5,438,398, Cl. 355-271.000.
- Takeuchi, Hiroyuki: See—  
Takeshima, Hirotsuka; Takeuchi, Hiroyuki; and Nakamura, Chikako, 5,438,264, Cl. 324-319.000.
- Takeuchi, Nobunari: See—  
Lee, Tekken; Takeuchi, Nobunari; Uchiyama, Haruyoshi; Shimizu, Kaoru; and Horiguchi, Tsuneo, 5,438,578, Cl. 372-32.000.
- Takeyari, Ryoji: See—  
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- Taki, Kenji: See—  
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- Takiar, Hem P.: See—  
Nguyen, Luu T.; and Takiar, Hem P., 5,437,095, Cl. 29-827.000.
- Takigen Manufacturing Co. Ltd.: See—  
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- Takiguchi, Tsuyoshi: See—  
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- Takimoto, Masaaki; Izumi, Minao; and Yamamoto, Hisataka, to Nippon Paint Co., Ltd. Colloidal particle dispersion and water-based coating composition. 5,438,083, Cl. 523-401.000.
- Takizawa, Tsuyoshi: See—  
Sato, Toshihiko; Takizawa, Tsuyoshi; Iwata, Yoichi; Ito, Hiroshi; and Nakayama, Takayoshi, 5,437,154, Cl. 60-276.000.
- Talreja, Sanjay S.: See—  
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- Tamaki, Sayuri: See—  
Iizuka, Masanori; Taniguchi, Takao; Isobe, Kazuo; Tamaki, Sayuri; Yamashita, Tadakazu; and Satake, Shinichi, 5,437,693, Cl. 44-302.000.
- Tamglass Engineering Oy: See—  
Yli-Vakkuri, Erkki; Kaonpaa, Arto; Salonen, Tapio; and Nikkanen, Jukka, 5,437,704, Cl. 65-107.000.
- Tamura, Tatsuya, to Hashimoto Forming Industry Co., Ltd. Window molding members and method of manufacturing same. 5,437,131, Cl. 52-716.600.
- Tamura, Yasunori: See—  
Okimatsu, Hideaki; and Tamura, Yasunori, 5,437,834, Cl. 419-24.000.
- Tanaka, Akio, to NEC Corporation. Low power driver circuit for an AC plasma display panel. 5,438,290, Cl. 327-108.000.
- Tanaka, Hidekazu: See—  
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- Tanaka, Hiroshi, to Max Co., Ltd. Air-pressure-operated implosion mechanism. 5,437,339, Cl. 173-210.000.
- Tanaka, Hiroyuki, to Nix Company Ltd. Automated development processor for dental x-ray film. 5,438,385, Cl. 354-337.000.
- Tanaka, Hitoshi: See—  
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- Tanaka, Mitsuhiro: See—  
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- Tanaka, So, to Sumitomo Electric Industries, Ltd. Method for depositing another thin film on an oxide thin film having perovskite crystal structure. 5,438,037, Cl. 505-329.000.
- Tanaka, Sumio: See—  
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- Tanaka, Tadao: See—  
Miichi, Yoshiaki; Tanaka, Tadao; and Harara, Mitsuhiro, 5,438,515, Cl. 364-424.050.
- Tanaka, Toshiaki: See—  
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- Tanaka, Toshiro; Nishiyama, Satoru; and Koyama, Masaharu, to Director-General, Printing Bureau, Ministry of Finance, Japan. Anti-counterfeit latent image formation object for bills, credit cards, etc. and method for making the same. 5,437,897, Cl. 428-29.000.
- Tanaka, Yasuhiro: See—  
Tanai, Takayoshi; Tanaka, Yasuhiro; and Saitoh, Tadashi, 5,438,665, Cl. 395-845.000.
- Tanaka, Yoshihisa: See—  
Kobayashi, Masahiko; Akashi, Masakatsu; Hirobe, Junichi; Sugaya, Tsutomu; Tanaka, Yoshihisa; Kusuda, Toshiaki; Makie, Ikuo; Aikawa, Yukihiko; Ishii, Satoshi; and Ohata, Yosuke, 5,438,390, Cl. 355-200.000.
- Tancrell, Roger H.: See—  
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- Tandberg Data A/S: See—  
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- Tani, Naoki: See—  
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- Tani, Yoshio: See—  
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- Taniai, Takayoshi; Tanaka, Yasuhiro; and Saitoh, Tadashi, to Fujitsu Limited. Direct memory access controller for handling cyclic execution of data transfer in accordance with stored transfer control information. 5,438,665, Cl. 395-845.000.
- Tanibata, Tohru: See—  
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- Tanigawa, Fumiyoshi: See—  
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- Tanigawa, Koichi; Nakahata, Kimio; Takeuchi, Akihiko; Nanataki, Hideo; and Ono, Kazuaki, to Canon Kabushiki Kaisha. Image forming apparatus with intermediate transfer member. 5,438,398, Cl. 355-271.000.
- Taniguchi, Keiko; Washino, Masahiro; Moriya, Shinobu; Shinoda, Hosi; Ohtaguro, Masami; Funae, Akihiro; and Iimuro, Shigeru, to Mitsui Toatsu Chemicals, Inc. Degradable non-woven fabric and preparation process thereof. 5,437,918, Cl. 428-224.000.
- Taniguchi, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Program debugging device and process. 5,438,574, Cl. 395-183.140.
- Taniguchi, Osamu; Okada, Shinjiro; Inaba, Yutaka; Shindo, Hitoshi; and Shibata, Hirofumi, to Canon Kabushiki Kaisha. Liquid crystal device. 5,438,443, Cl. 359-81.000.
- Taniguchi, Takao: See—  
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- Taniguro, Masahiro: See—  
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- Taphorn, Joseph B.: See—  
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- Target Therapeutics, Inc.: See—  
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- Tasaka, Michihisa: See—  
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- Tatsumi, Shigeki: See—  
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- Taylor, Charles, to HWE, Inc. Vibrating massage apparatus. 5,437,607, Cl. 601-49.000.
- Taylor, Peter: See—  
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- Taylor, Robert D.; Smith, Gary L.; and Olsen, Ritchie, to Morton International, Inc. Enhanced thermal and ignition stability azide gas generant intermediates. 5,437,229, Cl. 102-288.000.
- Taylor, William R., to Figgie International Inc. Personal alarm system. 5,438,320, Cl. 340-573.000.
- Tayonaka, Takashi; Tsuji, Shinji; and Takeyari, Ryoji, to Hitachi, Ltd. Optical routing system. 5,438,444, Cl. 359-123.000.
- TEAC Corporation: See—  
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- Nishiumi, Hiroshi; Ishii, Kanjyu; and Hara, Mitsuhiro, 5,438,463, Cl. 360-57.000.
- Tebbens, Denise C.: See—  
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- Technical Materials, Inc.: See—  
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- Teichmuller, Gerhard; and Muller, Gerd, to Jenapharm GmbH. Process for the production of unsaturated 17  $\alpha$ -cyanomethyl-17  $\beta$ -hydroxy steroids. 5,438,134, Cl. 540-32.000.
- Teixeira, Marcelo Jose B.: See—  
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- Teknekon Communication Systems, Inc.: See—  
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- Tekno Industries, Inc.: See—  
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- Tektronix, Inc.: See—  
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- Lynch, Eugene F.; Cherry, Guy W.; and Schwartz, Mayer D., 5,438,423, Cl. 358-335.000.
- Shank, Gordon W., 5,438,531, Cl. 364-724.100.
- Telect, Inc.: See—  
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- Telefonaktiebolaget LM Ericsson: See—  
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- Teleco Incorporated: See—  
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- Telic Technologies Corporation: See—  
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- Teltrend Inc.: See—  
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- Temple University - Of the Commonwealth Systems of Higher Education: See—  
Edgington, Thomas S.; Colman, Robert W.; Kappelmayer, Janos; Edmunds, L. Henry, Jr.; and Bernabei, Alvise, 5,437,864, Cl. 424-145,100.
- Templeton, Joe B., to Casey, James C. Bearing and seal assembly for trencher endless chain drives. 5,437,509, Cl. 384-142,000.
- Tenjinbayashi, Koji, to Agency of Industrial Science Technology; and Ministry of International Trade & Industry. Phase conjugate interferometer for testing paraboloidal mirror surfaces. 5,438,412, Cl. 356-359,000.
- Tennies, Winston L.: See—  
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- Tena, Nelson N. H.; Bieber, Marcia; and Bhat, Neelima M., to Leland Stanford Junior University. The Board of Trustees of the Triple gradient process with antibody panning to recover nucleated fetal cells from maternal blood. 5,437,987, Cl. 435-7,250.
- Tepic, Slobodan; and Goelings, Carel, to Synthes (U.S.A.). External fixation device for osteosynthesis. 5,437,666, Cl. 606-55,000.
- Terai, Takehiro; and Tatsumi, Shigeki, to Nissan Motor Co., Ltd. Air bag lid structure including a main lid and a sub lid. 5,437,470, Cl. 280-728,300.
- Terao, Takao: See—  
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- Terasima, Junichi; Asai, Toshinori; and Kawahori, Masaki, to Kabushiki Kaisha Sega Enterprises. Data reading and image processing system for CD-ROM. 5,437,464, Cl. 273-434,000.
- Terpay, Gregory W.: See—  
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- Terry, Jane M.: See—  
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- Terumo Kabushiki Kaisha: See—  
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- Tetrad Corporation: See—  
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- Teunissen, John: See—  
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- Texas Instruments Deutschland, GmbH: See—  
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- Texas Instruments Incorporated: See—  
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- Fritz, Galen F., 5,438,165, Cl. 174-256,000.
- Hashimoto, Masashi, 5,438,538, Cl. 365-154,000.
- Houston, Theodore W., 5,438,548, Cl. 365-227,000.
- Loewenstein, Lee M., 5,437,765, Cl. 216-51,000.
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- Thermo King Corporation: See—  
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- Thevenard, Paul: See—  
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- Thomas, Brian J.: See—  
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- Thompson, Christopher D.; and Hoepfl, Joseph R., to Snap-on Incorporated. Ratcheting screwdriver. 5,437,212, Cl. 81-63,100.
- Thompson, Craig; and Eakin, Lawrence L., to AlliedSignal Inc. Method and apparatus for isolating electronic boards from shock and thermal environments. 5,438,162, Cl. 174-52,200.
- Thompson, Sidney R.: See—  
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- Grancher, Alain; and Michel, Ludovic, 5,438,020, Cl. 437-183,000.
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- Thorwirth, Ralf: See—  
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- Townsend, David M., to S.T. Technologies, Inc. Air filter and method of construction. 5,437,701, Cl. 55-486,000.
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- Triebel, Thomas, to MERO-Raumstruktur GmbH & Co. Lattice girders, in particular for trusses. 5,437,136, Cl. 52-693,000.
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- Trimedyne, Inc.: See—  
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- Tripathy, Sukant K.: See—  
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- Yamada, Kouji: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,438,045, Cl. 514-81.000.
- Yamada, Kunihiko: See—  
Kaneda, Naoya; Hirasawa, Masahide; Yamada, Kunihiko; Kaneda, Kitahiro; and Niida, Mitsu, 5,438,190, Cl. 250-201.300.
- Yamada, Masahiro: See—  
Sano, Hideo; Yoneyama, Tomio; Murata, Yukichi; and Yamada, Masahiro, 5,437,716, Cl. 106-22.00K.
- Yamada, Shuhei; Ikukawa, Shuji; and Nakayama, Jitsuko, to Seiko Epson Corporation. Tolan derivative, liquid crystal composition containing the derivative, and liquid crystal display device having the composition, 5,437,815, Cl. 252-299.660.
- Yamada, Takeo: See—  
Kazama, Akira; Oshige, Takahiko; Yamada, Yoshiro; Yamada, Takeo; Yamazaki, Takeshi; Takayama, Takamitsu; and Nomura, Shuichi, 5,438,415, Cl. 356-369.000.
- Yamada, Yoshiro: See—  
Kazama, Akira; Oshige, Takahiko; Yamada, Yoshiro; Yamada, Takeo; Yamazaki, Takeshi; Takayama, Takamitsu; and Nomura, Shuichi, 5,438,415, Cl. 356-369.000.
- Yamagami, Hiroshi: See—  
Haraga, Hideaki; Yagi, Toshihiko; Kon, Miki; Shimazaki, Hiroshi; Urakawa, Yoshihide; Yamada, Yoshitaka; Ezaki, Atsuo; and Matsuzaka, Syoji, 5,437,966, Cl. 430-505.000.
- Yamagami, Kiyomi; Ishitaka, Yoshihiko; Yamagami, Hiroshi; Sugawara, Kiyomi; Ishitaka, Yoshihiko; Yamagami, Hiroshi; Yamaguchi, Masahiko; Kano, Mitsuru; and Hebiguchi, Hiroyuki, 5,438,421, Cl. 359-75.000.
- Yamagishi, Machio: See—  
Ochiai, Akihiko; Hashimoto, Makoto; Matsushita, Takeshi; Yamagishi, Machio; Sato, Hiroshi; and Shimanoe, Muneharu, 5,437,762, Cl. 216-20.000.
- Yamaguchi, Hidefumi, to International Business Machines Corporation. Liquid crystal display apparatus and method and apparatus for driving same, 5,438,342, Cl. 345-58.000.
- Yamaguchi, Masahiko: See—  
Sugawara, Kiyomi; Ishitaka, Yoshihiko; Yamagami, Hiroshi; Yamaguchi, Masahiko; Kano, Mitsuru; and Hebiguchi, Hiroyuki, 5,438,421, Cl. 359-75.000.
- Yamaguchi, Yasuhiko: See—  
Mizoguchi, Yoshimi; Ishii, Hiroshi; Kimura, Kiyoshi; Fukuchi, Masakazu; Takeda, Makoto; Maruyama, Hiroyuki; Yamaguchi, Yasuhiko; Taki, Kenji; Akamatsu, Masashi; and Kurohata, Takao, 5,438,437, Cl. 358-518.000.
- Yamaguchi, Yoshihiro: See—  
Nakagawa, Akio; Yasuhara, Norio; Matsudai, Tomoko; Yamaguchi, Yoshihiro; Omura, Ichiro; and Funaki, Hideyuki, 5,438,220, Cl. 257-487.000.
- Yamaha Corporation: See—  
Masuda, Hideyuki; and Kunimoto, Toshifumi, 5,438,156, Cl. 84-659.000.
- Yamaichi Electronics Co., Ltd.: See—  
Sagano, Hideki, 5,437,557, Cl. 439-72.000.
- Yamakawa, Kazuhiko: See—  
Kuretake, Masato; Zushi, Takayasu; Kitagawa, Motonobu; Yamakawa, Kazuhiko; Okamoto, Yoshimi; and Uda, Sawayo, 5,437,472, Cl. 280-737.000.
- Yamamoto Chemicals, Inc.: See—  
Fujita, Shigeo; Matsumoto, Mansuke; Kumagae, Yojiro; Wada, Sayuri; and Hashimoto, Shuichi, 5,438,032, Cl. 503-221.000.
- Yamamoto, Hisataka: See—  
Takimoto, Masaaki; Izumi, Minao; and Yamamoto, Hisataka, 5,438,083, Cl. 523-401.000.
- Yamamoto, Kazunori: See—  
Komatsu, Katsuki; Yamamoto, Kazunori; and Nishi, Shinichi, 5,438,393, Cl. 355-246.000.
- Yamamoto, Keisaku; Ikeda, Kiyoshi; and Fukuyama, Masahiro, to Sumitomo Chemical Company, Limited. Rubber composition, 5,438,101, Cl. 525-274.000.
- Yamamoto, Masanaga; Kaneko, Kiyotaka; Arai, Minoru; and Soga, Takashi, to Fuji Photo Film Co., Ltd. Still video camera and device for adjusting control data for amount of strobe emission, 5,438,367, Cl. 348-371.000.
- Yamamoto, Satoshi; and Kamei, Kenji, to Dainippon Screen Mfg. Co., Inc. Apparatus for detecting position of a notch in a semiconductor wafer, 5,438,209, Cl. 250-559.290.
- Yamamoto, Shinya: See—  
Goto, Kunifumi; Yamamoto, Shinya; Fukunuma, Tetsuhiko; Watanabe, Yasushi; and Yamada, Kiyohiro, 5,437,543, Cl. 418-55.500.
- Yamamoto, Takakazu, to Yuasa Corporation. Solid polymer electrolyte, 5,437,804, Cl. 252-62.200.
- Yamamoto, Takashi: See—  
Kanda, Toshiyuki; Tajima, Hisao; Takabayashi, Hiroshi; Yamamoto, Takashi; and Mori, Hideo, 5,438,484, Cl. 362-31.000.
- Yamana, Koji: See—  
Ito, Osamu; Yoshimoto, Kyoosuke; Kiyose, Yoshihiro; Nakane, Kazuhiko; Mashimo, Akira; Onda, Hiroyuki; Yamana, Koji; and Nagata, Takuya, 5,438,557, Cl. 369-44.320.
- Yamane, Akio: See—  
Ubukata, Kimiko; Nakagami, Satoru; and Yamane, Akio, 5,437,978, Cl. 435-6.000.
- Yamanishi, Takahiro: See—  
Yoshida, Ryoichi; Fujii, Hiroaki; Tsuji, Atsushi; Shimizu, Tomoko; Osada, Nobuya; and Yamanishi, Takahiro, 5,437,471, Cl. 280-730.200.
- Yamano, Motozo; Haino, Kozo; Yoshida, Akio; and Miura, Hidetoshi, to Mitsubishi Paper Mills Limited. Lithographic printing plate, 5,437,957, Cl. 430-232.000.
- Yamano, Shozo: See—  
Shiokama, Yoshiharu; and Yamano, Shozo, 5,438,387, Cl. 354-402.000.
- Yamanouchi, Kazuhiko; Tanaka, Mitsuhiro; and Horio, Yasufumi, to Kazuhiko Yamanouchi; and NGK Insulators, Ltd. Surface acoustic wave filter device with symmetrical electrode arrangement, 5,438,306, Cl. 333-195.000.
- Yamashita, Hirofumi: See—  
Kogo, Yasuo; Ito, Takefumi; Okumura, Mitsuhiro; Yoshizaki, Kiyoshi; Fujihara, Takeji; and Yamashita, Hirofumi, 5,437,921, Cl. 428-288.000.
- Yamashita, Hiroshi: See—  
Itoh, Katsuyuki; and Yamashita, Hiroshi, 5,438,207, Cl. 250-492.230.
- Yamashita, Hitoshi: See—  
Itoh, Hiroshi; Abe, Takashi; Yamashita, Hitoshi; Yoshimura, Toshihiro; Hisanaga, Takeshi; Takebayashi, Takao; Nakata, Kunio; and Hashimoto, Chikara, 5,437,902, Cl. 428-68.000.
- Yamashita, Masahiro; Kawada, Norihiko; and Nakamura, Satoshi, to Sony Corporation. Solid-state imaging apparatus employing independently variable odd and even lines of photodiodes, 5,438,365, Cl. 348-297.000.
- Yamashita, Masami: See—  
Doi, Takao; Itaya, Noriko; and Yamashita, Masami, 5,438,107, Cl. 525-456.000.
- Yamashita, Masayasu, to Koito Manufacturing Co., Ltd. Printed circuit board and electronic parts to be mounted thereon, 5,438,480, Cl. 361-760.000.
- Yamashita, Tadakazu: See—  
Iizuka, Masanori; Taniguchi, Takao; Isobe, Kazuo; Tamaki, Sayuri; Yamashita, Tadakazu; and Satake, Shinichi, 5,437,693, Cl. 44-302.000.
- Yamatsu, Isao: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,438,045, Cl. 514-81.000.
- Yamauchi, Noriaki; Kawamura, Nobuki; Miura, Tatuo; Hashizume, Shuhei; Nakamae, Isao; Yoshigoe, Kazumi; Suzuki, Hiroyuki; and



- Minami, Iwao, to Sumitomo Chemical Company, Limited. Granular reactive dye composition and production process thereof. 5,437,688, Cl. 8-526.000.
- Yamauchi, Yasuhiro; and Komori, Akito, to Mitsubishi Jukogyo Kabushiki Kaisha. Gas heating apparatus. 5,437,265, Cl. 126-657.000.
- Yamaya, Masaaki: See—  
Kondou, Takashi; Yamaya, Masaaki; Yoshioka, Hiroshi; Ohtsuka, Yasuhiro; Tojima, Kazuo; Shibata, Yasufumi; Ohkuwa, Naomi; and Okayama, Shinobu, 5,437,817, Cl. 252-299.670.
- Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Electronic device with plural pad connection of semiconductor chip to leads. 5,438,222, Cl. 257-673.000.
- Yamazaki, Takeshi: See—  
Kazama, Akira; Oshige, Takahiko; Yamada, Yoshiro; Yamada, Takeo; Yamazaki, Takeshi; Takayama, Takamitsu; and Nomura, Shuichiro, 5,438,415, Cl. 356-369.000.
- Yamazaki, Toshiyuki: See—  
Koguchi, Toshiharu; Yamazaki, Toshiyuki; and Matsumura, Mitsunori, 5,438,466, Cl. 360-96.400.
- Yamazaki, Yuji; and Ohno, Koh, to Nikon Corporation. Absolute encoder. 5,438,330, Cl. 341-11.000.
- Yan, Li, to AT&T Corp. System and method for filtering video signals. 5,438,374, Cl. 348-620.000.
- Yanagawa, Hiroshi, to Matsumoto Heavy Industry Co. Ltd.; and Isuzu Motors Limited. Method and apparatus for manufacturing a cam shaft. 5,437,097, Cl. 29-888.100.
- Yanagi, Haruyuki: See—  
Kawakami, Hideaki; Kiyohara, Takehiko; Suzuki, Tetsuo; Asano, Junichi; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Saikawa, Satoshi; and Kinoshita, Hiroyuki, 5,437,444, Cl. 271-22.000.
- Yanagisawa, Akira: See—  
Imamura, Masato; Nakajima, Kiichi; and Yanagisawa, Akira, 5,437,832, Cl. 419-2.000.
- Yancopoulos, George: See—  
Bardle, Yves-Alain; Leibrock, Joachim; Lottspeich, Friedrich; Edgar, David; Yancopoulos, George; and Thoenen, Hans, 5,438,121, Cl. 530-399.000.
- Yang, Deng-ke: See—  
Doane, J. William; Yang, Deng-ke; and Chien, Liang-Chy, 5,437,811, Cl. 252-299.010.
- Yang, Fu-chin: See—  
Ho, Edmund Y.; Yang, Fu-chin; and Lin, Jung-lung, 5,438,254, Cl. 324-76.820.
- Yang, Ming-Tzong; and Hong, Gary, to United Microelectronics Corporation. Method of fabrication of MOSFET device with buried bit line. 5,438,009, Cl. 437-52.000.
- Yano, Douglas H.: See—  
Hemmady, Jayant G.; Reilly, Craig P.; Romy, Neil J.; Spanke, Ronald A.; and Yano, Douglas H., 5,438,565, Cl. 370-60.000.
- Yano, Hiroyuki; Okano, Haruo; Watanabe, Tohru; and Horioka, Keiji, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor device. 5,437,961, Cl. 430-316.000.
- Yarkosky, Eugene F.; Friday, Deborah; and Cacciatore, Patricia A., to Enthone-Omi, Inc. Method of preparing aluminum memory disks. 5,437,887, Cl. 427-131.000.
- Yarus, Michael J.: See—  
Liao, Hans H.; Medwid, Richard D.; Heefner, Donald L.; Sniff, Kathleen S.; Hassler, Randal A.; and Yarus, Michael J., 5,437,997, Cl. 435-257.100.
- Yashiki, Takashi: See—  
Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, 5,437,835, Cl. 420-421.000.
- Yasuhara, Norio: See—  
Nakagawa, Akio; Yasuhara, Norio; Matsudai, Tomoko; Yamaguchi, Yoshihiro; Omura, Ichiro; and Funaki, Hideyuki, 5,438,220, Cl. 257-487.000.
- Yasunaga, Tatsuya: See—  
Sugizaki, Yasuaki; Ueda, Keiji; Satoh, Hiroshi; Nishimoto, Hidetoshi; Yasunaga, Tatsuya; and Yashiki, Takashi, 5,437,835, Cl. 420-421.000.
- Yazaki Corporation: See—  
Ikari, Akira, 5,438,310, Cl. 337-208.000.
- Yen, Chu-Sun: See—  
Hornak, Thomas; Petruno, Patrick; Walker, Richard C.; Lai, Benny W. H.; Yen, Chu-Sun; Stout, Cheryl L.; and Wu, Jieh-Taorn, 5,438,621, Cl. 380-43.000.
- Yli-Vakkuri, Erkki; Kaonpaa, Arto; Salonen, Tapio; and Nikkanen, Jukka, to Tamglass Engineering Oy. Method and furnace for bending glass sheets. 5,437,704, Cl. 65-107.000.
- Yokoyama, Kazuo; and Shibata, Motohito, to Matsushita Electric Industrial Co., Ltd. Positioning device. 5,438,206, Cl. 250-424.110.
- Yokoyama, Masataka: See—  
Shige, Tomoo; Makabe, Yasushi; and Yokoyama, Masataka, 5,437,779, Cl. 205-106.000.
- Yokoyama, Yukio: See—  
Itoh, Ryoh; Yokoyama, Yukio; and Ono, Takao, 5,438,339, Cl. 343-702.000.
- Yoneda, Tomio; Ishida, Shigeru; and Mishina, Haruo, to Hitachi Techno Engineering Co., Ltd. Apparatus for drawing paste pattern on substrate. 5,437,727, Cl. 118-669.000.
- Yoneka, Masayuki; Kawamura, Kazuhiro; Torata, Shin-ichiro; and Takahashi, Takeshi, to Doryokuro Kakuneryo Kaihatsu Jigyodan. Method of separating and recovering ruthenium from high-level radioactive liquid waste. 5,437,847, Cl. 423-2.000.
- Yoneyama, Tomio: See—  
Sano, Hideo; Yoneyama, Tomio; Murata, Yukichi; and Yamada, Masahiro, 5,437,716, Cl. 106-22.00K.
- Yoon, InBae. Suturing method, apparatus and system for use in endoscopic procedures. 5,437,680, Cl. 606-139.000.
- Yoon, Sei-Seung, to Samsung Electronics Co., Ltd. Semiconductor memory using low power supply voltage. 5,438,543, Cl. 365-189.110.
- Yoshida, Akio: See—  
Yamano, Motozo; Haino, Koza; Yoshida, Akio; and Miura, Hidetoshi, 5,437,957, Cl. 430-232.000.
- Yoshida, Henry: See—  
Sayed-Bolorforosh, Mir S.; Greenstein, Michael; Gururaja, Turuvekere R.; and Yoshida, Henry, 5,438,554, Cl. 367-140.000.
- Yoshida, Hideki: See—  
Murakami, Daisuke; Yoshida, Hideki; and Terao, Takao, 5,438,303, Cl. 332-109.000.
- Yoshida, Ryouichi; Fujii, Hiroaki; Tsuji, Atsushi; Shimizu, Tomoko; Osada, Nobuya; and Yamanishi, Takahiro, to Takata Corporation. Inflator with starter for side collision air bag device. 5,437,471, Cl. 280-730.200.
- Yoshida, Takehiro, to Canon Kabushiki Kaisha. Facsimile apparatus with controlled image page transmission after retransmission. 5,438,427, Cl. 358-405.000.
- Yoshida, Yoshikazu: See—  
Fukuzawa, Keiji; and Yoshida, Yoshikazu, 5,438,340, Cl. 343-781.00R.
- Yoshida, Yukihiro, to Sharp Kabushiki Kaisha. Multivalued multiplier for binary and multivalued logic data. 5,438,533, Cl. 364-746.200.
- Yoshigoe, Kazumi: See—  
Yamauchi, Noriaki; Kawamura, Nobuaki; Miura, Tatuo; Hashizume, Shuhei; Nakamae, Isao; Yoshigoe, Kazumi; Suzuki, Hiroyuki; and Minami, Iwao, 5,437,688, Cl. 8-526.000.
- Yoshihisa, Youetsu: See—  
Murata, Kazuo; Yoshihisa, Youetsu; Takeda, Kazunari; and Izuchi, Syuichi, 5,437,942, Cl. 429-192.000.
- Yoshimoto, Kyosuke: See—  
Ito, Osamu; Yoshimoto, Kyosuke; Kiyose, Yoshihiro; Nakane, Kazuhiko; Mashimo, Akira; Onda, Hiroyuki; Yamana, Koji; and Nagata, Takuya, 5,438,557, Cl. 369-44.320.
- Yoshimura, Hideyuki: See—  
Nagayama, Kuniaki; Denkov, Nikolai D.; Douchkin, Tzetzto D.; and Yoshimura, Hideyuki, 5,437,892, Cl. 427-372.200.
- Yoshimura, Hiroyuki: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,438,045, Cl. 514-81.000.
- Yoshimura, Katsuhiko: See—  
Saida, Muneco; Hirasawa, Yutaka; and Yoshimura, Katsuhiko, 5,437,914, Cl. 428-209.000.
- Yoshimura, Shinichi: See—  
Asou, Yoshio; Hayashi, Bunya; Sato, Hideharu; Matsumoto, Takumi; Ishikawa, Makoto; Kaneko, Ryushiro; Shimauchi, Keisuke; and Yoshimura, Shinichi, 5,437,306, Cl. 137-625.640.
- Yoshimura, Toshihiro: See—  
Itoh, Hiroshi; Abe, Takashi; Yamashita, Hitoshi; Yoshimura, Toshihiro; Hisanaga, Takeshi; Takebayashi, Takao; Nakata, Kunio; and Hashimoto, Chikara, 5,437,902, Cl. 428-68.000.
- Yoshioka, Hiroshi: See—  
Kondou, Takashi; Yamaya, Masaaki; Yoshioka, Hiroshi; Ohtsuka, Yasuhiro; Tojima, Kazuo; Shibata, Yasufumi; Ohkuwa, Naomi; and Okayama, Shinobu, 5,437,817, Cl. 252-299.670.
- Yoshizaki, Kiyoshi: See—  
Kogo, Yasuo; Ito, Takefumi; Okumura, Mitsuhiro; Yoshizaki, Kiyoshi; Fujihara, Takeji; and Yamashita, Hirofumi, 5,437,921, Cl. 428-288.000.
- Yoshizumi, Akira: See—  
Shimozawa, Hiroshi; Fujieda, Shinetsu; Hayase, Shuzi; Nakano, Yoshihiko; Yoshizumi, Akira; and Uchida, Ken, 5,438,113, Cl. 528-25.000.
- Younan, Kais; Wolf, David; Lycette, Mark; Glatfelter, Troy; Hoffman, Kevin; and Banerjee, Arindam, to United Solar Systems Corporation. Photovoltaic shingle system. 5,437,735, Cl. 136-251.000.
- Youngkin, Carroll. Method for aligning a golf putting stroke. 5,437,446, Cl. 273-32.00A.
- Yozan Inc.: See—  
Kumagai, Ryohei, 5,438,682, Cl. 395-800.000.
- Yu, Jang-Hyun: See—  
Kim, Tae-Sig; and Yu, Jang-Hyun, 5,438,247, Cl. 318-696.000.
- Yu, Robert C. U.; and Ong, Beng S., to Xerox Corporation. Electrophotographic imaging member with enhanced photo-electric sensitivity. 5,437,950, Cl. 430-58.000.
- Yuan, Hansen A.; Fredrickson, Bruce E.; and Edwards, W. Thomas, to AMEI Technologies Inc. Spinal fixation systems with bifurcated connectors. 5,437,669, Cl. 606-61.000.
- Yuasa Corporation: See—  
Murata, Kazuo; Yoshihisa, Youetsu; Takeda, Kazunari; and Izuchi, Syuichi, 5,437,942, Cl. 429-192.000.
- Yamamoto, Takakazu, 5,437,804, Cl. 252-62.200.
- Yugen Kaisha Clean Up System: See—  
Furukawa, Sadaishi, 5,437,698, Cl. 47-66.000.
- Yugengaiha Mutsumichi Kenkyujo: See—  
Sugimoto, Mutsumi, 5,437,475, Cl. 280-801.200.

- Yukawa Hiroshi: See—  
Eda, Yukio; Fujimoto, Hirohisa; Hisata, Nahoko; and Yukawa Hiroshi, 5,438,579, Cl. 372-34.000.
- Yuugen Kaisha Frontier: See—  
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- Zambon Group S.p.A.: See—  
Norcini, Gabriele; and Santangelo, Francesco, 5,438,046, Cl. 514-89.000.
- Santangelo, Francesco; Casagrande, Cesare; and Norcini, Gabriele, 5,438,047, Cl. 514-104.000.
- Zaopo, Antonio: See—  
Redondo, Eduardo G.; Castellani, Luca; and Zaopo, Antonio, 5,437,930, Cl. 428-419.000.
- Zavacky, Paul M.; Fan, John C. C.; McClelland, Robert; Jacobsen, Jeffrey; Dingle, Brenda; and Spitzer, Mark B., to Kopin Corporation. Single crystal silicon arrayed devices for display panels. 5,438,241, Cl. 315-169.300.
- Zawadzki, Rainer K.: See—  
Claus, Steven L.; Pastel, Michael J.; and Zawadzki, Rainer K., 5,438,071, Cl. 514-410.000.
- Zehnder, Beat: See—  
LaRoche, Hans L.; Weber, Markus; and Zehnder, Beat, 5,437,798, Cl. 210-761.000.
- Zeiner, Harold R. Multi-functional table with elevational capabilities. 5,437,236, Cl. 108-147.000.
- Zelger, Josef: See—  
Ehli, Thomas; Geoffroy, Andre; Marti, Erwin; Zelger, Josef; Franke, Karlheinz; and Burkhard, Andreas, 5,437,818, Cl. 252-301.210.
- Zellweger Luwa AG: See—  
Plaschy, Martin; and Krebs, Walter, 5,437,182, Cl. 73-160.000.
- Zenda, Hiroki, to Kabushiki Kaisha Toshiba. Display control apparatus for converting color/monochromatic CRT gradation into flat panel gradation. 5,438,652, Cl. 395-131.000.
- Zeneca Limited: See—  
Clough, John M.; Godfrey, Christopher R. A.; de Fraine, Paul J.; Hutchings, Michael G.; and Anthony, Vivienne M., 5,438,059, Cl. 514-256.000.
- Matthews, Ian R., 5,438,066, Cl. 514-361.000.
- Zenith Electronics Corporation: See—  
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- Zermatt Holdings Ltd.: See—  
Johnston, Craig, 5,437,112, Cl. 36-128.000.
- Zeytoonjian, Douglas; Zeytoonjian, Frederick, Sr.; Kramer, Harold; and Allen, Paul, to Cart Watch, Inc. Golf cart control and monitoring apparatus. 5,438,319, Cl. 340-571.000.
- Zeytoonjian, Frederick, Sr.: See—  
Zeytoonjian, Douglas; Zeytoonjian, Frederick, Sr.; Kramer, Harold; and Allen, Paul, 5,438,319, Cl. 340-571.000.
- Zhang, Peiming: See—  
Bergstrom, Donald E.; Andrews, Philip C.; Nichols, Ruthann; and Zhang, Peiming, 5,438,131, Cl. 536-28.600.
- Zheng, Shuming; Beissinger, Richard L.; Wasan, Darsh T.; Sehgal, Lakshman R.; and Rosen, Arthur L., to Illinois Institute of Technology; and Northfield Laboratories, Inc. Oxygen carrying multiple emulsions. 5,438,041, Cl. 514-6.000.
- Zhu, Jingdong: See—  
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- Zieve, Peter B.; Hartmann, John L.; Janicki, Peter W.; Assadi, Michael D.; and Tomchick, Scott C., to Electroimpact, Inc. Electromagnetic bolt insertion and collar swaging system. 5,437,094, Cl. 29-718.000.
- Zimmer, Ernst, to Kuka Schweissanlagen & Roboter GmbH. Multiaxial manipulator. 5,437,207, Cl. 74-490.020.
- Zimmer, Inc.: See—  
Lozier, Antony J.; Johnson, John R.; and Dimar, John R., II, 5,437,671, Cl. 606-61.000.
- Zimmer, Randy W.: See—  
Schmidt, Frances E.; Zimmer, Randy W.; and Schultz, Wendy L., 5,437,345, Cl. 182-129.000.
- Zink, Albert H. Golf club holder and turf repair tool. 5,437,449, Cl. 273-32.00B.
- Zinn, Bernd; and Lolic, Srboislav, to Grote & Hartmann GmbH & Co. KG. Electrical contact element. 5,437,566, Cl. 439-839.000.
- Zipfel, George G., Jr.: See—  
Smith, Thomas E.; Terpay, Gregory W.; and Zipfel, George G., Jr., 5,438,627, Cl. 381-199.000.
- Ziv-El, Jakob, to Discourse Technologies, Inc. Remote teaching system. 5,437,555, Cl. 434-336.000.
- Zushi, Takayasu: See—  
Kuretake, Masato; Zushi, Takayasu; Kitagawa, Motoonobu; Yamakawa, Kazuhiko; Okamoto, Yoshimi; and Uda, Sawayo, 5,437,472, Cl. 280-737.000.
- Zwick GmbH & Co.: See—  
Dripke, Manfred; and Saum, Gerhard, 5,437,191, Cl. 73-816.000.
- Zymogenetics, Inc.: See—  
Laustsen, Mads, 5,437,774, Cl. 204-182.300.
- 501 Daiken Industries Ltd.: See—  
Arase, Takuya; Shibuya, Yoshiyuki; and Daimon, Shigeo, 5,437,805, Cl. 252-62.510.

## LIST OF REISSUE PATENTEEES

TO WHOM

### PATENTS WERE ISSUED ON THE 1ST DAY OF AUGUST, 1995

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Bay, William E.: See—  
Cohen, Martin L.; Bay, William E.; and Errigo, Lynn E., Re. 35,007, Cl. 252-700.000.
- Bugnon, Philippe; Herren, Fritz; and Medinger, Bernhard, to Ciba-Geigy Corporation. Diketopyrrolopyrrole pigments in platelet form. Re. 35,009, Cl. 548-453.000.
- Ciba-Geigy Corporation: See—  
Bugnon, Philippe; Herren, Fritz; and Medinger, Bernhard, Re. 35,009, Cl. 548-453.000.
- Cohen, Martin L.; Bay, William E.; and Errigo, Lynn E., to Omniglow Corporation. Preparation of chemiluminescent vinyl halide or vinylidene halide polymer structures. Re. 35,007, Cl. 252-700.000.
- Errigo, Lynn E.: See—  
Cohen, Martin L.; Bay, William E.; and Errigo, Lynn E., Re. 35,007, Cl. 252-700.000.
- Greenway Services, Inc.: See—  
Ripley, Thomas L., Sr.; and Indyk, Henry, Re. 35,006, Cl. 47-66.000.
- Herren, Fritz: See—  
Bugnon, Philippe; Herren, Fritz; and Medinger, Bernhard, Re. 35,009, Cl. 548-453.000.
- Indyk, Henry: See—  
Ripley, Thomas L., Sr.; and Indyk, Henry, Re. 35,006, Cl. 47-66.000.
- M. B. Walton, Inc.: See—  
Torres, Bonifacio, Re. 35,005, Cl. 15-119.100.
- Medinger, Bernhard: See—  
Bugnon, Philippe; Herren, Fritz; and Medinger, Bernhard, Re. 35,009, Cl. 548-453.000.
- Omniglow Corporation: See—  
Cohen, Martin L.; Bay, William E.; and Errigo, Lynn E., Re. 35,007, Cl. 252-700.000.
- Ripley, Thomas L., Sr.; and Indyk, Henry, to Greenway Services, Inc., The. Turfing systems for stadia. Re. 35,006, Cl. 47-66.000.
- Torres, Bonifacio, to M. B. Walton, Inc. Replacement sponge assembly for mops. Re. 35,005, Cl. 15-119.100.

## LIST OF REEXAMINATION PATENTEEES

TO WHOM

### CERTIFICATES WERE ISSUED

- Baker, Jeffrey P.; La, Duong T.; and Coverstone, Randy A., to Hewlett-Packard Company. Thermal ink jet pen body construction having improved ink storage and feed capability. B1 4,771,295, 8-1-95, Cl. 347-87.000.
- Coverstone, Randy A.: See—  
Baker, Jeffrey P.; La, Duong T.; and Coverstone, Randy A., B1 4,771,295, Cl. 347-87.000.
- Dorflinger, Max F.: See—  
Duffy, Richard J.; Dudley, Joseph R.; Fruehe, Gregory A.; and Dorflinger, Max F., B1 5,221,170, Cl. 411-428.000.
- Dudley, Joseph R.: See—  
Duffy, Richard J.; Dudley, Joseph R.; Fruehe, Gregory A.; and Dorflinger, Max F., B1 5,221,170, Cl. 411-428.000.
- Duffy, Richard J.; Dudley, Joseph R.; Fruehe, Gregory A.; and Dorflinger, Max F., to Nylok Fastener Corporation. Coated threaded fasteners. B1 5,221,170, 8-1-95, Cl. 411-428.000.
- Fruehe, Gregory A.: See—  
Duffy, Richard J.; Dudley, Joseph R.; Fruehe, Gregory A.; and Dorflinger, Max F., B1 5,221,170, Cl. 411-428.000.
- Hayes, Stephen L.: See—  
Stern, Carl M.; Meckstroth, Richard N.; and Hayes, Stephen L., B1 5,045,016, Cl. 446-409.000.
- Hewlett-Packard Company: See—  
Baker, Jeffrey P.; La, Duong T.; and Coverstone, Randy A., B1 4,771,295, Cl. 347-87.000.
- Innova Development Corporation: See—  
Stern, Carl M.; Meckstroth, Richard N.; and Hayes, Stephen L., B1 5,045,016, Cl. 446-409.000.
- La, Duong T.: See—  
Baker, Jeffrey P.; La, Duong T.; and Coverstone, Randy A., B1 4,771,295, Cl. 347-87.000.
- Meckstroth, Richard N.: See—  
Stern, Carl M.; Meckstroth, Richard N.; and Hayes, Stephen L., B1 5,045,016, Cl. 446-409.000.
- Nylok Fastener Corporation: See—  
Duffy, Richard J.; Dudley, Joseph R.; Fruehe, Gregory A.; and Dorflinger, Max F., B1 5,221,170, Cl. 411-428.000.
- Stern, Carl M.; Meckstroth, Richard N.; and Hayes, Stephen L., to Innova Development Corporation. Toy vehicle with electronic sounder and direction sensor. B1 5,045,016, 8-1-95, Cl. 446-409.000.

## LIST OF DESIGN PATENTEEES

- A. K. Reels Pty Ltd.: See—  
Anderson, Robert F., 360,822, Cl. D8-358.000.
- A.W. Faber-Castell, Unternehmensverwaltung GmbH & Co.: See—  
Stukenkemper, Heinrich, 360,897, Cl. D19-73.000.
- Abe, Tsutomu: See—  
Tokuda, Hiroyuki; Sekine, Tetsuya; Higuma, Masahiko; Abe, Tsutomu; and Ikeda, Masami, 360,895, Cl. D18-56.000.
- Abraham, James E.: See—  
Schepher, Robert M.; Groendal, Dale M.; Abraham, James E.; Hahn, Thomas R.; Baumgartner, Cheryl D.; Smith, Douglas A.; and Scholten, Brian L., 360,770, Cl. D6-372.000.
- Adaptive Micro Systems, Inc.: See—  
Salinas, Christopher J.; and Levac, Ronald A., 360,847, Cl. D10-115.000.
- Adidas Sarragan France: See—  
Fernandez, Monso; Arturo, 360,917, Cl. D21-204.000.
- Albertson, David V. Water filter. 360,929, 8-1-95, Cl. D23-209.000.
- Allekotte, Heinz; and Spitzley, Gunther P. Multi-purpose display device. 360,779, 8-1-95, Cl. D6-449.000.
- Aluminum Company of America: See—  
Botterman, Ralph C., 360,867, Cl. D12-211.000.
- American Manufacturing Company, Inc.: See—  
Sheftel, Steven J., 360,953, Cl. D25-67.000.
- American Standard Inc.: See—  
Hohenthaner, Franz G., 360,935, Cl. D23-293.100.
- Anderson, Robert F., to A. K. Reels Pty Ltd. Hose reel. 360,822, 8-1-95, Cl. D8-358.000.
- Andrasic, Steven E.; Hytken, Paul J.; Wierengo, David A.; and Haralson, Craig S., to Myro, Inc. Tube key. 360,791, 8-1-95, Cl. D6-541.000.
- Antoniou, Anthony J. Iron type golf club head. 360,923, 8-1-95, Cl. D21-220.000.
- Antoniou, Anthony J. Iron type golf club head. 360,925, 8-1-95, Cl. D21-220.000.

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- Apt, Fred G., III; Brightbill, Keith E.; Conaway, Brian J.; and Ward, Coy D., to Rubbermaid Incorporated. Storage drawer. 360,778, 8-1-95, Cl. D6-448.000.
- Ashida, Kenichiro: See—  
Barr, Lance; and Ashida, Kenichiro, 360,903, Cl. D21-48.000.
- ATI-Orion: See—  
Brockway, Laura; Sydlowski, Paul; and Nikkhoy-Toussi, Nasseradin, 360,840, Cl. D10-81.000.
- ATTINELLO, JOHN S.; Glover, William E.; and Reid, Kevin A., to Goodyear Tire & Rubber Company. The. Tire tread. 360,859, 8-1-95, Cl. D12-147.000.
- Attinello, John S.; Glover, William E.; and Reid, Kevin A., to Goodyear Tire & Rubber Company. The. Tire tread. 360,860, 8-1-95, Cl. D12-147.000.
- Attinello, John S.; Glover, William E.; and Reid, Kevin A., to Goodyear Tire & Rubber Company. The. Tire tread. 360,863, 8-1-95, Cl. D12-151.000.
- Augustine, Cesario C.: See—  
Wiedemann, John D.; and Augustine, Cesario C., 360,813, Cl. D8-52.000.
- Autier, Jacques J., to Salomon S.A. Upper part of walking shoe. 360,747, 8-1-95, Cl. D2-970.000.
- Bailey, Tracy A., to Federal Express Corporation. Data entry terminal. 360,880, 8-1-95, Cl. D14-100.000.
- Baldwin, Robert M. Allergy testing needles. 360,945, 8-1-95, Cl. D24-133.000.
- Ball, Arthur W. Caulk saver. 360,828, 8-1-95, Cl. D9-439.000.
- Barr, Lance; and Ashida, Kenichiro, to Nintendo Company, Ltd. Controller for a video game machine. 360,903, 8-1-95, Cl. D21-48.000.
- Baumgartner, Cheryl D.: See—  
Schepher, Robert M.; Groendal, Dale M.; Abraham, James E.; Hahn, Thomas R.; Baumgartner, Cheryl D.; Smith, Douglas A.; and Scholten, Brian L., 360,770, Cl. D6-372.000.
- Beckett, Sharon M. Magnet. 360,849, 8-1-95, Cl. D11-132.000.
- Bergh, James A.: See—  
Temple, James M.; Bergh, James A.; and Stanley, Robert P., 360,800, Cl. D6-629.000.
- Bernstein, Michael S.: See—  
Crossley, David W.; Sundberg, Brian C.; and Bernstein, Michael S., 360,933, Cl. D23-278.000.
- Beroni, Claudio: See—  
Echazabal, Alberto; and Beroni, Claudio, 360,866, Cl. D12-209.000.
- Bertoli, Franco. Lavatory. 360,934, 8-1-95, Cl. D23-292.000.
- Better Sleep Mfg. Co.: See—  
Emery, William W.; and Fritts, Russell A., 360,759, Cl. D3-306.000.
- Binney & Smith Inc.: See—  
Volk, Robert S.; and Marino, Joseph A., 360,894, Cl. D19-36.000.
- Birkholz, Douglas J.; and Boda, James C., to Fiskars Inc. Cap for a rotary paper trimmer carriage. 360,891, 8-1-95, Cl. D18-34.000.
- Birkholz, Douglas J.; and Boda, James C., to Fiskars Inc. Carriage for a rotary blade paper trimmer. 360,892, 8-1-95, Cl. D18-34.000.
- Blue, Robin. Reading tray. 360,776, 8-1-95, Cl. D6-406.000.
- Bobby Grace Golf Design, Inc.: See—  
Grace, Bobby, 360,922, Cl. D21-217.000.
- Bochnak, Bruce: See—  
Camp, William P., Jr.; Bochnak, Bruce; Tennant, Steven C.; and Bukovitz, Richard K., 360,763, Cl. D4-138.000.
- Boda, James C.: See—  
Birkholz, Douglas J.; and Boda, James C., 360,891, Cl. D18-34.000.
- Birkholz, Douglas J.; and Boda, James C., 360,892, Cl. D18-34.000.
- Boekeloo, James F. Funnel cover. 360,889, 8-1-95, Cl. D15-150.000.
- Bogner, Peter K., to P/S Engineering and Manufacturing Co. Fishing reel. 360,928, 8-1-95, Cl. D22-140.000.
- Boisset, Jean C., to Grand Vins Jean Claude Boisset. Bottle. 360,831, 8-1-95, Cl. D9-529.000.
- Bomatic, Inc.: See—  
Hestehave, Borge; and Hestehave, Kjeld, 360,830, Cl. D9-520.000.
- Bonko, Mark L.; and McClain, Myron M., to Goodyear Tire & Rubber Company. The. Tractor tire. 360,862, 8-1-95, Cl. D12-151.000.
- Bostic, James R.; Doop, Alan E.; Heutmaker, Michael E.; and Peterson, Stephen S., to NordicTrack, Inc. Exercise treadmill. 360,915, 8-1-95, Cl. D21-192.000.
- Botterman, Ralph C., to Aluminum Company of America. Vehicle wheel. 360,867, 8-1-95, Cl. D12-211.000.
- Bourgeois, Cory. Combined toilet and fluid motor seat lifter. 360,937, 8-1-95, Cl. D23-309.000.
- Bowser, Robert A. Head dress cap. 360,746, 8-1-95, Cl. D2-865.000.
- Brackett, Frances G. Portable desk for motor vehicles. 360,869, 8-1-95, Cl. D12-423.000.
- Brayer, Randall R.; Robinson, Beale A.; and Weimer, Andrew F., to Goodyear Tire & Rubber Company. The. Tire tread. 360,858, 8-1-95, Cl. D12-147.000.
- Bridgestone Corporation: See—  
Himuro, Yasuo; and Hamada, Yasuhiro, 360,856, Cl. D12-146.000.
- Brightbill, Keith E.: See—  
Apt, Fred G., III; Brightbill, Keith E.; Conaway, Brian J.; and Ward, Coy D., 360,778, Cl. D6-448.000.
- Brockway, Laura; Sydlowski, Paul; and Nikkhoy-Toussi, Nasseradin, to ATI-Orion. PH meter. 360,840, 8-1-95, Cl. D10-81.000.
- Brown, Dennis N., to Northwest Podiatric laboratory, Inc. Shoe and boot expander. 360,816, 8-1-95, Cl. D8-106.000.
- Brown, Richard S., Sr. Wall mounted support rack for headband, barrette, and bow wearing apparel. 360,787, 8-1-95, Cl. D6-512.000.
- Brown, Robert L., to Tonka Corporation. Toy projectile shooter. 360,914, 8-1-95, Cl. D21-147.000.
- Bucher, John C.; Wu, Shih T.; and Tao, Ta-Yao, to Chien Luen Industries Company, Ltd., Inc. Combined neon ceiling fan motor housing and support rod. 360,942, 8-1-95, Cl. D23-411.000.
- Buhner, Manfred. Combined calendar and map. 360,896, 8-1-95, Cl. D19-20.000.
- Bukovitz, Richard K.: See—  
Camp, William P., Jr.; Bochnak, Bruce; Tennant, Steven C.; and Bukovitz, Richard K., 360,763, Cl. D4-138.000.
- Camp, William P., Jr.; Bochnak, Bruce; Tennant, Steven C.; and Bukovitz, Richard K., to Wooster Brush Company. The. Scrub brush handle. 360,763, 8-1-95, Cl. D4-138.000.
- Canon Kabushiki Kaisha: See—  
Tokuda, Hiroyuki; Sekine, Tetsuya; Higuma, Masahiko; Abe, Tsutomu; and Ikeda, Masami, 360,895, Cl. D18-56.000.
- Carlson, Clarence J. Golf ball retriever. 360,918, 8-1-95, Cl. D21-206.000.
- Carter, Stanley R.: See—  
Moskovich, Robert; and Carter, Stanley R., 360,761, Cl. D4-104.000.
- Case Logic, Inc.: See—  
Temple, James M.; Bergh, James A.; and Stanley, Robert P., 360,800, Cl. D6-629.000.
- Casio Computer Co., Ltd.: See—  
Goto, Atsushi, 360,836, Cl. D10-38.000.
- Sayama, Takahiko, 360,835, Cl. D10-38.000.
- Chien Luen Industries Company, Ltd., Inc.: See—  
Bucher, John C.; Wu, Shih T.; and Tao, Ta-Yao, 360,942, Cl. D23-411.000.
- Choi, Chung-Hing, to Hing Fat Toys Manufacturer Ltd. Racket. 360,899, 8-1-95, Cl. D21-212.000.
- Choi, Chung-Hing, to Hing Fat Toys Manufacturer Limited. Toy axe. 360,913, 8-1-95, Cl. D21-145.000.
- Chui, Lawrence L. S., to Lung Sun Plastic & Metal Factory Limited. Combined security device torch and compass. 360,837, 8-1-95, Cl. D10-62.000.
- Cinna: See—  
Mourgue, Pascal, 360,784, Cl. D6-479.000.
- Cohen, Milton L.; and Siegel, Jeff, to Lifetime Hoan Corporation. Storage caddy for knives and kitchen tools, utensils and gadgets. 360,811, 8-1-95, Cl. D7-641.000.
- Coin Concepts, Inc.: See—  
Lankiewicz, Jeffery R., 360,900, Cl. D21-10.000.
- Colgate-Palmolive Company: See—  
Moskovich, Robert; and Carter, Stanley R., 360,761, Cl. D4-104.000.
- Collins, Floyd W. Combination zipper and telephone dialing manipulator. 360,854, 8-1-95, Cl. D11-221.000.
- Collins, Larry D. Merchandising display. 360,764, 8-1-95, Cl. D6-396.000.
- Collmar, Teddy P., to Great 2000 Enterprises, Inc. Combined ceiling fan and light. 360,940, 8-1-95, Cl. D23-377.000.
- Combi Corporation: See—  
Koga, Harukaze, 360,916, Cl. D21-194.000.
- Conaway, Brian J.: See—  
Apt, Fred G., III; Brightbill, Keith E.; Conaway, Brian J.; and Ward, Coy D., 360,778, Cl. D6-448.000.
- Cornell, Edward C.; DeLay, Daniel J.; and Giese, Robert D., to Intermatic Incorporated. Outdoor light fixture. 360,962, 8-1-95, Cl. D26-67.000.
- Cousins, Morison S., to Dart Industries Inc. Bag storer and dispenser. 360,788, 8-1-95, Cl. D6-515.000.
- Cowhey, James G.: See—  
Starec, Rado; Schiavello, Antonino; and Cowhey, James G., 360,873, Cl. D13-143.000.
- Crossley, David W.; Sundberg, Brian C.; and Bernstein, Michael S., to Safety 1st, Inc. Infant bathtub. 360,933, 8-1-95, Cl. D23-278.000.
- CUI International, Inc.: See—  
El-Edwy, Magda, 360,749, Cl. D3-11.000.
- Cullen, Michael E.; DeLay, Daniel J.; and Giese, Robert D., to Intermatic Incorporated. Outdoor light fixture. 360,964, 8-1-95, Cl. D26-68.000.
- Cullen, Michael E.; DeLay, Daniel J.; and Giese, Robert D., to Intermatic Incorporated. Outdoor light fixture. 360,965, 8-1-95, Cl. D26-68.000.
- Curd Enterprises, Inc.: See—  
Fish, Darrell; and King, Mechelle, 360,767, Cl. D6-349.000.
- Czerlanis, John A.; and Strandell, Timothy B., to Intermatic Incorporated. Outdoor light fixture. 360,961, 8-1-95, Cl. D26-67.000.
- Czerlanis, John A.; Solberg, Kent A.; Giese, Robert d.; and DeLay, Daniel J., to Intermatic Incorporated. Outdoor light fixture. 360,963, 8-1-95, Cl. D26-67.000.
- Danfoss A/S: See—  
Vestergaard, Anders, 360,930, Cl. D23-233.000.
- Dart Industries Inc.: See—  
Cousins, Morison S., 360,788, Cl. D6-515.000.
- DeLay, Daniel J.: See—  
Cornell, Edward C.; DeLay, Daniel J.; and Giese, Robert D., 360,962, Cl. D26-67.000.
- Cullen, Michael E.; DeLay, Daniel J.; and Giese, Robert D., 360,964, Cl. D26-68.000.
- Cullen, Michael E.; DeLay, Daniel J.; and Giese, Robert D., 360,965, Cl. D26-68.000.
- Czerlanis, John A.; Solberg, Kent A.; Giese, Robert d.; and DeLay, Daniel J., 360,963, Cl. D26-67.000.
- DeZego, Anita J. Word brick structures. 360,911, 8-1-95, Cl. D21-108.000.



- Dinaud, Pierre F., to Pacific Chemical Company. Perfume container. 360,823, 8-1-95, Cl. D9-300.000.
- Diversified Products Corporation: See—  
Rockwell, Gary L.; and Simpson, Peter E., 360,924, Cl. D21-195.000.
- Dolan, Patrick. Chandelier. 360,966, 8-1-95, Cl. D26-86.000.
- Dolco Packaging Corp.: See—  
Meier, Carl J.; and Ramirez, Richard L., 360,808, Cl. D7-550.000.
- Donato, Anthony; and Mier-Langner, Alejandro, to Lightolier Division of the Genlyte Group Incorporated. Track light. 360,959, 8-1-95, Cl. D26-63.000.
- Doop, Alan E.: See—  
Bostic, James R.; Doop, Alan E.; Heutmaker, Michael E.; and Peterson, Stephen S., 360,915, Cl. D21-192.000.
- DSM&T Co., Inc.: See—  
Wilson, Daniel P., 360,871, Cl. D13-133.000.  
Wilson, Daniel P., 360,872, Cl. D13-133.000.
- Duff, Marion V.; Unger, Jeffery P.; and Hoffman, Alfred E. Housing for an electrical distribution panel. 360,874, 8-1-95, Cl. D13-152.000.
- Dutro Company: See—  
Dutro, William A.; and Measom, Ty, 360,803, Cl. D7-332.000.
- Dutro, William A.; and Measom, Ty, to Dutro Company. Two burner cooker. 360,803, 8-1-95, Cl. D7-332.000.
- Dyer, Elizabeth A.: See—  
Dyer, Richard D.; and Dyer, Elizabeth A., 360,878, Cl. D13-156.000.
- Dyer, Richard D.; and Dyer, Elizabeth A. Toddler-proof outlet cover. 360,878, 8-1-95, Cl. D13-156.000.
- Echazabal, Alberto; and Beroni, Claudio, to Motoring Accessories Inc. Vehicle wheel. 360,866, 8-1-95, Cl. D12-209.000.
- El-Edwy, Magda, to CUI International, Inc. Umbrella case. 360,749, 8-1-95, Cl. D3-11.000.
- Emery, William W.; and Fritts, Russell A., to Better Sleep Mfg. Co. Utility basket. 360,759, 8-1-95, Cl. D3-306.000.
- Emhart Inc.: See—  
Mark, Darren M.; and Yost, Hollis K., 360,931, Cl. D23-238.000.
- Emotron AB: See—  
Gronwall, Hans, 360,879, Cl. D13-162.000.
- Esselte Dymo, N.V.: See—  
Tremlett, Jonathan, 360,890, Cl. D18-19.000.
- Evans, Mildred S. Combined towel and mesh bag. 360,797, 8-1-95, Cl. D6-608.000.
- Federal Express Corporation: See—  
Bailey, Tracy A., 360,880, Cl. D14-100.000.
- Fernandez, Monso; and Arturo, to Adidas Saragran France. Cover segment for a soccer ball. 360,917, 8-1-95, Cl. D21-204.000.
- Fibox Oy Ab: See—  
Ropponen, Matti; and Merilainen, Heikki, 360,877, Cl. D13-184.000.
- Fish, Darrell; and King, Mechelle, to Card Enterprises, Inc. Stackable step stool. 360,767, 8-1-95, Cl. D6-349.000.
- Fiskars Inc.: See—  
Birkholz, Douglas J.; and Boda, James C., 360,891, Cl. D18-34.000.  
Birkholz, Douglas J.; and Boda, James C., 360,892, Cl. D18-34.000.
- Foster, Ronald S.: See—  
Hill, Andrew C.; and Foster, Ronald S., 360,781, Cl. D6-455.000.
- Franklin Brass Manufacturing Company: See—  
Sharpe, Norton, 360,792, Cl. D6-546.000.
- Frederiksen, Jesper B., to Interlego AG. Toy building element. 360,909, 8-1-95, Cl. D21-108.000.
- Frederiksen, Jesper B., to Interlego AG. Toy building element. 360,910, 8-1-95, Cl. D21-108.000.
- Friedman, Dov. Golf-bag shaped water/beverage container. 360,805, 8-1-95, Cl. D7-515.000.
- Fritts, Russell A.: See—  
Emery, William W.; and Fritts, Russell A., 360,759, Cl. D3-306.000.
- General Protection Dalecarlia AB: See—  
Mats, Lindgren, 360,827, Cl. D9-433.000.
- Gibson, William R.: See—  
Meeker, Paul K.; and Gibson, William R., 360,905, Cl. D21-71.000.
- Giese, Robert D.: See—  
Cornell, Edward C.; DeLay, Daniel J.; and Giese, Robert D., 360,962, Cl. D26-67.000.  
Cullen, Michael E.; DeLay, Daniel J.; and Giese, Robert D., 360,964, Cl. D26-68.000.  
Cullen, Michael E.; DeLay, Daniel J.; and Giese, Robert D., 360,965, Cl. D26-68.000.  
Czerlanis, John A.; Solberg, Kent A.; Giese, Robert d.; and DeLay, Daniel J., 360,963, Cl. D26-67.000.
- Glebe, Gregory N. Collapsible lectern. 360,777, 8-1-95, Cl. D6-419.000.
- Glover, William E.: See—  
ATTINELLO, JOHN S.; Glover, William E.; and Reid, Kevin A., 360,859, Cl. D12-147.000.  
Atinello, John S.; Glover, William E.; and Reid, Kevin A., 360,860, Cl. D12-147.000.  
Atinello, John S.; Glover, William E.; and Reid, Kevin A., 360,863, Cl. D12-151.000.
- Goldado, Michael E. Combination leg support pillow and detachable footrest. 360,796, 8-1-95, Cl. D6-601.000.
- Goodyear Tire & Rubber Company, The: See—  
ATTINELLO, JOHN S.; Glover, William E.; and Reid, Kevin A., 360,859, Cl. D12-147.000.  
Atinello, John S.; Glover, William E.; and Reid, Kevin A., 360,860, Cl. D12-147.000.  
Atinello, John S.; Glover, William E.; and Reid, Kevin A., 360,863, Cl. D12-151.000.
- Bonko, Mark L.; and McClain, Myron M., 360,862, Cl. D12-151.000.
- Brayer, Randall R.; Robinson, Beale A.; and Weimer, Andrew F., 360,858, Cl. D12-147.000.
- Graas, Maurice; and Munster, John C. M., 360,861, Cl. D12-147.000.
- Hermann, Robert J.; and Schuster, Daniel E., 360,857, Cl. D12-147.000.
- Munster, John C. M.; and Van Tuyt, Jan H., 360,864, Cl. D12-151.000.
- Goris, Gregory A., to Hall Surgical. Surgical saw blade hub. 360,946, 8-1-95, Cl. D24-146.000.
- Goto, Atsushi, to Casio Computer Co., Ltd. Wrist watch. 360,836, 8-1-95, Cl. D10-38.000.
- Graas, Maurice; and Munster, John C. M., to Goodyear Tire & Rubber Company, The. Tire tread. 360,861, 8-1-95, Cl. D12-147.000.
- Grace, Bobby, to Bobby Grace Golf Design, Inc. Golf putter head. 360,922, 8-1-95, Cl. D21-217.000.
- Grand Vins Jean Claude Boisset: See—  
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- Gronwall, Hans, to Emotron AB. Electrical control housing for electric motors. 360,879, 8-1-95, Cl. D13-162.000.
- Grosfillex, Raymond, to Grosfillex Sarl. Combined flower pot with fill spout. 360,850, 8-1-95, Cl. D11-152.000.
- Grosfillex Sarl: See—  
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- Groulx, James M.; and Olson, Ogden R., to Hon Industries, Inc. Chair. 360,769, 8-1-95, Cl. D6-372.000.
- Haase, Richard. Grommet. 360,820, 8-1-95, Cl. D8-356.000.
- Hackett, Thomas M. Wheeled riding toy. 360,906, 8-1-95, Cl. D21-74.000.
- Hahn, Thomas R.: See—  
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- Hall, Anita. Seat cover. 360,798, 8-1-95, Cl. D6-611.000.
- Hall, David, to Velodyne Acoustics, Inc. Loudspeaker. 360,886, 8-1-95, Cl. D14-216.000.
- Hall Surgical: See—  
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- Halm, Hans, to Lingner & Fischer GmbH. Toothbrush. 360,760, 8-1-95, Cl. D4-104.000.
- Hamada, Masanori; and Sato, Takashi, to Matsushita Electric Industrial Co. Ltd. Electric rice cooker. 360,804, 8-1-95, Cl. D7-354.000.
- Hamada, Yasuhiro: See—  
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- Harman, James T.; and Harman, Cindy M. Package for covered container. 360,826, 8-1-95, Cl. D9-415.000.
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- Hess, Stephen C., to Winston Furniture Co. of Alabama, Inc. Chair frame. 360,771, 8-1-95, Cl. D6-376.000.
- Hestehave, Borge; and Hestehave, Kjeld, to Bomatic, Inc. Water bottle. 360,830, 8-1-95, Cl. D9-520.000.
- Hestehave, Kjeld: See—  
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- Himuro, Yasuo; and Hamada, Yasuhiro, to Bridgestone Corporation. Automobile tire. 360,856, 8-1-95, Cl. D12-146.000.
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- Huen, Hing-Man, to Power Lite Metal Works manufactory Limited. Flashlight. 360,958, 8-1-95, Cl. D26-49.000.
- Huerto, Robert R.; and Sharber, Jerry L., to Rubbermaid Office Products Inc. File storage container. 360,898, 8-1-95, Cl. D19-90.000.
- Hughes, Richard R. Switch plate cover. 360,876, 8-1-95, Cl. D13-177.000.
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- Johnson, Reed B., to Usability Systems, Inc. Audio/video console. 360,881, 8-1-95, Cl. D14-103.000.
- Juma, Saad. Female anti-incontinence appliance. 360,944, 8-1-95, Cl. D24-124.000.
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- Karnaze, Christopher. Speaker stand. 360,887, 8-1-95, Cl. D14-224.000.
- Keeney, Truman R. Rolled paper holder. 360,789, 8-1-95, Cl. D6-518.000.
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- Kimata, Akinori, to Makita Corporation. Portable electric drill. 360,814, 8-1-95, Cl. D8-68.000.
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Mostardo, August F., 360,949, Cl. D24-174.000.
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- Lee, Gary S.; and Lee, Barbara M. Lotto number selector. 360,902, 8-1-95, Cl. D21-37.000.
- Lee, Simeon T., to Regent Lighting Corporation. Utility light with clamp and hanger. 360,952, 8-1-95, Cl. D26-60.000.
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- Marchi, Luca. Head for keys. 360,818, 8-1-95, Cl. D8-347.000.
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235		5,437,083	716.6		5,437,131	863.73		147	5,437,236	37	5,437,734	III	5,437,354
238		5,437,084	741.1		5,437,138	864.35				108	5,437,735	III	5,437,355
243.521		5,437,085		CLASS 33		864.71		346	5,437,237		5,437,736	III	5,437,356
402.13		5,437,086	317		5,437,139						5,437,737	III	5,437,357
469.5		5,437,087	331.5		5,437,140	335	CLASS 74				5,437,738	III	5,437,358
527.6		5,437,088	399		5,437,141	359		470.29	5,437,238		5,437,739	III	5,437,359
527.7		5,437,089	415		5,437,142	489		475.22	5,437,239	249	5,437,740	III	5,437,360
598		5,437,090	445		5,437,143	490.02				251	5,437,741	III	5,437,361
600		5,437,091	466		5,437,144	551.1				259	5,437,742	III	5,437,362
		5,437,092		CLASS 35		559		235	5,437,240		5,437,743	III	5,437,363
611		5,437,093	486		5,437,701	567		268	5,437,241		5,437,744	III	5,437,364
623.1		5,437,094									5,437,745	III	5,437,365
718		5,437,095		CLASS 36		403	CLASS 75				5,437,746	III	5,437,366
827		5,437,096	15.6		5,437,145	471		14	5,437,242		5,437,747	III	5,437,367
888.02		5,437,097	330		5,437,146	474		49	5,437,243		5,437,748	III	5,437,368
888.1		5,437,098		CLASS 37		490					5,437,749	III	5,437,369
890		5,437,099	417		5,437,147	581		21	5,437,244		5,437,750	III	5,437,370
								76	5,437,245		5,437,751	III	5,437,371
116	CLASS 38	5,437,100		CLASS 39		114		325	5,437,246		5,437,752	III	5,437,372
153		5,437,101	78		5,437,148			669	5,437,247		5,437,753	III	5,437,373
298.4		5,437,102	80		5,437,149	63.1	CLASS 81				5,437,754	III	5,437,374
372		5,437,103		CLASS 40				718	5,437,248		5,437,755	III	5,437,375
			39.02		5,437,150						5,437,756	III	5,437,376
	CLASS 33		233		5,437,151	98	CLASS 83	73	5,437,244		5,437,757	III	5,437,377
266		5,437,104	274		5,437,152	471.3		785	5,437,246		5,437,758	III	5,437,378
644		5,437,105	276		5,437,153	701					5,437,759	III	5,437,379
					5,437,154						5,437,760	III	5,437,380
90	CLASS 34	5,437,106	313		5,437,155	95.1	CLASS 84				5,437,761	III	5,437,381
117		5,437,107	611		5,437,156	600		17	5,437,249		5,437,762	III	5,437,382
196		5,437,108	655		5,437,157	653		44.2	5,437,247		5,437,763	III	5,437,383
231		5,437,109	739		5,437,158	659		51	5,437,248		5,437,764	III	5,437,384
			746		5,437,159	726					5,437,765	III	5,437,385
	CLASS 36					727					5,437,766	III	5,437,386
31		5,437,110	24		5,437,160		CLASS 91				5,437,767	III	5,437,387
88		5,437,111	37		5,437,161	369.2		17	5,437,249		5,437,768	III	5,437,388
128		5,437,112	125		5,437,162	446		44.2	5,437,247		5,437,769	III	5,437,389
			126		5,437,163			51	5,437,248		5,437,770	III	5,437,390
	CLASS 37		259.1		5,437,164						5,437,771	III	5,437,391
231		5,437,113	465		5,437,165	13.2	CLASS 92				5,437,772	III	5,437,392
											5,437,773	III	5,437,393
											5,437,774	III	5,437,394
											5,437,775	III	5,437,395
											5,437,776	III	5,437,396
											5,437,777	III	5,437,397
											5,437,778	III	5,437,398
											5,437,779	III	5,437,399
											5,437,780	III	5,437,400
											5,437,781	III	5,437,401
											5,437,782	III	5,437,402
											5,437,783	III	5,437,403
											5,437,784	III	5,437,404
											5,437,785	III	5,437,405
											5,437,786	III	5,437,406
											5,437,787	III	5,437,407
											5,437,788	III	5,437,408
											5,437,789	III	5,437,409
											5,437,790	III	5,437,410
											5,437,791	III	5,437,411
											5,437,792	III	5,437,412
											5,437,793	III	5,437,413
											5,437,794	III	5,437,414
											5,437,795	III	5,437,415
											5,437,796	III	5,437,416
											5,437,797	III	5,437,417
											5,437,798	III	5,437,418
											5,437,799	III	5,437,419
											5,437,800	III	5,437,420
											5,437,801	III	5,437,421

## CLASSIFICATION OF PATENTS

102	CLASS 181	204	5,437,382	214.1	5,438,192	148 B	5,437,453	CLASS 311	870.02	5,438,329
106	5,438,169	235	5,437,383	231.18	5,438,193	153 S	5,437,454	5,438,246	CLASS 341	
210	5,438,170			288	5,438,194	164.1	5,437,447	5,438,247	11	5,438,330
	5,438,171	14	5,437,764	292	5,438,195	169	5,437,456		35	5,438,331
179	5,437,345	18	5,437,763	306	5,438,196	185 A	5,437,457	CLASS 320		
		20	5,437,762	309	5,438,197	187.1	5,437,448	15	5,438,248	CLASS 342
81	5,437,346	51	5,437,765	330	5,438,198	192	5,437,458		5,438,249	5,438,333
		85	5,437,761	334	5,438,199	246	5,437,459	17	5,438,250	5,438,334
264	5,437,347			338.4	5,438,200	262	5,437,460	25	5,438,251	5,438,332
18 A	5,437,351	118	5,438,174	341.1	5,438,201	292	5,437,462	44	5,438,252	5,438,335
71.5	5,437,352			363.07	5,438,202	310	5,437,463			5,438,336
164	5,437,353	CLASS 218		396 ML	5,438,203	434	5,437,464	207	5,438,253	5,438,337
299	5,437,354	CLASS 219		423 R	5,438,205			CLASS 323		
				424.11	5,438,206	CLASS 279	5,437,465	107	5,438,254	CLASS 343
CLASS 192				492.2	5,438,204	22		76.82	5,438,254	700 MS
18 A	5,437,355	CLASS 220		492.23	5,438,207	CLASS 280		117 R	5,438,255	5,438,338
105 BA	5,437,356			551	5,438,208	11.22	5,437,466		5,438,256	5,438,339
CLASS 194				559.29	5,438,209	112.2	5,437,467		5,438,257	CLASS 345
206	5,437,357	CLASS 221		5,437,801		602	5,437,468		5,438,258	
212	5,437,358			5,437,802		728.3	5,437,469	142	5,438,259	5,438,341
CLASS 198				5,437,803		730.2	5,437,471	158.1	5,438,260	5,438,342
341	5,437,359	CLASS 222		5,437,804		737	5,437,472	186	5,438,261	5,438,344
460.2	5,437,360			5,437,805		738	5,437,473	207.16	5,438,262	CLASS 346
465.1	5,437,361			5,437,806		749	5,437,474	306	5,438,263	
11 R	5,438,172	CLASS 223		5,437,807		801.1	5,437,475	319	5,438,264	135.1
52 R	5,438,173			5,437,808				326	5,438,265	5,438,348
269	5,438,173	CLASS 224		5,437,809		CLASS 281			5,438,266	5,438,349
400	5,438,176			5,437,810		151	5,437,476	339	5,438,267	CLASS 347
517	5,438,177	CLASS 225		5,437,811		CLASS 283		399	5,438,268	
CLASS 203				5,437,812		117	5,437,478	402	5,438,269	12
57	5,437,770	CLASS 226		5,437,813		CLASS 285		429	5,438,270	19
CLASS 204				5,437,814		49	5,437,479	444	5,438,271	87
84	5,437,771	CLASS 227		5,437,815		167	5,437,480	537	5,438,272	B1 4,771.295
149	5,437,776			5,437,816		174	5,437,481	546	5,438,273	5,438,350
153.1	5,437,772	CLASS 228		5,437,817		CLASS 292		636	5,438,274	5,438,351
153.11	5,437,773			5,437,818		308	5,437,482	662	5,438,275	5,438,352
182.3	5,437,774	CLASS 229		5,437,819		CLASS 294		765	5,438,276	
188	5,437,775			5,437,820		19.2	5,437,487		5,438,277	CLASS 348
224 R	5,437,777	CLASS 230		5,438,210		88	5,437,488	27	5,438,278	
298.21	5,437,778			5,438,211		106	5,437,489	38	5,438,279	5,438,355
CLASS 205		CLASS 231		5,438,212		CLASS 296		71	5,438,280	5,438,356
106	5,437,779			5,438,213		97.22	5,437,491	86	5,438,281	5,438,358
CLASS 206		CLASS 232		5,438,214		166	5,437,492	124	5,438,282	5,438,359
63.3	5,437,362			5,438,215		CLASS 297		108	5,438,283	5,438,360
140	5,437,364	CLASS 233		5,438,216		150	5,437,493	124	5,438,284	5,438,361
151	5,437,365			5,438,217		216.19	5,437,494	3	5,438,285	5,438,362
315.3	5,437,366	CLASS 234		5,438,218		241	5,437,495	5	5,438,286	5,438,363
317	5,437,367			5,438,219		283.2	5,437,496	54	5,438,287	5,438,364
320	5,437,368	CLASS 235		5,438,220		338	5,437,497	65	5,438,288	5,438,365
341	5,437,369			5,438,221		452.34	5,437,498	97	5,438,289	5,438,366
373	5,437,370	CLASS 236		5,438,222		CLASS 298		108	5,438,290	5,438,367
430	5,437,371			5,438,223		289	5,437,499	170	5,438,291	5,438,368
539	5,437,372	CLASS 237		5,438,224		CLASS 299		206	5,438,292	5,438,369
881	5,437,372			5,438,225		CLASS 300		355	5,438,293	5,438,370
CLASS 208		CLASS 238		5,438,226		CLASS 301		384	5,438,294	5,438,371
45	5,437,780			5,438,227		116.2	5,437,501	408	5,438,295	5,438,372
46	5,437,781	CLASS 239		5,438,228		CLASS 302		560	5,438,296	5,438,373
53	5,437,782			5,438,229		167		565	5,438,297	5,438,374
139	5,437,783	CLASS 240		5,438,230		CLASS 303		289	5,438,298	5,438,375
				5,438,231		CLASS 304		1 A	5,438,299	5,438,376
137	5,437,373	CLASS 241		5,438,232		CLASS 305		16	5,438,300	5,438,377
170	5,437,374			5,438,233		CLASS 306		45	5,438,301	CLASS 351
208	5,437,374	CLASS 242		5,438,234		CLASS 307		167	5,438,302	5,438,378
591	5,437,375			5,438,235		CLASS 308				5,438,379
95	5,437,785	CLASS 243		5,438,236		CLASS 309		105	5,438,303	CLASS 354
170	5,437,786			5,438,237		CLASS 310		199	5,438,304	5,438,380
189	5,437,787	CLASS 244		5,438,238		CLASS 311		108	5,438,305	5,438,381
333.01	5,437,788			5,438,239		CLASS 312		105	5,438,306	5,438,382
357	5,437,789	CLASS 245		5,438,240		CLASS 313		108	5,438,307	5,438,383
512.1	5,437,794			5,438,241		CLASS 314		108	5,438,308	5,438,384
635	5,437,795	CLASS 246		5,438,242		CLASS 315		17.1	5,438,309	5,438,385
640	5,437,796			5,438,243		CLASS 316		32	5,438,310	5,438,386
669	5,437,797	CLASS 247		5,438,244		CLASS 317		195	5,438,311	5,438,387
710	5,437,790			5,438,245		CLASS 318		151	5,438,312	CLASS 355
712	5,437,791	CLASS 248		5,438,246		CLASS 319		306	5,438,313	5,438,388
727	5,437,792			5,438,247		CLASS 320			5,438,314	5,438,389
728	5,437,793	CLASS 249		5,438,248		CLASS 321		140	5,438,315	5,438,390
761	5,437,794			5,438,249		CLASS 322		208	5,438,316	5,438,391
767	5,437,799	CLASS 250		5,438,250		CLASS 323		140	5,438,317	5,438,392
787	5,437,800			5,438,251		CLASS 324		208	5,438,318	5,438,393
CLASS 211				5,438,252		CLASS 325		426	5,438,319	5,438,394
40	5,437,376	CLASS 251		5,438,253		CLASS 326		457	5,438,320	5,438,395
86	5,437,377			5,438,254		CLASS 327		471	5,438,321	5,438,396
115	5,437,378	CLASS 252		5,438,255		CLASS 328		477	5,438,322	5,438,397
169	5,437,379			5,438,256		CLASS 329		539	5,438,323	5,438,398
184	5,437,380	CLASS 253		5,438,257		CLASS 330		554	5,438,324	5,438,399
CLASS 215				5,438,258		CLASS 331		554	5,438,325	5,438,400
11.1	5,437,381	CLASS 254		5,438,259		CLASS 332		571	5,438,326	5,438,401
				5,438,260		CLASS 333		571	5,438,327	CLASS 356
		CLASS 255		5,438,261		CLASS 334		573	5,438,328	5,438,402
				5,438,262		CLASS 335		573	5,438,329	5,438,403
		CLASS 256		5,438,263		CLASS 336		573	5,438,330	5,438,404
				5,438,264		CLASS 337		573	5,438,331	5,438,405
		CLASS 257		5,438,265		CLASS 338		573	5,438,332	5,438,406
				5,438,266		CLASS 339		573	5,438,333	5,438,407
		CLASS 258		5,438,267		CLASS 340		573	5,438,334	5,438,408
				5,438,268		CLASS 341		573	5,438,335	5,438,409
		CLASS 259		5,438,269		CLASS 342		573	5,438,336	5,438,410
				5,438,270		CLASS 343		573	5,438,337	
		CLASS 260		5,438,271		CLASS 344		573	5,438,338	
				5,438,272		CLASS 345		573	5,438,339	
		CLASS 261		5,438,273		CLASS 346		573	5,438,340	
				5,438,274		CLASS 347		573	5,438,341	
		CLASS 262		5,438,275		CLASS 348		573	5,438,342	
				5,438,276		CLASS 349		573	5,438,343	
		CLASS 263		5,438,277		CLASS 350		573	5,438,344	
				5,438,278		CLASS 351		573	5,438,345	
		CLASS 264		5,438,279		CLASS 352		573	5,438,346	
				5,438,280		CLASS 353		573	5,438,347	
		CLASS 265		5,438,281		CLASS 354		573	5,438,348	
				5,438,282		CLASS 355		573	5,438,349	
		CLASS 266		5,438,283		CLASS 356		573	5,438,350	
				5,438,284		CLASS 357		573	5,438,351	
		CLASS 267		5,438,285		CLASS 358		573	5,438,352	
				5,438,286		CLASS 359		573	5,438,353	
		CLASS 268		5,438,287		CLASS 360		573	5,438,354	
				5,438,288		CLASS 361		573	5,438,355	
		CLASS 269		5,438,289		CLASS 362		573	5,438,356	
				5,438,290		CLASS 363		573	5,438,357	
		CLASS 270		5,438,291		CLASS 364		573	5,438,358	
				5,438,292		CLASS 365		573	5,438,359	
		CLASS 271		5,438,293		CLASS 366		573	5,438,360	
				5,438,294		CLASS 367		573	5,438,361	
		CLASS 272		5,438,295		CLASS 368		573	5,438,362	

CLASSIFICATION OF PATENTS									
359	5,438,412					5,438,669	492	5,437,854	
363	5,438,413	CLASS 364		CLASS 375		5,438,670	700	5,437,855	CLASS 436
364	5,438,414	138	5,438,506	200	5,438,589	5,438,674		5	5,437,946
369	5,438,415	140	5,438,507		5,438,596	5,438,672	CLASS 434		5,437,947
373	5,438,416	401	5,438,508	259	5,438,590	5,438,673	50	5,437,856	5,437,948
394	5,438,417	408	5,438,509	261	5,438,591	5,438,676	32	5,437,857	45
399	5,438,418	413.11	5,438,510	283	5,438,592	5,438,680	51	5,437,858	5,437,949
	5,438,419	419.01	5,438,511	317	5,438,593	5,438,677	59	5,437,859	5,437,950
440	5,438,420	419.1	5,438,512	332	5,438,594	5,438,678	70.2	5,437,860	5,437,951
			5,438,664	340	5,438,595	5,438,679	70.08	5,437,861	5,437,954
CLASS 358		424.03	5,438,513			5,438,681	85.1	5,437,863	5,437,955
299	5,438,422	424.05	5,438,514	272	5,438,597	5,438,682	145.1	5,437,864	5,437,956
335	5,438,423		5,438,515	352	5,438,598	5,438,667	184.1	5,437,865	5,437,957
336	5,438,424	426.01	5,438,516			5,438,666	195.1	5,437,866	5,437,959
	5,438,425		5,438,517	CLASS 377		5,438,665	401	5,437,867	5,437,960
403	5,438,426	440	5,438,518		5,438,599		405	5,437,868	5,437,963
405	5,438,427	444.02	5,438,519	20	5,438,600	CLASS 400	406	5,437,869	5,437,964
436	5,438,428	470	5,438,520	47	5,438,601		411	5,437,870	5,437,967
445	5,438,429	474.17	5,438,521	48		5,437,512	465	5,437,872	5,437,965
450	5,438,430	474.31	5,438,522			CLASS 401	466	5,437,873	5,437,966
457	5,438,431	479	5,438,523	4	5,438,602		466	5,437,874	5,437,967
467	5,438,432	480	5,438,524	39	5,438,603	CLASS 402	72.1	5,437,544	5,437,968
468	5,438,433	507	5,438,525	112	5,438,613		79	5,437,545	5,437,969
487	5,438,434	578	5,438,526	98.2	5,438,604	CLASS 403	223	5,437,546	5,437,970
496	5,438,435		5,438,527	135	5,438,605		548	5,437,547	5,437,971
500	5,438,436	580	5,438,528			CLASS 379			5,437,972
518	5,438,437	709.1	5,438,529	24	5,438,606		154	5,437,515	
537	5,438,438	709.11	5,438,530	31	5,438,607	CLASS 404			
		724.1	5,438,531	58	5,438,608		2	5,437,516	3
		746.2	5,438,533		5,438,609	CLASS 405		5,437,875	5,437,876
CLASS 359					5,438,610			5,437,877	5,437,878
10	5,438,439	CLASS 365			5,438,611	CLASS 406		5,437,879	5,437,880
11	5,438,440		5,438,535	93	5,438,614			5,437,881	5,437,882
15	5,438,441	49	5,438,536	144	5,438,615	CLASS 407		5,437,883	5,437,885
54	5,438,442	52	5,438,537	201	5,438,616			5,437,886	
75	5,438,443	154	5,438,538	327	5,438,617	CLASS 408			
123	5,438,444	159	5,438,539	387	5,438,618				
124	5,438,445	174	5,438,540	412	5,438,619	CLASS 409			
196	5,438,446	182	5,438,541						
200	5,438,447		5,438,542	CLASS 380					
214	5,438,448	185	5,438,544	15	5,438,620	CLASS 410			
216	5,438,449	189.05	5,438,545	43	5,438,621				
393	5,438,451	189.11	5,438,546	46	5,438,622	CLASS 411			
511	5,438,452	200	5,438,547						
636	5,438,453	207	5,438,548	17	5,438,623	CLASS 412			
641	5,438,454	227	5,438,549	71	5,438,624				
748	5,438,455	229	5,438,550	96	5,438,625	CLASS 413			
835	5,438,456	233.5	5,438,551	183	5,438,626				
855	5,438,457			199	5,438,627	CLASS 414			
CLASS 360		CLASS 366		CLASS 382					
10.2	5,438,458	209	5,437,505	156	5,438,629	22.51	5,437,527		
38.1	5,438,459	CLASS 367		159	5,438,630	24.6	5,437,528		
46	5,438,460			169	5,438,631	225	5,437,529		
51	5,438,461	88	5,438,552	181	5,438,632	259	5,437,536		
53	5,438,462	140	5,438,553	197	5,438,633	331	5,437,530		
57	5,438,463		5,438,554	232	5,438,635	1001	5,437,537		
73.03	5,438,464	CLASS 368		270	5,438,633	555	5,437,531		
75	5,438,465			278	5,438,632	1006	5,437,532		
96.4	5,438,466	10	5,438,555	279	5,438,636	789.5	5,437,533		
103	5,438,467	205	5,438,556			789.9	5,437,534		
107	5,438,468			CLASS 383		798.3	5,437,535		
109	5,438,469	CLASS 369		107	5,437,507	CLASS 415			
113	5,438,470	36	5,438,534	123	5,437,508				
132	5,438,471	44.32	5,438,537	CLASS 384		9	5,437,538		
	5,438,472	48	5,438,538	68	5,437,539	CLASS 416			
CLASS 361		54	5,438,539	142	5,437,509				
118	5,438,473	58	5,438,560	538	5,437,510	CLASS 417			
158	5,438,474	100	5,438,561						
191	5,438,489	110	5,438,562	CLASS 385		5	5,437,541		
683	5,438,475	124	5,438,563	10	5,438,637	CLASS 418			
	5,438,476	190	5,438,564	16	5,438,638				
689	5,438,477	CLASS 370		30	5,438,639	258	5,437,542		
704	5,438,478		5,438,565	43	5,438,640	CLASS 419			
707	5,438,479	60	5,438,566	137	5,438,641				
760	5,438,480		5,438,567	CLASS 392		55.5	5,437,543		
813	5,438,481		5,438,568	485	5,438,642	CLASS 420			
816	5,438,482	79	5,438,569	CLASS 395					
825	5,438,483	94.2	5,438,570	2.1	5,438,643	1	5,437,832		
CLASS 362		94.3	5,438,571		5,438,644	24	5,437,833		
31	5,438,484	123	5,438,572	22	5,438,645	CLASS 421			
32	5,438,485			24	5,438,646				
61	5,438,486	10.3	5,438,573	26	5,438,647	CLASS 422			
	5,438,487	37.1	5,438,577	82	5,438,648				
	5,438,490	48	5,438,575	106	5,438,649	1	5,437,836		
83.1	5,438,491	53	5,438,576	114	5,438,650	1	5,437,837		
101	5,438,488			131	5,438,651	67	5,437,838		
	5,438,493	CLASS 372			5,438,652	78	5,437,839		
106	5,438,494	32	5,438,578		5,438,653	82.08	5,437,840		
108	5,438,492	34	5,438,579		5,438,654	100	5,437,841		
125	5,437,504	36	5,438,580	139	5,438,655	106	5,437,842		
153.1	5,438,495	38	5,438,581	143	5,438,656	186	5,437,844		
CLASS 363		45	5,438,582	148	5,438,657	186.07	5,437,843		
16	5,438,496		5,438,583	153	5,438,658	199	5,437,845		
17	5,438,497		5,438,584	155	5,438,659	297	5,437,846		
21	5,438,498	50	5,438,585		5,438,660	CLASS 423			
24	5,438,500	86	5,438,587	157	5,438,661				
35	5,438,501			161	5,438,662	2	5,437,847		
35	5,438,502	CLASS 373		162	5,438,663	7	5,437,848		
43	5,438,503	108	5,438,588	182.07	5,438,675	66	5,437,849		
60	5,438,504	CLASS 374		183.14	5,438,574	171	5,437,850		
95	5,438,505	119	5,437,506	200	5,438,671	239.1	5,437,851		
				375	5,438,668	263	5,437,852		
						352	5,437,853		



## CLASSIFICATION OF PATENTS

MIT	5,437,563	136	5,437,582	CLASS 514	505	5,438,091	CLASS 544	22	5,437,630
701	5,437,564	218	5,437,577	1	5,438,069	555	5,438,092	49	5,437,631
752	5,437,565	CLASS 475		1	5,438,040	706	5,438,093	53	5,437,632
839	5,437,566	220	5,437,583	6	5,438,041	730	5,438,094	53	5,437,633
831	5,437,567	275	5,437,584	21	5,438,042	785	5,438,095	53	5,437,634
CLASS 440		331	5,437,585	23	5,438,043	832	5,438,096	53	5,437,635
38	5,437,568	CLASS 477		78	5,438,044	102	5,438,139	89.1	5,437,656
CLASS 441		35	5,437,586	104	5,438,045	147	5,438,140	95	5,437,636
129	5,437,569	CLASS 482		104	5,438,046	176	5,438,141	96	5,437,637
CLASS 446		7	5,437,587	104	5,438,047	240	5,438,142	101	5,437,638
DI 5,045,016		54	5,437,588	104	5,438,048	240	5,438,143	110	5,437,639
CLASS 451		72	5,437,589	104	5,438,049	321	5,438,144	110	5,437,640
8	5,437,125	90	5,437,590	104	5,438,050	110	5,438,146	116	5,437,641
296	5,437,570	127	5,437,591	104	5,438,051	210	5,438,147	130	5,437,642
344	5,437,571	CLASS 483		202	5,438,052	229	5,438,148	165	5,437,644
CLASS 482		40	5,437,592	210	5,438,053	263.2	5,438,149	167	5,437,645
136	5,437,572	CLASS 492		221	5,438,054	324.1	5,438,151	263	5,437,646
CLASS 484		13	5,437,593	224.5	5,438,055	324.5	5,438,150	278	5,437,649
4	5,437,574	CLASS 493		252	5,438,056	453	Re.35,009	283	5,437,650
CLASS 485		88	5,437,594	256	5,438,057	CLASS 526		313	5,437,651
67.4	5,438,699	CLASS 493		258	5,438,058	125	5,438,110	349	5,437,652
74	5,438,683	213	5,437,595	258	5,438,059	CLASS 528		378	5,437,653
5,438,684		213	5,437,596	258	5,438,060	16	5,437,600	378	5,437,654
5,438,700		213	5,437,597	258	5,438,061	21	5,437,601	378	5,437,655
5,438,701		213	5,437,598	258	5,438,062	29	5,437,602	378	5,437,656
5,438,702		213	5,437,599	258	5,438,063	30	5,437,603	378	5,437,657
5,438,703		213	5,437,600	258	5,438,064	40	5,437,604	378	5,437,658
5,438,704		213	5,437,601	258	5,438,065	217	5,437,605	378	5,437,659
5,438,705		213	5,437,602	258	5,438,066	2	5,437,606	378	5,437,660
5,438,706		213	5,437,603	258	5,438,067	49	5,437,607	378	5,437,661
5,438,707		213	5,437,604	258	5,438,068	91	5,437,608	378	5,437,662
5,438,708		213	5,437,605	258	5,438,069	152	5,437,609	378	5,437,663
5,438,709		213	5,437,606	258	5,438,070	CLASS 602		378	5,437,664
5,438,710		213	5,437,607	258	5,438,071	18	5,437,611	378	5,437,665
5,438,711		213	5,437,608	258	5,438,072	18	5,437,612	378	5,437,666
5,438,712		213	5,437,609	258	5,438,073	18	5,437,613	378	5,437,667
5,438,713		213	5,437,610	258	5,438,074	18	5,437,614	378	5,437,668
5,438,714		213	5,437,611	258	5,438,075	18	5,437,615	378	5,437,669
5,438,715		213	5,437,612	258	5,438,076	18	5,437,616	378	5,437,670
5,438,716		213	5,437,613	258	5,438,077	18	5,437,617	378	5,437,671
5,438,717		213	5,437,614	258	5,438,078	18	5,437,618	378	5,437,672
5,438,718		213	5,437,615	258	5,438,079	18	5,437,619	378	5,437,673
5,438,719		213	5,437,616	258	5,438,080	18	5,437,620	378	5,437,674
5,438,720		213	5,437,617	258	5,438,081	18	5,437,621	378	5,437,675
5,438,721		213	5,437,618	258	5,438,082	18	5,437,622	378	5,437,676
5,438,722		213	5,437,619	258	5,438,083	18	5,437,623	378	5,437,677
5,438,723		213	5,437,620	258	5,438,084	18	5,437,624	378	5,437,678
5,438,724		213	5,437,621	258	5,438,085	18	5,437,625	378	5,437,679
5,438,725		213	5,437,622	258	5,438,086	18	5,437,626	378	5,437,680
5,438,726		213	5,437,623	258	5,438,087	18	5,437,627	378	5,437,681
5,438,727		213	5,437,624	258	5,438,088	18	5,437,628	378	5,437,682
5,438,728		213	5,437,625	258	5,438,089	18	5,437,629	378	5,437,683
5,438,729		213	5,437,626	258	5,438,090	18	5,437,630	378	5,437,684
5,438,730		213	5,437,627	258	5,438,091	18	5,437,631	378	5,437,685
5,438,731		213	5,437,628	258	5,438,092	18	5,437,632	378	5,437,686
5,438,732		213	5,437,629	258	5,438,093	18	5,437,633	378	5,437,687
5,438,733		213	5,437,630	258	5,438,094	18	5,437,634	378	5,437,688
5,438,734		213	5,437,631	258	5,438,095	18	5,437,635	378	5,437,689
5,438,735		213	5,437,632	258	5,438,096	18	5,437,636	378	5,437,690
5,438,736		213	5,437,633	258	5,438,097	18	5,437,637	378	5,437,691
5,438,737		213	5,437,634	258	5,438,098	18	5,437,638	378	5,437,692
5,438,738		213	5,437,635	258	5,438,099	18	5,437,639	378	5,437,693
5,438,739		213	5,437,636	258	5,438,100	18	5,437,640	378	5,437,694
5,438,740		213	5,437,637	258	5,438,101	18	5,437,641	378	5,437,695
5,438,741		213	5,437,638	258	5,438,102	18	5,437,642	378	5,437,696
5,438,742		213	5,437,639	258	5,438,103	18	5,437,643	378	5,437,697
5,438,743		213	5,437,640	258	5,438,104	18	5,437,644	378	5,437,698
5,438,744		213	5,437,641	258	5,438,105	18	5,437,645	378	5,437,699
5,438,745		213	5,437,642	258	5,438,106	18	5,437,646	378	5,437,700
5,438,746		213	5,437,643	258	5,438,107	18	5,437,647	378	5,437,701
5,438,747		213	5,437,644	258	5,438,108	18	5,437,648	378	5,437,702
5,438,748		213	5,437,645	258	5,438,109	18	5,437,649	378	5,437,703
5,438,749		213	5,437,646	258	5,438,110	18	5,437,650	378	5,437,704
5,438,750		213	5,437,647	258	5,438,111	18	5,437,651	378	5,437,705
5,438,751		213	5,437,648	258	5,438,112	18	5,437,652	378	5,437,706
5,438,752		213	5,437,649	258	5,438,113	18	5,437,653	378	5,437,707
5,438,753		213	5,437,650	258	5,438,114	18	5,437,654	378	5,437,708
5,438,754		213	5,437,651	258	5,438,115	18	5,437,655	378	5,437,709
5,438,755		213	5,437,652	258	5,438,116	18	5,437,656	378	5,437,710
5,438,756		213	5,437,653	258	5,438,117	18	5,437,657	378	5,437,711
5,438,757		213	5,437,654	258	5,438,118	18	5,437,658	378	5,437,712
5,438,758		213	5,437,655	258	5,438,119	18	5,437,659	378	5,437,713
5,438,759		213	5,437,656	258	5,438,120	18	5,437,660	378	5,437,714
5,438,760		213	5,437,657	258	5,438,121	18	5,437,661	378	5,437,715
5,438,761		213	5,437,658	258	5,438,122	18	5,437,662	378	5,437,716
5,438,762		213	5,437,659	258	5,438,123	18	5,437,663	378	5,437,717
5,438,763		213	5,437,660	258	5,438,124	18	5,437,664	378	5,437,718
5,438,764		213	5,437,661	258	5,438,125	18	5,437,665	378	5,437,719
5,438,765		213	5,437,662	258	5,438,126	18	5,437,666	378	5,437,720
5,438,766		213	5,437,663	258	5,438,127	18	5,437,667	378	5,437,721
5,438,767		213	5,437,664	258	5,438,128	18	5,437,668	378	5,437,722
5,438,768		213	5,437,665	258	5,438,129	18	5,437,669	378	5,437,723
5,438,769		213	5,437,666	258	5,438,130	18	5,437,670	378	5,437,724
5,438,770		213	5,437,667	258	5,438,131	18	5,437,671	378	5,437,725
5,438,771		213	5,437,668	258	5,438,132	18	5,437,672	378	5,437,726
5,438,772		213	5,437,669	258	5,438,133	18	5,437,673	378	5,437,727
5,438,773		213	5,437,670	258	5,438,134	18	5,437,674	378	5,437,728
5,438,774		213	5,437,671	258	5,438,135	18	5,437,675	378	5,437,729
5,438,775		213	5,437,672	258	5,438,136	18	5,437,676	378	5,437,730
5,438,776		213	5,437,673	258	5,438,137	18	5,437,677	378	5,437,731
5,438,777		213	5,437,674	258	5,438,138	18	5,437,678	378	5,437,732
5,438,778		213	5,437,675	258	5,438,139	18	5,437,679	378	5,437,733
5,438,779		213	5,437,676	258	5,438,140	18	5,437,680	378	5,437,734
5,438,780		213	5,437,677	258	5,438,141	18	5,437,681	378	5,437,735
5,438,781		213	5,437,678	258	5,438,142	18	5,437,682	378	5,437,736
5,438,782		213	5,437,679	258	5,438,143	18	5,437,683	378	5,437,737
5,438,783		213	5,437,680	258	5,438,144	18	5,437,684	378	5,437,738
5,438,784		213	5,437,681	258	5,438,145	18	5,437,685	378	5,437,739
5,438,785		213	5,437,682	258	5,438,146	18	5,437,686	378	5,437,740
5,438,786		213	5,437,683	258	5,438,147	18	5,437,687	378	5,437,741
5,438,787		213	5,437,684	258	5,438,148	18	5,437,688	378	5,437,742
5,438,788									

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

5,437,567	5,437,615	5,437,521	5,437,792	5,438,164	5,437,323
5,437,579	5,437,646	5,437,743	5,437,793	5,438,324	5,437,329
5,437,621	5,437,658	5,437,907	5,437,839	5,438,422	5,437,330
5,437,650	5,437,662	5,437,912	5,437,865	5,438,441	5,437,331
5,437,657	5,437,681	5,437,770	5,437,867	5,438,522	5,437,340
5,437,719	5,437,786	5,437,497	5,437,883	5,437,374	5,437,367
5,437,740	5,437,838	5,437,369	5,437,884	5,437,486	5,437,430
5,437,781	5,437,899	5,437,451	5,437,891	5,437,614	5,437,489
5,437,819	5,437,916	5,438,171	5,437,925	5,437,780	5,437,601
5,437,829	5,438,130	5,438,203	5,437,950	5,438,103	5,437,604
5,437,853	5,438,192	5,437,408	5,437,962	5,438,115	5,437,620
5,437,939	5,438,241	5,437,409	5,437,977	5,437,122	5,437,660
5,437,964	5,438,314	5,437,505	5,438,024	5,437,130	5,437,699
5,437,991	5,438,319	5,437,552	5,438,028	5,437,260	5,437,701
5,438,025	5,438,323	5,437,561	5,438,081	5,437,261	5,437,763
5,438,041	5,438,333	5,438,402	5,438,114	5,437,647	5,437,765
5,438,088	5,438,449	5,438,510	5,438,124	5,437,980	5,437,783
5,438,126	5,438,464	5,437,087	5,438,154	5,438,187	5,437,785
5,438,161	5,438,498	5,437,103	5,438,217	5,438,297	5,437,800
5,438,219	5,438,553	5,437,152	5,438,235	5,438,423	5,437,809
5,438,239	5,438,631	5,437,190	5,438,244	5,438,516	5,437,869
5,438,274	5,438,632	5,437,247	5,438,257	5,438,531	5,437,885
5,438,326	5,438,646	5,437,383	5,438,263	5,438,638	5,437,906
5,438,369	5,438,655	5,437,401	5,438,317	5,438,677	5,437,998
5,438,489	5,438,697	5,437,410	5,438,320	Re. 35,006	5,438,049
5,438,502	5,437,075	5,437,421	5,438,322	5,437,099	5,438,142
5,438,517	5,437,125	5,437,493	5,438,337	5,437,140	5,438,165
5,438,521	5,437,168	5,437,504	5,438,343	5,437,184	5,438,166
5,438,536	5,437,188	5,437,588	5,438,344	5,437,219	5,438,170
5,438,565	5,437,197	5,437,639	5,438,351	5,437,224	5,438,177
5,438,570	5,437,204	5,437,643	5,438,354	5,437,226	5,438,225
5,438,605	5,437,235	5,437,685	5,438,355	5,437,236	5,438,267
5,438,606	5,437,253	5,437,686	5,438,366	5,437,272	5,438,315
5,438,611	5,437,257	5,437,694	5,438,396	5,437,310	5,438,316
5,438,614	5,437,375	5,437,706	5,438,435	5,437,311	5,438,360
5,438,618	5,437,426	5,437,745	5,438,446	5,437,382	5,438,476
5,438,684	5,437,436	5,437,875	5,438,456	5,437,448	5,438,548
5,437,098	5,437,498	5,437,876	5,438,457	5,437,534	5,438,658
5,437,244	5,437,578	5,437,877	5,438,457	5,437,562	5,438,660
5,437,352	5,437,584	5,437,878	5,438,505	5,437,654	5,438,670
5,437,356	5,437,593	5,437,889	5,438,512	5,437,655	5,438,671
5,437,391	5,437,600	5,437,889	5,438,555	5,437,720	5,437,229
5,437,659	5,437,629	5,437,986	5,438,581	5,437,738	5,437,343
5,437,671	5,437,735	5,438,003	5,438,592	5,437,767	5,437,366
5,437,675	5,437,753	5,438,006	5,438,633	5,437,795	5,437,651
5,437,863	5,437,789	5,438,035	5,438,633	5,437,797	5,437,854
5,437,873	5,437,955	5,438,061	5,438,633	5,437,830	5,438,490
5,437,890	5,437,994	5,438,062	5,438,633	5,437,848	5,437,246
5,437,999	5,438,040	5,438,064	5,438,633	5,437,855	5,437,326
5,438,056	5,438,085	5,438,071	5,438,633	5,437,898	5,437,127
5,438,096	5,438,095	5,438,102	5,438,633	5,437,923	5,437,258
5,438,131	5,438,097	5,438,112	5,438,633	5,437,928	5,437,413
5,438,271	5,438,146	5,438,136	5,438,633	5,437,934	5,437,446
5,438,503	5,438,172	5,438,148	5,438,633	5,437,959	5,437,496
5,437,062	5,438,180	5,438,149	5,438,633	5,438,026	5,437,736
5,437,138	5,438,181	5,438,152	5,438,633	5,438,034	5,437,852
5,437,377	5,438,417	5,438,265	5,438,633	5,438,055	5,437,905
5,437,395	5,438,420	5,438,308	5,438,633	5,438,106	5,438,411
5,437,554	5,438,485	5,438,374	5,438,633	5,438,109	5,438,436
5,437,696	5,438,491	5,438,440	5,438,633	5,438,118	5,438,572
5,437,709	5,438,492	5,438,486	5,438,633	5,438,174	5,438,598
5,437,823	5,438,513	5,438,615	5,438,633	5,438,272	5,437,447
5,437,936	5,438,607	5,438,616	5,438,633	5,437,096	5,437,094
5,438,236	5,437,091	5,438,676	5,438,633	5,437,547	5,437,225
5,437,388	5,437,388	5,045,016	5,437,105	5,438,481	5,437,303
5,437,574	5,437,108	5,437,509	5,437,107	5,438,552	5,437,418
5,437,612	5,437,163	5,437,831	5,437,116	5,437,101	5,437,482
5,437,274	5,437,173	5,438,230	5,437,193	5,437,222	5,437,958
5,437,332	5,437,288	5,438,406	5,437,262	5,437,440	5,437,982
5,437,613	5,437,387	5,438,585	5,437,295	5,437,595	5,438,162
5,437,782	5,437,462	Re. 35,007	5,437,296	5,437,124	5,438,349
5,438,619	5,437,537	5,437,149	5,437,390	5,437,177	5,438,433
5,437,267	5,437,619	5,437,158	5,437,411	5,437,380	5,438,508
5,437,285	5,437,642	5,437,174	5,437,466	5,437,670	5,438,617
5,437,291	5,437,710	5,437,277	5,437,514	5,437,679	5,437,179
5,437,424	5,437,754	5,437,278	5,437,528	5,437,690	5,437,307
5,437,460	5,437,812	5,437,289	5,437,538	5,437,729	5,437,113
5,437,638	5,437,868	5,437,294	5,437,623	5,437,927	5,437,212
5,437,656	5,437,882	5,437,328	5,437,640	5,438,158	5,437,275
5,437,680	5,437,909	5,437,389	5,437,712	5,438,311	5,437,292
5,437,821	5,437,932	5,437,399	5,437,744	5,437,066	5,437,297
5,437,857	5,437,935	5,437,406	5,437,748	5,437,076	5,437,309
5,438,201	5,438,027	5,437,427	5,437,760	5,437,086	5,437,345
5,438,242	5,438,042	5,437,429	5,437,766	5,437,117	5,437,351
5,438,243	5,438,075	5,437,441	5,437,768	5,437,119	5,437,610
5,438,404	5,438,226	5,437,499	5,437,806	5,437,169	5,437,628
5,438,414	5,438,410	5,437,540	5,437,811	5,437,201	5,437,653
5,438,599	5,438,460	5,437,581	5,437,851	5,437,249	5,437,749
5,437,067	5,438,509	5,437,648	5,437,856	5,437,255	5,437,820
5,437,102	5,438,639	5,437,669	5,437,929	5,437,263	5,437,844
5,437,194	5,438,702	5,437,673	5,437,940	5,437,279	5,437,997
5,437,250	5,437,106	5,437,711	5,438,051	5,437,287	5,438,205
5,437,282	5,438,610	5,437,728	5,438,069	5,437,299	5,438,338
5,437,539	5,437,300	5,437,758	5,438,078	5,437,305	5,438,602
5,437,542	5,437,415	5,437,772	5,438,086	5,437,316	5,438,673
5,437,551	5,437,494	5,437,788	5,438,093		

## DESIGN PATENTS

01 :	360,771	360,931	17 :	360,790	26 :	360,770	360,893	44 :	360,878
04 :	360,776	360,936		360,805		360,812	360,968	45 :	360,933
	360,777	360,940		360,832		360,820	360,952		360,767
	360,888	360,944		360,851		360,869	360,787		360,787
	360,904	360,946		360,852		360,918	360,753		360,753
05 :	360,928	360,756	08 :	360,889		360,926	360,778	46 :	360,880
06 :	360,742	360,800		360,901		360,927	360,898	47 :	360,880
	360,743	360,841	09 :	360,948		360,950	360,813		360,960
	360,745	360,868		360,949	27 :	360,757	360,857	48 :	360,746
	360,764	360,744	12 :	360,961		360,825	360,858		360,748
	360,782	360,780		360,962		360,915	360,859		360,751
	360,785	360,788		360,963		360,929	360,860		360,876
	360,792	360,797		360,964		360,781	360,862		360,882
	360,794	360,807		360,965		360,845	360,863		360,951
	360,795	360,826	18 :	360,849		360,911	360,867		360,956
	360,806	360,866		360,938		360,954	360,905	49 :	360,803
	360,810	360,922		360,957		360,775	360,912		360,955
	360,815	360,923	21 :	360,769		360,759	360,914	53 :	360,798
	360,830	360,925		360,843		360,761	360,945		360,816
	360,842	360,942	22 :	360,902		360,829	360,967		360,821
	360,865	360,749		360,937		360,900	360,762		360,828
	360,871	360,750	23 :	360,809		360,959	360,796		360,903
	360,872	360,808		360,920	35 :	360,848	360,855	55 :	360,791
	360,886	360,854	24 :	360,789		360,752	360,966		360,847
	360,887	360,874	25 :	360,833	36 :	360,799	360,772		360,891
	360,919	360,881		360,840		360,811	360,817		360,892
	360,921	360,932	15 :	360,953		360,824	360,894		360,906

## PLANT PATENTS

06 :	9,228	9,229	9,230	9,231	13 :	9,224	9,225
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August 8, 1995 Volume 1177 Number 2

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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1175 O.G. 52, on June 20, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1174 O.G. 57, on May 9, 1995.

International fees were changed, effective on January 1, 1995, due to a change in the exchange rate of the U. S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1168 O.G. 99, on Nov. 29, 1994.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective Oct. 1, 1994, and were announced in the *Official Gazette* at 1165 O.G. 132, on Aug. 30, 1994.

The schedule of PCT fees (in U.S. dollars), effective June 20, 1995, is as follows:

## International Application (PCT Chapter I) fees:

Transmittal fee.....	210.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed.....	640.00
—Corresponding prior U.S. national application filed.....	420.00
—Supplemental search fee, per additional invention (payable only upon invitation).....	180.00
European Patent Office as ISA.....	1722.00

## International fees

Basic fee.....	604.00
Basic Supplemental fee (for each page over 30).....	12.00
Designation fee per country or region	
—For the first 10 national or regional offices designated.....	147.00
—For each designation in excess of 10 offices.....	No Charge

Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
—Designation fee.....	147.00
—Confirmation fee.....	73.50

## International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:

Handling fee.....	185.00
Preliminary examination fee	

## USPTO as International Preliminary Examining Authority (IPEA)

—USPTO was ISA in PCT Chapter I.....	460.00
—Additional examination fee, per additional invention (payable only upon invitation).....	140.00
—USPTO was not ISA in PCT Chapter I.....	690.00
—Additional examination fee, per additional invention (payable only upon invitation).....	240.00

## U.S. National Stage Fees

### Basic National fee

#### USPTO was IPEA

—All claims presented satisfied provisions of PCT Article 33(2) to (4).....	46.00	92.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4).....	330.00	660.00
USPTO was ISA but not IPEA.....	365.00	730.00
USPTO was neither ISA nor IPEA		

—Filed without a search report from the European Patent Office or the Japanese Patent Office.....	490.00	980.00
—Filed with a search report from the European Patent Office or the Japanese Patent Office.....	425.00	850.00

### Other National fees

—For each independent claim in excess of 3.....	38.00	76.00
—For each claim in excess of 20..	11.00	22.00
—For each application containing a multiple dependent claim.....	120.00	240.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1).....	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1).....	130.00	130.00

May 30, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

## Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on August 4, 1992 for which maintenance fees due at 3 years and

six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,134,725 through 5,136,720  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on August 2, 1988 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,760,610 through 4,761,833  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on July 31, 1984 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,462,115 through 4,463,454  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

#### 37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$480.00  
By other than a small entity .....\$960.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$965.00  
By other than a small entity .....\$1,930.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,450.00  
By other than a small entity .....\$2,900.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) .....\$65.00  
By other than a small entity .....\$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable .....\$640.00  
(2) unintentional .....\$1,500.00

#### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

#### PATENTS WHICH EXPIRED May 31, 1995 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,150	06/613,802	05/20/86
(4,385,761)	(06/235,945)	(05/31/83)
Re. 32,936	07/212,291	05/30/89
(4,668,462)	(06/820,449)	(05/26/87)
Re. 32,984	07/124,315	07/11/89
(4,668,984)	(06/813,398)	(05/26/87)
Re. 33,285	07/352,865	07/31/90
(4,668,877)	(06/754,245)	(05/26/87)
Re. 33,402	07/295,655	10/23/90
(4,669,001)	(06/552,159)	(05/26/87)
Re. 34,530	07/845,336	02/01/94
(4,668,524)	(06/823,943)	(05/26/87)
4,385,407	06/275,589	05/31/83
4,385,409	06/262,792	05/31/83
4,385,411	06/263,103	05/31/83
4,385,422	06/244,954	05/31/83
4,385,423	06/218,624	05/31/83
4,385,430	06/274,939	05/31/83
4,385,435	06/385,217	05/31/83
4,385,438	06/274,901	05/31/83
4,385,442	06/229,129	05/31/83
4,385,444	06/268,579	05/31/83
4,385,448	06/281,680	05/31/83
4,385,451	06/227,834	05/31/83
4,385,471	06/304,838	05/31/83
4,385,473	06/237,163	05/31/83
4,385,483	06/340,664	05/31/83
4,385,484	06/294,589	05/31/83
4,385,488	06/247,650	05/31/83
4,385,490	06/220,210	05/31/83
4,385,505	06/254,126	05/31/83
4,385,514	06/281,444	05/31/83
4,385,517	06/277,681	05/31/83
4,385,519	06/229,423	05/31/83
4,385,520	06/259,774	05/31/83
4,385,523	06/346,882	05/31/83
4,385,536	06/362,846	05/31/83
4,385,537	06/263,075	05/31/83
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4,385,545	06/299,811	05/31/83
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4,385,559	06/224,298	05/31/83
4,385,560	06/251,317	05/31/83
4,385,569	06/311,867	05/31/83
4,385,571	06/254,455	05/31/83
4,385,580	06/243,088	05/31/83
4,385,582	06/252,394	05/31/83
4,385,589	06/334,742	05/31/83
4,385,592	06/287,517	05/31/83
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4,385,611	06/249,771	05/31/83
4,385,616	06/294,505	05/31/83
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4,385,646	06/236,482	05/31/83

Patent Number	Serial Number	Issue Date	4,386,112	06/317,685	05/31/83
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4,385,650	06/252,970	05/31/83	4,386,130	06/305,856	05/31/83
4,385,654	06/341,729	05/31/83	4,386,133	06/355,963	05/31/83
4,385,662	06/308,754	05/31/83	4,386,135	06/338,473	05/31/83
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4,385,664	06/289,549	05/31/83	4,386,145	06/375,423	05/31/83
4,385,677	06/241,966	05/31/83	4,386,163	06/334,571	05/31/83
4,385,689	06/225,107	05/31/83	4,386,166	06/261,735	05/31/83
4,385,693	06/238,830	05/31/83	4,386,172	06/264,564	05/31/83
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4,385,703	06/249,240	05/31/83	4,386,194	06/349,836	05/31/83
4,385,711	06/286,640	05/31/83	4,386,196	06/364,589	05/31/83
4,385,721	06/300,399	05/31/83	4,386,199	06/259,876	05/31/83
4,385,733	06/262,300	05/31/83	4,386,200	06/306,966	05/31/83
4,385,741	06/234,255	05/31/83	4,386,203	06/305,857	05/31/83
4,385,744	06/239,392	05/31/83	4,386,208	06/283,651	05/31/83
4,385,754	06/244,320	05/31/83	4,386,215	06/325,157	05/31/83
4,385,776	06/237,738	05/31/83	4,386,217	06/265,908	05/31/83
4,385,781	06/236,615	05/31/83	4,386,218	06/308,326	05/31/83
4,385,791	06/238,691	05/31/83	4,386,220	06/366,609	05/31/83
4,385,800	06/217,389	05/31/83	4,386,221	06/315,796	05/31/83
4,385,813	06/368,698	05/31/83	4,386,224	06/297,683	05/31/83
4,385,819	06/335,470	05/31/83	4,386,229	06/307,452	05/31/83
4,385,835	06/248,448	05/31/83	4,386,230	06/331,831	05/31/83
4,385,840	06/268,957	05/31/83	4,386,235	06/234,962	05/31/83
4,385,846	06/323,419	05/31/83	4,386,237	06/218,976	05/31/83
4,385,863	06/263,328	05/31/83	4,386,257	06/239,275	05/31/83
4,385,870	06/235,594	05/31/83	4,386,261	06/227,042	05/31/83
4,385,871	06/231,058	05/31/83	4,386,263	06/285,144	05/31/83
4,385,881	06/252,177	05/31/83	4,386,294	06/318,942	05/31/83
4,385,892	06/356,443	05/31/83	4,386,298	06/251,824	05/31/83
4,385,898	06/252,530	05/31/83	4,386,309	06/271,265	05/31/83
4,385,903	06/316,170	05/31/83	4,386,321	06/269,182	05/31/83
4,385,917	06/290,294	05/31/83	4,386,323	06/227,892	05/31/83
4,385,918	06/342,853	05/31/83	4,386,325	06/309,950	05/31/83
4,385,921	06/275,484	05/31/83	4,386,329	06/278,776	05/31/83
4,385,922	06/296,284	05/31/83	4,386,330	06/234,739	05/31/83
4,385,923	06/296,598	05/31/83	4,386,332	06/288,875	05/31/83
4,385,926	06/296,597	05/31/83	4,386,333	06/317,108	05/31/83
4,385,938	06/300,839	05/31/83	4,386,334	06/346,838	05/31/83
4,385,939	06/321,052	05/31/83	4,386,354	06/216,753	05/31/83
4,385,954	06/400,360	05/31/83	4,386,357	06/265,962	05/31/83
4,385,958	06/290,496	05/31/83	4,386,363	06/252,864	05/31/83
4,385,959	06/286,873	05/31/83	4,386,371	06/287,561	05/31/83
4,385,960	06/363,696	05/31/83	4,386,372	06/297,885	05/31/83
4,385,962	06/274,316	05/31/83	4,386,389	06/273,847	05/31/83
4,385,963	06/298,259	05/31/83	4,386,396	06/328,552	05/31/83
4,385,964	06/382,312	05/31/83	4,386,427	06/246,893	05/31/83
4,385,969	06/287,492	05/31/83	4,386,429	06/219,509	05/31/83
4,385,978	06/302,151	05/31/83	4,386,433	06/246,977	05/31/83
4,385,980	06/238,296	05/31/83	4,667,343	06/920,234	05/26/87
4,385,981	06/255,569	05/31/83	4,667,344	06/684,665	05/26/87
4,385,982	06/263,631	05/31/83	4,667,346	06/919,209	05/26/87
4,385,983	06/291,695	05/31/83	4,667,349	06/870,246	05/26/87
4,385,986	06/252,020	05/31/83	4,667,353	06/663,156	05/26/87
4,385,992	06/278,184	05/31/83	4,667,357	06/917,074	05/26/87
4,385,993	06/275,658	05/31/83	4,667,365	06/831,829	05/26/87
4,385,994	06/315,055	05/31/83	4,667,369	06/835,193	05/26/87
4,386,002	06/263,378	05/31/83	4,667,372	06/852,104	05/26/87
4,386,005	06/222,760	05/31/83	4,667,373	06/816,054	05/26/87
4,386,012	06/344,707	05/31/83	4,667,378	06/785,890	05/26/87
4,386,013	06/295,340	05/31/83	4,667,380	06/907,390	05/26/87
4,386,016	06/315,218	05/31/83	4,667,382	06/857,999	05/26/87
4,386,028	06/403,947	05/31/83	4,667,384	06/781,789	05/26/87
4,386,032	06/253,261	05/31/83	4,667,385	06/768,854	05/26/87
4,386,049	06/229,497	05/31/83	4,667,394	06/834,138	05/26/87
4,386,052	06/316,889	05/31/83	4,667,402	06/646,144	05/26/87
4,386,054	06/310,745	05/31/83	4,667,403	06/726,785	05/26/87
4,386,060	06/343,831	05/31/83	4,667,406	06/723,744	05/26/87
4,386,061	06/256,983	05/31/83	4,667,408	06/793,282	05/26/87
4,386,074	06/287,189	05/31/83	4,667,409	06/905,425	05/26/87
4,386,097	06/288,078	05/31/83	4,667,414	06/769,071	05/26/87
4,396,098	06/317,807	05/31/83	4,667,420	06/713,577	05/26/87
4,386,099	06/322,903	05/31/83	4,667,423	06/738,223	05/26/87
4,386,103	06/229,805	05/31/83	4,667,424	06/737,139	05/26/87
4,386,108	06/340,440	05/31/83	4,667,428	06/728,100	05/26/87
			4,667,432	06/897,596	05/26/87



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4,667,435	06/757,436	05/26/87	4,667,695	06/862,156	05/26/87
4,667,437	06/756,372	05/26/87	4,667,706	06/820,969	05/26/87
4,667,442	06/735,061	05/26/87	4,667,709	06/719,700	05/26/87
4,667,445	06/756,239	05/26/87	4,667,710	06/896,379	05/26/87
4,667,450	06/766,431	05/26/87	4,667,713	06/866,522	05/26/87
4,667,468	06/715,523	05/26/87	4,667,714	06/815,387	05/26/87
4,667,469	06/805,691	05/26/87	4,667,728	06/854,301	05/26/87
4,667,470	06/795,790	05/26/87	4,667,730	06/883,368	05/26/87
4,667,475	06/848,237	05/26/87	4,667,736	06/737,825	05/26/87
4,667,477	06/716,941	05/26/87	4,667,737	06/861,553	05/26/87
4,667,478	06/652,621	05/26/87	4,667,739	06/837,928	05/26/87
4,667,488	06/895,684	05/26/87	4,667,741	06/767,571	05/26/87
4,667,495	06/711,220	05/26/87	4,667,745	06/846,862	05/26/87
4,667,497	06/785,482	05/26/87	4,667,746	06/681,359	05/26/87
4,667,498	06/626,154	05/26/87	4,667,771	06/488,211	05/26/87
4,667,499	06/779,978	05/26/87	4,667,772	06/758,690	05/26/87
4,667,502	06/727,480	05/26/87	4,667,776	06/856,364	05/26/87
4,667,510	06/849,845	05/26/87	4,667,777	06/844,188	05/26/87
4,667,511	06/734,479	05/26/87	4,667,778	06/824,554	05/26/87
4,667,515	06/802,726	05/26/87	4,667,780	06/714,967	05/26/87
4,667,520	06/805,123	05/26/87	4,667,781	06/796,361	05/26/87
4,667,521	06/806,683	05/26/87	4,667,787	06/698,796	05/26/87
4,667,524	06/738,095	05/26/87	4,667,791	06/807,952	05/26/87
4,667,528	06/662,256	05/26/87	4,667,792	06/657,125	05/26/87
4,667,529	06/767,834	05/26/87	4,667,795	06/738,784	05/26/87
4,667,533	06/731,302	05/26/87	4,667,797	06/811,420	05/26/87
4,667,536	06/649,129	05/26/87	4,667,798	06/860,667	05/26/87
4,667,540	06/704,277	05/26/87	4,667,799	06/739,411	05/26/87
4,667,545	06/740,633	05/26/87	4,667,804	06/556,603	05/26/87
4,667,546	06/842,812	05/26/87	4,667,806	06/772,776	05/26/87
4,667,547	06/654,708	05/26/87	4,667,807	06/804,611	05/26/87
4,667,550	06/813,663	05/26/87	4,667,809	06/706,972	05/26/87
4,667,558	06/766,252	05/26/87	4,667,811	06/651,025	05/26/87
4,667,559	06/839,907	05/26/87	4,667,819	06/831,095	05/26/87
4,667,560	06/838,589	05/26/87	4,667,822	06/813,847	05/26/87
4,667,566	06/828,053	05/26/87	4,667,824	06/761,574	05/26/87
4,667,570	06/685,136	05/26/87	4,667,826	06/743,898	05/26/87
4,667,571	06/408,752	05/26/87	4,667,831	06/710,098	05/26/87
4,667,573	06/723,754	05/26/87	4,667,835	06/747,643	05/26/87
4,667,576	06/780,193	05/26/87	4,667,836	06/883,968	05/26/87
4,667,578	06/828,111	05/26/87	4,667,841	06/810,064	05/26/87
4,667,593	06/904,605	05/26/87	4,667,842	06/854,562	05/26/87
4,667,599	06/726,324	05/26/87	4,667,844	06/708,888	05/26/87
4,667,600	06/833,640	05/26/87	4,667,848	06/804,442	05/26/87
4,667,604	06/763,677	05/26/87	4,667,849	06/823,184	05/26/87
4,667,606	06/862,218	05/26/87	4,667,857	06/851,735	05/26/87
4,667,611	06/857,923	05/26/87	4,667,859	06/822,634	05/26/87
4,667,617	06/788,627	05/26/87	4,667,868	06/915,657	05/26/87
4,667,620	06/792,379	05/26/87	4,667,875	06/707,232	05/26/87
4,667,621	06/779,677	05/26/87	4,667,878	06/781,193	05/26/87
4,667,625	06/800,297	05/26/87	4,667,879	06/767,745	05/26/87
4,667,626	06/827,164	05/26/87	4,667,880	06/703,816	05/26/87
4,667,629	06/837,805	05/26/87	4,667,881	06/725,487	05/26/87
4,667,633	06/670,823	05/26/87	4,667,883	06/682,661	05/26/87
4,667,636	06/840,755	05/26/87	4,667,885	06/768,900	05/26/87
4,667,639	06/840,649	05/26/87	4,667,887	06/777,757	05/26/87
4,667,643	06/803,955	05/26/87	4,667,892	06/755,843	05/26/87
4,667,645	06/863,959	05/26/87	4,667,896	06/870,820	05/26/87
4,667,649	06/735,662	05/26/87	4,667,898	06/761,983	05/26/87
4,667,651	06/816,354	05/26/87	4,667,899	06/676,034	05/26/87
4,667,652	06/907,450	05/26/87	4,667,902	06/667,685	05/26/87
4,667,657	06/789,143	05/26/87	4,667,903	06/655,893	05/26/87
4,667,658	06/854,830	05/26/87	4,667,904	06/656,039	05/26/87
4,667,659	06/823,574	05/26/87	4,667,907	06/672,656	05/26/87
4,667,667	06/785,888	05/26/87	4,667,908	06/673,378	05/26/87
4,667,668	06/726,064	05/26/87	4,667,911	06/757,947	05/26/87
4,667,673	06/588,276	05/26/87	4,667,912	06/840,879	05/26/87
4,667,675	06/836,992	05/26/87	4,667,917	06/733,191	05/26/87
4,667,676	06/745,854	05/26/87	4,667,919	06/798,820	05/26/87
4,667,678	06/770,044	05/26/87	4,667,920	06/787,074	05/26/87
4,667,682	06/751,016	05/26/87	4,667,922	06/796,463	05/26/87
4,667,684	06/699,805	05/26/87	4,667,938	06/797,994	05/26/87
4,667,687	06/686,797	05/26/87	4,667,945	06/924,732	05/26/87
4,667,688	06/555,582	05/26/87	4,667,949	06/498,340	05/26/87
4,667,689	06/742,490	05/26/87	4,667,950	06/329,520	05/26/87
4,667,690	06/570,904	05/26/87	4,667,960	06/719,404	05/26/87
4,667,692	06/525,001	05/26/87	4,667,963	06/786,308	05/26/87
			4,667,965	06/752,624	05/26/87
			4,667,966	06/795,166	05/26/87

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4,667,968	06/716,516		4,668,220	06/787,427	05/26/87
4,667,971	06/741,771	05/26/87	4,668,222	06/613,933	05/26/87
4,667,972	06/657,339	05/26/87	4,668,223	06/825,935	05/26/87
4,667,973	06/317,441	05/26/87	4,668,227	06/731,897	05/26/87
4,667,976	06/789,381	05/26/87	4,668,229	06/905,144	05/26/87
4,667,979	06/816,139	05/26/87	4,668,238	06/784,862	05/26/87
4,667,980	06/703,675	05/26/87	4,668,241	06/723,726	05/26/87
4,667,981	06/708,525	05/26/87	4,668,244	06/768,114	05/26/87
4,667,985	06/834,726	05/26/87	4,668,249	06/513,446	05/26/87
4,667,986	06/663,476	05/26/87	4,668,250	06/744,579	05/26/87
4,667,987	06/817,265	05/26/87	4,668,251	06/800,515	05/26/87
4,667,988	06/712,104	05/26/87	4,668,257	06/737,389	05/26/87
4,667,989	06/873,204	05/26/87	4,668,261	06/745,645	05/26/87
4,667,997	06/792,284	05/26/87	4,668,262	06/814,838	05/26/87
4,668,000	06/835,540	05/26/87	4,668,279	06/724,451	05/26/87
4,668,002	06/910,280	05/26/87	4,668,280	06/659,731	05/26/87
4,668,010	06/819,640	05/26/87	4,668,281	06/849,332	05/26/87
4,668,011	06/765,258	05/26/87	4,668,283	06/746,884	05/26/87
4,668,012	06/652,496	05/26/87	4,668,287	06/780,342	05/26/87
4,668,013	06/797,792	05/26/87	4,668,291	06/516,387	05/26/87
4,668,017	06/628,235	05/26/87	4,668,295	06/726,868	05/26/87
4,668,019	06/849,805	05/26/87	4,668,296	06/832,291	05/26/87
4,668,028	06/731,017	05/26/87	4,668,298	06/874,510	05/26/87
4,668,030	06/775,133	05/26/87	4,668,302	06/715,689	05/26/87
4,668,032	06/654,573	05/26/87	4,668,303	06/801,333	05/26/87
4,668,036	06/799,752	05/26/87	4,668,307	06/811,841	05/26/87
4,668,037	06/535,417	05/26/87	4,668,310	06/474,886	05/26/87
4,668,038	06/782,154	05/26/87	4,668,317	06/804,191	05/26/87
4,668,045	06/882,747	05/26/87	4,668,321	06/782,268	05/26/87
4,668,046	06/832,127	05/26/87	4,668,323	06/702,029	05/26/87
4,668,048	06/757,314	05/26/87	4,668,324	06/773,981	05/26/87
4,668,058	06/777,401	05/26/87	4,668,327	06/821,426	05/26/87
4,668,059	06/756,827	05/26/87	4,668,331	06/862,159	05/26/87
4,668,067	06/902,730	05/26/87	4,668,343	06/649,130	05/26/87
4,668,068	06/843,073	05/26/87	4,668,344	06/786,944	05/26/87
4,668,071	06/588,129	05/26/87	4,668,345	06/705,630	05/26/87
4,668,083	06/799,390	05/26/87	4,668,349	06/921,901	05/26/87
4,668,087	06/800,411	05/26/87	4,668,354	06/901,770	05/26/87
4,668,088	06/866,988	05/26/87	4,668,355	06/773,769	05/26/87
4,668,099	06/776,751	05/26/87	4,668,360	06/590,402	05/26/87
4,668,101	06/800,859	05/26/87	4,668,364	06/865,622	05/26/87
4,668,103	06/642,874	05/26/87	4,668,365	06/664,657	05/26/87
4,668,104	06/918,631	05/26/87	4,668,366	06/790,673	05/26/87
4,668,105	06/826,329	05/26/87	4,668,367	06/880,077	05/26/87
4,668,107	06/765,399	05/26/87	4,668,368	06/821,979	05/26/87
4,668,108	06/714,867	05/26/87	4,668,369	06/879,019	05/26/87
4,668,111	06/779,413	05/26/87	4,668,373	06/756,050	05/26/87
4,668,117	06/846,960	05/26/87	4,668,379	06/737,243	05/26/87
4,668,120	06/789,330	05/26/87	4,668,380	06/541,720	05/26/87
4,668,121	06/776,211	05/26/87	4,668,381	06/706,604	05/26/87
4,668,123	06/706,787	05/26/87	4,668,384	06/730,769	05/26/87
4,668,127	06/854,847	05/26/87	4,668,385	06/770,187	05/26/87
4,668,138	06/750,400	05/26/87	4,668,389	06/702,237	05/26/87
4,668,140	06/805,744	05/26/87	4,668,395	06/838,962	05/26/87
4,668,141	06/759,691	05/26/87	4,668,398	06/765,899	05/26/87
4,668,143	06/645,781	05/26/87	4,668,399	06/450,221	05/26/87
4,668,151	06/751,983	05/26/87	4,668,405	06/746,628	05/26/87
4,668,152	06/836,326	05/26/87	4,668,407	06/814,281	05/26/87
4,668,154	06/751,971	05/26/87	4,668,408	06/745,472	05/26/87
4,668,155	06/778,662	05/26/87	4,668,409	06/537,627	05/26/87
4,668,156	06/705,727	05/26/87	4,668,410	06/858,569	05/26/87
4,668,157	06/804,422	05/26/87	4,668,413	06/830,855	05/26/87
4,668,165	06/844,636	05/26/87	4,668,420	06/820,353	05/26/87
4,668,170	06/701,565	05/26/87	4,668,431	06/837,348	05/26/87
4,668,172	06/783,834	05/26/87	4,668,436	06/808,801	05/26/87
4,668,174	06/783,205	05/26/87	4,668,437	06/775,347	05/26/87
4,668,175	06/737,125	05/26/87	4,668,439	06/741,639	05/26/87
4,668,176	06/841,306	05/26/87	4,668,440	06/879,657	05/26/87
4,668,179	06/801,874	05/26/87	4,668,441	06/355,701	05/26/87
4,668,181	06/840,656	05/26/87	4,668,448	06/760,463	05/26/87
4,668,185	06/787,925	05/26/87	4,668,449	06/770,818	05/26/87
4,668,186	06/702,037	05/26/87	4,668,451	06/732,181	05/26/87
4,668,188	06/823,768	05/26/87	4,668,461	06/608,523	05/26/87
4,668,193	06/687,643	05/26/87	4,668,465	06/665,228	05/26/87
4,668,194	06/825,059	05/26/87	4,668,466	06/703,166	05/26/87
4,668,203	06/804,597	05/26/87	4,668,467	06/623,734	05/26/87
4,668,205	06/781,298	05/26/87	4,668,472	06/672,098	05/26/87
			4,668,473	06/769,782	05/26/87

Patent Number	Serial Number	Issue Date	4,668,733	06/844,912	05/26/87
4,668,478	06/627,130	05/26/87	4,668,734	06/811,862	05/26/87
4,668,479	06/744,061	05/26/87	4,668,738	06/813,316	05/26/87
4,668,484	06/579,368	05/26/87	4,668,740	06/723,278	05/26/87
4,668,491	06/760,482	05/26/87	4,668,741	06/786,424	05/26/87
4,668,492	06/801,737	05/26/87	4,668,743	06/757,558	05/26/87
4,668,493	06/749,661	05/26/87	4,668,744	06/787,122	05/26/87
4,668,494	06/685,635	05/26/87	4,668,746	06/831,679	05/26/87
4,668,496	06/782,316	05/26/87	4,668,749	06/727,817	05/26/87
4,668,498	06/781,278	05/26/87	4,668,758	06/782,750	05/26/87
4,668,503	06/590,833	05/26/87	4,668,762	06/861,374	05/26/87
4,668,506	06/766,741	05/26/87	4,668,765	06/836,762	05/26/87
4,668,508	06/578,645	05/26/87	4,668,766	06/835,595	05/26/87
4,668,509	06/637,023	05/26/87	4,668,767	06/834,251	05/26/87
4,668,511	06/527,950	05/26/87	4,668,769	06/762,099	05/26/87
4,668,516	06/689,050	05/26/87	4,668,770	06/608,321	05/26/87
4,668,529	06/722,652	05/26/87	4,668,771	06/808,899	05/26/87
4,668,535	06/646,677	05/26/87	4,668,776	06/846,520	05/26/87
4,668,538	06/629,534	05/26/87	4,668,778	06/729,905	05/26/87
4,668,543	06/599,247	05/26/87	4,668,779	06/582,434	05/26/87
4,668,547	06/680,507	05/26/87	4,668,784	06/765,154	05/26/87
4,668,548	06/815,341	05/26/87	4,668,794	06/736,679	05/26/87
4,668,554	06/690,658	05/26/87	4,668,808	06/640,059	05/26/87
4,668,561	06/859,477	05/26/87	4,668,809	06/742,127	05/26/87
4,668,565	06/835,884	05/26/87	4,668,810	06/818,622	05/26/87
4,668,569	06/800,157	05/26/87	4,668,820	06/722,173	05/26/87
4,668,571	06/859,176	05/26/87	4,668,821	06/827,676	05/26/87
4,668,575	06/861,765	05/26/87	4,668,822	06/894,390	05/26/87
4,668,576	06/753,074	05/26/87	4,668,823	06/567,424	05/26/87
4,668,579	06/576,081	05/26/87	4,668,824	06/635,829	05/26/87
4,668,586	06/787,088	05/26/87	4,668,825	06/625,957	05/26/87
4,668,587	06/841,786	05/26/87	4,668,828	06/492,087	05/26/87
4,668,591	06/710,240	05/26/87	4,668,829	06/776,738	05/26/87
4,668,592	06/743,182	05/26/87	4,668,830	06/809,720	05/26/87
4,668,598	06/754,324	05/26/87	4,668,831	06/840,488	05/26/87
4,668,599	06/896,304	05/26/87	4,668,832	06/785,636	05/26/87
4,668,600	06/732,702	05/26/87	4,668,835	06/783,999	05/26/87
4,668,606	06/799,893	05/26/87	4,668,838	06/839,638	05/26/87
4,668,608	06/903,863	05/26/87	4,668,846	06/907,164	05/26/87
4,668,609	06/787,946	05/26/87	4,668,850	06/814,093	05/26/87
4,668,618	06/574,647	05/26/87	4,668,854	06/765,139	05/26/87
4,668,625	06/638,494	05/26/87	4,668,861	06/680,759	05/26/87
4,668,628	06/718,600	05/26/87	4,668,866	06/793,416	05/26/87
4,668,629	06/599,201	05/26/87	4,668,869	06/788,188	05/26/87
4,668,631	06/777,674	05/26/87	4,668,870	06/623,765	05/26/87
4,668,632	06/698,654	05/26/87	4,668,871	06/664,388	05/26/87
4,668,637	06/619,467	05/26/87	4,668,891	06/680,846	05/26/87
4,668,643	06/749,829	05/26/87	4,668,893	06/768,397	05/26/87
4,668,647	06/735,769	05/26/87	4,668,894	06/258,084	05/26/87
4,668,648	06/827,926	05/26/87	4,668,896	06/708,910	05/26/87
4,668,654	06/884,843	05/26/87	4,668,902	06/849,654	05/26/87
4,668,657	06/758,413	05/26/87	4,668,905	06/817,863	05/26/87
4,668,658	06/758,414	05/26/87	4,668,909	06/607,089	05/26/87
4,668,660	06/598,560	05/26/87	4,668,910	06/912,207	05/26/87
4,668,661	06/664,064	05/26/87	4,668,913	06/711,864	05/26/87
4,668,663	06/593,756	05/26/87	4,668,916	06/744,593	05/26/87
4,668,664	06/863,029	05/26/87	4,668,922	06/756,407	05/26/87
4,668,668	06/825,760	05/26/87	4,668,931	06/829,877	05/26/87
4,668,672	06/710,790	05/26/87	4,668,934	06/663,251	05/26/87
4,668,677	06/722,304	05/26/87	4,668,936	06/787,831	05/26/87
4,668,679	06/812,976	05/26/87	4,668,938	06/418,439	05/26/87
4,668,680	06/808,122	05/26/87	4,668,942	06/673,015	05/26/87
4,668,681	06/843,915	05/26/87	4,668,946	06/817,223	05/26/87
4,668,682	06/753,708	05/26/87	4,668,953	06/725,252	05/26/87
4,668,683	06/841,656	05/26/87	4,668,955	06/551,379	05/26/87
4,668,684	06/831,139	05/26/87	4,668,957	06/660,203	05/26/87
4,668,686	06/832,212	05/26/87	4,668,958	06/747,007	05/26/87
4,668,687	06/799,670	05/26/87	4,668,963	06/888,288	05/26/87
4,668,688	06/664,770	05/26/87	4,668,964	06/794,730	05/26/87
4,668,696	06/759,779	05/26/87	4,668,967	06/867,837	05/26/87
4,668,697	06/600,695	05/26/87	4,668,978	06/639,344	05/26/87
4,668,698	06/670,019	05/26/87	4,668,979	06/680,773	05/26/87
4,668,699	06/762,736	05/26/87	4,668,982	06/745,968	05/26/87
4,668,710	06/812,881	05/26/87	4,668,983	06/800,175	05/26/87
4,668,711	06/878,088	05/26/87	4,668,993	06/902,822	05/26/87
4,668,713	06/809,099	05/26/87	4,668,999	06/677,975	05/26/87
4,668,720	06/762,946	05/26/87	4,669,003	06/858,996	05/26/87
4,668,723	06/786,769	05/26/87	4,669,008	06/690,464	05/26/87
			4,669,010	06/765,954	05/26/87

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4,669,013	06/718,911	05/26/87	5,018,388	07/532,023	05/28/91
4,669,015	06/719,191	05/26/87	5,018,397	07/470,928	05/28/91
4,669,022	06/456,237	05/26/87	5,018,403	07/541,155	05/28/91
4,669,023	06/662,898	05/26/87	5,018,411	07/355,298	05/28/91
4,669,029	06/791,194	05/26/87	5,018,412	07/377,888	05/28/91
4,669,038	06/765,404	05/26/87	5,018,413	07/475,948	05/28/91
4,669,042	06/753,504	05/26/87	5,018,414	07/532,799	05/28/91
4,669,044	06/627,310	05/26/87	5,018,417	07/409,141	05/28/91
4,669,045	06/601,345	05/26/87	5,018,419	07/397,173	05/28/91
4,669,054	06/730,145	05/26/87	5,018,420	07/283,473	05/28/91
4,669,055	06/705,559	05/26/87	5,018,422	07/524,465	05/28/91
4,669,057	06/538,695	05/26/87	5,018,425	07/392,403	05/28/91
4,669,060	06/864,362	05/26/87	5,018,439	07/300,864	05/28/91
4,669,067	06/763,379	05/26/87	5,018,443	07/407,631	05/28/91
4,669,075	06/697,487	05/26/87	5,018,446	07/477,590	05/28/91
4,669,081	06/825,849	05/26/87	5,018,452	07/415,206	05/28/91
4,669,085	06/241,309	05/26/87	5,018,457	07/367,302	05/28/91
4,669,088	06/660,777	05/26/87	5,018,463	07/380,810	05/28/91
4,669,089	06/781,936	05/26/87	5,018,467	07/443,360	05/28/91
4,669,099	06/787,571	05/26/87	5,018,468	07/344,747	05/28/91
4,669,106	06/714,959	05/26/87	5,018,470	07/536,789	05/28/91
4,669,115	06/725,508	05/26/87	5,018,472	07/373,538	05/28/91
4,669,116	06/448,418	05/26/87	5,018,478	07/269,531	05/28/91
4,669,118	06/784,685	05/26/87	5,018,480	07/207,794	05/28/91
4,669,124	06/907,174	05/26/87	5,018,491	07/348,950	05/28/91
5,018,222	07/587,772	05/28/91	5,018,500	07/441,881	05/28/91
5,018,225	07/452,550	05/28/91	5,018,504	07/411,490	05/28/91
5,018,227	07/439,875	05/28/91	5,018,505	07/608,817	05/28/91
5,018,229	07/504,614	05/28/91	5,018,508	07/493,442	05/28/91
5,018,230	07/508,165	05/28/91	5,018,510	07/315,329	05/28/91
5,018,231	07/572,772	05/28/91	5,018,525	07/430,613	05/28/91
5,018,232	07/437,625	05/28/91	5,018,533	07/357,553	05/28/91
5,018,233	07/372,842	05/28/91	5,018,534	07/490,904	05/28/91
5,018,235	07/406,337	05/28/91	5,018,536	07/080,257	05/28/91
5,018,236	07/511,258	05/28/91	5,018,539	07/431,556	05/28/91
5,018,238	07/353,812	05/28/91	5,018,543	07/467,840	05/28/91
5,018,240	07/515,455	05/28/91	5,018,547	07/516,163	05/28/91
5,018,247	07/472,796	05/28/91	5,018,551	07/494,362	05/28/91
5,018,249	07/094,048	05/28/91	5,018,554	07/394,533	05/28/91
5,018,252	07/445,270	05/28/91	5,018,556	07/328,497	05/28/91
5,018,253	07/307,416	05/28/91	5,018,557	07/495,022	05/28/91
5,018,254	07/562,324	05/28/91	5,018,559	07/432,381	05/28/91
5,018,261	07/507,603	05/28/91	5,018,563	07/422,525	05/28/91
5,018,262	07/415,865	05/28/91	5,018,565	07/573,284	05/28/91
5,018,264	07/482,718	05/28/91	5,018,570	07/399,432	05/28/91
5,018,270	07/417,515	05/28/91	5,018,573	07/451,683	05/28/91
5,018,271	07/243,074	05/28/91	5,018,578	07/563,765	05/28/91
5,018,279	07/512,652	05/28/91	5,018,584	07/424,595	05/28/91
5,018,281	07/613,995	05/28/91	5,018,588	07/587,575	05/28/91
5,018,282	07/592,004	05/28/91	5,018,589	07/387,138	05/28/91
5,018,286	07/511,480	05/28/91	5,018,590	07/477,706	05/28/91
5,018,288	07/574,302	05/28/91	5,018,603	07/397,845	05/28/91
5,018,292	07/459,431	05/28/91	5,018,610	07/314,717	05/28/91
5,018,295	07/410,849	05/28/91	5,018,614	07/461,612	05/28/91
5,018,296	07/448,932	05/28/91	5,018,627	07/599,453	05/28/91
5,018,297	07/490,470	05/28/91	5,018,632	07/545,718	05/28/91
5,018,298	07/467,957	05/28/91	5,018,634	07/581,614	05/28/91
5,018,299	07/423,931	05/28/91	5,018,635	07/557,584	05/28/91
5,018,306	07/517,720	05/28/91	5,018,637	07/474,986	05/28/91
5,018,309	07/417,454	05/28/91	5,018,643	07/407,330	05/28/91
5,018,320	07/308,298	05/28/91	5,018,648	07/530,475	05/28/91
5,018,325	07/587,774	05/28/91	5,018,651	07/290,747	05/28/91
5,018,327	07/203,344	05/28/91	5,018,653	07/361,256	05/28/91
5,018,330	07/472,726	05/28/91	5,018,668	07/502,767	05/28/91
5,018,338	07/427,425	05/28/91	5,018,670	07/463,251	05/28/91
5,018,342	07/508,573	05/28/91	5,018,672	07/441,470	05/28/91
5,018,351	07/286,404	05/28/91	5,018,673	07/438,271	05/28/91
5,012,354	07/348,490	05/28/91	5,018,678	07/429,300	05/28/91
5,018,366	07/306,342	05/28/91	5,018,681	07/444,690	05/28/91
5,018,368	07/420,282	05/28/91	5,018,683	07/589,822	05/28/91
5,018,369	07/450,501	05/28/91	5,018,684	06/732,186	05/28/91
5,018,373	07/502,829	05/28/91	5,018,686	07/398,790	05/28/91
5,018,374	07/403,493	05/28/91	5,018,688	07/250,468	05/28/91
5,018,377	07/430,667	05/28/91	5,018,691	07/498,913	05/28/91
5,018,380	07/307,121	05/28/91	5,018,693	07/504,627	05/28/91
5,018,381	07/406,893	05/28/91	5,018,697	07/463,510	05/28/91
5,018,382	07/488,220	05/28/91	5,018,698	07/506,065	05/28/91
			5,018,706	07/483,803	05/28/91



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5,018,709	07/394,723	05/28/91	5,019,043	07/385,373	05/28/91
5,018,711	07/465,406	05/28/91	5,019,045	07/328,165	05/28/91
5,018,712	07/539,899	05/28/91	5,019,050	07/358,415	05/28/91
5,018,723	07/488,125	05/28/91	5,019,055	07/454,983	05/28/91
5,018,724	07/426,978	05/28/91	5,019,056	07/247,734	05/28/91
5,018,729	07/403,160	05/28/91	5,019,060	07/308,540	05/28/91
5,018,730	07/559,672	05/28/91	5,019,070	07/162,070	05/28/91
5,018,731	07/617,663	05/28/91	5,019,072	07/485,589	05/28/91
5,018,733	07/335,920	05/28/91	5,019,075	07/561,360	05/28/91
5,018,738	07/408,550	05/28/91	5,019,081	06/940,281	05/28/91
5,018,739	07/507,024	05/28/91	5,019,087	06/915,512	05/28/91
5,018,743	07/509,587	05/28/91	5,019,100	07/214,207	05/28/91
5,018,744	07/344,467	05/28/91	5,019,102	07/382,651	05/28/91
5,018,745	07/591,254	05/28/91	5,019,106	07/392,771	05/28/91
5,018,746	07/475,781	05/28/91	5,019,112	07/378,849	05/28/91
5,018,747	07/489,031	05/28/91	5,019,119	07/481,308	05/28/91
5,018,748	07/357,558	05/28/91	5,019,120	07/407,239	05/28/91
5,018,750	07/360,953	05/28/91	5,019,131	07/549,617	05/28/91
5,018,751	07/373,328	05/28/91	5,019,146	07/511,423	05/28/91
5,018,753	07/365,941	05/28/91	5,019,157	07/383,502	05/28/91
5,018,756	07/424,908	05/28/91	5,019,159	07/350,472	05/28/91
5,018,757	07/530,616	05/28/91	5,019,160	07/493,650	05/28/91
5,018,760	07/415,218	05/28/91	5,019,180	07/477,047	05/28/91
5,018,772	07/352,426	05/28/91	5,019,185	07/436,737	05/28/91
5,018,773	07/381,137	05/28/91	5,019,188	07/511,105	05/28/91
5,018,782	07/487,282	05/28/91	5,019,192	07/593,853	05/28/91
5,018,783	07/409,152	05/28/91	5,019,193	07/237,540	05/28/91
5,018,786	07/401,171	05/28/91	5,019,195	07/325,376	05/28/91
5,018,789	07/538,215	05/28/91	5,019,197	07/267,825	05/28/91
5,018,794	07/512,521	05/28/91	5,019,198	07/490,785	05/28/91
5,018,799	07/495,650	05/28/91	5,019,207	07/342,324	05/28/91
5,018,801	07/531,623	05/28/91	5,019,216	07/562,423	05/28/91
5,018,811	07/555,202	05/28/91	5,019,221	07/298,120	05/28/91
5,018,815	07/449,344	05/28/91	5,019,224	07/479,689	05/28/91
5,018,818	07/535,635	05/28/91	5,019,227	07/433,698	05/28/91
5,018,819	07/534,264	05/28/91	5,019,233	07/434,605	05/28/91
5,018,822	07/448,794	05/28/91	5,019,237	07/409,146	05/28/91
5,018,823	07/398,878	05/28/91	5,019,239	07/439,755	05/28/91
5,018,827	07/426,125	05/28/91	5,019,241	07/515,815	05/28/91
5,018,830	07/418,031	05/28/91	5,019,242	07/551,322	05/28/91
5,018,842	07/178,669	05/28/91	5,019,244	07/287,457	05/28/91
5,018,844	07/457,469	05/28/91	5,019,277	07/527,141	05/28/91
5,018,861	07/370,306	05/28/91	5,019,279	07/454,332	05/28/91
5,018,862	07/564,394	05/28/91	5,019,281	07/450,134	05/28/91
5,018,863	07/319,001	05/28/91	5,019,286	07/484,289	05/28/91
5,018,868	07/433,314	05/28/91	5,019,294	07/514,216	05/28/91
5,018,876	07/459,659	05/28/91	5,019,299	07/534,010	05/28/91
5,018,885	07/517,845	05/28/91	5,019,301	07/560,264	05/28/91
5,018,895	07/420,403	05/28/91	5,019,322	07/233,980	05/28/91
5,018,896	07/368,420	05/28/91	5,019,323	07/318,492	05/28/91
5,018,898	07/445,427	05/28/91	5,019,324	07/408,266	05/28/91
5,018,900	07/436,445	05/28/91	5,019,330	07/562,348	05/28/91
5,018,901	07/222,583	05/28/91	5,019,335	07/377,575	05/28/91
5,018,907	07/407,915	05/28/91	5,019,341	06/895,542	05/28/91
5,018,916	07/571,320	05/28/91	5,019,352	07/570,440	05/28/91
5,018,918	07/380,606	05/28/91	5,019,353	07/324,783	05/28/91
5,018,924	07/512,847	05/28/91	5,019,354	07/551,366	05/28/91
5,018,929	07/457,298	05/28/91	5,019,356	07/155,726	05/28/91
5,018,930	07/492,479	05/28/91	5,019,357	07/197,363	05/28/91
5,018,932	07/544,695	05/28/91	5,019,358	07/241,194	05/28/91
5,018,933	07/504,325	05/28/91	5,019,360	07/535,998	05/28/91
5,018,934	07/440,921	05/28/91	5,019,366	07/354,198	05/28/91
5,018,935	07/434,941	05/28/91	5,019,370	07/377,396	05/28/91
5,018,946	07/494,114	05/28/91	5,019,378	07/395,488	05/28/91
5,018,950	07/461,022	05/28/91	5,019,390	07/056,504	05/28/91
5,018,952	07/359,462	05/28/91	5,019,399	07/376,577	05/28/91
5,018,960	07/464,166	05/28/91	5,019,403	07/450,192	05/28/91
5,018,961	07/525,102	05/28/91	5,019,405	07/608,919	05/28/91
5,018,965	07/436,252	05/28/91	5,019,410	07/286,949	05/28/91
5,018,967	07/567,611	05/28/91	5,019,418	07/198,605	05/28/91
5,018,985	07/396,252	05/28/91	5,019,419	07/442,759	05/28/91
5,018,987	07/516,263	05/28/91	5,019,423	07/289,807	05/28/91
5,018,991	07/522,326	05/28/91	5,019,425	07/275,712	05/28/91
5,018,997	07/536,356	05/28/91	5,019,430	07/431,209	05/28/91
5,019,010	07/338,851	05/28/91	5,019,432	07/419,152	05/28/91
5,019,031	07/491,365	05/28/91	5,019,437	07/340,637	05/28/91
5,019,032	07/503,788	05/28/91	5,019,441	07/326,019	05/28/91
			5,019,443	07/448,964	05/28/91

Patent Number	Serial Number	Issue Date	5,019,802	07/451,096	05/28/91
5,019,444	07/361,267	05/29/91	5,019,804	07/335,795	05/28/91
5,019,456	07/236,572	05/28/91	5,019,817	07/567,144	05/28/91
5,019,458	07/340,421	05/28/91	5,019,820	07/400,311	05/28/91
5,019,459	07/505,159	05/28/91	5,019,823	07/446,543	05/28/91
5,019,462	07/301,026	05/28/91	5,019,826	07/250,675	05/28/91
5,019,472	07/243,293	05/28/91	5,019,829	07/307,503	05/28/91
5,019,475	07/497,360	05/28/91	5,019,834	07/377,593	05/28/91
5,019,476	07/435,946	05/28/91	5,019,857	07/334,953	05/28/91
5,019,477	07/375,660	05/28/91	5,019,860	07/371,972	05/28/91
5,019,478	07/429,298	05/28/91	5,019,861	07/419,963	05/28/91
5,019,510	07/113,655	05/28/91	5,019,895	07/533,590	05/28/91
5,019,511	07/183,456	05/28/91	5,019,902	07/388,055	05/28/91
5,019,513	07/296,849	05/28/91	5,019,904	07/445,369	05/28/91
5,019,515	07/237,670	05/28/91	5,019,905	07/099,148	05/28/91
5,019,538	07/434,222	05/28/91	5,019,926	07/337,015	05/28/91
5,019,540	07/491,063	05/28/91	5,019,927	07/441,248	05/28/91
5,019,543	07/375,446	05/28/91	5,019,933	07/440,924	05/28/91
5,019,544	07/564,905	05/29/91	5,019,937	07/429,152	05/28/91
5,019,548	07/397,821	05/28/91	5,019,952	07/439,319	05/28/91
5,019,557	07/378,497	05/28/91	5,019,958	07/479,275	05/28/91
5,019,565	07/444,924	05/28/91	5,019,959	07/245,823	05/28/91
5,019,568	07/370,058	05/28/91	5,019,961	07/334,080	05/28/91
5,019,572	07/476,863	05/28/91	5,019,988	07/352,365	05/28/91
5,019,574	07/414,170	05/28/91	5,019,994	07/359,218	05/28/91
5,019,580	07/452,902	05/28/91	5,020,012	07/590,451	05/28/91
5,019,585	07/405,917	05/28/91	5,020,033	07/590,271	05/28/91
5,019,586	07/440,880	05/28/91	5,020,034	07/167,487	05/28/91
5,019,587	07/361,090	05/28/91	5,020,043	07/310,775	05/28/91
5,019,590	07/414,730	05/28/91	5,020,061	07/556,463	05/28/91
5,019,598	07/366,458	05/28/91	5,020,069	07/452,141	05/28/91
5,019,601	07/395,956	05/28/91	5,020,080	07/370,864	05/28/91
5,019,604	07/343,417	05/28/91	5,020,083	07/354,408	05/28/91
5,019,606	07/374,467	05/28/91	5,020,087	07/434,935	05/28/91
5,019,620	07/589,292	05/28/91	5,020,090	07/434,934	05/28/91
5,019,623	07/385,396	05/28/91	5,020,105	07/395,291	05/28/91
5,019,626	07/161,135	05/28/91	5,020,106	07/476,626	05/28/91
5,019,631	07/396,944	05/28/91	5,020,109	07/445,061	05/28/91
5,019,633	07/068,756	05/28/91	5,020,113	07/229,407	05/28/91
5,019,634	07/418,371	05/28/91	5,020,116	07/450,187	05/28/91
5,019,644	07/386,268	05/28/91	5,020,125	07/323,630	05/28/91
5,019,645	07/520,303	05/28/91	5,020,135	07/030,743	05/28/91
5,019,647	07/197,872	05/28/91	5,020,142	07/338,076	05/28/91
5,019,653	07/522,942	05/28/91	5,020,150	07/432,849	05/28/91
5,019,657	07/346,529	05/28/91	5,020,152	07/357,959	05/28/91
5,019,659	07/569,115	05/28/91			
5,019,665	07/510,772	05/28/91			
5,019,672	07/391,598	05/28/91			
5,019,674	07/477,759	05/28/91			
5,019,676	07/525,803	05/28/91			
5,019,677	07/551,621	05/28/91			
5,019,683	07/423,444	05/28/91			
5,019,687	07/473,782	05/28/91			
5,019,691	07/551,075	05/28/91			
5,019,701	07/581,416	05/28/91			
5,019,704	07/448,959	05/28/91			
5,019,705	07/460,464	05/28/91			
5,019,710	07/331,404	05/28/91			
5,019,711	07/326,688	05/28/91			
5,019,712	07/363,230	05/28/91			
5,019,719	07/464,221	05/28/91			
5,019,732	07/322,430	05/28/91			
5,019,741	07/522,818	05/28/91			
5,019,742	07/102,786	05/28/91			
5,019,747	07/499,010	05/28/91			
5,019,752	07/207,603	05/28/91			
5,019,753	07/488,263	05/28/91			
5,019,758	07/593,769	05/28/91			
5,019,762	07/531,679	05/28/91			
5,019,765	07/492,674	05/28/91			
5,019,774	07/228,977	05/28/91			
5,019,776	07/355,343	05/28/91			
5,019,778	07/426,335	05/28/91			
5,019,780	07/425,645	05/28/91			
5,019,782	07/497,769	05/28/91			
5,019,787	07/428,695	05/28/91			
5,019,793	07/526,160	05/28/91			
5,019,797	07/414,532	05/28/91			

Errata

Patent No.	Serial No.	Issue Date	Filing Date
4,977,011	07/245,492	12/11/90	09/19/88
4,938,821	07/089,197	07/03/90	08/24/87

## Errata

In the list of patents which expired on Feb. 13, 1995, due to failure to pay maintenance fees, in the O.G. of Apr. 25, 1995, the following patent should not have appeared:

Patent No.	Serial No.	Issue Date	Filing Date
4,991,328	07/344,874	02/12/91	04/28/89

## Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

**4,698,542**, Re. S.N. 08/436,871, May 8, 1995, Cl. 310/67R, BRUSHLESS DIRECT CURRENT MOTOR SYSTEM, Rolf Muller, Owner of Record: *Papst Licensing GMBH, Spaichingen, Federal Rep. of Germany*, Attorney or Agent: Kenneth H. Samples, Ex. Gp.: 2102

**4,707,095**, Re. S.N. 08/434,123, May 2, 1995, Cl. 173.11, FILM REWINDER, Owner of Record: *Yoshiyoki Nakano, et al.*, Owner of Record: *Nippon Kogaku K.K., Tokyo, Japan*, Attorney or Agent: Mitchell W. Shapiro, Ex. Gp.: 2101

**4,761,058**, Re. S.N. 08/464,368, June 5, 1995, Cl. 359, BIASING LIQUID CRYSTAL DISPLAYS HAVING CAPACITORS AND TRANSISTORS, Yukitoshi Okubo, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Fitzpatrick, Cella, Harper and Scinto, Ex. Gp.: 2515

**4,816,433**, Re. S.N. 08/468,636, June 6, 1995, Cl. 502, SOLID CATALYST COMPONENT FOR THE POLYMERIZATION OF OLEFINS AND AN OLEFIN POLYMERIZATION CATALYST, Minoru Terano, et al., Owner of Record: *Toho Titanium Co., Ltd., Tokyo, Japan*, Attorney or Agent: Birch, Stewart, Kolasch and Birch, Ex. Gp.: 1106

**4,964,030**, Re. S.N. 08/336,199, Nov. 3, 1994, Cl. 364/417, APPARATUS AND METHOD FOR TRANSLATING SENTENCES CONTAINING PUNCTUATION MARKS, Hitoshi Suzuki, et al., Owner of Record: *Sharp Kabushiki Kaisha, Osaka, Japan*, Attorney or Agent: Terrell C. Birch, Ex. Gp.: 2411

**4,994,319**, Re. S.N. 08/459,634, June 2, 1995, Cl. 428, MEMBER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES, Kazuo Nojima, et al., Owner of Record: *Ricoh Co., Ltd., Tokyo, Japan*, Attorney or Agent: Steven B. Kelber, Ex. Gp.: 1504

**5,052,497**, Re. S.N. 08/462,019, June 5, 1995, Cl. 173, APPARATUS FOR DRIVING A DRILLING OR PERCUSSION TOOL, Jan P. Houben, Owner of Record: *S-B Power Tool Co., Chicago, Ill.*, Attorney or Agent: Clarence J. Fleming, Ex. Gp.: 3204

**5,094,224**, Re. S.N. 08/354,624, Dec. 13, 1994, Cl. 126/391, ENHANCED TUBULAR HEAT EXCHANGER, Mark A. Diesch, Owner of Record: *United States Trust Company of New York, New York, N.Y.*, Attorney or Agent: Dennis M. Mc Williams, Ex. Gp.: 3404

**5,124,977**, Re. S.N. 08/430,809, Apr. 26, 1995, Cl. 370/58.1, SWITCHING SYSTEM FOR SWITCHING CELLS HAVING ERROR DETECTION APPARATUS, Takahiko Kozaki, et

al., Owner of Record: *Hitachi Ltd., Tokyo, Japan*, Attorney or Agent: Carl I. Brundidge, Ex. Gp.: 2603

**5,140,000**, Re. S.N. 08/365,125, Dec. 28, 1994, Cl. 505/001.00, OXIDE 247 SUPERCONDUCTING MATERIAL, Jeffrey L. Tallon, Owner of Record: *New Zealand, Dept. of Scientific And Industrial Research, Physics and Engineering Laboratory Her Majesty The Queen in Right of Lower Hutt, New Zealand*, Attorney or Agent: Vincent T. Pace, Ex. Gp.: 1105

**5,170,274**, Re. S.N. 08/353,393, Dec. 8, 1994, Cl. 359/182, OPTICAL TRANSMITTER, Naoki Kuwata, et al., Owner of Record: *Fujitsu Limited, Kawasaki-Shi, Japan*, Attorney or Agent: H.J. Staas, Ex. Gp.: 2606

**5,174,313**, Re. S.N. 08/362,822, Dec. 22, 1994, Cl. 132/321, GERMICIDAL DENTAL FLOSS AND METHOD FOR FABRICATION, Edwin Rosenberger, Owner of Record: *Inventor*, Attorney or Agent: Eric J. Kraus, Ex. Gp.: 3303

**5,176,509**, Re. S.N. 08/369,848, Jan. 5, 1995, Cl. 417/423.7, AXIALLY COMPACT SMALL FAN, Fritz Schmider, et al., Owner of Record: *Papst Licensing GMBH, Spaichingen Federal of Republic of Germany*, Attorney or Agent: Jon P. Christensen, Ex. Gp.: 3403

**5,194,893**, Re. S.N. 08/377,254, Jan. 24, 1995, Cl. 355/53, EXPOSURE METHOD AND PROJECTION EXPOSURE APPARATUS, Kenji Nishi, Owner of Record: *Nikon Corp., Tokyo, Japan*, Attorney or Agent: Nelson H. Shapiro, Ex. Gp.: 2101

**5,200,071**, Re. S.N. 08/417,143, Apr. 5, 1995, Cl. 210, TRANSLATING MAGNETIC FIELD TREATMENT DEVICE, Michael S. Spiegel, Owner of Record: *Quantum Systems International Inc., N. Miami Beach, Fla.*, Attorney or Agent: Bruce C. Zotter, Ex. Gp.: 1306

**5,201,581**, Re. S.N. 08/420,254, Apr. 11, 1995, Cl. 374/36, METHOD AND APPARATUS FOR MEASURING MASS FLOW AND ENERGY CONTENT USING A LINEAR FLOW METER, William H. Vander Heyent, Owner of Record: *Badger Meter, Inc., Milwaukee, Wis.*, Attorney or Agent: Michael J. McGovern, Ex. Gp.: 2406

**5,204,714**, Re. S.N. 08/383,081, Jan. 6, 1995, Cl. 354/403, OBJECT DISTANCE DETECTING APPARATUS, Osamu Nonaka, et al., Owner of Record: *Olympus Optical Co., Ltd., Tokyo, Japan*, Attorney or Agent: Louis Weinstein, Ex. Gp.: 2101

**5,212,915**, Re. S.N. 08/448,695, May 24, 1995, Cl. 179.1, MODULAR SYSTEM FOR OBTAINING EQUIPPED WALLS AND WORKBENCHES IN PARTICULAR FOR USE IN LABORATORIES, Buzzi Antonio, Owner of Record: *Arredi Tecnici Villa S.P.A., Viale Cinque Giornate, Italy*, Attorney or Agent: Thomas W. Ehrmann, Ex. Gp.: 3504

**5,230,196**, Re. S.N. 08/444,538, May 19, 1995, Cl. 52/646, POLYBEDRON BUILDING SYSTEM, Theodore R. Zeigler, Owner of Record: *World Shelters, Inc., Springfield, Va.*, Attorney or Agent: Harold R. Brown, Ex. Gp.: 3504

**5,242,055**, Re. S.N. 08/445,778, May 22, 1995, Cl. 206/532, PACKAGING SYSTEM FOR MEDICATION, Raymond I. Pora, Owner of Record: *UDL Laboratories Inc., Rockfield, Ill.*, Attorney or Agent: Paul M. Odell, Ex. Gp.: 3208

**5,283,613**, Re. S.N. 08/379,830, Jan. 27, 1995, Cl. 355/203, MONITORING SYSTEM WITH DUAL MEMORY FOR ELECTROPHOTOGRAPHIC PRINTING MACHINES USING REPLACEABLE CARTRIDGES, Christian G. Midgley, Sr., Owner of Record: *Xerox Corp., Stamford, Conn.*, Attorney or Agent: Robert Hutter, Ex. Gp.: 2105

**5,293,860**, Re. S.N. 08/389,268, Feb. 17, 1995, Cl. 126/110, STANDING PILOT FURNACE WITH VENTED VESTIBULE, Ronald S. Tomlinson, et al., Owner of Record: *Inner-*

*City Products Corp., Laverne, Tenn.*, Attorney or Agent: Kevin R. Erdman, Ex. Gp.: 3406

**5,305,874**, Re. S.N. 08/445,681, May 22, 1995, Cl. 206/371, SELF PROTECTION CHEMICAL DISPENSER HOLDER, John H. Mc Laughlin, Owner of Record: *Inventor*, Attorney or Agent: Michael O. Sturm, Ex. Gp.: 3208

## Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**4,861,041**, Reexam. No. 90/003,865, June 20, 1995, Cl. 273/292, METHODS OF PROGRESSIVE JACKPOT GAMING, Daniel A. Jones, et al., Owner of Record: *D & D Gaming Patents, Ft. Lauderdale, Fla.*, Attorney or Agent: Robert E. Purcell, Englewood, Colo., Ex. Gp.: 3304, Requester: Janal M. Kalis, Oppenheimer Wolff & Donnelly, Minneapolis, Minn.

**4,960,546**, Reexam. No. 90/003,863, June 16, 1995, Cl. 261/122.1, DIFFUSER MOUNTING ARRANGEMENT FOR WASTE WATER AERATION SYSTEMS, Charles E. Tharp, et al., Owner of Record: *Environmental Dynamics, Inc., Boone, Mo.*, Attorney or Agent: Richard R. Johnson, Kokjer Kircher Bowman & Johnson, Kansas, City, Mo., Ex. Gp.: 1305, Requester: Daniel V. Thompson, Thompson & Howison, Dallas, Tex.

**5,077,480**, Reexam. No. 90/003,864, June 16, 1995, Cl. 250/575, TRANSMISSOMETER HAVING SOLID STATE LIGHT SOURCE, John E. Traina, Owner of Record: *United Sciences, Gibsonia, Pa.*, Attorney or Agent: Lynn J. Alstadt, Buchanan Ingersoll, Pittsburgh, Pa., Ex. Gp.: 2509, Requester: Owner

## Patents Available For License or Sale

08/320,911	SWIVEL ELECTRIC WHEELCHAIR
Contact:	Wieslaw Pokusa 132 Oakridge Dr. Windsor Locks, Conn. 06096 (voice): (203) 627-8995 (fax): (203) 627-5692
D. 358,897	SECURITY WINDOW INSET FOR INTERIOR DOOR
CONTACT:	Douglas A. Denton 2820 Marilona Drive Sacramento, Calif. 95821 (voice): (916) 481-3565 (fax): (916) 481-2924
5,305,728	BOW SIGHT APPARATUS
Contact:	Dennis L. Young RD#1 Box 28A Lot 16120 Enon Valley, Pa. (voice): (412) 336-5034 (fax): (412) 336-6780
5,382,338	PHOTOVOLTAIC ELECTRICFIELD GAS RECOVERY METHOD
Contact:	Tony Thomas 435 Schwartz Ave. Baltimore, Md. 21212 (voice): (410) 323-6671

## Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Dream Teams, Oakland, N.J., Reg. No. 1,616,855 for the mark "DREAM TEAM", Canc. No. 22,884.

Vincent Sloan Kennedy, Westminster, Calif., Reg. No. 1,324,760 for the mark "WAVE BLADE", and Design, Canc. No. 22,988.

Virtual Machine Corporation, Pittsburgh, Pa., Reg. No. 1,602,046 for the mark "CHOREOGRAPHER", Canc. No. 23,292.

Raymond J. Faugeaux, DBA Geckopede, Kailua, Hi., Reg. No. 1,600,122, for the mark "GECKOPEDE", Canc. No. 23,463.

Fales Yachts, Inc., Bristol, R.I., Reg. No. 1,010,401, for the mark "SEEKER", Canc. No. 23,754.

JEAN BROWN  
Administrator,  
Trademark Trial and  
Appeal Board,  
for Robert M. Anderson  
Deputy Assistant  
Commissioner for Trademarks

## Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office and have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before September 22, 1995.

Beyer, James E., 106 Oak Knoll Dr., Dayton Ohio 45419

Corbin, David H., 8283 Opal Rd., Warrenton, Va. 22186

Follett, Robert J., 623 N. Piedmont St., Arlington, Va. 22203

Goodwin, Sean W., 744 Lysander Dr., S.E., Calgary, AB, T2C 1X1, Canada

Mims, Mary S., 6106 Arbor St., Cheverly, Md. 20785

Wintercorn, Richard A., 109 Juniper Hills, Williamsburg, Va. 23188

July 12, 1995 KAREN L. BOVARD, Director  
Office of Enrollment and Discipline

## Registration To Practice

The following person successfully passed the registration examination that was held November 2, 1994, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office



until his registration certificate is mailed to him. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before September 22, 1995.

Crittenden, James F., 232 Worcester Rd., Hollis, N.H. 03049

July 12, 1995

KAREN L. BOVARD, *Director*  
Office of Enrollment and Discipline

#### Registration To Practice

The following person successfully passed the registration examination that was held October 14, 1992, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before September 22, 1995.

Figlin, Cheryl R., 625 N. 29th St., Allentown, Pa. 18104

July 12, 1995

KAREN L. BOVARD, *Director*  
Office of Enrollment and Discipline

#### Registration To Practice

The following person successfully passed the registration examination that was held October 13, 1993, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until his registration certificate is mailed to him. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before September 22, 1995.

Smith, Michael S., 4034 170th Ave., S.E., Bellevue, Wash. 98008

July 12, 1995

KAREN L. BOVARD, *Director*  
Office of Enrollment and Discipline

#### Errata

"All reference to Patent No. 5,430,061 to Charlotte A. Maltin of Great Britain for 'THERAPEUTIC APPLICATIONS OF CLENBUTEROL' appearing in the *Official Gazette* of July 04, 1995 should be deleted since no patent was granted."

#### Removal From Register

Pursuant to 37 CFR § 10.11(b), a survey letter was directed on January 23, 1995, to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other

letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address or the forwarding address (or order) had expired.

Accordingly, the names of the following persons have been removed from the Register of Patent Attorneys and Agents.

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June 19, 1995

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## Errata

In the Notice of Certificates of Correction appearing at 1163 O.G. 13, delete all reference to Patent No. 5,051,260, of June 7, 1994, since no Certificate of Correction was granted.

Certificates of Correction  
For The Week of August 8, 1995

P. 8,349	5,284,026	5,366,372	5,397,618
P. 9,115	5,286,739	5,366,537	5,399,160
P. 9,116	5,288,348	5,367,208	5,399,203
Re. 34,519	5,291,075	5,367,222	5,399,900
Re. 34,880	5,293,659	5,367,712	5,401,334
Re. 34,926	5,297,158	5,368,659	5,401,543
D. 356,833	5,300,608	5,369,259	5,401,588
D. 358,725	5,301,996	5,369,934	5,401,627
D. 358,943	5,305,917	5,370,061	5,402,490
D. 359,847	5,310,062	5,371,697	5,402,682
4,873,459	5,310,352	5,372,431	5,403,310
4,906,552	5,314,943	5,372,764	5,403,656
4,936,664	5,315,415	5,373,213	5,403,953
4,965,320	5,318,362	5,373,513	5,404,188
4,969,913	5,321,089	5,374,295	5,404,368
4,972,504	5,321,511	5,374,297	5,404,517
4,989,885	5,321,797	5,376,076	5,404,597
5,044,567	5,322,109	5,376,231	5,404,680
5,046,406	5,322,731	5,377,316	5,404,748
5,062,019	5,323,542	5,377,375	5,405,144
5,066,655	5,324,203	5,377,684	5,405,559
5,073,901	5,324,520	5,378,059	5,405,991
5,102,590	5,325,573	5,378,289	5,406,434
5,140,467	5,326,643	5,378,510	5,406,594
5,142,407	5,327,835	5,378,768	5,407,923
5,164,370	5,330,359	5,379,261	5,408,252
5,178,303	5,330,510	5,380,291	5,408,292
5,182,724	5,331,305	5,380,407	5,408,304
5,189,013	5,335,257	5,380,635	5,408,345
5,201,995	5,343,335	5,382,278	5,409,658
5,203,179	5,344,712	5,382,587	5,410,180
5,206,345	5,346,644	5,383,510	5,410,220
5,207,686	5,348,799	5,383,858	5,410,423
5,229,004	5,350,571	5,385,944	5,410,439
5,229,058	5,352,022	5,386,526	5,410,450
5,230,261	5,352,319	5,387,349	5,410,733
5,230,741	5,353,371	5,389,661	5,411,138
5,231,068	5,357,092	5,389,668	5,411,239
5,236,664	5,357,474	5,390,876	5,411,561
5,243,447	5,357,528	5,392,140	5,411,916
5,252,538	5,358,552	5,392,407	5,412,100
5,254,164	5,358,846	5,393,167	5,412,201
5,256,062	5,360,924	5,393,210	5,412,202
5,256,825	5,361,271	5,393,511	5,412,232
5,262,389	5,361,920	5,393,681	5,412,662
5,263,118	5,363,165	5,393,876	5,412,736
5,263,323	5,363,242	5,394,683	5,412,775
5,269,415	5,363,771	5,395,018	5,413,458
5,276,049	5,364,339	5,395,074	5,413,623
5,276,077	5,365,063	5,395,556	5,413,778
5,283,646	5,365,767	5,396,814	5,413,783

5,413,930	5,414,184	5,415,483	5,417,479	5,418,091	5,419,264	5,420,307	5,425,682
5,413,985	5,414,416	5,416,323	5,417,731	5,418,099	5,419,298	5,422,044	5,426,590
5,414,039	5,414,443	5,416,908	5,417,882	5,418,130	5,419,897	5,423,112	
5,414,179	5,415,480	5,417,240	5,417,884	5,418,771	5,420,036	5,424,246	



Summary of Final Decisions  
Issued by the  
Trademark Trial and Appeal Board  
May 29 - June 2, 1995

Date Issued	Type of Case <sup>(1)</sup>	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
5-31	CANC (R)	20,236	American Auto Rental, Inc. v. Richard J. Gillis	Abandonment	Request for Reconsideration Denied (Cancellation Dismissed)	"AMERICAR" (leasing and renting of vehicles)	"AMERICAR" (leasing and renting of vehicles)		No
5-31	EX	74/356,214	Mark Owens and Caroline Owens	2(d)	Refusal Affirmed	"PEP" (and design) (vitamin and nutrient- based food bars)	"PEP" (cereal breakfast foods); "PEP" (cereal breakfast foods containing vitamins and minerals)		No
6-1	EX	74/320,077	adidas AG	2(c)(1)	Refusal Reversed	"STREETBALL" (sports balls)			No

(1) EX = EX PARTE APPEAL; OPP = OPPOSITION; CANCELLATION; CU = CONCURRENT USE; (R) = REQ. FOR RECONSIDERATION

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Arkansas	Little Rock: Arkansas State Library .....	(501) 682-2053
California	Los Angeles Public Library .....	(213) 228-7220
	Sacramento: California State Library .....	(916) 654-0069
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PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
<b>CHEMICAL EXAMINING GROUPS</b>		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100— JOHN E. KITTLE, Director .....	308-0661	03/24/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director .....	308-1235	06/14/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director .....	308-0651	08/13/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director .....	308-2351	07/07/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director .....	308-0196	01/11/94
<b>ELECTRICAL EXAMINING GROUPS</b>		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director .....	308-1782	08/30/93
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COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300— BOBBY R. GRAY, Director .....	305-9600	04/14/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director .....	308-0771	03/17/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500— JANICE A. HOWELL, Director .....	308-0956	02/01/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director .....	305-4700	11/30/93
DESIGN, GROUP 2900—JOHN E. KITTLE, Director .....	308-0661	01/10/94
<b>MECHANICAL EXAMINING GROUPS</b>		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director .....	308-1113	04/25/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director .....	308-1148	02/22/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director .....	308-0858	05/30/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director .....	308-0861	04/07/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director .....	308-1021	04/11/94

\*A communication from the examiner should have been received in most applications filed prior to this date.

## Patents will Expire as Follows:

(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimer. 35 U.S.C. 154(c)(1).

(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).

(3) All design patents are granted for a term of 14 years from the date of the grant.

However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

## TRADEMARK OPERATION

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 Condition of Trademark Applications as of July 1, 1995

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 3—Kathryn A. Erskine, Managing Attorney, (703) 308-9103 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/13/95	05/30/95
Law Office 4—Sharon Marsh, Managing Attorney, (703) 308-9104 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21, Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/24/95	05/06/95
Law Office 5—Mary Sparrow, Managing Attorney, (703) 308-9105 Cosmetics, Cleaning Preparations, Paper Products and Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/27/95	03/01/95
Law Office 6—Myra Kurzberd, Managing Attorney, (703) 308-9106 Scientific Equipment, Furniture, Houseware and Glass—Int. Classes 9, 20, 21, Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/27/95	03/06/95
Law Office 7—David Shallant, Managing Attorney, (703) 308-9107 Lubricants, Fuels, Industrial Equipment & Materials—Int. Classes 4, 6, 11, 14, 19 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/06/95	05/01/95
Law Office 8—Thomas Lamone, Managing Attorney, (703) 308-9108 Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/13/95	05/01/95
Law Office 9—Sidney Moskowitz, Managing Attorney, (703) 308-9109 Lubricants, Industrial Equipment, Materials & Musical Instruments—Int. Classes 4, 6, 7, 8, 12, 13, 15, 16, 17, 18, 19, Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/31/95	04/12/95
Law Office 10—Jean Logan, Managing Attorney, (703) 308-9110 Cordage, Fibers, Yarns, Threads, Fabrics, Clothing & Floor Coverings—Int. Classes 22, 23, 24, 25, 26, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/08/95	04/03/95
Law Office 11—Thomas Howell, Managing Attorney, (703) 308-9111 Paints, Pharmaceuticals & Medical Apparatus—Int. Classes 2, 5, 10 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/17/95	02/27/95
Law Office 12—Deborah Cohn, Managing Attorney, (703) 308-9112 Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/27/95	04/17/95
Law Office 13—Craig Morris, Managing Attorney, (703) 308-9113 Chemicals, Food, Beverages, Wines & Spirits—Int. Classes 1, 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/01/94	04/03/95
Law Office 14—Ron Williams, Managing Attorney, (703) 308-9114 Chemicals, Food, Beverages, Wines & Spirits—Int. Classes 1, 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/21/94	05/25/95
Law Office 15—Paul Fabrenkopf, Managing Attorney, (703) 308-9115 Rubber, Leather Goods & Clothing—17, 18, 25 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/02/95	03/29/95
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Jodi Rush, Director (703) 308-9000		
Post Registration Section—Jacqueline Cole, Managing Attorney, (703) 308-9500		
Affidavits Under Sections 8 & 15 (All Classes)	08/10/94	—0—
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Section 12(C) Publications (All Classes)	—0—	—0—

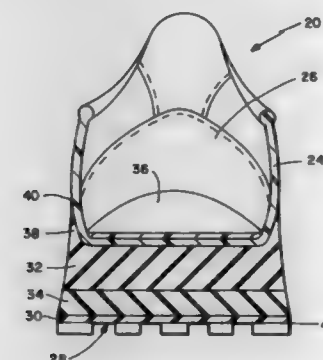
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- \* These dates identify the oldest unassigned new case in each law office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examiner.

## REEXAMINATIONS

AUGUST 8, 1995

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,322,895 (2645th)  
**STABILIZED ATHLETIC SHOE**  
 Stan Hockerson, 62 Vallejo St., Petaluma, Calif. 94952  
 Reexamination Request No. 90/002,657, Mar. 2, 1992.  
 Reexamination Certificate for Patent No. 4,322,895, issued Apr. 6, 1982, Ser. No. 101,708, Dec. 10, 1979.  
 The portion of the term of this patent subsequent to Apr. 6, 1998, has been disclaimed.  
 Int. Cl.<sup>6</sup> A43B 5/00, 23/08  
 U.S. Cl. 36—129



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

Claims 2 and 3 dependent on an amended claim, are determined to be patentable.

1. An Athletic Shoe comprising a sole having a midsole [with a forefoot and heel portions] formed of a resilient force-absorbing material, an outsole mounted below the midsole, said outsole being formed of a durable material for contact with a surface, an upper mounted on the sole, the upper having a counter forming a heel cup having exterior sidewalls with lower edges, a support band carried on the upper rim of the midsole and secured about the sidewalls of the heel cup, said band extending upwardly and merging with the vertical midspan of the heel cup for supporting and stabilizing the heel cup relative to the sole during contact of the sole onto the surface when in use, said midsole comprising a forefoot portion and heel portion means, said heel portion means being pyramid shaped in lateral cross section with a lower rim having opposite sides which flare outwardly to locations which lie sufficiently laterally beyond the lower edges of the heel cup for substantially stabilizing the shoe during initial contact on the surface along one side of the sole, the opposite sides of the lower rim of the heel portion means having a lateral width greater than the lateral width of the heel cup midspan, and the midsole and support band having wall means which inclines upwardly from the lower rim of the heel portion means to the heel cup midspan for resisting flexing of the [side] sidewalls of the heel cup relative to the sole during said initial contact on the surface along one side of the sole.

B1 5,085,365 (2646th)  
**WATER SOLUBLE SOLDERING FLUX**  
 Raymond L. Turner, La Habra, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.  
 Reexamination Request No. 90/002,963, Feb. 3, 1993.  
 Reexamination Certificate for Patent No. 5,085,365, issued Feb. 4, 1992, Ser. No. 523,765, May 15, 1990.  
 Int. Cl.<sup>6</sup> B23K 1/20; H05K 3/34  
 U.S. Cl. 228—223

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2 and 3 are cancelled.

Claims 1, 5, 8-10, 12 and 13, are determined to be patentable as amended.

Claims 4, 6-7, 11 and 14, dependent on an amended claim, are determined to be patentable.

New claims 15-23 are added and determined to be patentable.

1. A method for soldering together a metal surface of a circuit board substrate and a metal surface of an electrical component in the circuit board, comprising applying to [a surface] one of the surfaces a soldering flux, heating one of said metal surfaces to a desired soldering temperature, [and] applying solder to one of said [surface,] metal surfaces, and joining the second metal surface to be soldered to the first; characterized in that said soldering flux consists essentially of (a) [a water-soluble organic acid having at least two carboxylic acid groups] citric acid and (b) at least one non-toxic carrier selected from the group consisting of water, alcohols, terpenes and mixtures thereof; while being substantially free of other carboxylic acids.

B1 5,091,171 (2647th)

Patent Not Issued For This Number

B1 5,153,833 (2648th)  
**ROBOTIC TELEVISION-CAMERA DOLLY SYSTEM**  
 Gary B. Gordon, Saratoga, Calif., and Robert R. Gonnelli, Valley Cottage, N.Y., assignors to Total Spectrum Manufacturing Inc., Valley Cottage, N.Y.  
 Reexamination Request No. 90/002,947, Feb. 3, 1993.  
 Reexamination Certificate for Patent No. 5,153,833, issued Oct. 6, 1992, Ser. No. 684,820, Apr. 15, 1991.  
 Continuation of Ser. No. 574,852, Aug. 30, 1990, Pat. No. 5,008,804, which is a continuation-in-part of Ser. No. 228,933, Jun. 23, 1988, Pat. No. 4,959,798  
 The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.  
 Int. Cl.<sup>6</sup> H04N 5/222; G06F 18/50; G05B 19/19  
 U.S. Cl. 364—424.02

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

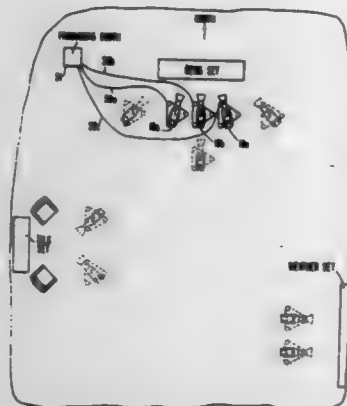
The patentability of claims 1-17 is confirmed.

1. The method of controlling the movement of at least one camera on a substantially planar floor having at least one target on the surface thereof for defining a reference point and a reference direction; said camera being mounted on a dolly having a rotation axis substantially normal to said floor and a translation axis substantially parallel to said floor; said dolly being provided with motor means for the translation and rotation thereof, and detection means for detecting said target



when said dolly is in the vicinity of said target, said method comprising the steps of:

- moving said dolly under the control of a controller along a predetermined path from said one target to another location on said floor, data corresponding to said predetermined path being stored in a memory of a processor as said dolly traverses said predetermined path;
- returning said dolly to the vicinity of said one target under the control of said controller;
- controlling, in response to an output from said detection means, said motor means to move the translation axis of



said dolly parallel to the reference direction defined by said one target, and to bring the rotation of said dolly into coincidence with the reference point defined by said one target, whereby said dolly is positioned at said reference point with a predetermined orientation; and

- moving said dolly along said desired path from said one target in accordance with the data stored in the memory of said processor, the movement of said dolly along said path being made by dead reckoning, the actual position of said dolly differing from said predetermined path by a position error accumulated during movement thereof.

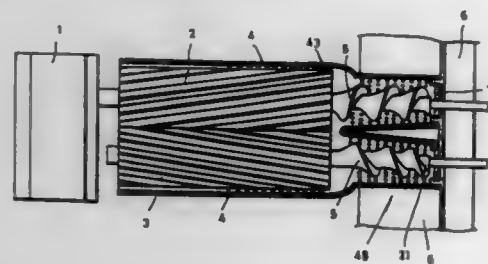
#### B1 5,156,872 (2649th) JUICE EXTRACTOR

Moon H. Lee, 17/3 Sajik 1-Dong, Dongrae-Gu Busan, Rep. of Korea

Reexamination Request No. 90/003,329, Feb. 2, 1994.  
Reexamination Certificate for Patent No. 5,156,872, issued Oct. 20, 1992, Ser. No. 827,431, Jan. 29, 1992.

Claims priority, application Rep. of Korea, Feb. 13, 1991, 91-2168; Feb. 22, 1991, 91-2911; Feb. 28, 1991, 91-3304

Int. Cl.<sup>6</sup> A23L 1/212, 2/06; A23N 1/00  
U.S. Cl. 426-489



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 10-17 and 19 is confirmed.

Claims 1-9, 18, 20 and 21 are cancelled.

[1. An apparatus for extracting juice from raw juice containing material, said apparatus comprising:

- a housing for supporting said apparatus and including a raw juice containing material inlet;
- a pair of meshing helical gears (2,3) with each said helical gear terminating in a tapered screw, including a plurality of teeth each tooth of which is formed with an addendum and a dedendum which are equal to each other to enable zero clearance between meshing teeth, and being rotatably secured in said housing to enable in use raw juice containing material to be supplied through said inlet of said housing to said pair of meshing helical gears for crushing said raw juice containing material to initially extract juice therefrom;
- a sieve (4) operatively positioned around said helical gears and each said tapered screws for enabling in use filtering and draining away from said helical gears and said tapered screws juice extracted by said helical gears and said tapered screws and with said sieve being branched (47,48) each branch housing at least a portion of one of said tapered screws, respectively, and with each branch of said sieve having a terminal end with a discharge outlet formed thereat to enable each said screw to further extract juice from said crushed raw juice containing material by compressingly moving said crushed juice containing material along one of said branch portions of said sieve and toward one of said discharge outlets formed in said sieve, and
- a power means (1) for supplying rotational output to said helical gears and said tapered screws such that in use said raw material supplied through said inlet is moved along said helical gears to one of said tapered screws, along one of said tapered screws and through one of said outlets formed in said sieve.]

19. The apparatus of claim 1, wherein said tapered screw of said helical gear has an end portion (21) with a flat portion (54) in a direction perpendicular to the axis of said screw and said flat portion is provided with one or more of projected portions (55) in a direction perpendicular to the axis of said screw.

#### B1 5,265,739 (2650th)

#### DOUBLE DENSITY STORAGE RACK SYSTEM FOR DATA TAPE CARTRIDGES

Macy J. Price, Jr., Louisville; Laurence G. Ball, Denver, and Andrew W. Wildhaber, Thornton, all of Colo., assignors to Engineered Data Products Incorporated, Broomfield, Colo.

Reexamination Request No. 90/003,503, Jul. 21, 1994.  
Reexamination Certificate for Patent No. 5,265,739, issued Nov. 30, 1993, Ser. No. 6,431, Jan. 21, 1993.

Continuation of Ser. No. 786,087, Oct. 31, 1991, Pat. No. 5,193,696, which is a continuation-in-part of Ser. No. 679,796, Apr. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 551,131, Jul. 6, 1990, Pat. No. 5,072,838, which is a continuation-in-part of Ser. No. 343,952, Apr. 26, 1989, abandoned

Int. Cl.<sup>6</sup> A47F 5/00  
U.S. Cl. 211-162

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

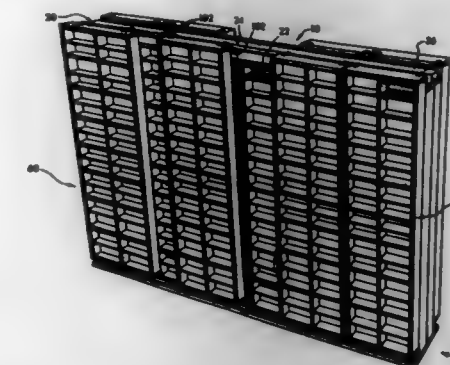
Claims 1, 2, 9, 10 are determined to be patentable as amended.

Claims 3-8, 11-15, dependent on an amended claim, are determined to be patentable.

1. A storage rack system for storing magnetic media data storage tape cartridges, said storage rack system comprising:  
a plurality of removable tape cartridge holders for storing tape cartridges;  
a first stationary rack having an upper surface;

- a first bottom base support for supporting said first stationary rack;
- means on opposing sides of said first stationary rack for holding said tape cartridge holders on each of said opposing sides of said first stationary rack;
- an upper track affixed to the upper surface of said first stationary rack for receiving rollers;
- a lower track affixed to said first bottom base support for receiving rollers;
- a second stationary rack having an upper surface;
- a second bottom base support for supporting said second stationary rack in an adjacent side-by-side relationship with said first stationary rack;
- means on opposing sides of said second stationary rack for holding said tape cartridge holders on each of said opposing sides of said secondary stationary rack;
- an upper track affixed to said upper surface of said second stationary rack for receiving rollers;
- a lower track on said second bottom base support for receiving rollers;
- a first movable rack;
- means on said first movable rack for supporting tape cartridge holders;
- upper rollers mounted on said first movable rack for engaging

ing said upper track on said first stationary rack and said upper track on said second stationary rack; and  
lower rollers mounted on said first movable rack for engaging said lower track on said first stationary rack and said



lower track on said second stationary rack; thereby providing for linear movement of said first movable rack from said first stationary rack to said second stationary rack in parallel directions relative to said first stationary rack and said second stationary rack.

## REISSUES

AUGUST 8, 1995

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,010

### METHOD OF COMPENSATING FOR CHANGES IN THE FLOW CHARACTERISTICS OF A DISPENSED FLUID TO MAINTAIN THE VOLUME OF DISPENSED FLUID AT A SETPOINT

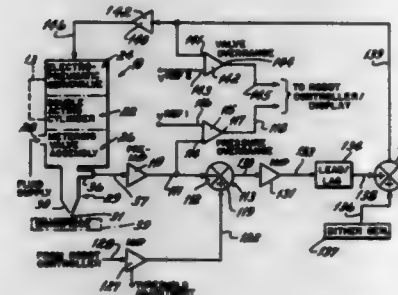
Richard P. Price, Parma Heights, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Original No. 5,054,650, dated Oct. 8, 1991, Ser. No. 494,500, Mar. 8, 1990. Division of Ser. No. 243,238, Sep. 7, 1988, Pat. No. 4,922,852, which is a continuation of Ser. No. 924,940, Oct. 30, 1986, abandoned. Application for reissue Sep. 27, 1993, Ser. No. 127,281

Int. Cl.<sup>6</sup> B67D 5/08; B05C 11/00; G01F 1/38

U.S. Cl. 222-1

25 Claims



1. A method of compensating for changes in the flow characteristics of a fluid being dispensed from a nozzle under the control of a metering valve in order to maintain the volume of fluid dispensed over a predetermined time interval at a desired setpoint, said method comprising the steps of:

- measuring the volume of fluid delivered to the metering valve during at least one said interval;
- calculating a correction factor correlated to the difference between said measured volume and said setpoint;
- multiplying a signal by said factor to generate a driving signal, and
- controlling said valve in accordance with at least said driving signal to maintain the volume of fluid dispensed at said desired setpoint.

17. A method of compensating for dynamic flow characteristics and intrinsic viscosity changes of a fluid being dispensed from a nozzle onto a workpiece, the nozzle being in fluid communication with a metering valve responsive to a control signal, and wherein the intrinsic viscosity changes are caused by phenomena other than shear effects, and the dynamic flow characteristics representing pressure flow non-linearities introduced by non-newtonian viscosity characteristics in the fluid, the method comprising the steps of:

- generating the control signal to provide a desired flow of the fluid through the nozzle, said control signal being correlated to at least a flow rate of the fluid; and
- modifying said control signal to reduce the pressure flow non-linearities introduced by the dynamic flow characteristics and to compensate for the intrinsic viscosity changes of the fluid.

22. A method of compensating for intrinsic viscosity changes of a fluid being dispensed from a nozzle onto a workpiece, the nozzle in fluid communication with a metering valve responsive to a control signal, and wherein the intrinsic viscosity changes are caused by phenomena other than shear effects, said method comprising the steps of:

- supplying the fluid under a pressure to the metering valve;

providing a tool speed signal representing a varying relative speed between the nozzle and the workpiece;  
adjusting said tool speed signal as a function of the intrinsic viscosity changes of the fluid to produce a driving signal;  
producing a feedback signal representing a fluid pressure correlated to a flow rate of the fluid; and  
producing the control signal as a function of said feedback signal and said driving signal to cause the metering valve to dispense a desired flow of fluid.

Re. 35,011

### ULTRASOUND ARRAY HAVING TRAPEZOIDAL OSCILLATOR ELEMENTS AND A METHOD AND APPARATUS FOR THE MANUFACTURE THEREOF

Wolfram Wersing, Kirchheim; Karl Lubitz, Ottobrunn; Reinhard Lerch, Heroldsberg; Hans Kaarmann, Buckenhof, and Martina Vogt, Fuerth, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

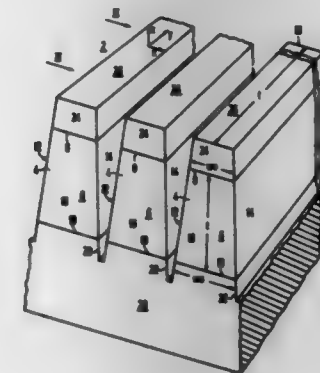
Original No. 5,045,746, dated Sep. 3, 1991, Ser. No. 484,352, Feb. 22, 1990. Application for reissue Sep. 3, 1993, Ser. No. 116,800

Claims priority, application European Pat. Off., Feb. 22, 1989, 89103112.2

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310-334

10 Claims



1. An ultrasound array comprising:

- a plurality of identical separated side-by-side oscillator elements each having a core of piezoelectric material and first and second spaced trapezoidal [electrode surfaces] electrodes at opposite sides of the core coated with electrode material, said first electrode having a surface facing an emission direction of the array and, said second electrode having a surface being disposed at a base region of the array, said first electrode surface being smaller in area in a plane substantially normal to said emission direction than said second electrode surface, and each oscillator element further having first and second non-parallel boundary surfaces extending between the respective surfaces of said first and second [electrode surfaces] electrodes so that each oscillator element has a trapezoidal cross-section which changes identically in a direction from said second electrode surface to said first electrode surface.



Re. 35,012

# SPARK PLUG FOR INTERNAL COMBUSTION ENGINES HAVING AN ALLOY LAYER BETWEEN THE ELECTRODES AND TIP ENDS

Kozo Takamura, Yasuyuki Sato, and Kanji Higuchi, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

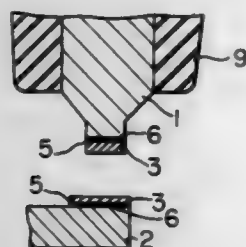
Original No. 4,581,558, dated Apr. 8, 1986, Ser. No. 450,801, Dec. 17, 1982. Application for reissue Jun. 9, 1993, Ser. No. 73,680

Claims priority, application Japan, Jan. 14, 1982, 57-4050

Int. Cl.<sup>6</sup> H01T 13/20, 13/32

U.S. Cl. 313-141

15 Claims



1. A spark plug for an internal combustion engine comprising:

- a center electrode;
- an earth electrode;
- a metal tip joined by welding to an ignition section of one of said electrodes, said metal tip being highly resistant to heat and wear and formed of material differing in the co-efficient of thermal expansion from the metal forming said one electrode; and
- an alloy layer of the metals of said one electrode and said metal tip, said alloy layer being provided for reducing thermal stresses applied to said metal tip and located at a welding portion between said metal tip and said one electrode and having a thickness of at least about 10  $\mu$ m.

6. A spark plug as claimed in claim 1, wherein said alloy layer is formed by holding said welding portion between said metal tip and said one electrode in an atmosphere of predetermined temperature for a predetermined period.

Re. 35,013

# TEMPERATURE CONTROL CIRCUIT HAVING SERIES CONNECTED FAIL-SAFE CONTROL

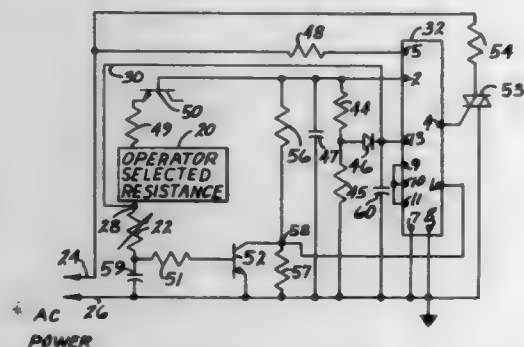
Richard L. Dennison, Burnsville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 5,057,669, dated Oct. 15, 1991, Ser. No. 471,380, Jan. 29, 1990. Application for reissue Feb. 11, 1993, Ser. No. 16,794

Int. Cl.<sup>6</sup> H05B 1/02

U.S. Cl. 219-501

4 Claims



1. An improved temperature control circuit that has a controller portion with an inhibit input, which, upon receiving a signal, inhibits operation of the control circuit, the temperature control circuit also having a temperature responsive circuit

portion that includes a resistive portion connected in series with a sensor portion, the connection common to the resistive portion and sensor portion presenting a signal when the control circuit is energized that is applied to the controller for establishing the operating control point for the control circuit, the improvement comprising:

a semiconductor switch connected in series with the sensor portion, said semiconductor switch having a collector and an emitter, said semiconductor switch conducting so long as there is current flow via the sensor portion; [and]

[an] a first impedance connected between said collector and said emitter of said semiconductor switch and to the inhibit input of the controller, said first impedance presenting a signal to inhibit input, when said semiconductor switch is not conducting, that is effective to inhibit the operation of the temperature control circuit; and

a second impedance connected in series with the resistive portion of the temperature responsive circuit portion, the second impedance equal to the impedance, presented in series with the sensor portion by the semiconductor switch.

Re. 35,014

# COMPOSITION OF POLYARYLATE, POLYAMIDE, POLYETHYLENE TEREPHTHALATE AND EPOXY RESIN

Kenji Yoshino, Kazuya Takemura, and Tadahiro Wakui, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan

Original No. 5,037,900, dated Aug. 6, 1991, Ser. No. 450,222, Dec. 12, 1989. Division of Ser. No. 412,900, Sep. 26, 1989, abandoned. Application for reissue Aug. 6, 1993, Ser. No. 102,769

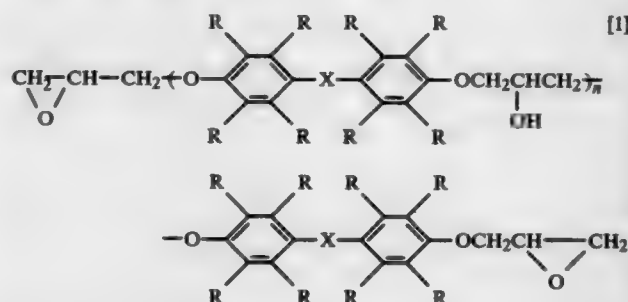
Claims priority, application Japan, Sep. 30, 1988, 63-246656; Dec. 26, 1988, 63-328719

Int. Cl.<sup>6</sup> C08L 67/02, 77/02, 77/04, 77/06

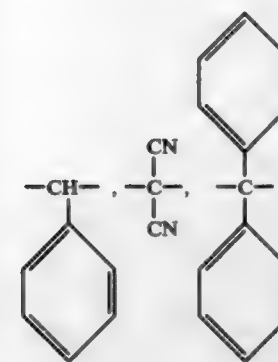
U.S. Cl. 525-423

3 Claims

1. A thermoplastic resin composition which comprises 100 parts by weight of a resin composition which comprises 100 parts by weight of a resin mixture consisting essentially of not less than 10 wt % of a polyarylate resin, not less than 20 wt % of a polyamide resin and from 3 to 60 wt % of a polyethylene terephthalate resin, and from 0.1 to 15 parts by weight of an epoxy resin of the following formula [1]



wherein X represents a direct bond, a lower alkylene group having from 1 to 4 carbon atoms, a lower alkylidene group having from 1 to 4 carbon atoms,



—SO<sub>2</sub>—, —O—, or —S— wherein part or all of the hydrogen atoms of X may be substituted with a halogen atom if X represents any hydrocarbon defined above, R's independently represent a hydrogen atom, a halogen atom, a lower alkyl group having from 1 to 4 carbon atoms, and n is an integer of 1 to 20.

## PLANT PATENTS

GRANTED AUGUST 8, 1995

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,232

### SHRUB ROSE PLANT NAMED 'CAPTAIN SAMUEL HOLLAND'

Felicitas J. Svejda, Nepean, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Agriculture, Ottawa, Canada

Filed Mar. 22, 1994, Ser. No. 215,824

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—1

1 Claim

1. A new and distinct variety of shrub rose plant characterized by the following combination of characteristics:

- (a) exhibits a spreading and trailing growth habit with glossy foliage,
- (b) forms on an intermediate basis in clusters attractive fuchsia red blossoms,
- (c) propagates well by the use of softwood cuttings,
- (d) exhibits a good winter hardiness, and
- (e) is particularly well suited for growing in the landscape;

substantially as herein shown and described.

9,233

### SHRUB CLIMBING ROSE PLANT NAMED 'MEITOSIER'

Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Sep. 28, 1994, Ser. No. 314,389

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—4

1 Claim

1. A new and distinct variety of Shrub Climbing rose plant characterized by the following combination of characteristics:

- (a) forms attractive large lightly-fragrant light Mandarin Orange blossoms having an old-rose configuration,
- (b) exhibits a propensity for climbing,
- (c) exhibits a good ability to reflower, and
- (d) is particularly well-suited for growing as ornamentation in the landscape;

substantially as herein shown and described.

9,234

### HYBRID TEA ROSE PLANT NAMED 'HAWAIIAN QUEEN MARTHA'

Gilbert R. Wyckoff, HCR 2 Box 6026, Keauau, HI. 96749

Filed Jul. 25, 1994, Ser. No. 280,202

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—11

1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique coloration of its blooms and also the long durability of the blooms; and combined with these qualities, the long cutting stems and attractive foliage plus quite good fragrance.

9,235

### CITRUS TREE 'ARTAKE'

Naomi Okudai, Arita; Iwao Oiyama, Tokyo; Ryoji Matsumoto, Chikushino; Toshio Takahara; Masashi Yamamoto, both of Minamitakaki; Denji Ishinchi, Mie; Kensuke Asada, Omura; Hidekazu Ikemiya, Okinawa; Hiroko Murata, Aomori, and Yoshio Yamada, Nagasaki, all of Japan, assignors to Fruit Tree Research Station, Ministry of Agriculture, Forestry and Fisheries, Tsukuba, Japan

Filed Mar. 16, 1994, Ser. No. 214,167

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—45

1 Claim

1. A new and distinct variety of citrus tree, substantially as illustrated and described herein, characterized over known citrus trees by (A) having a moderate vigor with a growth habit of spreading; (B) having a medium compressed round type fruit, with a deep orange skin color, and a smooth skin;

wherein said fruit is moderately peeled; and the flesh of the fruit has a soft texture, a moderate orange flavor and a low acidity, is juicy and sweet; and seedless; and thus said fruit is suitable as table fruit; (C) having a relatively strong resistance to diseases.

9,236

### IMPATIENS PLANT NAMED 'TWIST'

Klara Dehan, Holon, Israel, assignor to Danziger - "Dan" Flower Farm, Post Beit Dagan, Israel

Filed Sep. 30, 1994, Ser. No. 316,094

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—87.6

1 Claim

1. A new and distinct cultivar of Impatiens plant named Twist, as illustrated and described.

9,237

### GERANIUM PLANT 'KLEHISP'

Siegfried Klemm, Hanflicker 8, D 70378 Stuttgart, Germany

Filed Aug. 4, 1994, Ser. No. 286,013

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—87.12

1 Claim

1. A new and distinct geranium cultivar, substantially as herein described and shown, characterized by its unusually compact and round habit, semi-double dark red flowers with velvety centers and dark green foliage.

9,238

MAIDENHAIR FERN PLANT NAMED 'BRONZE VENUS'

Wim P. Tas, Aalsmeer, Netherlands, assignor to Milestone Agriculture, Inc., Apopka, Fla.

Filed Oct. 6, 1994, Ser. No. 321,823

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—88.3

1 Claim

1. A new and distinct cultivar of Fern plant named Bronze Venus, as illustrated and described.



**PATENTS**  
**GRANTED AUG. 8, 1995**

**ERRATA**

<b>For</b>	<b>See</b>
<b>CLASS</b>	<b>PATENT NO.</b>
034-061 .....	5,438,773
600-109 .....	5,438,975
600-186 .....	5,438,976
138-121 .....	5,439,035
139-028 .....	5,439,037
192-056 .....	5,439,086
239-018 .....	5,439,170
588-254 .....	5,439,322
464-181 .....	5,439,416
483-014 .....	5,439,431
096-025 .....	5,439,513
156-176 .....	5,439,529
136-200 .....	5,439,528
216-002 .....	5,439,552
216-058 .....	5,439,553
216-016 .....	5,439,554
435-040 .....	5,439,667
525-107 .....	5,439,896
424-059 .....	5,439,954
522-092 .....	5,439,956
528-421 .....	5,439,966
424-450 .....	5,439,967
546-344 .....	5,440,047
327-034 .....	5,440,178
326-038 .....	5,440,182
360-135 .....	5,440,474
374-041 .....	5,440,566
395-500 .....	5,440,568
380-046 .....	5,440,640
395-002 .....	5,440,661
395-002 .....	5,440,662
395-002 .....	5,440,663
359-007 .....	5,440,669
364-141 .....	5,440,695
371-022 .....	5,440,724

## PATENTS

GRANTED AUGUST 8, 1995

### GENERAL AND MECHANICAL

5,438,705

#### HONEY BEE PROTECTIVE BAG

Arturo Mendez; Esmeraldo Quintanilla; John Norris, and Juan Garza, all of 851 N. Almond, Alice, Tex. 78332  
Filed May 4, 1994, Ser. No. 237,869  
Int. Cl.<sup>6</sup> A42B 3/00

U.S. Cl. 2-4

2 Claims



1. A honey bee protective bag for temporary emergency protection of a person against stinging attack by a swarm of bees by using a lightweight, compact, single-use, flexible plastic upper body protective garment carried by a user when travelling in bee infested areas, the honey bee protective bag comprising:

a generally rectangular plastic bag for enclosing the upper body of the user, the plastic bag comprising a transparent plastic sheet folded to form a closed top and sealed along each edge to define an open bottom having a circumference adapted to fit over the shoulders and arms of the user, the bag having a length and width suitable for containing the upper body of the user therein, a circular opening through one side of the bag proximal the closed top thereof wherethrough breathing air for the user may flow, and a hem provided along the circumference of the bottom, the bag being imperforate except for the open bottom and the circular opening, the bag having a common circumferential dimension from the closed top to adjacent the open bottom;

an elastic band provided in the hem, the elastic band having a circumference substantially smaller than the circumference of the open bottom whereby the open bottom is drawn together for tightly encircling the waist of the user; and

a discoid mesh screen attached to the bag such to cover the circular opening for preventing bees from entering the bag while simultaneously allowing breathing air to pass freely therethrough.

5,438,706

#### LATERAL EYE SHIELDING DEVICE

James A. K. Lambur, 7600 W. College Dr., Palos Heights, Ill. 60463

Filed Mar. 25, 1994, Ser. No. 219,067

Int. Cl.<sup>6</sup> A61F 9/04

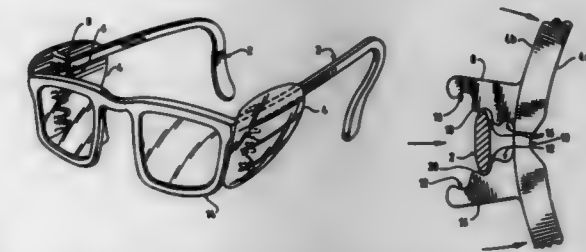
U.S. Cl. 2-13

3 Claims

1. A lateral eye shielding device, adapted for use with optical glasses having a pair of temple arms, comprising a pair of shield members, each shield member having a plurality of independent means for attaching the shield member to one of the temple arms,

each independent means for attaching the shield member to one of the temple arms being positioned at a spaced vertical distance from one another, so that by selective employment of one of the independent means for attaching

the shield member to a temple arm, the shield member may be selectively positioned at distinct vertical positions relative to the temple arm, whereby variable vertical lateral shielding of the eye is provided, each shield member has an inner surface and an outer surface and the plurality of independent means for attaching the shield member to one of the temple arms are disposed on the inner surface thereof, and wherein each of the independent means for attaching the shield member to one of the temple arms comprises a vertical jaw having an upper jaw member and a complementary mirror image lower jaw member,



said upper jaw member of the vertical jaw has a lower surface in opposition to an upper surface of the complementary mirror image lower jaw member, whereby a temple member may be removably secured therebetween, and

wherein the lower surface of the upper jaw member of the vertical jaw and the upper surface of the complementary mirror image lower jaw member each contain a plurality of rabbets for individually gripping a select sized temple member.

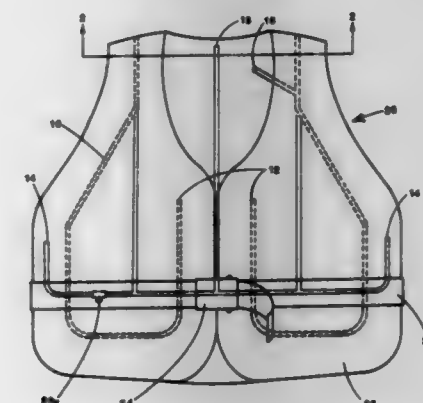
5,438,707

#### BODY COOLING APPARATUS

Stephen T. Horn, R.R. 2 Box 4800, White Stone, Va. 22578  
Continuation of Ser. No. 53,661, Apr. 29, 1993, abandoned. This application Nov. 3, 1994, Ser. No. 333,787  
Int. Cl.<sup>6</sup> A41D 13/00

U.S. Cl. 2-69

4 Claims



1. A body cooling apparatus for cooling the body of a wearer comprising:

a body garment including a supporting layer of material;  
a tubing network having interconnected tubing;  
said tubing network supported to said supporting layer of material;  
a connector on said tubing network;



a plurality of openings in said tubing, wherein said plurality of openings have an aggregate total cross-sectional area less than the cross-sectional area of the inner pathway of said tubing so that pressure may be retained within said tubing resulting in expansion and temperature drop of said gas escaping from said plurality of openings.

5,438,708

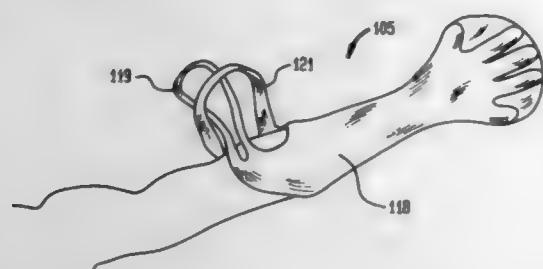
# MANUAL WASTE COLLECTION, CONTAINMENT, AND DISPOSAL DEVICE

Jay S. Jacovitz, 4 Boxwood Rd., Norwalk, Conn. 06851-1105  
Filed Dec. 20, 1993, Ser. No. 170,373

Int. Cl. A41D 19/00

U.S. Cl. 2-161.6

19 Claims



1. A glove device for manually collecting and containing material, comprising:

- a palm portion suitable for substantially covering the palm of the user's hand, said palm portion including compartments to receive the fingers and thumb of either a left or right hand;
- a sleeve portion connected to said palm portion which is suitable for substantially completely covering the wrist and forearm of the user;
- contact means for contacting the material to be collected and contained, said contact means being positioned on said palm portion of the glove; and
- a pair of handles positioned on said sleeve portion; said handles being of a length and width suitable for being looped through each other for attachment of the sleeve portion to the user's elbow and for encircling the user's ungloved hand to permit the user to invert the glove device by grasping and pulling said handles.

5,438,709

# LUBRICOUS GLOVES AND METHOD FOR MAKING LUBRICOUS GLOVES

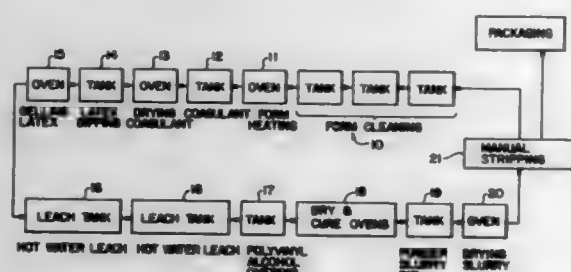
Richard Green, Livingston, N.J.; Glenn F. Stockum, and Mao-Ching Chen, both of Arlington, Tex., assigns to Johnson & Johnson Orthopaedics, Inc., Raynham, Mass.

Filed Mar. 20, 1992, Ser. No. 854,146

Int. Cl. A41D 19/00

U.S. Cl. 2-167

3 Claims



1. A lubricous glove for use in applying substrates comprising:

- a base of elastomeric material defining an internal volume

for receiving a hand of a wearer, said base having an outer surface; and

- said outer surface having a lubricous coating thereon comprising polyvinyl alcohol and thickener wherein the base of elastomeric material defines a finger portion, a palm portion and a wrist portion for receiving the fingers of a hand, the palm of a hand and the wrist of a hand, respectively, and the lubricous coating extends about the surface of the finger portion and a part of the palm portion and does not include the wrist portion of the elastomeric material.

5,438,710

# THERMAL NOSE PROTECTOR AND SKI GOGGLES

Neil McDonald, Beaconsfield, Canada; Kathleen McDonald, 320, rue Pean, Beaconsfield, Québec, Canada H9W 1B6, and Sharon McDonald, Beaconsfield, Canada, assigns to Kathleen McDonald, Beaconsfield, Canada

Filed Feb. 10, 1994, Ser. No. 194,271

Int. Cl. A61F 9/02; A41D 13/00

U.S. Cl. 2-439

3 Claims



1. In combination, a thermal nose protector and ski goggles to which the thermal nose protector is releasably attached in an operative position thereof, said ski goggles having a unitary transparent pane supported by an integral frame to extend in a curved plane in the path of the wearer's field of vision, said ski goggles frame having a peripheral interior edge carrying a foam-like strip, having air pockets, said strip engaging the skier's face whereby a substantially closed air chamber is formed ahead of the skier's face within said ski goggles, said interior edge pile strip defining a lower intermediate portion adapted to extend transversely over a fraction of the wearer's nose; said thermal nose protector consisting of:

- first flexible sheet, sized to conformingly fit over all of the skier's nose, said first sheet made from a soft thermally insulating sheet material, said first sheet adapted for direct engagement with the skin of said skier's nose;
- a second flexible sheet defining a main portion with an external surface made from a multi-hook, airtight sheet material, said hooks complementary to the air pockets formed on the foam-like strip of said ski goggle lower intermediate portion, said second sheet having inner and outer edge portions, said second sheet main portion flatly engaging in operative position against said, air pockets of said lower intermediate portion of said ski goggles, said second sheet inner edge portion extending in operative position inwardly beyond said foam-like strip of said lower intermediate portion of ski goggles and into said ski goggles closed air chamber, the multiple hooks of said second sheet main portion releasably gripping the said complementary air pockets of said lower intermediate portion of said foam-like strip of the ski goggles in hook and loop fastening fashion, whereby the thermal nose protector is adapted to become sandwiches between the wearer's nose and the lower intermediate portion of the ski goggles, said second airtight sheet outer edge portion also sized to extend in operative position beyond the tip of said skier's nose whereby a substantially open air chamber

is defined by the thermal nose protector outer edge portion beneath the skier's nose and ahead of the skier's mouth; and

- bonding means, fixedly interconnecting said first and second sheets flatly against one another; wherein an air breathing channel is formed coextensively of said open air chamber for promoting air breathing from the nose of the skier, said air breathing channel to extend generally transversely of the direction of displacement of the skier whereby the nose of the skier is to be shielded from incoming cold air.

5,438,711

# APPARATUS FOR AUTOMATICALLY FEEDING SEAT COVERING PAPER TOILET SEAT

Mitsuhiko Higuchi; Shigeru Mizoguchi, both of Kitakyushu; Naoji Yamashita, and Takayoshi Adachi, both of Kasugai, all of Japan, assigns to Toto Ltd., Fukuoka and Aicho Electric Co., Ltd., Aicho, both of Japan

Continuation of Ser. No. 796,676, Nov. 25, 1991, abandoned.

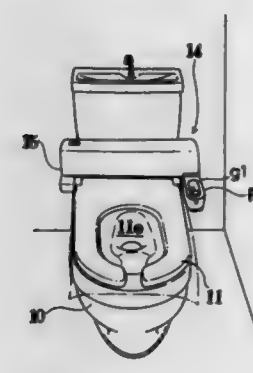
This application Oct. 7, 1993, Ser. No. 133,735

Claims priority, application Japan, Nov. 26, 1990, 2-324946; May 30, 1991, 3-127910

Int. Cl. A47K 13/20

U.S. Cl. 4-243.3

14 Claims



1. An apparatus for automatically feeding seat covering paper for a toilet seat comprising:

- an electrically driven seat covering paper feeding mechanism for feeding said seat covering paper from a seat covering paper roll stored in a seat covering paper roll storage portion onto a toilet seat body through a seat covering paper feed path; said seat covering paper being divided into sections; said seat covering paper feeding mechanism including a seat covering paper feeding motor;
- an electrically driven seat covering paper cutting mechanism including means for cutting said seat covering paper fed onto the surface of said toilet seat body at a rear edge portion of a one of said sections of said seat covering paper;
- timer means for measuring an operating time of said seat covering paper feeding motor;
- revolution detecting means for detecting a total number of revolutions of said seat covering paper feeding motor within a predetermined time;
- seat covering paper position detecting means for detecting a through hole at a completion position of said seat covering paper effective to accurately detect the completion of a feeding of said seat covering paper onto said toilet seat body;
- a control unit for operating said seat covering paper feeding mechanism and said seat covering paper cutting mechanism by predetermined control signals sequentially output therefrom to thereby control feeding said seat cover-

ing paper to be fed on said toilet seat body and cutting of said seat covering paper;

means, responsive to a completion of a first predetermined total number of revolutions of said seat covering paper feeding motor within said predetermined time, for stopping said seat covering paper feeding motor;

means, responsive to a completion of a second predetermined total number of revolutions of said seat covering paper feeding motor at a completion of said predetermined time, for permitting continued operation of said seat covering paper feeding motor for an additional period of time following said predetermined time;

said second predetermined total number of revolutions being less than said first predetermined number of revolutions;

means, responsive to a completion of less than said second predetermined number of revolutions within said predetermined time, for terminating operation of said seat covering paper feeding motor; and

(f) battery means for supplying electricity to said seat covering paper feeding mechanism, said seat covering paper cutting mechanism, said control unit, said timer means, said revolution detecting means and said paper detecting means.

5,438,712

# HOT TUB HEATER SYSTEM

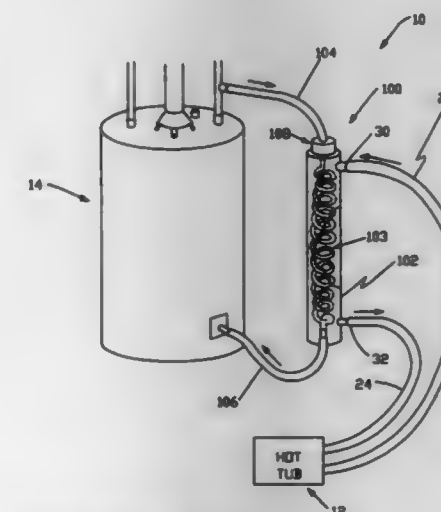
James N. Hubenthal, 4409 Country Club Dr., Pittsburgh, Pa. 15236

Filed Aug. 11, 1993, Ser. No. 104,661

Int. Cl. E04H 4/00

U.S. Cl. 4-493

3 Claims



1. A hot tub heater system comprising:

- a hot tub having water within; and
- means for heating the water within the hot tub, said heating means comprised of a hot water heater which heats a body of water within a tank and means for transferring heat from the water within the tank to the water of the hot tub without any intermixing thereof, said heat transfer means in fluidic communication with the hot tub and the hot water heater, said heat transfer means comprising a piping assembly which acts as a heat exchanger, said heat transfer means comprising a first conduit for transferring water from the hot tub to the piping assembly, a second conduit for transferring water from the piping assembly back to the hot tub and means for pumping water from the hot tub to the piping assembly through the first conduit and back to the hot tub through the second conduit, said piping assembly comprised of an input and an output, said first conduit fluidically connected to the input, said second conduit fluidically connected to the output, said piping assembly comprising a closed tube having the inlet and the

outlet and a tubing loop through which water from the hot water heater circulates through, said tubing loop extending through the tube in a sealed manner therewith such that heat can be transferred through the tubing loop between the water of the hot water tank and the water of the hot tub circulating through the tube, said tubing loop comprising of a plurality of raised ridges to increase the surface area thereof for more effective heat transfer.

5,438,713

# SEAMLESS BATHROOM MODULE FOR A MARINE VESSEL

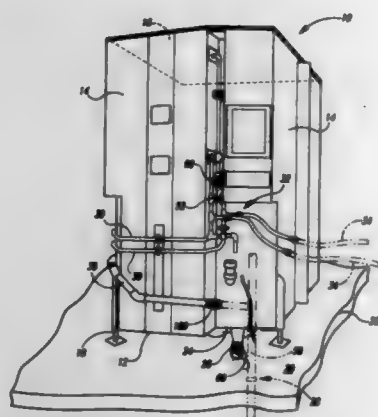
Richard E. Clarke, Auburn, Wash., assignor to Amtech Corporation, Yelm, Wash.

Filed Jan. 28, 1994, Ser. No. 188,494

Int. Cl. A47K 8/00; E03C 1/20, 1/29

U.S. Cl. 4-663

16 Claims



1. A prefabricated bathroom module for a marine vessel, the marine vessel having a plumbing system and deck that supports the module, the module comprising:

- a floor positioned above the deck of the vessel, said floor having top and bottom surfaces with said bottom surface facing the deck, said floor being slanted relative to the deck toward a predetermined position, said floor having a first aperture therethrough at said predetermined position and a second aperture adjacent to said first aperture;
- a plurality of walls attached to said floor and extending upward from said floor, said walls being interconnected to form and interior area defining a room, each of said walls having a top portion;
- a ceiling attached to said top portions of said walls;
- at least one bathroom fixture within said interior area; and,
- a drain assembly attached to said floor at said predetermined position, said drain assembly having a first drain pipe coaxially aligned with said first aperture, a first drain trap bowl attached to said bottom surface of said floor around said first aperture, and a drain line attached at one end to said first drain trap bowl and adapted to be attached at an opposite end to the plumbing system of the vessel, said first drain trap bowl being shaped to retain fluid therein at a predetermined fluid level, said first drain pipe extending downward from said floor into said first drain trap bowl and terminating at a position below said predetermined fluid level, said first drain trap bowl having an aperture therein with a bottom edge positioned at said predetermined fluid level, and said drain line is attached to said first drain trap bowl at said aperture so fluid within said first drain trap bowl above said fluid level will flow out of said first drain trap bowl through said drain line and into the plumbing system of said vessel, and said drain assembly having a second drain pipe coaxially aligned with said second aperture, a second drain trap bowl attached to said bottom surface of said floor adjacent to said second aperture, said second drain trap bowl being coupled to said first drain trap bowl and shaped to retain fluid therein at

said predetermined fluid level, said second drain pipe extending downward from said floor into said second drain trap bowl and terminating at a position below said predetermined fluid level.

5,438,714

# FRESH WATER MANIFOLD DISTRIBUTION SYSTEM AND METHOD

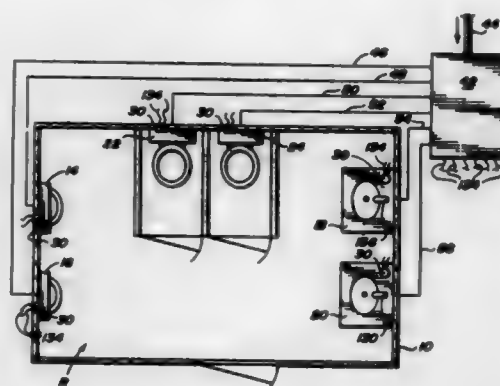
Daniel C. Shaw, Geneva, Fla., assignor to Bauer Industries, Inc., Orlando, Fla.

Filed Oct. 31, 1989, Ser. No. 429,556

Int. Cl. E03C 1/10, 1/05

U.S. Cl. 4-664

13 Claims



1. Fresh water control system, comprising:

- a) a fresh water supply line having a plurality of spaced outlets;
- b) at least first and second water manifolds, each manifold comprising an inlet, in flow communication with an associated one of said outlets, and at least a first remotely operable valve means operably associated with each of said manifolds for selectively supplying water to a remote fixture comprising a sink, or a toilet or urinal;
- c) at least first and second cooperating check valve means operably associated with said supply line intermediate the outlets to which said manifolds are in flow communication, each of said check valve means for permitting water to flow therebeyond in a first direction while preventing water from flowing therebeyond in an opposite second direction;
- d) there are a plurality of said remotely operable first valve means and of said sinks or toilets or urinals;
- e) each of said first valve means of said first manifold supplies fresh water only to one of said sinks; and,
- f) each of said first valve means of said second manifold supplies water only to one of said toilets and/or urinals.

5,438,715

# LOUNGER FOR PREGNANT WOMEN

Royd A. Jackman, 443 S. Maple St., Ames, Iowa 50010

Filed Jun. 14, 1994, Ser. No. 260,242

Int. Cl. A47C 17/66, 27/00

U.S. Cl. 5-110

2 Claims

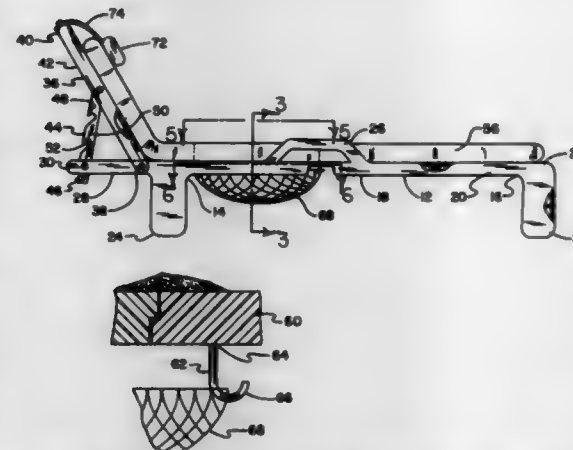
1. A new and improved jack relax relief lounger providing the safest and most comfortable lounger for pregnant women comprising, in combination:

- a first frame assembly having a first end, a second end, an intermediate extent therebetween, a lower surface, and an upper surface, a set of legs integral with both the lower surface of the first end and the lower surface of the second end, a set of handles integral with the upper surface of the intermediate extent, a first frame extension integral with the first end of the first frame assembly, the extension having a right support, a left support, and an intermediate support therebetween;

a second frame assembly having a first end, a second end, and an intermediate extent therebetween, the first end pivotally secured to the first end of the first frame assembly;

a third frame assembly having a first end, a second end, and an intermediate extent therebetween, the first end pivotally secured to the intermediate extent of the second frame assembly, a plurality of grooves along the intermediate extent, the grooves optionally coupling the third frame assembly to the intermediate support of the first frame assembly, the third frame assembly serving to adjust the second frame assembly from a horizontal position to a substantially vertical position in relation to the first frame assembly;

the first frame assembly, the second frame assembly, and the



third frame assembly together forming a frame component;

- a support pad secured to the frame component, the support pad having a circular recess therethrough, a reinforcing element surrounding the circular recess;
- a plurality of hooks each having a first end and a hooked second end, each first end secured to the reinforcing element of the circular recess of the support pad, a circular mesh support pouch removably secured to each second hooked end of the plurality of hooks;
- a pad cover dimensioned to be received within the circular recess of the support pad and provide a flat surface, the pad cover secured within the circular recess by a fastening means;
- a head rest having a plurality of straps secured to the second end of the second frame assembly.

5,438,716

# BOX SPRING ASSEMBLY WITH IMPROVED SPRING INSTALLATION CAPABILITIES

Upton R. Dabney, Lexington, Ky., assignor to Hoover Group, Inc., Alpharetta, Ga.

Filed Oct. 12, 1993, Ser. No. 133,910

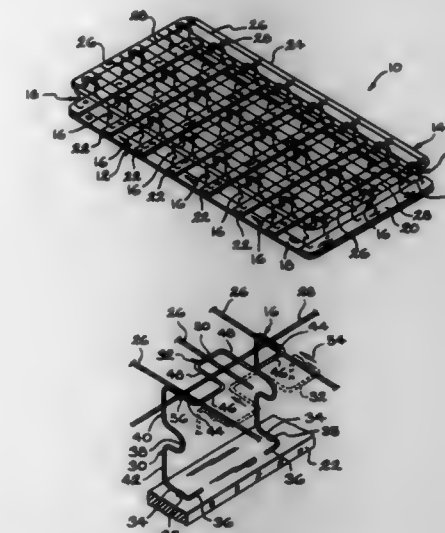
Int. Cl. A47C 23/04, 23/053

U.S. Cl. 5-247

16 Claims

1. In a box spring assembly having a support deck, a frame and a plurality of spring modules, said support deck being generally rectangular and including a border wire and a wire grid, said border wire extending around and defining a perimeter of said deck, said wire grid being mounted to said border wire and defined thereby, said wire grid including a plurality of straight wires arranged in crisscross fashion, said straight wires including a plurality of long wires extending lengthwise in said assembly and a plurality of cross wires extending crosswise in said assembly, said frame being generally rectangular and including side rails, end rails and cross rails, said side rails and end rails defining a perimeter of said frame and said cross rails extending transversely between said side rails, said plural-

ity of spring modules mounted between said frame and said deck to yieldably support said deck a predetermined distance above said frame, said spring modules including a pair of yieldable sections extending upward from said frame to said deck, the improvement comprising a deck attaching section extending between upper ends of said yieldable sections, said deck attaching section including a pair of end bars extending in the same general direction from said yieldable sections and termi-



nating in terminal ends which are spaced apart and located to one side of said yieldable sections, a cross bar extending between said terminal ends of said end bars, said deck attaching section being configured to engage one of said straight wires in an interwoven fashion in response to movement of said spring module in a direction transverse to said one of said straight wires, said one of said straight wires being interwoven with said deck attaching section such that said one of said straight wires extends over said end bars and under said cross bar.

5,438,717

# CANOPY SUPPORT

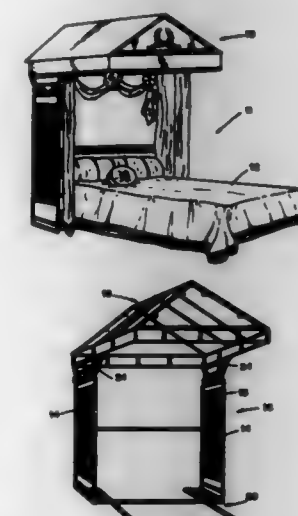
Robert T. Wells, Rte. 3, Box 389, Oliver Springs, Tenn. 37840

Filed Feb. 22, 1994, Ser. No. 199,828

Int. Cl. A47C 29/00

U.S. Cl. 5-414

15 Claims



1. A canopy support for supporting a canopy above a bed



including floor-mounted bed-supporting structure, the canopy support comprising:

- a frame independent of the bed or its floor-mounted bed-supporting structure including
  - a) at least one support member including elongated post means positionable in an upright condition adjacent the bed;
  - b) means for maintaining the post means of the support member in an upright condition including a base connected to the elongated post means and adapted to rest upon the floor which underlies the bed so that the canopy is supportable by the canopy support independent of support from the bed, the base having a relatively low height to accommodate the positioning of the bed over or atop the base; and
  - c) elongated support means associated with the support member from which a canopy is to be supported, the elongated support means being fixedly joined at one end to the support member so as to extend over the bed so that the support means is maintained in a free-standing, cantilevered condition above the bed and so that when the canopy is supported by the elongated support means, the canopy overhangs the bed.

5,438,718

**SPRING UNITS FOR MATTRESSES AND THE LIKE**  
Bernard J. Kelly, Lancashire, Great Britain, and Antonio B. Cabeza, Madrid, Spain, assignors to Slumberland Holdings Limited, Chadderton, England

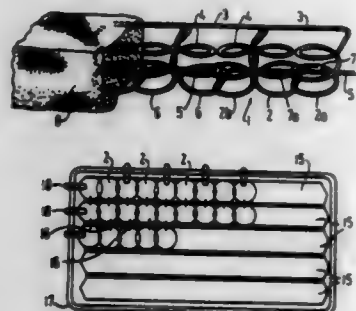
Division of Ser. No. 695,855, Apr. 5, 1991, abandoned. This application May 24, 1993, Ser. No. 65,225

Claims priority, application Spain, Aug. 5, 1988, 8802464; United Kingdom, Aug. 6, 1988, 8818725

Int. Cl.<sup>6</sup> A47C 27/04, 27/20

U.S. Cl. 5-477

9 Claims



1. A spring unit for a spring upholstered article such as a mattress or furniture, comprising: a single length of wire defining a single length spring, said single length spring including a plurality of adjacent coil springs which each have upper and lower coils, each coil spring being joined to adjacent coil springs by wire links which constitute extensions of at least one of the upper and lower coils, said single length spring being sheathed within a sleeve or envelope of cloth to define a sheathed single length spring, said sheathed single length spring being arranged to define adjacent rows of sheathed coil springs in which longitudinal axes of the coil springs in the adjacent rows are substantially parallel to one another, the upper coils of the coil springs in adjacent rows lying in a substantially common plane and the lower coils of the coil springs in adjacent rows lying in a substantially common plane.

5,438,719

**INTEGRATED PILLOW CASE AND FITTED SHEET**

Anthony Jerlean, 17175 San Juan, Detroit, Mich. 48221

Filed Oct. 3, 1994, Ser. No. 316,908

Int. Cl.<sup>6</sup> A47G 9/02

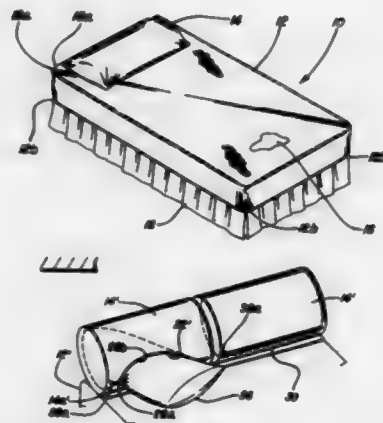
U.S. Cl. 5-485

6 Claims

1. An integrated pillow case and fitted sheet for being used with respect to a mattress and at least one pillow, the mattress

having a head, said integrated pillow case and fitted sheet comprising:

- a fitted sheet structured for form fitting with respect to a mattress having a head; and
- at least one pillow case connected to said fitted sheet, each pillow case of said at least one pillow case comprising a pillow case having a head end and a case slit therein adjacent said head end, each said pillow case being everywhere closed except at said case slit, wherein a pillow is passed through said case slit to be thereupon encased by a selected said pillow case;



wherein the fitted sheet has a head which is located at the head of the mattress when said fitted sheet is form fitted onto the mattress, said at least one pillow case being connected to said fitted sheet adjacent said head of said fitted sheet and adjacent said head end of each said pillow case; wherein further, each said pillow case lies on said fitted sheet whereupon each said pillow case is free to pivot with respect to said fitted sheet about said connection of each said pillow case to said fitted sheet.

5,438,720

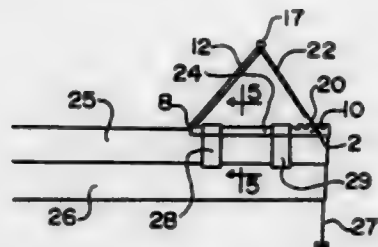
**TOE PROTECTOR AND RELATED DEVICES**  
Yousef Daneshvar, 33200 Slocum, Farmington, Mass. 41024

Filed Sep. 16, 1992, Ser. No. 945,618

Int. Cl.<sup>6</sup> A47C 21/02

U.S. Cl. 5-505.1

33 Claims



16. A toe protector that protects a person's toes from an overlying cover of a bed by supporting such a cover above the person's toes while the person lies on the bed and that can be erected for use and collapsed for non-use, said toe protector comprising:

- a generally horizontal base for placement on a bed, said base forming one side of a triangle when viewed from a side of the bed;
- means supported on said base forming an enclosure for the person's toes;
- said means forming an enclosure for the person's toes comprising, when viewed from the side of the bed, a second side of the triangle and a third side of the triangle;
- said second and third sides extending from said base at re-

spective acute angles to said base so as to come together at an apex of the triangle that is over said base;

said means forming an enclosure for the person's toes further comprising means forming an opening for allowing a person to place the toes within the enclosure;

and said means forming an enclosure further comprising means providing for said second and third sides to pivot about said apex, as viewed from the side of the bed;

including heater means disposed to generate heat within said enclosure;

in which said heater means comprises an elongate heating element disposed in a member of said base that extends transversely across the bed, and including a reflector disposed behind said heating element to reflect heat into said enclosure.

5,438,721

**APPARATUS AND METHOD FOR MANAGING WASTE FROM PATIENT CARE, MAINTENANCE AND TREATMENT**

Demetrios A. Pahnos, Mt. Pleasant; James R. Stolpmann, Charleston; James M. C. Thomas, Mt. Pleasant; David N. Ashcraft, Charleston; Roger D. Dalton, Ladson; James J. Romano, Charleston; Kenneth R. Smith, Charleston; Timothy R. Trauernicht, Charleston, and Michael V. Bolden, Charleston, all of S.C., assignors to SSI Medical Services, Inc., Charleston, S.C.

PCT No. PCT/US92/09954, § 371 Date Jun. 11, 1993, § 102(e)

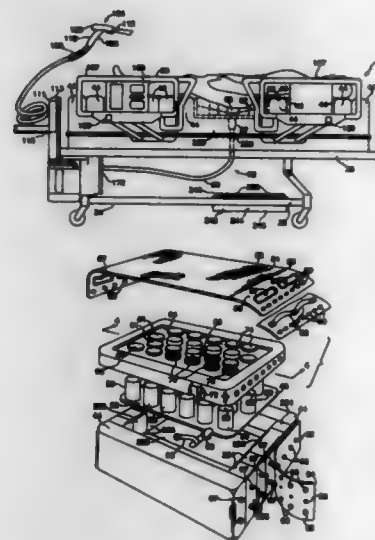
Date Jun. 11, 1993, PCT Pub. No. WO93/09749, PCT Pub. Date May 27, 1993

Continuation-in-part of Ser. No. 792,216, Nov. 13, 1991, Pat. No. 5,269,030. This PCT application Nov. 10, 1992, Ser. No. 74,860

Int. Cl.<sup>6</sup> A61G 7/02

U.S. Cl. 5-604

53 Claims



16. A low air loss patient support apparatus, comprising:

- a) a frame;
- b) a plurality of low air loss sacks,
  - i) said sacks being carried by said frame,
  - ii) said sacks being configured to be connected in communication with a source of pressurized gas and configured to be inflatable with pressurized gas, and
  - iii) said sacks being configured to define a low air loss support surface conforming to at least a first portion of the patient's body for supporting the patient above said frame when said sacks are inflated with pressurized gas; and
- c) means for managing waste associated with a patient who is supported at least in part on said low air loss support surface, said waste managing means including:
  - i) means for supporting at least a second portion of the

patient coplanar with said low air loss support surface of said sacks, and

ii) means for catching the waste associated with the patient,

A) said catching means being supported by said second portion supporting means between the patient and said second portion supporting means.

5,438,722

**PATIENT TRANSFER CHAIR SYSTEM**

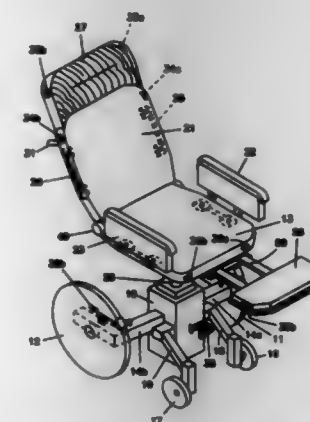
Don J. Jayamanne, 555 Oak St. #306, Glendale, Calif. 91204

Filed Jun. 20, 1994, Ser. No. 262,989

Int. Cl.<sup>6</sup> A61G 7/16

U.S. Cl. 5-618

13 Claims



1. A patient transfer device to facilitate safe and easy patient transfer onto and out of a hospital bed, comprising:

- a seat;
- a backrest and a footrest, each with adjustment means for adjusting and aligning the backrest and footrest horizontally to the surface of the bed to facilitate patient transfer by slidingly drawing the patient onto and out of the bed to the patient transfer device;
- removable armrests attached to the seat and armrest attachment mechanisms mounted on the backrest for attaching the armrests to the backrest, the armrests thereby providing a barrier to secure the patient during transfer between the patient transfer device and the bed;
- a chair frame with a center base mounted on a pair of front wheels and a pair of rear wheels;
- a hydraulic pump with a vertically displacing shaft mounted on the center base, the vertically displacing shaft being rigidly mounted to the underside of the seat of the chair, and the vertically displacing shaft being actuated for vertical elevation of the seat; and
- attachment means for attaching the patient transfer device to the bed.

5,438,723

**COLLAPSIBLE BED AND PANEL HINGE**

Timothy Carroll, London, Canada, assignor to Carroll Equipment Sales Corporation, London, Canada

Continuation-in-part of Ser. No. 903,409, Jun. 24, 1992, Pat. No. 5,257,428. This application Mar. 26, 1993, Ser. No. 38,201

The portion of the term of this patent subsequent to Nov. 2, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A47C 19/00

U.S. Cl. 5-620

20 Claims

1. A knock-down bed separable into three frame components and a head board and a foot board for re-assembly into a packed bed for ease of storage and transport comprising:

- a head section, a foot section and a seat section, each section including a frame;
- means for releasably connecting said head section at an inner

end to one end of said seat section and for releasably connecting said foot section at an inner end to the other end of said seat section;  
 a set of fixed support legs comprising a pair of legs mounted on the frames of each of said head and foot section;  
 a mattress deck comprising a head section panel at the inner end of the head section, a seat section panel overlying the seat section, and articulated foot section panels at the inner end of the foot section;  
 hinge means for pivotally interconnecting said head section panel, seat section panel and foot section panels, said hinge means comprising a generally cylindrical bar secured along an edge of an end of each panel by a plurality of equispaced panel extensions defining narrow slots therebetween proximate the panel edge, said bar having a flat face adjacent the edge at each slot and having a diametrically opposed flat face along the opposite side of the bar, and a plurality of equispaced, arcuate extensions alternating from opposite sides of an opposed end of another panel



adapted to mate with and fit into the said slots, adjacent arcuate extensions effectively being opposed to each other and defining a gap therebetween substantially equal to the width of the bar at the diametrically opposed flat faces to allow the opposed extensions to snugly fit over the bar when adjacent panels are positioned at an angle of about 90° to each other and locking the panels together when the angle between the panels is less than about 90°;  
 means mounted on said head section frame for pivotally raising said head section panel;  
 means mounted on said foot section frame for pivotally raising said foot section panel;  
 a head board and a foot board and means for releasably mounting said head board and said foot board respectively at outer ends of the head section and the foot section; and wheels detachably mounted on bottom ends of said fixed legs, whereby upon knock-down of the bed into components the head board and the foot board are securable to the seat section to form a base for receiving the head section and the foot section.

5,438,724

#### METHOD FOR USING PLASTIC FASTENERS FOR SHOE-LASTING APPLICATIONS

F. Gerard Merner, Round Pond, Me., assignor to Avery Dennison Corp., Pasadena, Calif.

Filed Oct. 29, 1992, Ser. No. 968,397

Int. Cl.<sup>6</sup> A43D 9/00

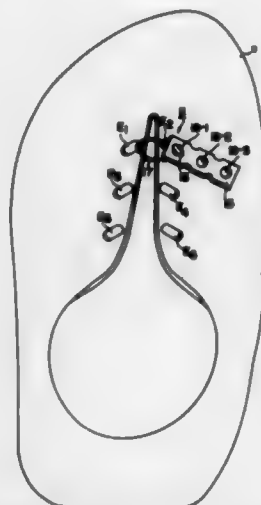
U.S. Cl. 12—142 LC

1 Claim

1. A method for tying together two pairs of shoelace eyelets on a shoe upper in such a way as to maintain the appropriate spacing between each respective pair while the shoe upper is being lasted, the first pair of shoelace eyelets having a different desired spacing than the second pair of shoelace eyelets, said method comprising the steps of:

- providing a pair of identical fasteners, each of said fasteners comprising
  - an elongated flexible filament having a first end and a second end,

- a cross-bar disposed at said first end of said elongated filament, said cross-bar having a pair of ends, and
- a paddle disposed at said second end of said elongated flexible filament, said paddle having two alternative openings through either of which both ends of said cross-bar may be completely inserted to form a loop, said two alternative openings being disposed at different distances from said cross-bar so that a loop appropriate for maintaining the proper spacing between the first pair of shoelace eyelets may be formed using one of said two alternative openings and a loop appropriate for



maintaining the proper spacing between the second pair of shoelace eyelets may be formed using the other of said two alternative shoelace eyelets;

- inserting both ends of said cross-bar of one of said fasteners first through one of said pair of shoelace eyelets on the shoe upper and then through one of said two alternative openings in said paddle to form a first sized loop; and
- inserting both ends of said cross-bar of the other of said fasteners first through the other of said pair of shoelace eyelets on the shoe upper and then through the other of said two alternative openings in said paddle to form a second sized loop.

5,438,725

#### APPARATUS FOR REMOVING EXCESSIVE ADHESIVES FROM FERRULES

Kinjiro Okada; Hiromasa Shiraiishi, both of Tokyo; Hirokazu Yokosawa, Nagano; Shinichi Takehana, Nagano, and Norio Kobayashi, Nagano, all of Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 886,360, May 21, 1992, abandoned. This application Mar. 8, 1994, Ser. No. 207,253

Claims priority, application Japan, May 22, 1991, 3-145247

Int. Cl.<sup>6</sup> A47L 25/00

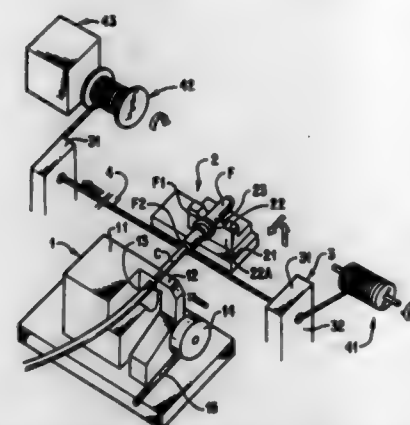
U.S. Cl. 15—97.1

3 Claims

1. Apparatus for removing an excessive liquid adhesive from an elongated ferrule which is attached to an elongated optical cable, said ferrule defining a longitudinal axis and having an elongated cylindrical side face, a front end face, and a rear end face, said apparatus comprising:

- a string member having a longitudinally extending portion lying in a vertical plane;
- a string running unit including a pair of spaced guide posts for supporting said string member therebetween, a take-up reel attached to said string member, and a driving motor coupled with said take-up reel for moving said string member between said guide posts; and
- a holder device consisting of a holding unit and a positioning unit provided on opposite sides of said plane, said holding unit including a pair of clamp members for

holding said optical cable in a horizontal position so that said optical cable is superimposed on said string member, and said positioning unit supporting said ferrule such that said longitudinal axis thereof is held horizontally and said



positioning unit being vertically and horizontally movable to position a bottom portion of said rear end face of said ferrule in contact with said string member so that any excessive adhesive liquid thereon adheres to said string member and is removed from said rear end face as said string member is moved.

5,438,726

#### TOOTH CLEANING SYSTEM WITH TIMER AND SIGNALING MEANS

Francisca P. Leite, 1558 E. 19th St., Brooklyn, N.Y. 11230

Filed May 9, 1994, Ser. No. 239,377

Int. Cl.<sup>6</sup> A46B 9/04

U.S. Cl. 15—105

3 Claims



1. A tooth cleaning system with timer and signaling means comprising:

- a handle having a top end with an interchangeable attachment means contained therein, a middle of said handle including a display screen which both displays and counts down a predetermined time period, an on/off reset button, a speaker, and a vibrating means, and a bottom end with an interchangeable attachment means contained therein, said handle having an ergonomically designed gripping means conforming to a user's hand;
- a plurality of interchangeable periodontal devices each with a complimentary interchangeable engagement part for releasable attachment to the attachment means at either the top or bottom end of said handle, said periodontal devices including a toothbrush head, a tongue scraper,

concave-shaped toothbrush head, compact toothbrush head, pick, dental floss apparatus having a roll of dental floss with cutter, and rubber headed gum massager so that said user can select any two devices at any one time to mount on the top and bottom ends of said handle; and

- electronic means within said handle operatively connecting together the display screen, on/off reset button, speaker and vibrating means such that it functions as a timing, signalling and signalling activation means for said on/off reset button to set a preselected period of time at the end of which according to the selection by the user the screen will display the expiration of the time, the speaker will emit an audio signal, and said vibrating means will vibrate in said handle to alert said user.

5,438,727

#### WRINGABLE FLAT-SURFACE SPONGE MOP

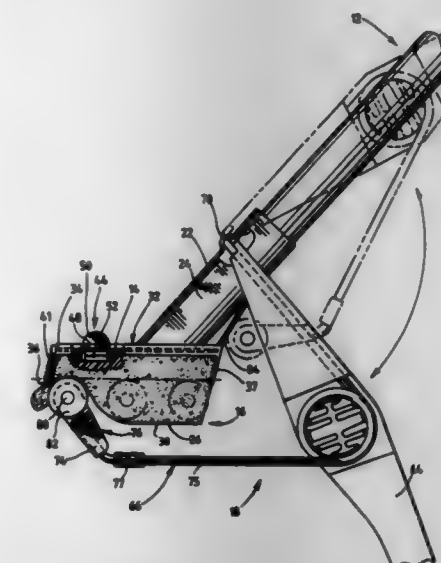
Paul B. Specht, Wilmette, Ill., assignor to M. B. Walton, Inc., Del.

Filed Jan. 10, 1994, Ser. No. 179,095

Int. Cl.<sup>6</sup> A47L 13/26

U.S. Cl. 15—119.2

3 Claims



1. A self-wringable mop for mopping substantially-flat surfaces comprising:

- an elongated handle having a longitudinal axis;
- a support assembly for a cleaning element secured adjacent one extremity of said elongated handle, and having a generally-planar surface disposed at an angle to said longitudinal axis for supporting a cleaning element;
- a compressible absorbent cleaning element having
  - a first surface substantially registering with and detachably secured to said generally-planar surface of said support assembly, and
  - a substantially-flat second surface spaced from said first surface and exposed and oriented with respect to the handle so that substantially the full area of said substantially-flat second surface is contactable with substantially-flat surfaces to be mopped, peripheral portions of said second surface extending beyond corresponding peripheral portions of said support assembly whereby said peripheral portions of said second surface facilitate mopping-action on surfaces immediately adjacent upstanding articles while inhibiting potentially-damaging contact of said support assembly therewith and cushioning such contact should it occur; and
- a hand actuated wringing assembly comprising
  - a lever mechanism pivotally secured to said elongated handle adjacent said one extremity of said elongated



handle and having a hand grip disposed relative to said longitudinal axis for limited pivotal rotation of the lever mechanism in relation to said elongated handle, and

(ii) a single roller unit operably secured to said lever mechanism and disposed so that upon pivotal actuation of said lever mechanism by limited pivotal rotation of said hand grip the roller unit rolls over said substantially-flat second surface and progressively compresses said cleaning element against said generally-planar surface of the support assembly, thereby progressively wringing absorbed fluids from said cleaning element, said wringing assembly being disposed relative to said elongated handle so that when in an at-rest position it does not interfere either functionally or visually with normal mopping operation;

said support assembly being metallic and said first surface of said compressible absorbent cleaning element including a plastic mounting plate secured thereto and having integrally-molded edge portions overlying edge portions of the metallic support assembly for shielding the edge portions of said support assembly from direct contact with upstanding articles when mopping surfaces immediately adjacent thereto.

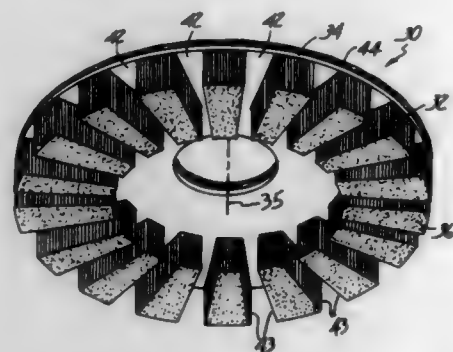
5,438,728

**ROTARY BRUSH WITH SEGMENTED FIBER SECTIONS**  
Michael J. Kuben, Maplewood; Lawrence J. Mann, Lake; Elmo, both of Minn., and Jonathan E. Noble, Cambridge, Iowa, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 18, 1994, Ser. No. 210,589  
Int. Cl.<sup>6</sup> A46B 1/00, 7/08, 9/02

U.S. Cl. 15—180

17 Claims



1. A rotary brush assembly for use with a surface treatment machine for treating a surface, the rotary brush comprising:

a circular disk with a central rotary axis, the disk having a generally flat first side and a second side;

a plurality of elongated fibers, the fibers individually attached to the first side of the disk, the fibers generally closely spaced and parallel to one another and having unattached ends which collectively define a generally planar treatment surface adjacent and generally parallel to the first side of the disk, the closely spaced and parallel arrangement of the fibers causing the fibers to resist bending and causing the unattached ends of the fibers to remain in contact with the surface to be treated, the fibers arranged to define a plurality of spaced apart segments on the generally planar treatment surface wherein each segment is wedge-shaped and has a periphery which, in part, includes at least two edges radially aligned for encountering recessed areas in a surface to be treated.

5,438,729

**APPARATUS FOR CLEANING AIR DUCTS**

Samuel O. Powell, 1115 Oak Hill Ave., Hagerstown, Md. 21740

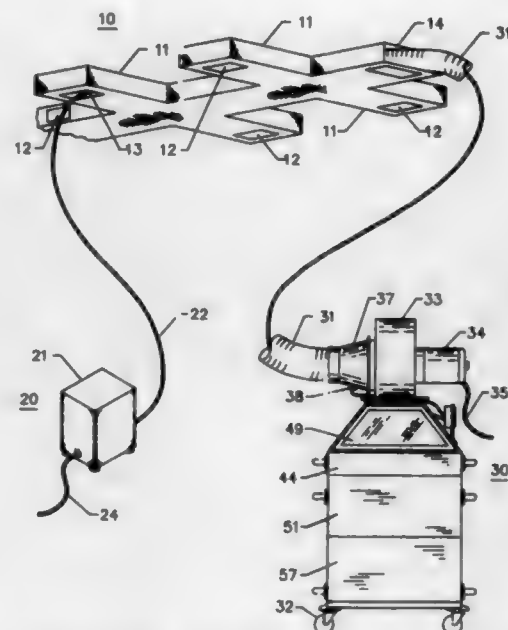
Continuation of Ser. No. 997,037, Dec. 28, 1992, abandoned.

This application Jul. 1, 1994, Ser. No. 270,790

Int. Cl.<sup>6</sup> F23J 3/02

U.S. Cl. 15—304

16 Claims



1. An apparatus for cleaning longitudinally elongated air channeling duct systems, comprising:

- a. a pneumatic agitator subsystem for placement, by an attending person, through a first opening in said duct systems, comprising:
  - a continuing supply of compressed air for driving said pneumatic agitator subsystem;
  - a whipping agitator communicating with said supply of compressed air through a snaking fluid conduit for longitudinal movement within the interior cavity of a duct of said air channeling duct systems, said agitator comprising means responsive to said compressed air supply to cause said agitator to undergo whipping action resulting in continuing automatic violent impact striking responsive to automatic flow of said compressed air randomly directed between said agitator and interior surfaces of said duct to dislodge adhering matter from said interior duct surfaces and suspend particles of said matter in contaminated air within said interior duct cavity;
- b. a vacuum cleaning subsystem for placement external to said duct systems for withdrawing said particles of dislodged matter in said contaminated air from said interior duct cavity through a sealed second opening into said duct systems, said vacuum subsystem comprising:
  - a continually operative vacuum fan;
  - a vacuum hose of appropriate diameter and length interposed between said vacuum fan and said second sealed opening into said interior duct cavity, said second opening is remotely removed from said first opening into said air channeling duct systems, said vacuum hose for conveying said particles in contaminated air from said duct systems to said cleaning subsystem; and
- c. a filtration subsystem communicating with said cleaning subsystem for recovery of said particles and air contaminants prior to discharge of filtered residual air into the local ambient environment of said air channeling duct systems.

5,438,730

**VALVE HANDLE AND METHOD OF FASTENING SAME TO A VALVE STEM**

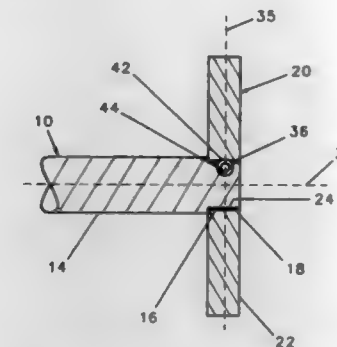
Charles C. Hansen, III, Hinsdale, Ill., assignor to Hansen Technologies Corporation, Burr Ridge, Ill.

Filed Aug. 16, 1993, Ser. No. 106,619

Int. Cl.<sup>6</sup> A47B 95/02

U.S. Cl. 16—114 R

1 Claim



1. A method of attaching a handle to a valve stem having a distal end with a polygon shape cross section and having a plurality of edges comprising the steps of:

- providing a handle with a first transverse aperture having a polygon shape including a plurality of flats and a plurality of edges at the joinder of respective pairs of said flats, complementary to a polygon defining a distal end of a valve stem for slidably receiving same therein, said transverse aperture having a principal axis,
- forming a second aperture through said handle, said second hole having an axis in a plane substantially perpendicular to said principal axis and said second aperture opening upon a portion of said transverse aperture defining an edge at a joinder of a pair of said plurality of flats,
- fitting said handle over a valve stem with a polygon shaped distal end fitted into said transverse aperture, and
- inserting a pin in said second aperture and with sufficient force to deform a portion of said one of said edges of said polygon shape distal end of said valve stem for retaining said handle on said stem.

5,438,731

**CART AND LUGGAGE HANDLE ASSEMBLY WITH AN ACTUATOR AND RELEASE APPARATUS**

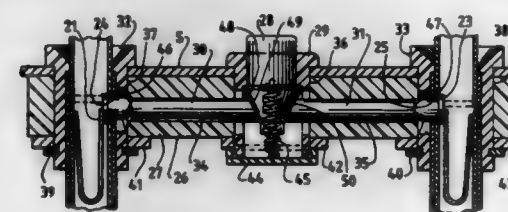
Eugene A. Kazmark, Jr., Joliet, Ill., assignor to Remin Laboratories, Inc., Joliet, Ill.

Continuation of Ser. No. 67,552, May 26, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 344,525

Int. Cl.<sup>6</sup> B25G 1/04

U.S. Cl. 16—115

14 Claims



1. A handle assembly for wheeled carts or luggage, said assembly comprising:

- (a) first and second tubes, the first tube extending into the second tube in telescoping relation with the second tube;
- (b) latching means disposed in one of the tubes for locking the first in a predetermined position relative to the second tube;
- (c) actuating means disposed a predetermined distance outwardly of the first and second tubes for unlatching the

latching means to allow sliding movement between the first and second tubes; and

(d) linking means disposed generally perpendicularly to the tubes between the actuating means and the tubes for reciprocating, sliding movement and for transmitting an unlatching force from the actuating means to the latching means;

the latching means and the linking means being separate members, the linking means being moveable in a generally perpendicular direction to the longitudinal axes of the first and second tubes, and the actuating means driving the linking means towards the latching means without pulling the linking means in the opposite direction.

5,438,732

**HINGE JOINT FOR THE SEATS OF VEHICLES AND THE LIKE**

Bernd Engels, Remscheid; Jans-Jürgen Funken, Wuppertal, and Hans-Gerd Hackländer, Remscheid, all of Germany, assignors to Keiper Recaro GmbH & Co., Remscheid, Germany

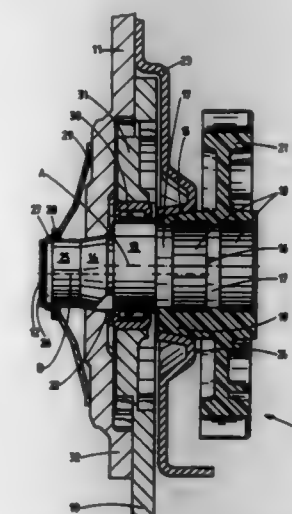
Filed Jul. 29, 1993, Ser. No. 99,720

Claims priority, application Germany, Aug. 24, 1992, 42 28 054.0

Int. Cl.<sup>6</sup> E05D 11/08, 11/10; B60N 2/22

U.S. Cl. 16—325

14 Claims



1. A hinge joint, particularly for changing the mutual positions of two portions of a seat, comprising first and second components; means for pivotally connecting said components with each other, including a cylindrical first portion journaled in said first component and first and second conical portions journaled in said second component, said cylindrical first portion having a first axis and said conical portions having axes parallel to said first axis, said connecting means having a metallic core and at least one of said conical portions having a hollow conical sleeve surrounding said core; and resilient means reacting against one of said components to bias said connecting means in the direction of said axes.

5,438,733

**COTTON DRAFTING FRAME**

Paul Melcher, Niederflachbach, and Jörg Hummel, Ebersbach-Fla, both of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Germany

Filed Dec. 8, 1992, Ser. No. 987,148

Claims priority, application Germany, Dec. 12, 1991, 41 40 984.1; Sep. 26, 1992, 42 32 302.9

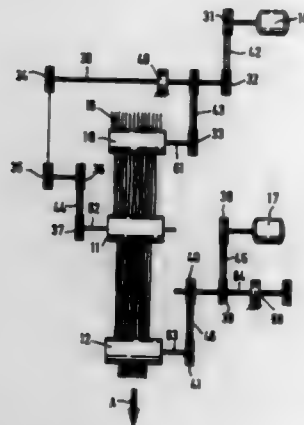
Int. Cl.<sup>6</sup> D01H 5/18

U.S. Cl. 19—293

21 Claims

1. A drafting frame for drafting sliver passing through the drafting frame in a direction of advance, comprising

- (a) first and second drafting roll pairs being spaced from one another consecutively in said direction of advance and each being formed of two cooperating drafting rolls; one drafting roll in each said drafting roll pair being a driven roll;
- (b) first and second drive motors;
- (c) first torque transmitting means connected to said first drive motor and to the driven roll of said first drafting roll pair for driving said first drafting roll pair in a forward sense for feeding said sliver in said direction of advance;
- (d) second torque transmitting means connected to said second drive motor and to the driven roll of said second



- drafting roll pair for driving said second drafting roll pair in a forward sense for feeding said sliver in said direction of advance;
- (e) electronic regulating means for regulating an rpm of at least one of said first and second drive motors for equalizing irregularities of the sliver;
- (f) first freewheel means for preventing a rotation of said first drafting roll pair in a reverse sense; said reverse sense being opposite to said forward sense; and
- (g) second freewheel means for preventing a rotation of said second drafting roll pair in a reverse sense; said reverse sense being opposite to said forward sense.

5,438,734

# BELT AND BUCKLE COMBINATION INCLUDING DUAL RING FASTENER

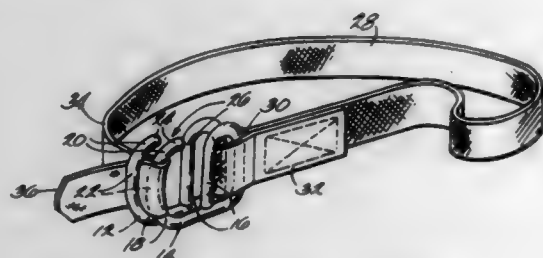
James R. Anderson, Menominee, Mich., assignor to Evergreen Tool Company, Inc., Menominee, Mich.

Filed Apr. 28, 1994, Ser. No. 234,872

Int. Cl.<sup>6</sup> A44B 11/18

U.S. Cl. 24—170

17 Claims



1. A belt and buckle combination comprising a buckle including a pair of G-shaped rings, each of said rings including a closed ring portion, and an open ring portion, said open ring portion being semiannular to provide an opening therein, and
- a flexible belt including a first end section, said first end section forming a closed loop extending through said closed ring portions of said rings so that said rings are inseparable from said closed loop, and a second end section having a free end, said free end being threadable

through said open ring portions of said rings so that when said second end section is pulled said belt is tightened, and said second end section thereafter being slidable through at least one of said openings in said open ring portions of said rings so that said second end section is separable from said rings without drawing said free end back through said open ring portion of both of said rings.

5,438,735

# SLOT AND TONGUE S-CONNECTOR FOR ALIGNING AND CLAMPING A SERIES OF TUBES IN PARALLEL

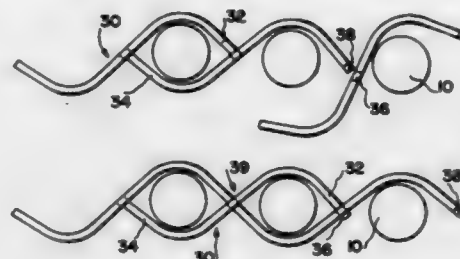
Edward E. Gayhart, Jr., North Canton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 26, 1993, Ser. No. 112,168

Int. Cl.<sup>6</sup> A44B 21/00

U.S. Cl. 24—335

2 Claims



1. A connector for use in series for aligning and clamping a series of tubes, the connector comprising:
- a member having a first recess near one end and a second recess near an opposite end, the first recess being located on one side of the member and the second recess being located on an opposite side of the member, the member also having a slot between the first recess and the second recess, the first recess for receiving one tube and the second recess for receiving another tube; and
- a tongue on at least one end of the member, the tongue being engageable with the slot of an adjacent identical connector.

5,438,736

# SWIVEL HOOK

Yasuhiro Terada, Uozu; Tsuneo Suzuki, Kurobe; Hideyuki Matsushima; Yoshiyuki Horita, both of Toyama, and Hiroaki Izumi, Kurobe, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

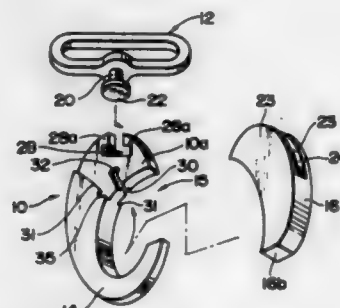
Filed Apr. 29, 1994, Ser. No. 235,344

Claims priority, application Japan, Apr. 30, 1993, 5-028600 U; Aug. 26, 1993, 5-051135 U

Int. Cl.<sup>6</sup> A44B 13/00

U.S. Cl. 24—599.8

4 Claims



1. A swivel hook comprising:
- a hook body including a proximal part having an aperture formed at its upper end to define a pair of overhangs and a substantially J-shaped hook portion extending downward from the proximal part,

- a connecting ring having an connecting axle provided on one side thereof, the connecting axle having an enlarged head formed on its distal end, the enlarged head being inserted into the aperture into engagement with the overhangs;
- a locking member having a pair of opposing side walls to define therebetween a chamber; and
- biasing means mounted in the chamber;
- the proximal part of the hook body being pivotally mounted on the locking member within the chamber with the aperture closed by the opposing side walls and with the biasing means acting between the proximal part and the locking member for normally urging the locking member into engagement with the J-shaped hook portion.

5,438,738

# THEFT-DETERRENT DEVICE FOR ATTACHMENT TO THEFT-ATTRACTIVE ARTICLES

Klas Stolz, Majgårdsvägen, and Bo Gustavsson, Gökivägen, both of Sweden, assignors to Färghälsan Svenska AB, Huddinge, Sweden

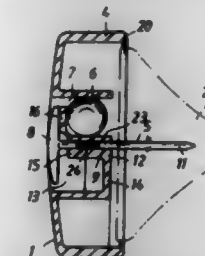
Filed Jul. 13, 1994, Ser. No. 274,268

Claims priority, application Sweden, May 9, 1994, 94016045

Int. Cl.<sup>6</sup> F16B 21/00; E05B 65/00

U.S. Cl. 24—704.1

20 Claims



1. A theft-deterrent device which is intended for attachment to theft-attractive articles and including
- a first element (1) which comprises a base element (4) and an elongated connecting unit (5) which projects out from said base element and which is intended for insertion through the article (3) to be protected, and
- a second element (2) which can be attached to and locked on said connecting unit (5) against movement away from the base element (4),
- said first element (1) further comprises at least one fragile marking substance container (6) which is intended to be broken, crushed or destroyed in some other way when the connecting unit (5) is manipulated, such as to release the marking substance from the container (6), characterized in that the base element (4) is a one-piece structure; in that the base element (4) includes a recess (7) having an opening through which the container (6) can be inserted into the recess (7); and
- in that the connecting unit (5) is insertably arranged in the base element (4) and constructed to hold and fix the marking substance container (6) in the recess (7) and to directly or indirectly break, crush or destroy in some other way the container (6) when the connecting unit (5) is forcibly manipulated.

5,438,739

# METHOD OF MAKING AN ELONGATED INK JET PRINTHEAD

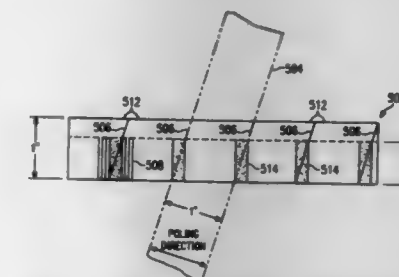
Daniel B. Granzow, Spring, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed May 25, 1993, Ser. No. 66,906

Int. Cl.<sup>6</sup> H01L 41/22

U.S. Cl. 29—25.35

20 Claims



1. A buckle assembly configured for one-handed release by an operator thereof, the buckle assembly comprising:
- a pair of clasps, each having a flexible release tab; and
- a main buckle including a hollow body with two sidewalls, an opening for jointly receiving said clasps, and a locking slot extending through each sidewall for providing access to the release tabs;
- each flexible release tab snaps into the respective locking slot to engage the sidewall upon full insertion of the clasp, and the locking slots are positioned on the main buckle so that the flexible release tabs are adapted for pressure contact by two fingers of one hand wherein simultaneous depression of said release tabs biases said pair of clasps into contact with each other so that said pair of clasps is propelled outwardly of the opening together with increased spring-release action.

1. A method of forming a printhead using a bar of piezoelectric material having a substantially planar face and a predetermined width, comprising:
- forming sheets of polarized piezoelectric material;
- joining edges of said sheets to form an elongated sheet, the



joined edges being aligned in parallel and forming a non-perpendicular angle with said planar face; and forming channels in said joined sheets for receiving ink, such that ones of said joined edges are traversed by two or more channels.

5,438,740

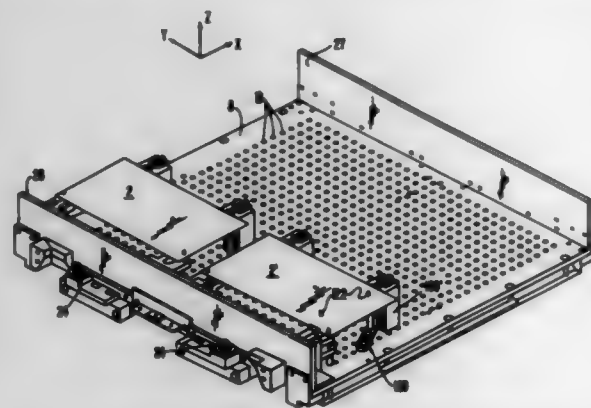
# RECONFIGURABLE FIXTURING PALLET FOR REGISTERING AND SUPPORTING MULTI-BOARD PANELS ON THE TABLE OF A PROGRAMMABLE ROUTING MACHINE

D. Patrick Carr, Longmont, and Kurt J. Hill, Berthoud, both of Colo., assignors to Cencorp, Inc., Longmont, Colo.  
Filed Feb. 28, 1994, Ser. No. 202,976

Int. Cl.<sup>6</sup> B23Q 7/14; B25B 5/00

U.S. Cl. 29—33 P

23 Claims



1. In a fixture having means for registering said fixture to a programmable machine and means for registering and supporting at least one mother panel of substrate material on said fixture for at least partial removal of at least one circuit board from said panel, said removal being performed by a router bit mounted on a spindle of said machine, and said spindle being moveable in X, Y, and Z relative to said panel along a routing path according to a program, the improvement comprising:

- a platform, said platform having a surface with an array of perforations therein;
- said mother panel to fixture registering and supporting means comprising tooling means, adjustably repositionable over a surface of said platform, for reconfiguring said fixture to various different mother panels requiring correspondingly different programs and routing paths, said tooling means comprising at least one tool post means for supporting said panel in parallel, spaced relation to said platform surface;
- connecting means, receivable into said perforations, for connecting said tool post means selectively at different locations on said surface of said platform according to requirements for each panel to be processed; and
- said tool post means comprising a linear way having means for registering said linear way to said platforms, and at least one sliding tool post which is mountable on and slidably repositionable along said linear way.

5,438,741

# TIE ROD MOUNTING/DETACHING DEVICE

Ching L. Ni, No. 86, Tien Mei, 5 Lin, Tien Mei Tsun, Nan Chuang Hsiang, Miaoli Hsien, Taiwan  
Filed Dec. 22, 1993, Ser. No. 173,772

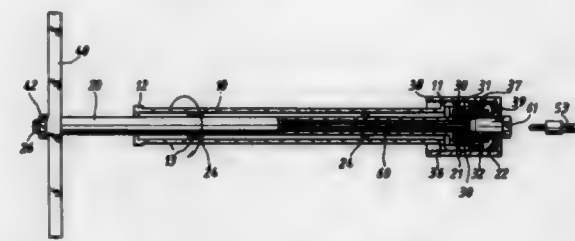
Int. Cl.<sup>6</sup> B23P 19/04

U.S. Cl. 29—240

6 Claims

1. A device for mounting/detaching a tie rod of a vehicle steering arrangement, the device comprising: an outer tube having a first end with a threaded outer periphery and a second end; an inner tube rotatably received in the outer tube and having a first end partially received in the first end of the outer

tube and a second end extending beyond the second end of the outer tube, a chuck being received in the first end of the inner tube for releasably holding an end of a tie rod; a sleeve mounted around the first end of the outer tube and including an actuating member in one end thereof for effecting opening and closing of the chuck and an inner periphery having a threaded section which engages with the threaded first end of the outer tube, such that when the outer tube rotates, the sleeve moves on the threaded first end of the outer tube along an axial direction of the outer tube to move the chuck between a first position of an opened status and a second position of a closed status; and an operative member securely attached to the second end of the inner tube for rotating the inner tube;



wherein the first end of the inner tube has a plurality of protrusions projecting inwardly from an inner periphery thereof, the chuck includes a relatively smaller end and a relatively larger end and has a plurality of circumferentially spaced guiding grooves formed in an outer periphery thereof and extending from the relatively smaller end to the relatively larger end for engaging with the protrusions on the inner periphery of the first end of the inner tube, the relatively larger end includes a plurality of circumferentially spaced longitudinal slits formed therein and a rough inner peripheral surface for securely holding the end of the tie rod.

5,438,742

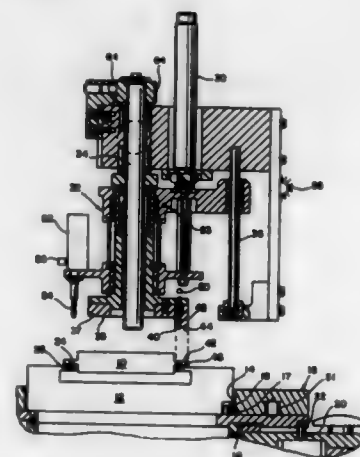
# APPARATUS FOR SETTING BLIND RIVETS

Eymard J. Chitty, Norwalk, and Peter Diederich, Southbury, both of Conn., assignors to Emhart Inc., Newark, Del.  
Continuation of Ser. No. 694,955, Apr. 30, 1991, abandoned.  
This application Apr. 30, 1992, Ser. No. 876,456

Int. Cl.<sup>6</sup> B23P 11/00, 19/04

U.S. Cl. 29—243.54

3 Claims



1. Apparatus for setting blind rivets to fasten a laminate made up of an upper component and a lower component, with the component having holes which are to be coaxial so that a rivet can be passed therethrough prior to setting comprising vertically displaceable rivet setting tool means, nest means supported for rotation about a vertical axis for

supporting the lower component of the laminate at a predetermined orientation, clamping means rotatable about a vertical axis and vertically displaceable from an elevated position to a lowered position engaging the top of the upper component, means for preventing the engagement of said clamping means and the top of the upper component unless said clamping means has a selected orientation relative to the upper component, means for verifying that a hole in the upper component is vertically coaxial with a hole in the lower component, signalling means for indicating operation of said verifying means, means for operating said clamping means to clamp the components together in said nest means when said clamp means is in engagement with the top of said upper components and after said verifying means verifies that said holes of said upper and lower components are in alignment, and said clamping means being selectively indexable to locate each of said aligned holes in the upper and lower components to a setting location where the component parts can be fastened together by said rivet setting tool.

5,438,743

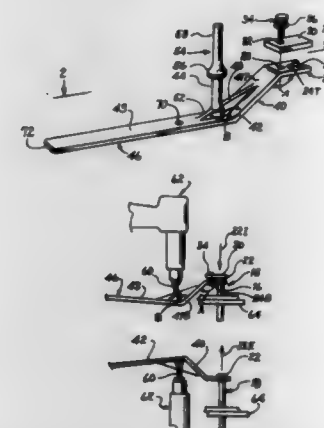
# APPARATUS FOR EXTRACTING AND INSTALLING A HINGE PIN

Rusty Simington, 8157 E. Susan Cir., Prescott, Ariz. 85314, and William Chilson, 670 Daniel Dr., Prescott, Ariz. 85301  
Filed Jan. 3, 1994, Ser. No. 176,836

Int. Cl.<sup>6</sup> B23P 19/04; B25B 27/02

U.S. Cl. 29—275

8 Claims



1. An accessory for an air hammer, comprising: a flat metal bar having a slot at its distal end, said slot having a width substantially equal to a width of a pin that is alternatively installed and extracted from a hinge; a force transfer bar having one end integrally connected to the proximal end of said flat metal bar, with bottom surfaces of said force transfer bar and said flat metal bar subtending a first obtuse angle; a lever bar with its proximal end integrally connected to the other end of said force transfer bar with top surfaces of said lever bar and said force transfer bar subtending a second obtuse angle; an anvil connected to said lever bar for insertion into a percussion sleeve of said air hammer; a first support plate coupled between said force transfer bar, said lever bar, and a portion of a member for maintaining a fixed connection of said member to said lever bar; and a second support plate coupled between said portion of said member and said lever bar for maintaining a fixed connection of said member to said lever bar.

5,438,744

# AUTOMATIC FINISHING METHOD FOR AIRTIGHT AND WATERPROOF SLIDE FASTENER

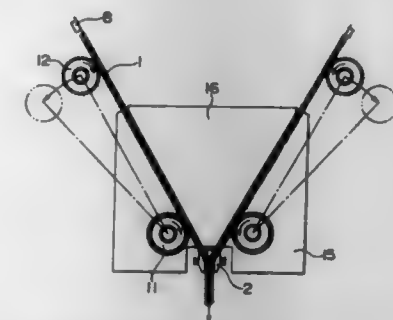
Yoichi Horikawa, and Tsutomu Hakoi, both of Toyama, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan  
Filed Aug. 31, 1993, Ser. No. 113,901

Claims priority, application Japan, Aug. 31, 1992, 4-273348

Int. Cl.<sup>6</sup> B21D 53/50

U.S. Cl. 29—408

5 Claims



1. An automatic finishing method for an airtight and waterproof slide fastener, comprising the steps of:

- (a) supplying each of a pair of slide fastener chains, which has coupling elements attached to a waterproof fastener tape by clamp elements, by a pair of toothed supply rollers meshing with the clamp elements of the respective slide fastener chain; and
- (b) threading the slide fastener chains through a slider situated on a travelling path of the slide fastener chains for interengaging the slide fastener chains and then discharging the interengaged slide fastener chains from the slider.

5,438,745

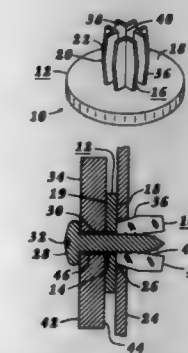
# METHOD OF INSTALLING A VEHICLE WINDOW UTILIZING A REUSEABLE ATTACHMENT MEMBER

Charles E. Cox, 1016 Superior St., Lot 6, Fort Myers, Fla. 33916  
Continuation-in-part of Ser. No. 819,078, Jan. 10, 1992, Pat. No. 5,341,599. This application May 9, 1994, Ser. No. 239,958

Int. Cl.<sup>6</sup> B23P 11/02

U.S. Cl. 29—525.1

8 Claims



1. A method of attaching an automobile window glass having an aperture penetrating therethrough, to a window regulator, the window regulator adaptable for raising and lowering the automobile window glass, the window regulator having an attachment side, a securing side and an aperture penetrating from the attachment side to the securing side, the method comprising:

- a) providing an attachment member, being of a one piece construction and being reusable, the attachment member comprising:
  - 1) an end member, the end member having a first side, a second side and an aperture penetrating from the first side to the second side;
  - 2) a plurality of prongs extending from the second side of

the end member, each prong having a pair of intersecting surfaces forming a contact edge, each of the intersecting surfaces having a contact surface, the prongs positioned in a circumferentially spaced pattern around the aperture of the end member, the contact edge of each prong overlying the aperture of the end member;

- b) inserting the prongs of the attachment member into the aperture of the automobile window glass until the second side of the end member of the attachment member comes into contact with the automobile window glass;
- c) positioning the first side of the end member of the attachment member in contact with the attachment side of the window regulator, the aperture of the window regulator aligned with the aperture of the attachment member;
- d) inserting a screw having threads, such insertion utilizing rotation means, through the aperture of the window regulator, the insertion from the securing side of the window regulator, through the aperture of the attachment member, the threads of the screw in contact with the contact edge of each prong, the insertion of the screw causing the prongs to radially extend outward from the aperture of the end member of the attachment member to bring each contact surface of each prong into contact with the automobile window glass, the prongs overlying the glass to securely clamp the automobile window glass to the window regulator.

5,438,746

**NEEDLE THREADING AND SWAGING SYSTEM**

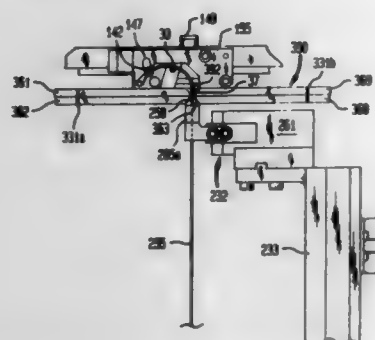
David Demarest, Parsippany; Robert B. Duncan, Bridgewater, and John F. Blanch, Tinton Falls, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jan. 13, 1994, Ser. No. 181,598

Int. Cl. B23P 23/00; B21G 1/02

U.S. Cl. 29—564.6

97 Claims



1. A needle threading and swaging apparatus for attaching a suture to a surgical needle having a suture receiving opening formed therein, said apparatus comprising:

- (a) a first means located at a first location for sorting a plurality of needles and orienting each needle for automatic handling at a first predetermined location;
- (b) a second means located at a second predetermined location for automatically cutting an indefinite length of suture material to a definite length and automatically inserting said suture into said suture receiving opening formed in said needle;
- (c) a third means for swaging said needle to close said suture receiving opening about a free end of said suture to secure said suture thereto and form therefrom a needle and suture assembly; and
- (d) indexing means for receiving each individual needle in a predetermined orientation at said first predetermined location and conveying said needle for sequential processing from said first to said second predetermined locations, said indexing means including multi-axis gripper means for retaining said needle in said predetermined orientation, and said multi-axis gripper means being movable between a

first retracted position and a second extended position with respect to said indexing means, whereby unsorted needles and an indefinite length of suture material are automatically formed into a plurality of oriented needle and suture assemblies.

5,438,747

**METHOD OF MAKING A THIN FILM MERGED MR HEAD WITH ALIGNED POLE TIPS**

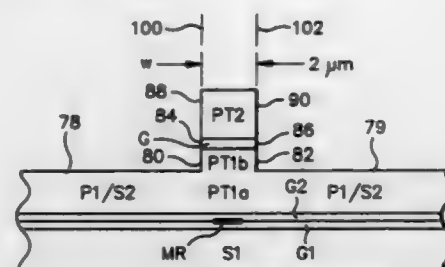
Mohamad T. Krounbi; Jyh-Shuey J. Lo, both of San Jose; Ching H. Tsang, Sunnyvale, and Robert M. Valletta, Citrus Heights, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 9, 1994, Ser. No. 208,396

Int. Cl. G11B 5/42

U.S. Cl. 29—603

28 Claims



1. A method of making a merged MR head which has a top and a bottom, the top and bottom of the merged MR head being bounded in part by an air bearing surface (ABS), the method comprising the steps of:

- depositing at least one magnetic layer to form a second shield layer S2 of an MR head and a bottom pole piece P1 which extends from an air bearing surface (ABS) to and including a back gap, the bottom pole piece P1 having an undefined pole tip portion which extends between the ABS and a zero throat level;
- depositing another magnetic layer to form a top pole piece P2 above the bottom pole piece P1 from the ABS to and including the back gap, the top pole piece P2 being formed with a defined pole tip element PT2 which extends between the ABS and the zero throat level and which has first and second vertical sidewalls; and
- directing at least one ion beam at the undefined pole tip portion of the bottom pole piece P1 at an angle  $\theta$  to the sidewalls of the defined pole tip element PT2; using the defined pole tip element PT2 as a mask, to vertically notch the bottom pole piece P1 on each side of the pole tip element PT2 to form the bottom pole piece P1 into pole tip elements PT1a and PT1b, the pole tip element PT1b being a pedestal with respect to bottom pole piece P1 and having first and second vertical sidewalls which are aligned with the first and second vertical sidewalls respectively of the pole tip element PT2.

5,438,748

**ENGAGEMENT MEMBER INSERTING TOOL FOR CONNECTOR**

Susumu Matsuzawa, Iwate, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Sep. 1, 1993, Ser. No. 115,002

Claims priority, application Japan, Sep. 3, 1992, 4-062159 U

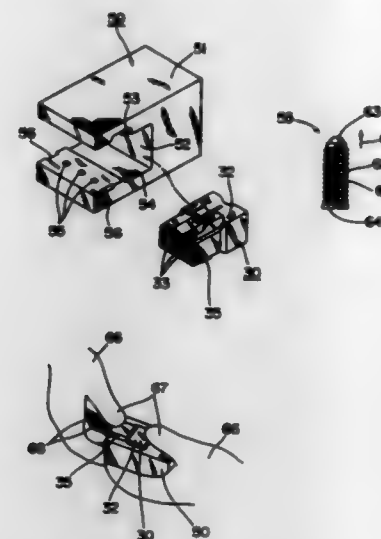
Int. Cl. H01R 43/22

U.S. Cl. 29—752

12 Claims

1. A tool for inserting an engagement member into a housing of a connector, the connector being designed so that the engagement member temporarily engaged with the housing is pushable into the housing to engage the engagement member with a terminal within the housing, thereby to engage the terminal with the housing, said tool comprising:

- a tool body provided with a path in which the housing can slide; and
- a pusher, positioned facing said path of said tool body, for coming into contact with the engagement member temporarily engaged with the housing when said housing is slid through said path, to push the engagement member into



the housing, said pusher retractably protruding into said path; wherein the pusher includes means for elastically urging a portion of said pusher toward the engagement member which is temporarily engaged with the housing passing through said path.

5,438,749

**METHOD OF MAKING A FLEX CIRCUIT INTERCONNECT FOR A MICROPROCESSOR EMULATOR AND A METHOD OF TESTING**

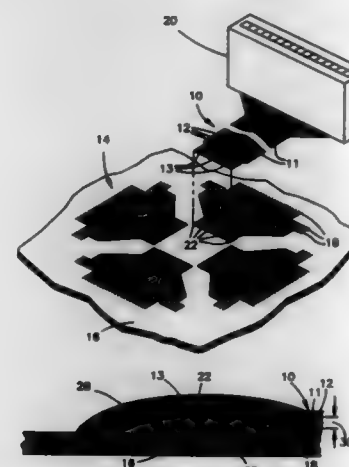
Ronnie J. Runyon, Kokomo, Ind., assignor to Delco Electronics Corp., Kokomo, Ind.

Filed Sep. 2, 1993, Ser. No. 114,861

Int. Cl. H01R 43/00

U.S. Cl. 29—825

13 Claims





encapsulant is applied to said inner surface, characterised in that the method comprises the following steps:

- a) applying a metered amount of said encapsulant to a first part (7) of the inner surface of the bottom (6) of the recess, which first part is surrounded by a raised portion (11), which raised portion (11) itself is surrounded by a second part (8) of said inner surface in such manner that the encapsulant (36) is retained by capillarity by the raised



- portion (11), which is adapted to be spaced over at least a part of its circumference from the cover section (20) when said section is secured to the card base,
- b) arranging the cover section (20) on the card base (1), the encapsulant (36) completely filling a first volume (V<sub>1</sub>) situated between said first part (7) and the cover section (20) and partly filling a second volume (V<sub>2</sub>) situated between said second part (8) and the cover section (20).

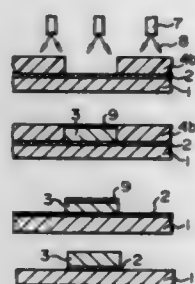
5,438,751

**PROCESS FOR PRODUCING PRINTED WIRING BOARD**  
Masashi Miyazaki, Hadano; Haruo Akahoshi, Hitachi; Shozo Nohara; Kenji Kikuta, both of Hadano, and Toshiaki Ishimaru, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 27, 1993, Ser. No. 112,337  
Claims priority, application Japan, Aug. 28, 1992, 4-229692  
Int. Cl.<sup>6</sup> H05K 3/06

U.S. Cl. 29-847

19 Claims



1. A process for producing a printed wiring board which comprises forming a photoresist film on a substrate, exposing the photoresist film to ultraviolet light, developing the photoresist film with a developer comprising a chlorine-free organic solvent and an alkaline aqueous solution to form a resist pattern, and conducting copper plating using the resist pattern as a plating resist to form a wiring pattern, said photoresist film being made from a copolymer of methacrylic acid as a resist material.

5,438,752

**METHOD OF MAKING DOUBLE-HEAD SIGNAL CONNECTORS FOR USE IN SCSI-II/SCSI-III COMPUTER NETWORKS**

Warren Chang, No. 24, Lane 20, Shuang Chong Road, Hsintien, Taipei Hsien, Taiwan

Filed Aug. 1, 1994, Ser. No. 283,862  
Int. Cl.<sup>6</sup> H01R 43/00

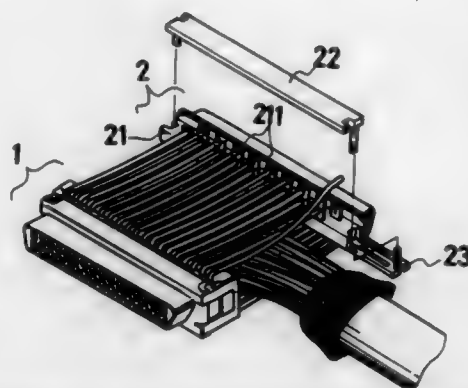
U.S. Cl. 29-857

1 Claim

1. A method of making a double-head signal connector for

use in SCSI-II/SCSI-III computer network, comprising the steps of:

- i) preparing a signal line distribution plate having an elongated center slot longitudinally disposed in the middle and pairs of retaining grooves symmetrically disposed at two opposite ends;
- ii) inserting the leading ends of the pairs of signal lines of a Transmission Data Bus Line through the elongated center slot of said signal line distribution plate from the back, then dividing the signal lines into two rows according to their colors or coded serial numbers, and then turning the two rows of signal lines backwards over the top or bottom side of the signal line distribution plate;
- iii) preparing a holding down plate having serrated portions at the back for holding down the signal lines on said signal line distribution plate, two parallel rows of slots longitudinally aligned, and pairs of retaining rods perpendicularly extended two opposite ends thereof at the back;
- iv) fastening said holding down plate by fitting said retaining rods into said retaining grooves, permitting the signal lines to be retained in place by the serrated portions of said holding down plate;
- v) preparing a female header having two longitudinal rows of slots for receiving the contact pins of a matching signal connector, two rows of contacts with sharp edges respectively extended out of the slots thereof from the back;



- vi) fastening said female header to said holding down plate and said signal line distribution plate by inserting the rows of contacts of said female header into the slots on said holding down plate permitting the sharp edges of the contacts of said female header to pierce the insulators of the signal lines and to make a respective electric contact;
- vii) preparing a male header having parallel rows of contacts with forked tails;
- viii) fastening the leading ends of the signal lines to the forked tails of the contacts of said male header permitting the forked tails of the contact of said male header to pierce the insulators of the signal lines and to make a respective electric contact;
- ix) fastening two fastening plates to said male header permitting the leading ends of the signal lines to be held connected to the contacts of said male header by said fastening plates;
- x) covering a layer of insulative material over the signal lines between said female header and said male header to seal out moisture;
- xi) covering a layer of shielding metal over the layer of insulative material to protect against the interference of external magnetic noises; and
- xii) fastening a cover shell to said female and male header and covering it over the layer of shielding metal permitting the Transmission Data Bus Line to extend out of said cover shell.

5,438,753

**PROCESS AND APPARATUS FOR CUTTING THROUGH A CABLE SHEATHING OF FIBRES**

Jiri Stepan, St. Gallerstrasse 76, CH-7320 Sargans, Czechoslovakia

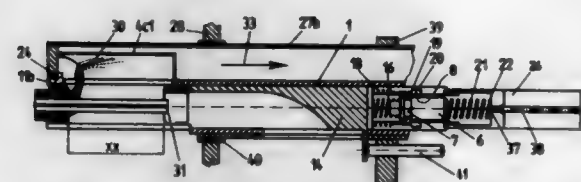
Filed Nov. 12, 1992, Ser. No. 971,188

Claims priority, application Switzerland, Nov. 12, 1991, 3295/91

Int. Cl.<sup>6</sup> H01R 43/00; H02G 1/12

U.S. Cl. 29-868

26 Claims



1. Process for cutting through a cable sheathing of fibres of a fiber optical cable, comprising the steps of: inserting the cable laterally into a lateral orifice of a cutting tool; surrounding the cable with said cutting tool; applying a suction force and an airstream to said fibres; guiding said airstream in order to bring the fibres to a cutting position projecting approximately radially from said cable; guiding said airstream in order to distribute and position the fibres over a part of said cutting tool; and cutting through the fibers by supplying a cutting energy to said cutting tool; wherein the cable is inserted into the cutting tool by the steps of: providing a manipulator with a cable holding device; holding the cable with said cable holding device; and inserting said cable by mechanically moving said manipulator.

5,438,754

**METHOD OF MAKING A VALVE LIFTER FOR ENGINE**  
Kazunaki Mori, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 870,596, Apr. 17, 1992, Pat. No. 5,251,587.

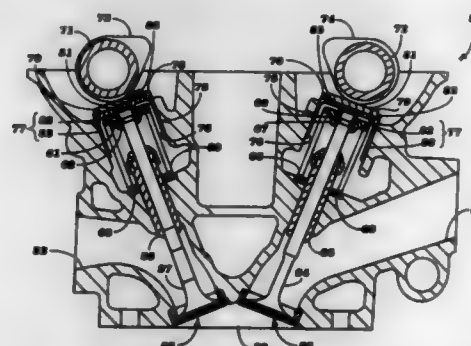
This application Jul. 16, 1993, Ser. No. 92,559

Claims priority, application Japan, Apr. 17, 1991, 3-113991

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29-888.43

8 Claims



1. A method of making a tappet assembly for transmitting motion between an actuating member and a valve stem member in a reciprocating machine, said method comprising the steps of forming a main body element having a cylindrical surface adapted to be supported for reciprocation in a bore of a component of said machine and a transversely extending surface having an opening therein, forming an engaging element having a first portion complementary to said opening and a second portion of larger effective cross sectional area, forming on said engaging element first portion a surface discontinuity, inserting said first portion into said opening of said main

body element with said second portion in engagement with said transversely extending surface and plastically deforming a portion of the main body element into said surface discontinuity of said first portion by forcing said second portion into said transversely extending surface for interlocking said elements to each other.

5,438,755

**METHOD OF MAKING A MONOLITHIC SHROUDED IMPELLER**

Melbourne F. Giberson, 5 Spring Mill Ln., Haverford, Pa. 19041  
Filed Nov. 17, 1993, Ser. No. 153,646

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29-899

7 Claims



1. A method of producing a high strength shrouded impeller from a rough monolithic blank comprising the following steps: (1) turning and boring the rough blank to an impeller profile circular in elevation, with an annular outer surface and a central eye, between which passageways are to extend; (2) using a three dimensional CNC milling machine with end mills, removing as much material as possible from what will be passageways in the impeller, and defining leading and trailing edge zones of vanes, by removing material in direct line of sight from the annular outer surface in a direction toward the eye and from the eye toward the annular outer surface of the impeller; (3) roughly defining passageways and vanes by forming a hole through a central zone of each said passageway; and (4) removing any unwanted remaining material in the passageways by three dimensional planing controlled by said CNC machine.

5,438,756

**METHOD FOR ASSEMBLING A TURBINE FRAME ASSEMBLY**

Kenneth L. Halchak, Wilmington, N.C.; Daniel C. Schwarz, Hamilton, and Martin L. Birmingham, West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 17, 1993, Ser. No. 169,443

Int. Cl.<sup>6</sup> B23P 15/00

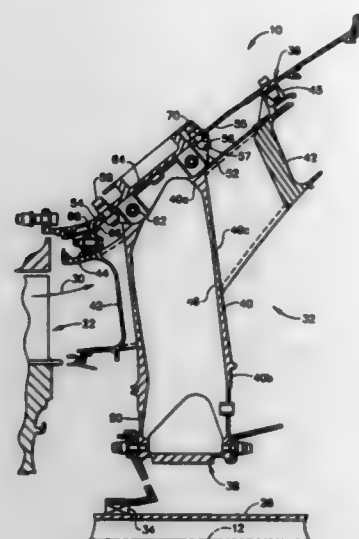
U.S. Cl. 29-899.2

8 Claims

1. A method of assembling a turbine frame assembly comprising:

- a) disposing an outer casing in a generally concentric relationship with an annular inner hub and a plurality of circumferentially spaced apart and radially extending struts attached to said hub;
- b) inserting a least one cam alignment tool through one of a plurality of mount holes in said outer casing and into a corresponding one of a plurality of mount holes in a base of a clevis attached to an outer end of a first one of said struts;
- c) rotating said cam alignment tool to cam said first one of said struts relative to said casing to align said plurality of

casing mount holes with said plurality of clevis base mount holes;



- d) fastening said clevis base to said outer casing; and  
e) removing said cam alignment tool.

5,438,757

## MULTIFUNCTION CUTTING TOOL

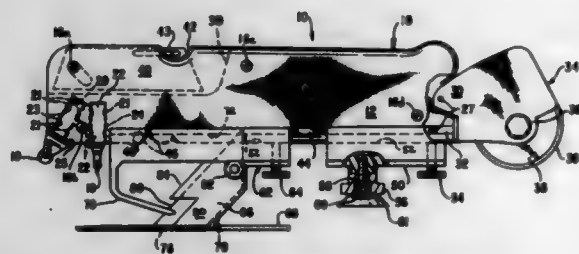
Sonja Weachenfelder, Stettiner Str. 7, 76694 Forst, Germany

Filed Sep. 22, 1994, Ser. No. 310,518

Int. Cl.<sup>6</sup> B26B 11/00, 27/00; C03B 33/12

U.S. Cl. 30-139

4 Claims



1. A multifunction cutting handtool comprising:  
a generally oblong handle having a front and a back end located on opposite ends of the long axis and an upper and a lower portion located on opposite sides of the short axis; said handle having two opposed halves joined along a centerline plane passing through said long and short axes and fastened together by removable machine screws passing therethrough;  
a generally trapezoidal cutting blade having a mounting slot defined near one end and a sharp edge along one side, said blade mounted rotatably in said handle by a removable machine screw passing through said handle halves and said mounting slot, said blade fitting in a retracted position within a recess formed along said upper portion of said handle between said halves and rotatably extendable forward of said handle for use as a cutting tool;  
said handle having an access cavity defined in said upper portion permitting said blade to be grasped for rotation; said blade having a slot defined therein aligned with said access cavity;  
a first mounting bracket having a glass cutter blade rotatably mounted on a first end and sized on a second end to resiliently snap fit into a first recess formed in the front end of said handle with said glass cutter blade aligned parallel with said handle centerline plane;  
a second recess on said lower portion of said handle for receiving said first mounting bracket with said glass cutter

- blade aligned perpendicular to said handle centerline plane;  
said mounting bracket having laterally extending shoulders sized to abut against said handle;  
a pair of rotatable tangential sharpening wheels mounted along said lower portion of said handle;  
a second mounting bracket having a rotatable cutting blade mounted on a first end and having first and second arms defined in a second end sized to resiliently snap fit into orifices defined in the back end of said handle;  
said arms having indentations defined in the lateral sides to resiliently receive protrusions formed in the walls of said orifices;  
said handle having guide slots defined along the lower portion of each of said opposed halves for slidably receiving the upper portion of open channel shaped carriages;  
a first carriage slidably receivable in said guide slots having a set screw for fixably attaching said first carriage to said handle and a bracket rotatably mounted to said first carriage on a first end and having a suction cup attached to a second end;  
said suction cup having a cylindrical top member sized to snap fit into an orifice formed in said first carriage bracket second end;  
a second carriage slidably receivable in said guide slots having a set screw for fixably attaching said second carriage to said handle, a crosspiece angled forward and down from said second carriage to a flat foot extending parallel to said handle lower portion and a guide arm extending down from said second carriage toward said foot;  
a generally trapezoid carpet blade mounted in said crosspiece with a cutting edge extending forward of said crosspiece from said second carriage to said foot; and  
a blade guard extending forward of said carpet blade from said carriage to a position near said foot.

5,438,758

## HEATED KNIFE

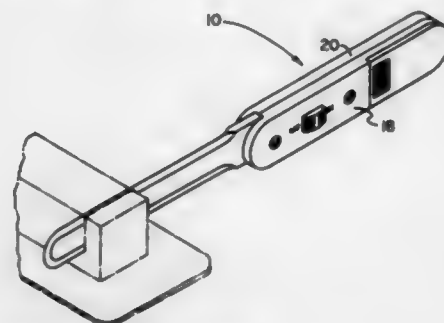
Jenny V. Roth-White, 78 Lancaster Drive, Broadstone, Dorset, United Kingdom BH189EL

Filed May 31, 1994, Ser. No. 251,188

Int. Cl.<sup>6</sup> B26B 3/03

U.S. Cl. 30-140

2 Claims



2. A heated knife comprising:  
an elongated linear handle having a length of about 11 cm;  
an elongated linear cutting blade formed of a thermally conductive material having a rounded tip end, a base end axially aligned with and coupled to the handle, a length of between about 9 cm to 11 cm, a width of between about 1 cm to 3 cm, and a thickness of about 1 cm to 3 cm;  
a heating element formed of a thermally conductive material disposed within the cutting blade with a portion thereof extended from the base end of the cutting blade;  
a battery coupled to the handle with the battery adapted to energize the heating element; and  
a switch coupled between the heating element and the battery and connected to the handle with the switch having one orientation for de-energizing the heating element and

another orientation for energizing the heating element, whereby allowing the cutting blade to be heated.

5,438,759

## BUTTON REMOVAL DEVICE

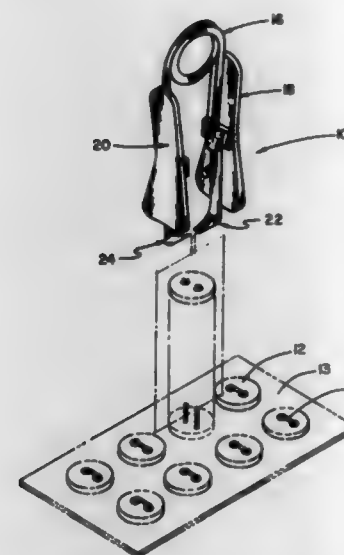
Janice A. Dieringer, P.O. Box 501 N741 Rolling Dr., Campbell-sport, Wis. 53010

Filed May 24, 1994, Ser. No. 248,107

Int. Cl.<sup>6</sup> B26B 13/02

U.S. Cl. 30-234

1 Claim



1. A button removal device for manual removal of buttons from card stock, comprising:

- a straight torsion spring, said straight torsion spring being of steel, bronze, nickel-steel or polymeric composition and further being formed as a one and one half turn wound spring having substantially parallel elongated free ends;  
a gripping member pair wherein each gripping member is affixed to an extended free end of said straight torsion spring, said gripping member comprising a first end portion comprising a thin plate having a widened free end with curving corners thereof, a central portion comprising a spring affixing means and a jaw affixing means and a second end portion comprising a thin plate having a uniform width throughout and curved corners thereon, said spring affixing means and said jaw affixing means comprising a thick raised portion having a hole of enlarged diameter bored partially therethrough and a hole of reduced diameter bored partially therethrough and in opposition to said hole of enlarged diameter, and furthermore said hole of enlarged diameter engages one of said free ends of the straight torsional spring; and  
a first jaw member and a second jaw member wherein each jaw member is affixed in one of said holes of reduced diameter by a fastening means and furthermore each of said first jaw member and said second jaw member has at least one substantially pointed free end thereof and has an incising portion distributed upon a plurality of edges therein.

5,438,760

## CORD SLITTER

William L. Chartier, 4074 Perrin Rd., Norwalk, Ohio 44857

Filed Oct. 20, 1994, Ser. No. 326,249

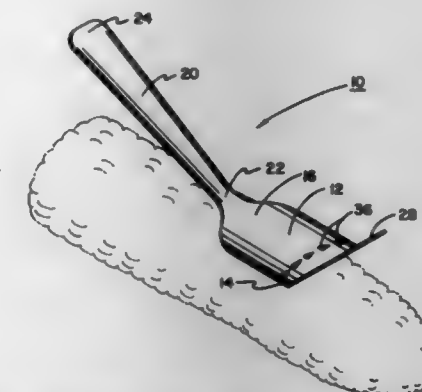
Int. Cl.<sup>6</sup> A47J 17/02; B26B 3/04, 5/00

U.S. Cl. 30-304

4 Claims

1. A new and improved cord slitter comprising, in combination:  
a central extent formed of a rigid material having a surface

- curved about a longitudinal axis with a forward end and a rearward end;  
a handle with a forward end and a rearward end, the handle extending rearwardly from the rearward end of the central extent;  
an upstanding plate with a forward end and a rearward end, the plate extending forwardly from the forward end of the central extent at an angle of between about 120 degrees



- and 150 degrees with respect to the axis of the central extent to provide rigidity to the system; and  
a plurality of teeth located at the forward end of the central extent, each tooth being formed in a triangular configuration through the cutting of a V-shaped slit to form a triangular projection and bending such projection in a direction opposite from the direction of bend of the external plate whereby pulling the central extent over an ear of corn will abrade the kernels to enhance the taste thereof.

5,438,761

## ROTATABLE CARPENTER'S LEVEL

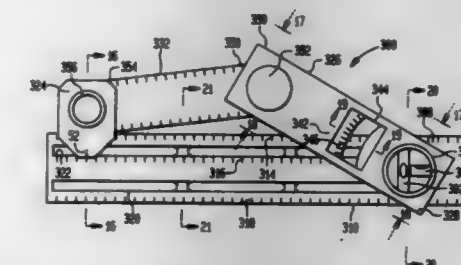
Luba M. Krumkaya, and Zinovi Khabal, both of 125 The Crossway, Yonkers, N.Y. 10701

Filed Sep. 16, 1993, Ser. No. 121,540

Int. Cl.<sup>6</sup> B43L 7/10; G01C 9/24

U.S. Cl. 33-451

4 Claims



1. A rotatable carpenter's level comprising  
a ruler member, having a first end,  
level means mounted on said ruler member,  
a first elongated member having a first end a second end, with said first end of said first elongated member pivotally connected to said first end of said ruler member,  
a second elongated member having a first end and a second end with said first end of said second elongated member pivotally connected to said second end of said first elongated member,  
a slider member slidably mounted on said ruler member and with said second end of said second elongated member pivotally connected to said slider member,  
with said first elongated member having an intermediate portion including means for viewing an adjacent portion of said ruler member and indicia for measurement of the angular relationship between said first elongated member and said ruler.



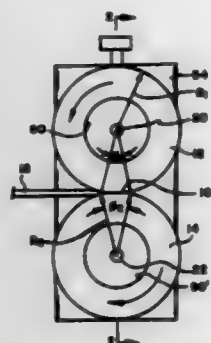
5,438,762

# MEANS TO ESTABLISH AND MAINTAIN AN ENGAGEMENT CHORD FOR PLIABLE AND INFLATABLE MEMBERS IN A DESIRED PLANE IN A MEASURING APPARATUS

Howard C. Shaw, 700 Wyndwicks Dr., St. Joseph, Mich. 49085  
Filed Feb. 14, 1994, Ser. No. 195,319Int. Cl.<sup>6</sup> G01B 5/04

U.S. Cl. 33-734

10 Claims



1. Mounting means for first and second bearings retained on a first shaft, said first and second bearings each having a flange with first and second holes therein, said first shaft being located in first and second slots in a housing to position said first shaft in said housing and establish a desired space relationship with a chord created between first and second inflatable and pliable members along a plane of engagement, said first shaft rotating in response to movement of a product along said chord, said first shaft being connected to an indicator to provide a signal representing a length from a starting point to an ending point on the product, the improvement comprising:

- a first plurality of mounting holes in said housing and located in a first pattern adjacent each of said first and second slots;
- a second plurality of mounting holes in said housing and located in a second pattern adjacent each of said first and second slots; and

fastener means extending through each of said first and second holes in the flange on the housing of said first and second bearings to position said first and second bearings in selected mounting holes of said first and second plurality of mounting holes to fix the position of said first shaft with respect to said chord as a function of the diameter of said first inflatable and pliable member and the length of said chord, said first and second patterns for said first and second plurality of mounting holes being such that the axial center of said first shaft is retained in a same vertical plane through said first and second slots with respect to said chord whenever the position of said first shaft is changed to modify the contact between the first and second inflatable and pliable members, said first and second patterns being such that sequential movement from one hole to the next hole in the first and second patterns simultaneously changes the space relationship between the first shaft and chord through a change in the coordinates of a mounting hole with respect to an immediate previous hole in said first pattern to achieve the desired vertical movement of the first shaft with respect to the chord along said vertical plane of said first and second slots is determined by the following formula:  $x$  equals the sine of the angle of clockwise rotation of a starting hole from the vertical plane of a slot, starting at a top hole, multiplied by one half of the distance between the starting first hole and an ending second hole and  $y$  equals the cosine of the angle of counter clockwise rotation from the plane of the slot, starting at the top hole, multiplied by one half of the distance between the starting first hole and ending second hole less the increment of change in dis-

tance along the same plane between the first shaft and desired plane.

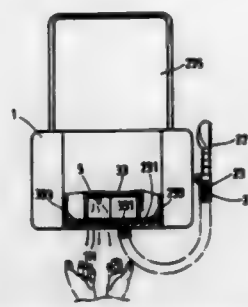
5,438,763

# MULTIPURPOSE ELECTRIC DRYER

Chung-hsiang Yang, No. 293, Tien-Chin Road, Sec. 4, Pei-Tun District, Taichung City, Taiwan  
Filed Nov. 29, 1994, Ser. No. 350,093Int. Cl.<sup>6</sup> F26B 19/00

U.S. Cl. 34-90

4 Claims



1. A multipurpose electric dryer comprising:

- a housing covered with a front cover, said front cover comprising a front opening, a flow guide moved in said front opening to let a flow of hot air be driven out of said front opening forward or downward, a vertical sliding way at one side, a first air hole communicated with said front opening, and a second air hole;
- a blast fan installed in said housing and having an air output port coupled with a fully clad electric positive-temperature-coefficient heater and connected to said first and second air holes;
- a towel rack mounted on said front cover below said front opening for holding towels;
- a sliding hanger moved in said vertical sliding way;
- a hot air hose having one end fixedly connected to said second air hole and an opposite end extended out of said front cover and coupled with an air-flow nozzle;
- a shutter linked to said sliding hanger by a pull rope and guide pulley set and moved with said sliding hanger to alternatively open said first and second air holes, permitting hot air from said blast fan and said fully clad electric positive-temperature-coefficient heater be driven out of said front opening on said front cover or said hot air hose;
- reversible means mounted on said front cover to pull said shutter away from said second air hole; and
- wherein when said air-flow nozzle is hung on said sliding hanger, said sliding hanger is forced downward to pull said shutter rightward, causing said shutter to open said first air hole and close said second air hole; when said air-flow nozzle is removed from said sliding hanger, said reversible means pulls said shutter leftwards to its former position to close said first air hole and open said second air hole.

5,438,764

# FOOT DRYER

George S. Reppas, 1030 San Raymond Rd., Hillsborough, Calif. 94010; Robert G. Reppas, 48 Highland Ave., Apt. 2, Cambridge, Mass. 02139; Charles B. Reppas, 502-225 Place South East, Bothell, Wash. 98021, and Katherine A. Reppas, 511 Via Collinas, West Lake Village, Calif. 91362

Filed Jan. 25, 1994, Ser. No. 186,651

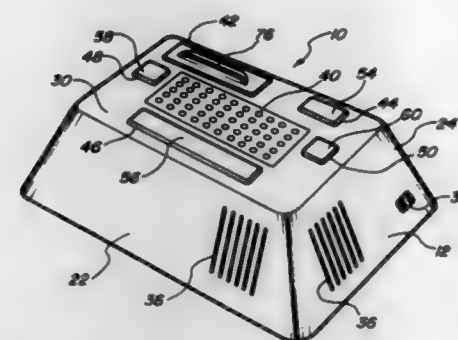
Int. Cl.<sup>6</sup> A61M 35/00

U.S. Cl. 34-343

16 Claims

1. An apparatus for drying toes on a foot of an individual, said apparatus comprising:
- a housing having a top panel and defining an internal cavity, said top panel defining a plurality of apertures extending through said top panel;

a blower disposed within said internal cavity;  
a powder dispenser disposed between said blower and said plurality of apertures; and  
a first switching member for activating said blower, said blower operative to blow air through said plurality of apertures in said top panel of said housing, said first switching member disposed on a portion of said top panel of said housing adjacent said plurality of apertures such



that said first switching member is activated by said individual positioning the ball of said foot on said first switching member and placing weight on the ball of said foot so as to position said toes of said individual directly above said plurality of apertures, wherein activation of said first switching member by placing the weight on the ball of said foot is operative to spread and open the area between said toes to allow said individual to flex said toes in and upward direction to effect the drying of said toes.

5,438,765

# METHOD AND APPARATUS FOR ELIMINATING THE FLUTTER OF A PAPER WEB IN THE DRYER SECTION OF A PAPERMAKING MACHINE BETWEEN TWO SINGLE FELT CONFIGURATIONS THEREIN

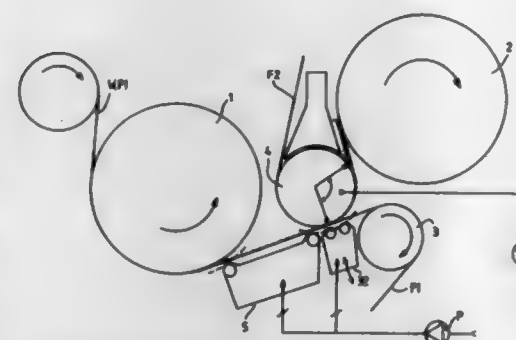
Jouko Tyrmä, Tampere, and Timo Haverinen, Masku, both of Finland, assignors to Valmet Paper Machinery Inc., Helsinki, Finland

Filed May 4, 1993, Ser. No. 56,856

Int. Cl.<sup>6</sup> F26B 3/24

U.S. Cl. 34-456

16 Claims



1. A method for eliminating the flutter of a paper web in the dryer section of a papermaking machine between two single felt configurations thereof, wherein said web is transferred from a dryer fabric of a first configuration onto a dryer fabric of a second configuration along a common run of said fabrics, the transfer being effected from one fabric to the other by means of a vacuum transfer roll, on which said second configuration dryer fabric is brought into contact with the web and around which said fabric is winding, comprising the steps of: providing a vacuum zone on the side of said first configuration dryer fabric upstream of a contact point between the web carried thereon and the second configuration dryer fabric winding around the vacuum transfer roll, said vacuum zone being defined by said first configuration dryer

fabric for retaining said web in contact with said first configuration dryer fabric, and  
blowing air at a location downstream of said contact point in the traveling direction of said first configuration dryer fabric, said air being blown from the side of said first configuration dryer fabric released from the web through the fabric into a gap formed between the second configuration dryer fabric lying on the vacuum transfer roll together with the web and the first configuration dryer fabric released from said web.

5,438,766

# TUMBLER FOR LOOSENING ENTANGLED CLOTHS

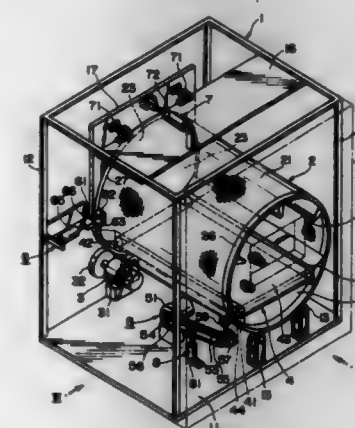
Yoshizo Nakamura, Takamatsu, Japan, assignor to Tokai Co., Ltd., Japan

Filed Dec. 27, 1993, Ser. No. 172,810

Int. Cl.<sup>6</sup> F26B 11/04

U.S. Cl. 34-602

6 Claims



1. A tumbler for loosening entangled cloth articles comprising a frame, a cylindrical drum rotatably supported by said frame for rotation about a horizontal axis, said cylindrical drum having an opening in each of first and second opposing ends, a first cover having an access opening and covering said first opposing end except for said access opening, a second cover pivotally mounted for movement between a first position closing said second opposing end and a second, open position, drive means for rotating said drum about said horizontal axis, and conveyer means, secured within said drum for rotation therewith, for discharging the cloth articles placed thereon through one of said openings when said drum is at rest in a predetermined position.

5,438,767

# SANDAL HAVING ADJUSTABLE STRAPS

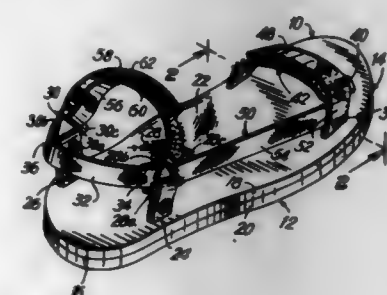
Michael Stein, Yardley, Pa., assignor to E. S. Originals, Inc., New York, N.Y.

Filed Dec. 16, 1993, Ser. No. 168,426

Int. Cl.<sup>6</sup> A43B 3/12

U.S. Cl. 36-11.5

8 Claims



1. A sandal, comprising:

a sole extending along a longitudinal direction between a toe end region and a heel end region;  
 a pair of heel posts spaced apart of each other along a transverse direction generally perpendicular to the longitudinal direction, each heel post having one end attached to the sole at the heel end region, and an opposite end attached to a heel cinch;  
 a heel strap extending generally along the transverse direction at the heel end region between heel strap ends respectively attached to a respective heel cinch;  
 a toe post having one end attached to the sole at the toe end region, and an opposite end attached to a toe cinch;  
 an adjustable toe strap having one toe strap end attached to the sole at the toe end region away from the toe post, and extending generally along the transverse direction through the toe cinch, and having an opposite toe strap end looped back against the toe strap; and  
 an adjustable cinch strap constituting a single, unitary band having a length longer than the length of the sole along the longitudinal direction, said band having a longitudinal portion and a transverse instep portion, said longitudinal portion having one cinch strap end attached to the toe post, said longitudinal portion extending generally along the longitudinal direction through the heel cinch on one of the heel posts, said transverse instep portion having a first section extending generally along the transverse direction through the heel cinch on the other of the heel posts, said transverse instep portion being folded to form a second section extending generally along the transverse direction and overlapping the first section to a variable extent along the transverse direction, said transverse instep portion forming a loop with the heel strap, said second section having an opposite cinch strap end movable relative to said one cinch strap end for simultaneously only adjusting the effective length of the longitudinal portion and the extent of the overlap of the first and second sections.

#### 5,438,768 SOLE INSERT

Hans B. Bauerfeind, Kempen, Germany, assignor to Bauerfeind GmbH & Co., Germany  
 PCT No. PCT/EP92/02966, § 371 Date Jul. 6, 1994, § 102(e) Date Jul. 6, 1994, PCT Pub. No. WO93/13685, PCT Pub. Date Jul. 22, 1993

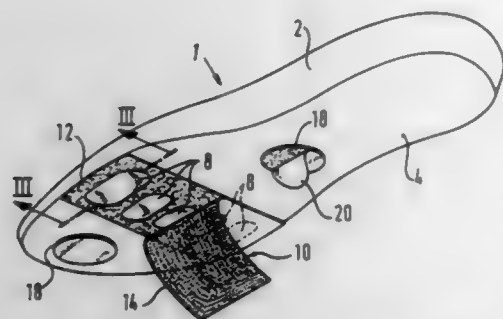
PCT Filed Dec. 21, 1992, Ser. No. 256,267

Claims priority, application Germany, Jan. 9, 1992, 42 00 362.8

Int. Cl. A43B 13/38

U.S. Cl. 36-44

10 Claims



1. An insole (1) constructed of an elastic material having recesses (6) therein on one side containing exchangeable elastic inserts (8,28), the insole (1) including, on the side containing the recesses (6), a first layer (12,32) comprising a bearing part of a flat adhesive seal (10,30), said bearing part containing spaces corresponding to and overlying said recesses (6) and extending at least over an area directly adjacent to said inserts (8,28), and a second layer (14,34) comprising a covering part of the flat adhesive seal which overlies and is releasably fastened to said bearing part of said seal (10,30), said covering part

covering at least said inserts (8,28) and adjacent areas to hold said inserts in place.

#### 5,438,769 ANKLE SUPPORTING DEVICE, PARTICULARLY FOR MOTORCYCLING BOOTS

Giovanni Mazzarolo, Coste di Maser, Italy, assignor to Alpine Stars S.p.A., Coste di Maser, Italy

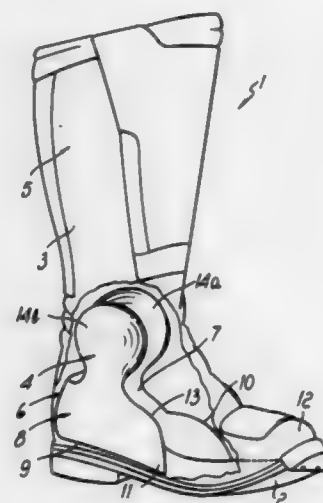
Filed Mar. 17, 1993, Ser. No. 32,586

Claims priority, application Italy, Mar. 20, 1992, TV92U0016

Int. Cl. A43B 5/00

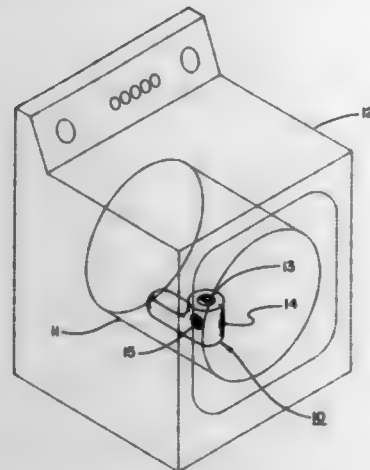
U.S. Cl. 36-131

8 Claims





prises: an L-shaped beating member formed of a heat-resistant polymeric material; free to move within said drum; and means within said beating member to dispense aromatic vapors when rotating in said drum dryer; said L-shaped beating member resembles a boot having an ankle portion and a foot portion; said means to dispense aromatic vapors comprises a perforated canister positioned fixedly within said ankle portion of said



beating member and spaced from the foot portion, the canister communicating through perforations in said beating member with the interior of the drum within which said member is freely positioned in use; the beating member having a receptacle concentrically mounted therewithin; said receptacle having an entrance opening extending through an exterior surface of the beating member in communication with the receptacle; a lid removably mounted to the entrance opening.

5,438,774

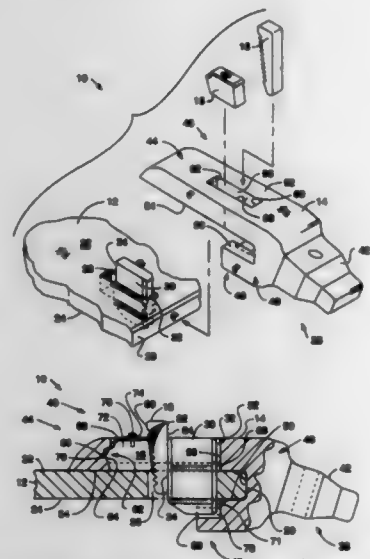
## MECHANICALLY ATTACHED ADAPTER

Rodney D. Fletcher, Peoria, and David P. Cressy, Chillicothe, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.  
Filed Oct. 6, 1993, Ser. No. 132,268

Int. Cl.<sup>6</sup> E02F 9/28

U.S. Cl. 37-436

16 Claims



1. A mechanically attached adapter, comprising:

- a forward working end portion having a nose adapted to receive a tooth; and
- a rearward end portion adapted for connection to a base edge of an implement and having an upper strap portion of a predetermined length, a lower strap portion generally

parallel to and spaced from the upper strap portion, an intermediate portion interconnecting the upper strap portion and the lower strap portion, and a cavity defined by the upper strap portion, the lower strap portion and the intermediate portion, the upper strap portion having an upper surface, a substantially flat lower surface, and an elongate slot defined therein between the upper surface and the lower surface and generally perpendicular with the lower surface, the elongate slot being defined by a pair of generally parallel spaced apart side surfaces, a forward end surface and a rearward end surface having a concave shape, said concave rearward end surface has a first generally flat surface beginning at the lower surface of the upper strap portion and extending upwardly and rearwardly toward the upper surface and a second surface extending from the first generally flat surface upwardly and forwardly toward the upper surface.

5,438,775

## METHOD AND MACHINE FOR AUTOMATICALLY IRONING AND STACKING MEN'S SOCKS

Teresa Chietti, S. Casciano val di Pesa; Alberto Frullini, Via di Brozzi, 151/A, 50145 Florence, and Nerina Naim, Scandicci, all of Italy, assignors to FA-MA di Maselli Maria e Frullini Alberto & C.S.n.c., Fract. S.; Alberto Frullini and Nerina Naim, both of Florence, all of Italy

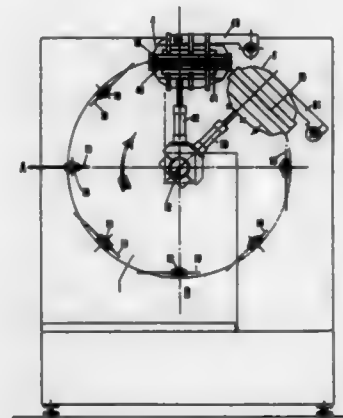
Filed Feb. 3, 1994, Ser. No. 191,970

Claims priority, application Italy, Feb. 4, 1993, FI93A14

Int. Cl.<sup>6</sup> D06F 71/04, 59/06; D06C 7/02

U.S. Cl. 38-23

21 Claims



1. A method for ironing and stacking socks, the method comprising:

- providing a plate with a plurality of sock supports positioned along a circumference of said plate;
- individually placing one of the socks on one of said sock supports at a loading position with a first side of a foot of the sock facing an operator;
- inspecting the first side of the sock at said loading position;
- moving the sock with said one sock support to a second side inspection position;
- rotating said one sock support to have a second side of the sock face the operator at said second side inspection position, said second side being substantially opposite said first side;
- inspecting said second side of the sock;
- marking the sock if the sock fails inspection;
- moving the sock with said one sock support from said second side inspection position to an ironing position;
- ironing the sock on said one sock support at said ironing position;
- moving the sock with said one sock support from said ironing position to a removal position;

removing the sock from said one sock support at said removal position;

transporting the removed sock along a second path;

removing the sock from said second path for further packaging if the sock has passed inspection.

5,438,776

## INDUSTRIAL IRONING MACHINE AND METHOD FOR MANUFACTURING A BED USED IN SUCH MACHINE

Romain Lapauw, Mellestraat 367, 8501 Heule, Belgium

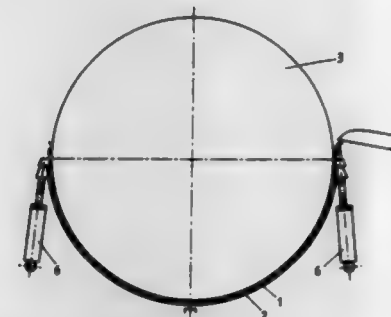
Filed Jun. 4, 1993, Ser. No. 71,264

Claims priority, application Belgium, Jun. 5, 1992, 09200519

Int. Cl.<sup>6</sup> D06F 65/06

U.S. Cl. 38-47

4 Claims



1. An industrial ironing machine comprising:

an ironing cylinder;

- a flexible bed extending substantially around half of said ironing cylinder, said flexible bed being composed of two flexible stainless steel plates having a laser weld along a circumference of said steel plates and a series of welded spots obtained by a laser technique, wherein one of said flexible stainless steel plates, which engages the ironing cylinder in an operative position, has a thickness of between 3 and 5 mm, and a second one of said flexible stainless steel plates, which is situated in an operative position away from said ironing cylinder, has a thickness of between 0.80 and 1.20 mm; and
- means for keeping the flexible bed pressed against the ironing cylinder.

5,438,777

## PICTURE FRAME WITH PICTURE HOLDER SECURED BY TWO-SIDED TAPE

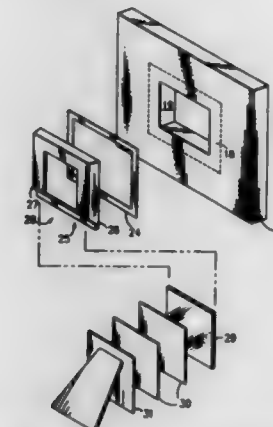
David Howell, 333 Hook Rd., Katonah, N.Y. 10536

Continuation-in-part of Ser. No. 919,206, Jul. 24, 1992, Pat. No. 5,199,200. This application May 14, 1993, Ser. No. 62,062

Int. Cl.<sup>6</sup> G09F 1/12

U.S. Cl. 40-152.1

7 Claims



1. A picture frame comprising a front frame member having a margin surrounding a picture opening; a segment of adhesive

tape disposed on said margin around edges of the picture opening at a proximal side of said member; said adhesive tape having adhesive on both surfaces; a one-piece picture holder member bonded by said adhesive tape to said front frame member at the margin thereof and having a rectangular four-sided front member with a front flat surface that is held by said tape to said front frame member and a retaining wall portion formed on three sides of said rectangular front member with a fourth side being open; a transparent plate removably retained within said picture holder member; and a frame back which is insertable into said open fourth side and is removably retained within said picture holder member for holding a picture between said frame back and said transparent plate.

5,438,778

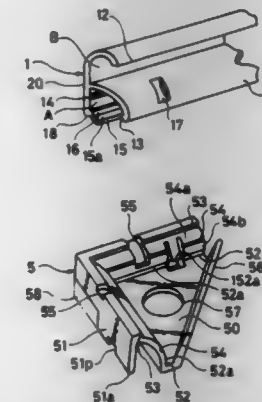
## FRAME

Takeo Komamura, Nakakanasugi, Matsudo-shi, Chiba, Japan  
Continuation of Ser. No. 904,932, Jan. 26, 1992, Pat. No. 5,279,056, which is a continuation of Ser. No. 580,222, Sep. 10, 1990, Pat. No. 5,189,820. This application Jul. 12, 1993, Ser. No. 83,949

Claims priority, application Japan, May 23, 1990, 2-131157  
Int. Cl.<sup>6</sup> G09F 1/12

U.S. Cl. 40-156

11 Claims



1. A frame, comprising:

- a plurality of elongate frame elements each of a respective predetermined length; and
  - at least one connecting corner element, having sides intersecting to form an outside corner and to be shorter than said frame elements, to which sides said frame elements are respectively mounted to be disposed angularly with respect to each other, said sides defining with said frame elements means for engaging therewith in a manner permitting angular movement therebetween,
- wherein at least one of said frame elements is mounted to a corresponding side of said at least one connecting corner element for retention solely thereby and in a manner permitting said angular movement relative thereto about a direction parallel to said corresponding side.

5,438,779

## ADVERTISING DISPLAY FOR USE ON SUNSHADES, UMBRELLAS AND THE LIKE

Mercedes Suarez, Zabala 3436, (1426) Buenos Aires, Argentina  
Filed Jun. 28, 1993, Ser. No. 83,452

Claims priority, application Argentina, Jun. 26, 1992, 322,644  
Int. Cl.<sup>6</sup> G09F 3/00

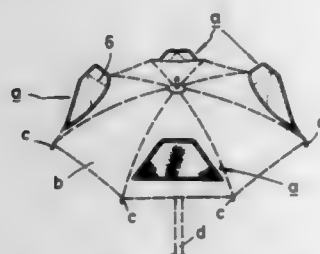
U.S. Cl. 40-317

7 Claims

1. An advertising display comprising:

- a bar having a first end and a second end;
- a plurality of rods each having a first end and a second end, said first end of said rods being pivotally connected to said first end of said bar, said plurality of rods extending radially from said first end of said bar;

a laminar cover attached to said plurality of rods, said laminar cover having a plurality of folding axes, each of said folding axes being disposed substantially equidistantly between each pair of adjacent rods;  
a display including a front laminar part and a rear laminar part, said front part having a front display surface and a rear surface, a portion of an outer perimeter of said front part being attached to said laminar cover, a portion of an outer perimeter of said rear part being attached to said laminar cover, a remaining portion of said outer perimeter of said front part being attached to a remaining portion of said outer perimeter of said rear part;



at least one rigid rod being attached to said rear surface of said front part, said at least one rigid rod having a first lower end and a second upper end, said first lower end being attached to said laminar cover;  
at least one rein having a first end and a second end, said first end of said rein being attached to said second upper end of said at least one rigid rod, said second end of said rein being attached to said laminar cover at a position which is disposed at a greater distance from said first end of said bar than a distance between where said portion of said outer perimeter of said front part is attached to said laminar cover and said first end of said bar.

5,438,780

## ROAD SIGN AND INFORMATION DISPLAY APPARATUS

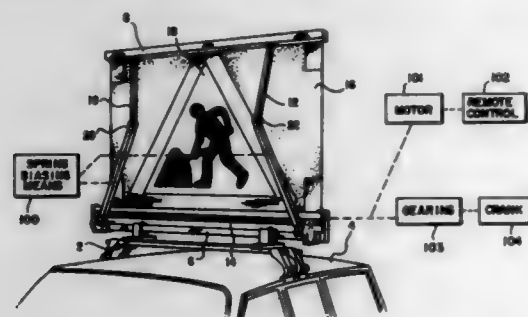
Bengt Winner, Upplands Väsby, Sweden, assignor to ATA Byggnad och Markprodukter AB, Sandbyberg, Sweden  
PCT No. PCT/SE91/00500, § 371 Date Mar. 11, 1993, § 102(e) Date Mar. 11, 1993, PCT Pub. No. WO92/01838, PCT Pub. Date Feb. 6, 1992

PCT Filed Jul. 17, 1991, Ser. No. 966,073

Claims priority, application Sweden, Jul. 17, 1990, 9002448  
Int. Cl. G09F 11/18

U.S. Cl. 40—514

1 Claim



1. An information display apparatus, comprising:  
an elongated roller;  
a screen of soft material that can be wound up on said roller attached at one side of the screen to said roller;  
a bar attached to said screen on a second side of said screen opposite to said roller;  
at least one folding arm connected between said bar and a

member which is fixed adjacent to and relative to said roller;  
a spring-biasing means for extending said at least one folding arm and, thereby, separating said bar from said roller such that said screen is unwound from said roller to a fully-extended position solely by the force of said spring-biasing means;  
means for rotating said roller such that said screen is wound around said roller and said bar is moved towards said roller against the direction of the bias of said spring-biasing means;  
further including means for attaching said apparatus to a roof rack of a vehicle;  
wherein said screen is formed out of a net fabric having sufficiently-sized holes therethrough that there is a visibility through the screen and such that air can readily pass through said screen, even when said screen is attached to a vehicle and driven in road use;  
wherein said apparatus includes at least one warning light mounted thereon; and  
wherein said warning lights are mounted on said bar and said bar is at a position substantially vertically above said roller.

5,438,781

## BUILDING SIGN SYSTEM

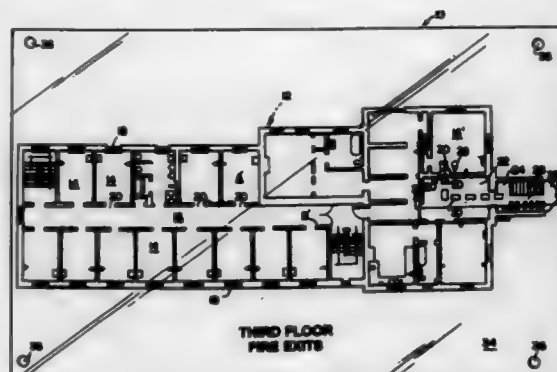
David W. Landmann, 1 Ocean Ter., Cumberland, Me. 04110

Filed Oct. 29, 1993, Ser. No. 143,107

Int. Cl. G09F 7/00, 19/00

U.S. Cl. 40—584

27 Claims



1. A sign for assisting sighted and visually impaired or blind persons to locate a route from point A to point B, the sign comprising:  
a first planar sheet printed with first means for supplying route information to sighted individuals; and  
a second planar sheet overlying said first planar sheet, including second means for supplying similar route information to blind or visually impaired individuals, said second means including tactile information indicating relative locations of point A and point B and a route therebetween.

5,438,782

## SIGN SYSTEM WITH RIB LOCK MECHANISM

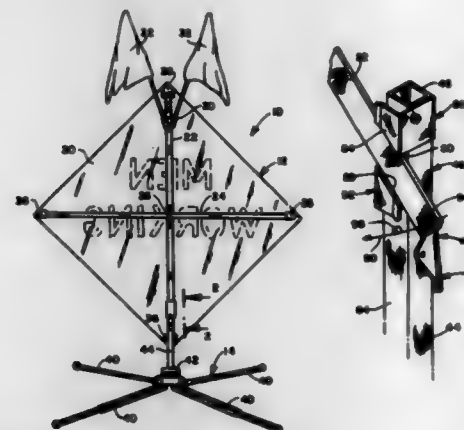
Tood Belobraydich, Downers Grove, and Jeffrey A. Williams, Westmont, both of Ill., assignors to The Dicke Tool Company, Downers Grove, Ill.

Continuation of Ser. No. 63,074, May 12, 1993, which is a continuation of Ser. No. 713,805, Jun. 12, 1991, Pat. No. 5,231,778. This application Sep. 20, 1994, Ser. No. 308,954  
The portion of the term of this patent subsequent to Aug. 3, 2010, has been disclaimed.

Int. Cl. G09F 15/00

U.S. Cl. 40—610

28 Claims



1. Apparatus, comprising:  
a rib having a generally rectangular cross section;  
an elongated double-ended mast having an outer surface, a first end to be supported and a free end;  
a pair of mounting clips carried by the mast adjacent the free end and spaced apart from each other to form a rib-receiving gap therebetween, and having portions spaced from the outer surface of the mast so as to form pockets for receiving the rib, said mounting clips having open ends communicating with the pockets so as to permit the rib, when disposed to have a portion thereof in said gap, to enter said pockets by pivoting the rib in said gap so as to align greater portions of the rib in overlying relationship with the mast; and  
locking means on the mast adjacent the mounting clips and remote from the mast first end to prevent movement of the rib out of said pockets.

lug which interfits into an opening in the butt plate to latch the butt plate in place on the magazine while permitting removal



thereof by depressing the lug to clear the opening of the butt plate.

5,438,784

## MAGAZINE SAFETY

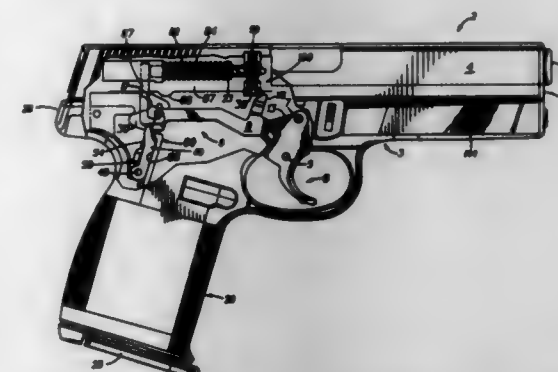
Lee M. Lenkarski, Ware, and Pardip K. Vaid, Northampton, both of Mass., assignors to Smith & Wesson Corp., Springfield, Mass.

Filed Aug. 19, 1994, Ser. No. 293,046

Int. Cl. F41A 17/36

U.S. Cl. 42—70.02

3 Claims



1. Magazine safety for a semi-automatic pistol having a frame including a muzzle end and a rear end and which provides for disposition of a trigger and a trigger spring, a grip for holding the pistol for firing and including a downwardly open magazine chamber therein for releasably receiving therein a magazine, a double action firing mechanism including a striker type firing pin with a firing pin spring disposed thereon operable in response to firing movement of the trigger and a depending leg portion releasably engageable by a pivotable sear, a trigger bar extending from the trigger and engageable with the sear to move the sear rearwardly to cock the firing pin spring and to release the leg portion of the firing pin, the improvement comprising a lever including a forward end and an after-end and being pivotable on the frame at a point adjacent the after-end of the lever and including a downwardly opening recess adjacent the forward end of the lever for engaging the sear to prevent the movement of said sear in response to movement of the trigger, said lever including a portion thereof engageable with the magazine when inserted into the

5,438,783

## BUTT PLATE ASSEMBLY FOR HANDGUN MAGAZINES

Gary A. Salezak, Windsor, Conn., and Robert C. Dioane, Ludlow, Mass., assignors to Smith & Wesson Corp., Springfield, Mass.

Filed Mar. 7, 1994, Ser. No. 207,350

Int. Cl. F41A 9/24

U.S. Cl. 42—7

5 Claims

1. A magazine for a semi-automatic firearm having a barrel and comprising a tube having an upper and a lower end, a spring longitudinally disposed within the tube, a floor plate disposed at the lower end of the tube and having a tang on an edge thereof which interengages with a notch in a lower edge of the tube whereby said edge of said floor plate is disposed in fixed relation to the tube while said floor plate is pivotable against the bias of the spring and a butt plate slidably disposed onto the lower end of the tube to retain and be retained in superimposed relationship therewith, said floor plate having a



magazine chamber of the pistol so that the lever is pivoted upwardly sufficiently to disengage the recess of the lever from the sear, and a safety spring releasably urging the lever downwardly against the trigger spring.

5,438,785

# SYSTEM FOR ASSEMBLING THE BARREL OF A MEDIUM OR LARGE CALIBRE GUN

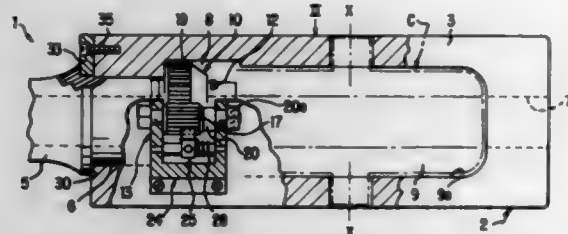
Georges H. Simon, Saint Germain du Puy, France, assignor to Giat Industries, Versailles, France

Filed Aug. 30, 1994, Ser. No. 297,754

Claims priority, application France, Oct. 4, 1993, 93 11780  
Int. Cl.<sup>6</sup> F41A 21/48

U.S. Cl. 42-75.02

15 Claims



1. An assembly system for attaching a barrel of a gun to a sleeve on a breech block of the gun, comprising:
  - a nut that is screwed onto a threaded end of the barrel to attach the barrel to the sleeve on the breech block, the nut being inserted into a cavity in the sleeve through an opening in the sleeve;
  - a gear mechanism that engages the nut and causes the nut to rotate, and
  - a drive system that engages the gear mechanism and causes the gear mechanism to rotate the nut, the drive system being operable from outside the sleeve.

5,438,786

# PISTOL REST

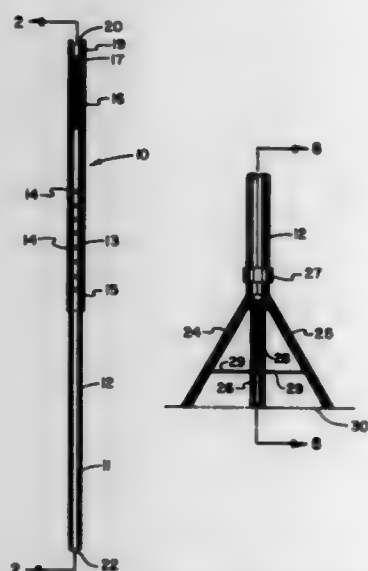
Darrell P. Hilderbrand, 1151 Huron Trail, Jamestown, Ohio 43335

Filed Dec. 10, 1993, Ser. No. 164,535

Int. Cl.<sup>6</sup> F41A 23/14

U.S. Cl. 42-94

1 Claim



1. A pistol rest comprising a slender, rigid telescopically-adjustable support rod; a knurled hand grip on said rod extending around an upper end thereof; and a cylindrical, deformable plastic plug replaceably screwed into the upper end of said rod, said plug having a recessed groove in its upper surface to

snugly receive and support a pistol barrel, wherein the lower end of said rod terminates in a foldable tripod leg member having a plurality of legs, the tripod leg member including a spring biased rod telescopically received within a lower end of said support rod, said spring biased rod having a fixture secured thereto, with a plurality of braces pivotally mounted to said fixture and to said legs to maintain said legs in a spread configuration when the spring biased rod is extended from the support rod.

5,438,787

# GUN STORAGE AND RAPID REMOVAL MOUNT

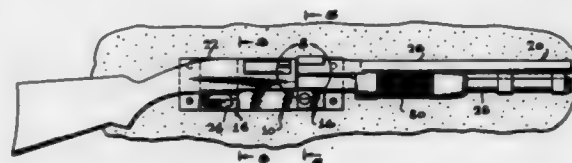
David A. McMaster, and Ronald J. Swanson, both of Los Angeles, Calif., assignors to Pro-Tech Design & Manufacturing, Inc., Los Angeles, Calif.

Filed Oct. 28, 1994, Ser. No. 330,987

Int. Cl.<sup>6</sup> F41C 27/00; B60R 7/14

U.S. Cl. 42-106

19 Claims



1. A gun storage and rapid removal mount comprising:
  - a cup for receiving the trigger guard of a long gun; and
  - a forward lock clamp for releasably engaging on a long gun forward of and in contact with the front of the receiver of the long gun so that said forward lock clamp prevents forward motion of the long gun and said trigger guard cup prevents rearward motion of the long gun, said forward lock clamp having a body and a head movable with respect to said body, said body and said head each having a groove therein to receive the long gun forward of its receiver and to restrain the long gun until said head of said lock clamp is moved away from said body of said forward lock clamp.

5,438,788

# FISH HOOK SETTING DEVICE

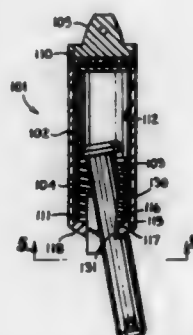
Homer C. Rich, 1100 S. Noland Rd., Independence, Mo. 64050, and Robert E. Morgan, 2255 NE. Porter Rd., Blue Springs, Mo. 64015

Filed May 16, 1994, Ser. No. 243,209

Int. Cl.<sup>6</sup> A01K 97/00

U.S. Cl. 43-15

13 Claims



1. A fish hook setting device comprising:
  - (a) a housing having an upper end, a lower end and an inner cavity; said housing further having a wall extending partially across said lower end of said housing and forming an opening extending therethrough;
  - (b) first securement means for securing a first length of fishing line to said upper end of said housing;

- (c) a plunger having a shaft and a head and positioned within said cavity such that said shaft is advanceable through said opening in said housing lower end;
- (d) a compression-type coil spring positioned within said cavity between said housing lower end wall and an overhanging edge of said plunger with said shaft of said plunger extending through said coil spring;
- (e) second securement means for securing a second length of fishing line to said shaft;
- (f) said plunger shaft having a notch formed in a side thereof and defining an abutment surface integrally and fixedly positioned in said plunger shaft and adapted to be positioned in abutting relationship with a lower surface of said housing lower end wall after said plunger shaft has been partially drawn out of said housing through said opening against the biasing force of said coil spring; abutment of said abutment surface of said shaft against said lower surface of said housing lower end wall preventing retraction of said plunger shaft within said housing so as to maintain said plunger in a set position and whereby application of a force on said plunger shaft directed away from said housing upper end advances said abutment surface out of engagement with said lower surface of said housing lower end wall allowing said coil spring to expand such that said plunger shaft is retracted into said housing.

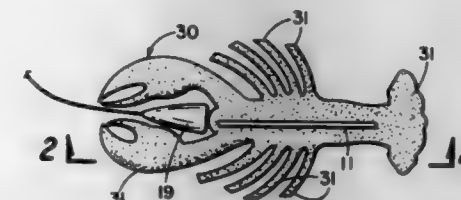
5,438,790

# BALANCED ARTIFICIAL BAIT

Jan J. Rigney, 12109 E. 76th St., North, Owasso, Okla. 74055  
Continuation of Ser. No. 679,761, Apr. 3, 1991, abandoned. This application May 6, 1992, Ser. No. 882,364  
Int. Cl.<sup>6</sup> A01K 85/00

U.S. Cl. 43-42.24

5 Claims



1. For use in combination with a hook having an average density greater than the average density of water, an artificial bait comprising a substantially homogeneous flexible absorbent body slidably engagable on at least a portion of said hook and shaped to simulate a natural bait, said body having an average density less than the average density of water, the volume of said body being proportioned to the volume of said hook such that the average density of said hook and said body taken together slightly exceeds the average density of water, whereby said hook and said body together sink relatively slowly in the water and free portions of said flexible body extend toward the water surface.

5,438,789

# FISHING ROD HOLDER ASSEMBLY

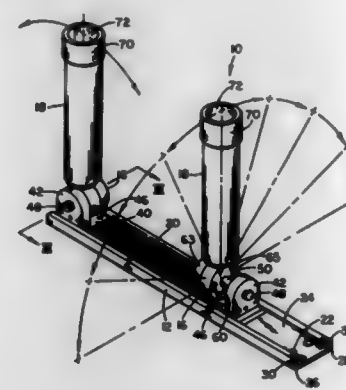
John E. Emory, Traverse City, Mich., assignor to Big Jon, Inc., Traverse City, Mich.

Filed Oct. 3, 1994, Ser. No. 316,936

Int. Cl.<sup>6</sup> A01K 97/10

U.S. Cl. 43-21.2

17 Claims



1. A rod holder assembly, comprising:
  - a channel adapted to be mounted on a boat;
  - a bracket comprising a base and a mounting flange, said base being configured so as to permit said bracket to be slidably inserted within said channel;
  - a locking pin on said flange;
  - a rod holder having an open end adapted to receive a fishing rod;
  - a hub fixed to said rod holder opposite said open end, said hub being pivotally mounted to said mounting flange of said bracket and having a plurality of hub apertures therein; and
  - a spring engaging said hub for resiliently biasing said hub against said mounting flange such that one of said hub apertures may be selectively aligned with said locking pin to lock the rod holder to said bracket and allow for angular adjustment of the rod holder to various fixed positions in a plane.

5,438,791

# POCKET HOLDER FOR SNEELED FISH HOOKS

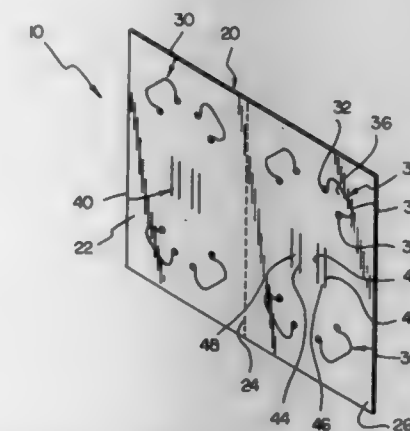
Lois M. Sherrod, 330 E. Grove St., Stockton, Calif. 95204

Filed May 9, 1994, Ser. No. 239,461

Int. Cl.<sup>6</sup> A01K 97/00

U.S. Cl. 43-57.2

6 Claims



2. A new pocket holder for snelled fish hooks for holding and storing fish hooks with leaders in a simple pocket-sized folder whereby the hook points are covered for safety and the leader lines are secured to prevent kinking and tangling while simultaneously allowing easy removal of the hook without interfering with other stored hooks, the pocket holder for snelled fish hooks comprising:
  - a folder wherein a fish hook with leader may be stored, the folder comprising a generally rectangular semi-stiff thin panel having at least one lateral straight score line thereon defining at least two contiguous similarly profiled panel sections, the panel being foldable on the score line to provide a closed position wherein the panel sections lie adjacent each other in facing touching relationship whereby defining an inside portion therebetween, the panel also having an open position wherein the panel sections extend away from each other divergently from the score line for providing access to the inside portion;

hook retaining means whereby the hook is removably secured inside the folder to preclude the hook point from snagging surrounding objects when the folder is closed, the hook retaining means comprising two pair of parallel spaced apart slits extending through at least one of the panel sections essentially central thereto, the slits defining a pair of retaining strips therebetween wherethrough the hook may be inserted; and

leader retaining means whereby the leader is removably secured inside the folder such that the leader is protected from tangling and kinking, the leader retaining means comprises a pair of spaced apart holes extending through at least one of the panel sections proximal each corner thereof, the holes in each pair of holes being joined together by a slit extending through the panel section, the slit following a generally arcuate path to form a rounded oblong tab coplanar the panel section, each tab being diagonally aligned relative the panel section such that the tabs lie in opposition to each other, the tabs also being pivotally displaceable relative the plane of the panel section whereby the combination of tabs and panel section defines a spool structure whereupon the leader may be wound.

5,438,792

## INSECT TRAPS

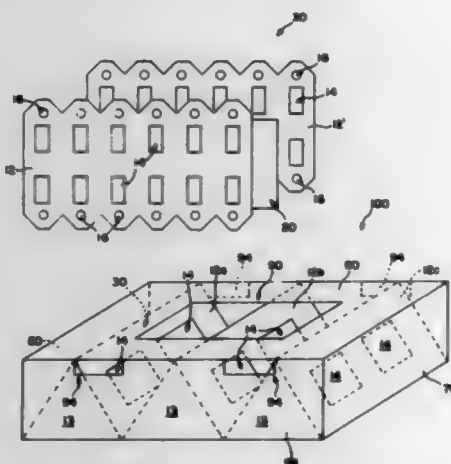
Edward Monett, Westfield, N.J., and Robert Blackman, 1023 Irving Ave., Westfield, N.J. 07090, assignors to Robert Blackman, Westfield, N.J.

Filed Jan. 25, 1994, Ser. No. 186,295

Int. Cl.<sup>6</sup> A01M 1/14

U.S. Cl. 43-114

20 Claims



1. An insect trap which comprises:

- (1) a generally rectangular shaped enclosure provided with a plurality of openings adapted to permit insects to pass therethrough, and
- (2) a folded composite planar sheet positioned within the enclosure to provide a plurality of generally triangular passageways within the enclosure,

said folded composite planar sheet comprising an upper folded sheet member and a lower folded sheet member between which is provided an adhesive sheet having applied thereto an insect retaining adhesive, said upper and lower sheet members having a plurality of openings therein to permit an insect passing thereon to contact an adhesive surface of said adhesive sheet and said adhesive sheet member and said upper and lower sheet members having a plurality of connecting apertures therethrough to permit insects to pass through said composite planar sheet.

5,438,793

## TREE CLIMBING DEVICE

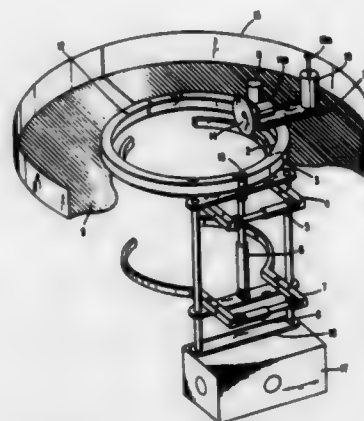
Elihu Eliachar, Haifa, and Elihu Mizrahi, Petach Tikva, both of Israel, assignors to Topteck Ltd., Haifa, Israel  
Continuation-in-part of Ser. No. 886,290, May 21, 1992, Pat. No. 5,301,459. This application Feb. 18, 1994, Ser. No. 198,064  
Claims priority, application Israel, Jun. 2, 1991, 98335

The portion of the term of this patent subsequent to Apr. 12, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B27L 1/00

U.S. Cl. 47-1.01

21 Claims



1. A device for climbing a vertical member comprising: upper engagement means for opening and closing into engagement with a first portion of said vertical member; lower engagement means for opening and closing into engagement with a second portion of said vertical member below said first portion; at least one extension/retraction means connected to said upper engagement means and said lower engagement means and for extending or retracting to vary the distance between said upper engagement means and said lower engagement means; and wherein one of said upper engagement means and lower engagement means is open and the other of said upper engagement means and lower engagement means is closed during the extension and retraction of said extension/retraction means.

5,438,794

## FARMING SYSTEM FOR CULTIVATING CROPS

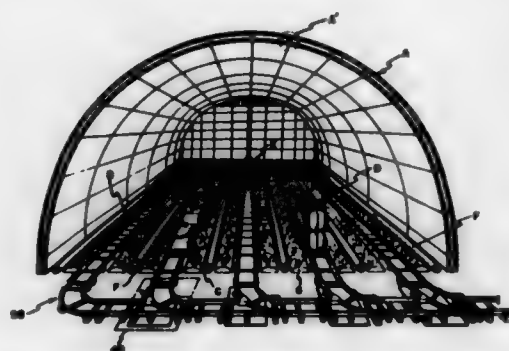
Gye-Sang Wi, #1-1101 Kumho-Mansion, 53 Sunwon-Dong, Yecheon-shi, Chollanam-do, Rep. of Korea  
Filed Apr. 9, 1993, Ser. No. 44,629

Claims priority, application Rep. of Korea, Apr. 10, 1992, 92-5921; Jun. 3, 1992, 92-9829; Nov. 19, 1992, 92-22816; Mar. 20, 1993, 93-4197

Int. Cl.<sup>6</sup> A01G 9/00

U.S. Cl. 47-17

12 Claims



1. A farming system for cultivating crops, comprising:

a housing for providing a farming area having levees defined therein, said levees defining a plurality of smaller areas within said housing;  
a plurality of track rails and a plurality of ducts arranged on alternate ones of said smaller areas between the levees; means provided on said track rail, for carrying farming tools needed to cultivate said crops and the harvest produced on said levees;  
agricultural chemical spraying means, loaded on the means for carrying, for spraying agricultural chemicals on said crops; and,  
temperature control means for supplying a hot air through said duct arrangement to said crops growing on said levees.

5,438,795

## TRELLIS WIRE SUPPORT SYSTEM

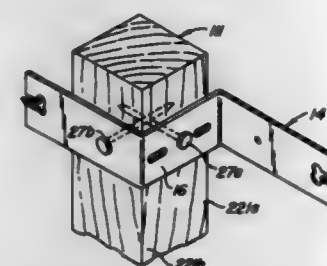
John M. Galbraith, P.O. Box 216, San Leandro, Calif. 94577

Filed Nov. 3, 1993, Ser. No. 147,206

Int. Cl.<sup>6</sup> A01G 17/06

U.S. Cl. 47-46

10 Claims



1. A trellis wire support system comprising: a plurality of horizontally spaced apart vertical posts adapted to support between them one or more trellis line wires; each post having a first side defined by horizontally spaced apart co-planar contact surfaces defining substantially the maximum width of said first side; said spaced apart posts positioned with their respective first sides disposed substantially parallel to the direction in which the line wires extend; a plurality of substantially identically formed generally Z-shaped bracket arms; at least one bracket arm mounted on each post; each bracket arm comprising a central flat web portion and first and second leg portions extending outwardly in opposite directions from, and at right angles to respectively associated opposite ends of said web portion; each bracket arm mounted on a post with the flat web section of the bracket arm securely positioned in contacting position with the respective first sides of an associated post and with the leg portions extending laterally outwardly to opposite sides of said post in opposite directions perpendicular to the plane of the spaced apart flat surfaces on the first side of said post; and means associated with the outer ends of the leg portions of each bracket arm for supporting a trellis line wire.

5,438,796

## LABEL IDENTIFIED PLANTER

Melvin A. Nathan, 5809 Lafayette Ave., Newark, Calif. 94560-2526

Filed Nov. 12, 1993, Ser. No. 151,121

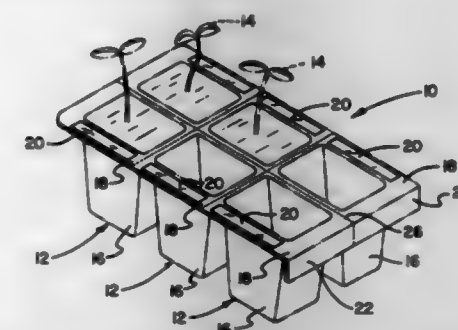
Int. Cl.<sup>6</sup> A01G 9/02

U.S. Cl. 47-66

7 Claims

1. A new label identified planter comprising: a container having a closed bottom and an open top end; a substantially horizontally extending flange coupled to and extending around said top end and outwardly therefrom; a label means positioned on said flange for receiving and displaying indicia;

a downwardly extending lip substantially orthogonally connected to said flange; and



a lip label means attached to said downwardly extending lip for receiving and displaying indicia.

5,438,797

## VERTICAL PLANTER

George Lendel, 1651 S. Vivian St., Longmont, Colo. 80501

Filed Apr. 25, 1994, Ser. No. 232,949

Int. Cl.<sup>6</sup> A01G 25/00

U.S. Cl. 47-82

8 Claims



1. A vertical planter comprising: a support base; a plurality of vertical pipe segments of equal outside diameter; said pipe segments further comprising a plurality of locking collars therebetween; said support base further comprising means for vertically supporting said pipe segments; a plurality of tiered vertically spaced apart flower pots centered about said pipe segments; dual support means for each of said flower pots with the exception of a lowermost flower pot comprising first a pile of dirt in each flower pot, and second a support bar means beneath each flower pot; and said support bar means further comprising a hole in each of said pipe segments and a bar through each of said holes the lowermost flower pot having dirt therein and including means for supporting said dirt within said lowermost flower pot.

5,438,798

SAFETY EDGE ASSEMBLY FOR A MOVABLE CLOSURE  
Günter Plamper, Strongsville, and Gerhard Plamper, Valley City, both of Ohio, assignors to Action Industries, Inc., Cleveland, Ohio

Filed Jul. 19, 1993, Ser. No. 94,362

Int. Cl.<sup>6</sup> E05F 15/02

U.S. Cl. 49-28

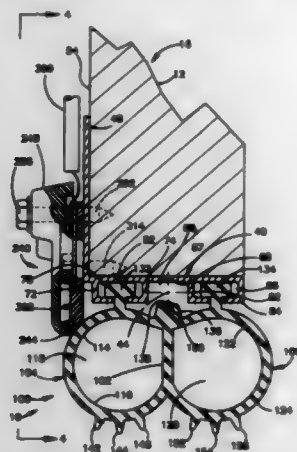
19 Claims

1. A safety edge assembly for mounting on a leading edge portion of a movable closure such as an overhead garage door, the door being movable by an electrically controlled operator in a first direction to close the door and in a second direction



opposite to the first direction to open the door, said safety edge an electrically conductive rigid mounting rail for connection with the door;

a deformable member supported on said mounting rail, said deformable member having a tubular wall defining a tubular chamber in said deformable member, said tubular wall having at least one inner surface defining said chamber and having an exposed outer surface; and



a conductive member disposed on said exposed outer surface of said deformable member, said conductive member being movable, upon deformation of said deformable member, from a first position normally spaced from said conductive mounting rail into a second position in engagement with said conductive mounting rail to complete an electrical circuit for controlling the direction of movement of the door.

5,438,799

# ARRANGEMENT WITH A DEVICE PIVOTING BETWEEN TWO POSITIONS SUCH AS A BARRIER ARRANGEMENT SWINGING BETWEEN A POSITION FORBIDDING THE ACCESS TO A RESERVED AREA AND AN ACCESS CLEARING POSITION

Joël R. Le Faucheur, Ableville La Riviere, France, assignor to Annie C. Kerjan, Ableville La Riviere, France  
Filed Jul. 27, 1993, Ser. No. 98,419

Claims priority, application France, Jul. 28, 1992, 90 09305  
Int. Cl.<sup>6</sup> E01F 13/00

U.S. Cl. 49-49

20 Claims



1. A barrier arrangement, comprising a barrier having at least one arm, means for mounting said barrier for rotation about a pivot axis between a raised position and a lowered position, drive means for pivoting said barrier about said barrier pivot axis, said drive means comprising an elongate lever, actuating means for actuating said drive means, and pivot means coupled to said lever for supporting said lever for pivoting about a pivot axis extending substantially parallel to said barrier pivot axis, a first lever arm being defined between said lever pivot axis and a first end of said lever and a second lever arm being defined between said pivot axis and a second end of said lever opposed to said first end, said first lever arm being smaller than said second lever arm, said drive means further comprising means for imparting a

force to said second lever arm for causing said lever to pivot about said lever pivot axis, said first lever arm being in operative engagement with said barrier such that upon pivoting of said lever about said lever pivot axis, said barrier pivots about said barrier pivot axis.

5,438,800

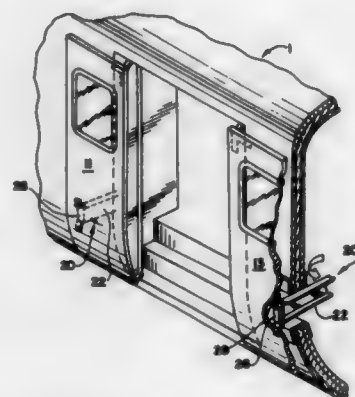
# STABILIZER FOR OUTSIDE SLIDING PLUG DOORS

Troy L. Porter, Roselle, Ill., assignor to Mark IV Transportation Products Corp., Niles, Ill.  
Filed Apr. 11, 1994, Ser. No. 226,140

Int. Cl.<sup>6</sup> E05D 15/10

U.S. Cl. 49-209

5 Claims



1. In an outside sliding plug door system of a type utilizing a door panel moving out of and away from an opening in a car side wall, a door panel stabilizer for preventing panel motion in an open position comprising:  
at least one door panel;  
said opening in said car side wall, alternately plugged and unplugged by said panel in moving from closed to open positions, respectively;  
means moving said panel out of said closed position to an open position along said car side wall adjacent said opening; and,  
means stabilizing said panel in an open position comprising:  
an arm on and extending from said car side wall, said arm having first and second ends;  
means mounting said arm first end in said car side wall for motion outward of said side wall and relative to said first end, said motion establishing a trajectory for said arm second end;  
means on said panel and arm second end for connecting said panel and arm second end when engaged;  
means moving said arm, thereby moving said second end through said trajectory when said panel is in an open position, said arm movement actuating said connection and capturing said panel;  
whereby connecting said panel and arm second end holds and stabilizes said panel, preventing panel motion in an opened position.

5,438,801

# QUARTER WINDOW OPENING/CLOSING APPARATUS

Mikiya Ishihara, Takahiro Yamada, and Fumihito Shimizu, all of Shizuoka, Japan, assignors to Azmo Co., Ltd., Shizuoka, Japan  
Filed Jun. 10, 1994, Ser. No. 258,058  
Claims priority, application Japan, Jul. 1, 1993, 5-036240 U

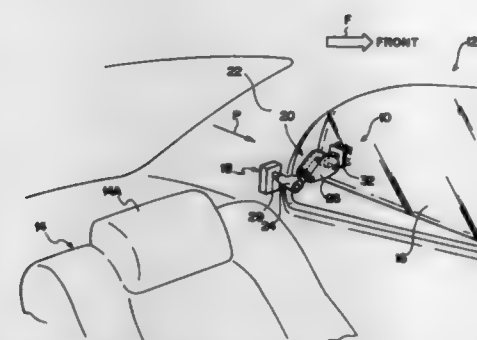
Int. Cl.<sup>6</sup> E05F 11/00

U.S. Cl. 49-357

16 Claims

1. A quarter window opening/closing apparatus comprising:  
a quarter window;  
a first link having a proximal attached rotatably to a vehicle body;

a second link having a proximal end connected rotatably to a distal end of said first link and said second link having a distal end attached rotatably to said quarter window; and urging means provided at a link-connecting portion where said proximal end of said second link is connected rotatably to said distal end of said first link, said urging means being adapted to urge said quarter window in one of an opening direction or a closing direction by means of said second link when said quarter window is in a state other than a fully closed state or a fully open state, said urging means maintaining both said fully closed state and said fully open state by generating a urging force applied at said first link and said second link;



said second link further comprising a stopper for preventing rotation of said first and second links when said quarter window is in said fully closed state or said fully open state, and said link-connecting portion is located on a lower side, as viewed in a vertical direction of said vehicle body, with respect to a straight line connecting a center of rotation of a first link-attaching portion where said proximal end of said first link is attached to said vehicle body and a center of rotation of a second link-attaching portion where said other end of said second link is attached to said quarter window.

5,438,802

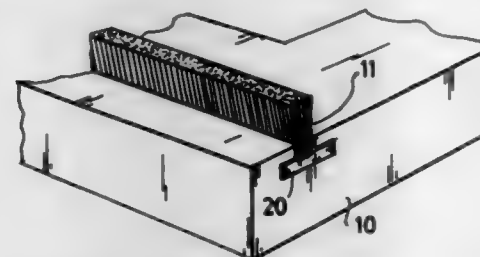
# WEATHERSTRIP ASSEMBLIES

Larry E. Johnson, Victor, N.Y., assignor to Ultrafab Inc., Farmington, N.Y.  
Filed Apr. 22, 1993, Ser. No. 52,022

Int. Cl.<sup>6</sup> E06B 7/16

U.S. Cl. 49-489.1

17 Claims



1. A weatherstrip assembly comprising:  
a) an elongated channel having a T-shaped cross-sectional area and an internal surface defined by a base and a pair of walls spaced apart from each other and extending vertically from said base and an opening opposite the base;  
b) a pair of lips, each lip forming an end of a wall distal from the base and each projecting in a direction toward the other lip to define a reduced cross-sectional area at the opening of said channel;  
c) a weatherstrip member comprising an elongated, flexible backing strip disposed in said channel, said backing strip having an upper surface facing said opening and a row of seal forming material extending along said upper surface and extending through said opening, said backing strip

comprising an elongated member having a generally rectangular cross-sectional area and external dimensions generally slightly less than said channel; and

d) local interference members comprising a plurality of nubbins disposed along said backing strip for engaging the portions of the internal surface of said channel proximate said nubbins to restrict longitudinal movement of the weatherstrip member in the channel, while allowing for advent movement and removal of the weatherstrip member.

5,438,803

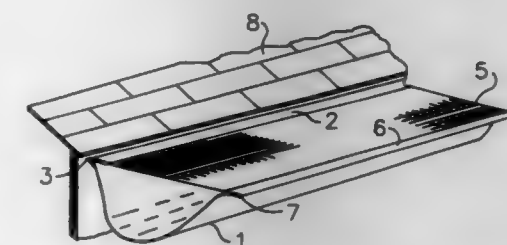
# RAIN GUTTER GUARD

George L. Blizard, Jr., Moorestown, N.J., assignor to Blizard Associates, Inc., Moorestown, N.J.  
Filed Oct. 29, 1993, Ser. No. 144,790

Int. Cl.<sup>6</sup> E04D 13/00

U.S. Cl. 52-12

9 Claims



1. A gutter guard adapted to be secured on top of a rain gutter, said gutter guard comprising:  
a rear portion which includes a curved portion arranged to secure said gutter guard to a rear wall of said rain gutter, said curved portion being shaped to provide a pivoting means for pivoting said gutter guard relative to said gutter;  
a front portion adapted to extend over a front wall of said gutter, said front portion having a pressure-sensitive adhesive on a bottom surface thereof, said front portion being adapted for attachment to said gutter in a closed position and said front portion being adapted for release from said gutter in an open position to allow access to said gutter; and  
an intermediate portion extending between said rear portion and said front portion and provided with openings sized to allow the passage of water while substantially retaining leaves and solid material.

5,438,804

# LANDSCAPE EDGING

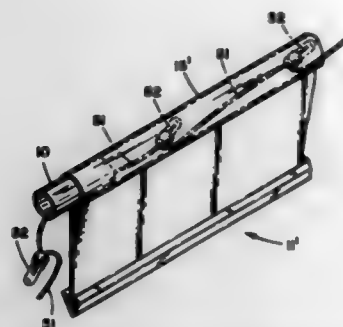
Donald J. Reum, Bonita Springs, Fla., and Mark Reum, Albany, Minn., assignors to Avon Plastics, Inc., Albany, Minn.  
Continuation of Ser. No. 126,426, Sep. 24, 1993, abandoned, which is a continuation of Ser. No. 994,080, Dec. 16, 1992, abandoned, which is a continuation of Ser. No. 879,547, May 4, 1992, abandoned, which is a continuation of Ser. No. 754,142, Aug. 30, 1991, abandoned, which is a continuation of Ser. No. 634,804, Dec. 28, 1990, abandoned, which is a continuation of Ser. No. 414,713, Sep. 29, 1989, abandoned. This application Jun. 3, 1994, Ser. No. 254,652  
Int. Cl.<sup>6</sup> A01G 1/08; F21V 21/00

U.S. Cl. 52-102

13 Claims

1. Landscape edging comprising:  
an elongated body member of predetermined length, height and thickness and defining first and second opposed faces, the body member being insertable into the ground;  
a top rail member extending longitudinally along a top portion of the body member, the member comprising a tubu-

lar member formed from material capable of transmitting light; and



lighting means disposed within the tubular top rail member for emitting light therefrom.

5,438,805

# DEVICE FOR RAISING AND LOWERING ELONGATED SUPPORT STRUCTURES

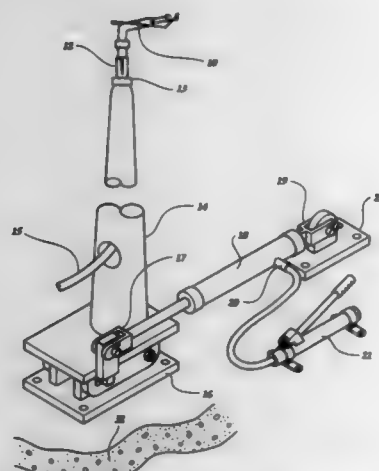
Charles R. McCrary, R.R. 1, Box 25, Estill, S.C. 29918

Filed Aug. 16, 1993, Ser. No. 106,828

Int. Cl.<sup>6</sup> B66C 23/06

U.S. Cl. 52-116

6 Claims



1. A device for raising and lowering elongated support structures, comprising:

- a. a base;
- b. a stand which is pivotally connected to said base near one end of said stand by means of a pivotal connection;
- c. an elongated support structure which is fixed to said stand; and
- d. an actuator means which has a control rod which extends generally horizontally from an end of said actuator means when said support structure is in a generally vertical position, wherein said control rod extends from said actuator means past said pivotal connection of said stand to said base and extends past said elongated support structure and is pivotally attached to said stand at a point of said stand which is opposite said support structure from said actuator means, wherein said control rod traverses and pulls said stand so as to cause said stand to pivot relative to said base and to move said stand from a vertical position to a horizontal position and which traverses in an opposite direction and pushes said stand to move said stand from a horizontal position to a vertical position.

5,438,806

# COMPOSITION FOR VIBRATION DAMPING

Per Reinhold, 10758 Riviera Pl. NE., Seattle, Wash. 98125

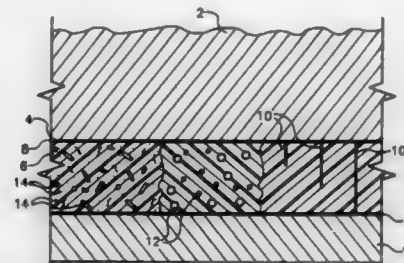
Filed Dec. 13, 1993, Ser. No. 165,663

The portion of the term of this patent subsequent to Aug. 9, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> E04B 1/98

U.S. Cl. 52-167.1

34 Claims



1. A composition for vibration damping of a structure releasing vibrational energy through its surface, said composition comprising:

- an elastomeric damping layer on the surface of the structure, said damping layer converting vibrational energy into strain energy and dissipating the strain energy as heat, said damping layer being structurally monolithic and substantially non-homogeneous such that the strain energy dissipated as heat by said damping layer is increased.

5,438,807

# CONSUMABLE SHOCK EVADER

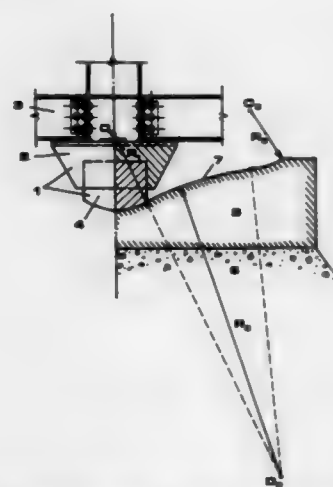
Valentin Shustov, 536 3/4 N. Genesee Ave., Los Angeles, Calif. 90036

Filed Nov. 18, 1993, Ser. No. 154,083

Int. Cl.<sup>6</sup> E02D 27/34; E04B 1/98

U.S. Cl. 52-167.4

1 Claim



1. A system of seismic base isolation devices attached to a supported superstructure to separate a superstructure from a rocking foundation for protection against damaging effect of strong earthquakes, with each of said devices comprising:

- a slip joint consisting of a consumable cylinder of a low shear strength and low friction material, said cylinder positioned in a massive housing, said housing located above said cylinder and rigidly connected to said supported superstructure;
  - a pedestal plate attached to a foundation and supporting said consumable cylinder with said cylinder being in sliding contact, along a lower surface thereof, with a concave upper surface of said pedestal plate during a lateral vibration of said foundation.
- said pedestal plate having an upper surface containing three

successive spherical areas smoothly transforming into each other and comprising:

- a concave central surface having a horizontal dimension equal to the corresponding horizontal dimension of the consumable cylinder's lower surface;
- a convex intermediate surface having a radius of vertical curvature a plurality times larger than the radius of curvature of said central surface; and
- a concave outer surface having a radius of vertical curvature much smaller than the radius of curvature of said intermediate surface.

5,438,808

# WOOD-SURFACED DOOR

James Costello, 195 W. Hills Rd., Huntington, N.Y. 11746

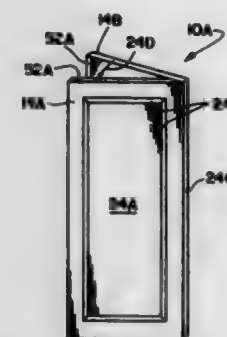
Filed Feb. 9, 1994, Ser. No. 194,027

The portion of the term of this patent subsequent to Feb. 15, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> E04C 1/00

U.S. Cl. 52-316

5 Claims



1. A wood-surfaced door formed of a metal core comprising cooperating door rectangular body panels each of thin gauge sheet metal construction material disposed in facing relation to each other, each said body panel having top, bottom and opposite side edges folded laterally thereof along fold lines correspondingly located along said top, bottom and opposite sides of each said body panel to contribute peripheral area rigidity to said body panel along said fold lines, four rectangular recesses in top and bottom areas of each said body panel bounded by four edges folded inwardly ninety degrees laterally of the plane of said body panel to form fold lines adapted to contribute along said fold lines a resistance to bending providing medial area rigidity to each said body panel, and plural wood panels adhesively secured in covering relation over an exterior surface of at least one door said body panel, whereby the external appearance of said door body panel is of a wooden article of manufacture.

5,438,809

# MODULAR TILE FLOORING SYSTEM

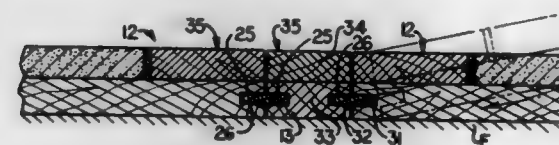
Gernot Ehrlich, Wilmington, N.C., assignor to Stone Art, Inc., Wilmington, S.C.

Filed Oct. 27, 1993, Ser. No. 144,235

Int. Cl.<sup>6</sup> E04F 15/022

U.S. Cl. 52-390

18 Claims



1. A modular flooring unit, comprising:  
a rigid base, said rigid base having upper and lower faces, peripheral edges, and a slot formed in at least one of said

peripheral edges, said at least one peripheral edge being aligned above and below said slot;

at least one tile bonded to said upper face of said base and having lateral edges; and

a compressible frame affixed to said base and extending around said at least one tile so as to surround said lateral edges of said at least one tile and further defining peripheral edges of the flooring unit;

said slot having a size and shape for receiving a first portion of an elongate spline so that a second portion of the spline protrudes from said slot, so that the second spline portion may be received within a corresponding slot defined in a different modular flooring element to join the different element to said unit.

5,438,810

# ROOFING PANELS AND ROOFING ASSEMBLIES THEREOF

Robert J. Bullen, "Lauren", South Lane, Ash, Surrey GU12 6NG, and Gordon D. Addison, 33 Ombesley Road, Worcester W93 7BP, both of England

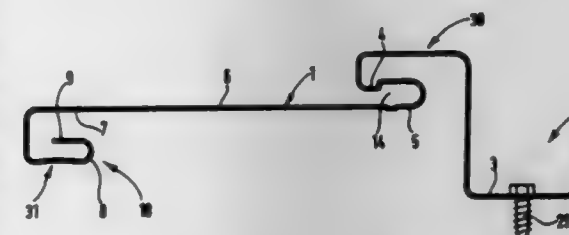
Filed Jan. 14, 1994, Ser. No. 182,607

Claims priority, application United Kingdom, Jan. 16, 1993, 9300792

Int. Cl.<sup>6</sup> E04D 1/36

U.S. Cl. 52-539

12 Claims



1. A roofing panel for use on an inclined roofing support structures, the roofing panel comprising: a panel member formed of sheet material and configured in section from a higher end thereof to a lower end thereof such as to define at the higher end thereof a downwardly depending foot arranged in use to enable securement of the panel member to the roofing support structures at or adjacent the higher end and then an upwardly extending ridge having a slot in a side of the ridge facing the lower end of the panel member, wherein the upwardly extending ridge projects a transverse distance from a main body of the panel member which is less than a transverse distance which the foot projects from the main body of the panel member; the lower end of the panel member including a downwardly directed ridge arranged in use to overlie an upwardly extending ridge of a next succeeding lower panel member and the lower end including a tongue directed towards the higher end of the panel member and lying beneath an under surface of the panel member and arranged in use to engage with a slot in the upwardly directed ridge of the next succeeding lower panel member for positive location therewithin, whereby the panel member in use lies over a downward depending securement foot of a next succeeding lower panel member.



5,438,811

**JOINTING METAL FIXTURE FOR CONSTRUCTION**

Shigeo Goya, 27-1, Kumoji 3-chome, Naha-shi, Okinawa-ken, Japan, assignor to Shigeo Goya and Shigeru Goya, both of Naha, Japan

Filed Dec. 16, 1993, Ser. No. 167,030

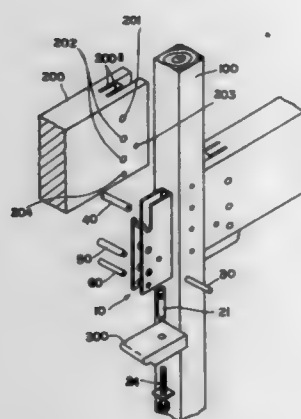
Claims priority, application Japan, Mar. 22, 1993, 5-018850

U

Int. Cl.<sup>6</sup> E04B 1/38

U.S. Cl. 52—702

6 Claims



1. A metal fixture employed for jointing wooden members together in a wooden structure, comprising:

a main member having a back side adapted to be secured to one wooden member, and a pair of lateral extensions extending forwardly from the back side and arranged parallel to each other, each of the lateral extensions having a pin through-hole, and at least one of a clogged joint groove and a through hole,

a design bracket disposed under the main member and adapted to cover a jointing portion of the wooden members,

a supporting member for supporting the design bracket under the main member, said supporting member having a cylindrical member having a pin through-hole and attached to the main member, a nut fixed to a lower end of the cylindrical member, and a bolt engaging the nut and supporting said design bracket under the main member, and

an insertion pin disposed between the cylindrical member and the main member for fixing the supporting member to the main member, said insertion pin passing through the pin through-holes of the lateral extensions and the cylindrical member.

5,438,812

**HOLLOW VENEERED POLE**

Robert W. Erickson, Minneapolis, Minn., assignor to Regents of The University of Minnesota, Minneapolis, Minn.

Filed Dec. 23, 1993, Ser. No. 173,351

Int. Cl.<sup>6</sup> E04C 3/36

U.S. Cl. 52—736.3

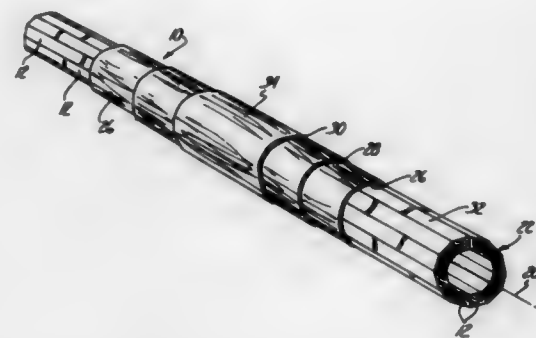
11 Claims

1. A hollow elongated member comprising a plurality of elongated wood strips having generally trapezoidal cross sections with outer surfaces and side edge surfaces formed at an angle relative to each other so that when the plurality of strips

are placed side to side, a hollow core is formed with a substantially continuous outer surface;

an adhesive for holding the wood strips in an assembled condition forming the hollow core; and

at least one substantially continuous layer of high strength veneer material on the exterior of the formed hollow core extending throughout the length and periphery of the core



to provide a high strength outer layer intimately, permanently secured on the core.

5,438,813

**METHOD FOR INSULATING WALLS OF FURNACE**

James A. Wade, Salina, Okla., assignor to A. P. Green Industries, Inc., Mexico, Mo.

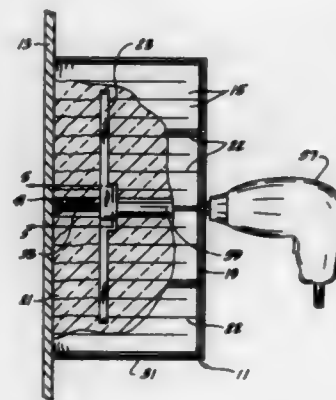
Continuation-in-part of Ser. No. 985,005, Dec. 2, 1992,

abandoned. This application Aug. 19, 1993, Ser. No. 110,163

Int. Cl.<sup>6</sup> E04B 1/38; E04G 21/00

U.S. Cl. 52—747.13

8 Claims



1. A method for insulating a furnace wall comprising the steps of:

providing a ceramic fiber module having a hot face and a cold face in parallel relationship, the module comprising a plurality of ceramic fiber mats having major surfaces perpendicular to the hot and cold faces, an elongate tine having a generally central opening therein, the tine impaling each of the mats in a plane generally parallel to the hot and cold faces, and a stud having first and second opposite ends, said first end protruding through and projecting outwardly from the cold face of the module, the tine receiving the stud through its central opening; placing a fastener on the stud with the tine being located between the fastener and the first end of the stud, the

fastener being engageable with the tine and being adapted for holding itself on the stud in a selected location along the length of the stud;

positioning the module with its cold face generally adjacent the interior wall of the furnace;

attaching as by welding the first end of the stud to the interior wall;

capturing the fastener with a fastening tool made of a yieldable material for movement of the fastener conjointly with the fastening tool; and

compressing the mats against the interior wall of the furnace with a predetermined compression force by moving the fastener with the fastening tool toward the first end of the stud against the tine such that the tine is driven toward the first end of the stud, the tine pushing the module against the interior wall of the furnace as the fastener is moved thereby enveloping the protruding part of said first end of the stud within the module and compressing the mats of the module against the interior wall with the mats supplying an increasing reaction force resisting further movement of the tine and fastener toward the first end of the stud, the tine being driven toward said first end of the stud by the fastening tool until the reaction force is sufficiently large to cause the fastening tool material to yield and the fastening tool to release the fastener.

of the held lid in a radially oriented position, such that the lid holding and releasing means releases the lid onto the bucket directly from the radially oriented position.

5,438,815

**PROCESS FOR PRODUCTION OF SPACER MEANS FOR POSITIONING BETWEEN ARTICLES**

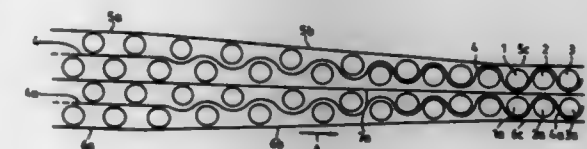
Norbert Fleuren, Gocher Str. 27, D-47559 Kranenburg, Germany

Filed Dec. 3, 1993, Ser. No. 162,460

Int. Cl.<sup>6</sup> B65B 35/54, 61/00, 17/00

U.S. Cl. 53—398

5 Claims



1. A process for the production of an arrangement of spacer means for positioning between a plurality of articles, said plurality of articles being supplied in at least first and second rows of articles in mutually displaced relationship and at a spacing in a transportation direction, said process comprising the steps of: introducing a flat spacer portion in the form of a substantially upstanding substantially flat strip between said articles and moving said articles in said first and second rows towards each other as said articles are being moved in said transportation direction whereby said spacer portion is forcibly shaped into a meander-like configuration as viewed in plan by contact with said articles themselves as said first and second rows of said articles are moved together to constitute a common row thereof.

5,438,814

**BUCKET LIDDING SYSTEM FOR CONTINUOUSLY CONVEYING BUCKETS**

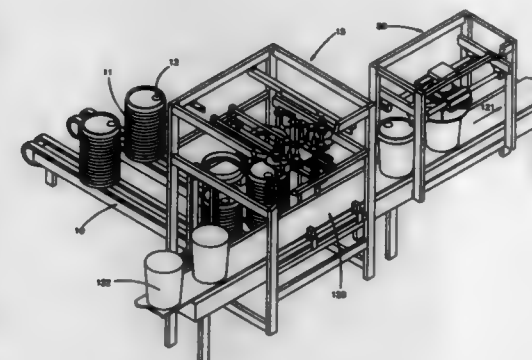
David E. Lovett, and Richard O'Brien, both of Indianapolis, Ind., assignors to Webber Manufacturing Co., Inc., Indianapolis, Ind.

Filed Sep. 21, 1993, Ser. No. 125,111

Int. Cl.<sup>6</sup> B65B 7/28

U.S. Cl. 53—75

31 Claims



13. A bucket lidding system for placing a lid having a fitting onto a bucket, the system comprising: means for holding and releasing the lid; means for rotating the held lid prior to releasing the lid; means for sensing the lid fitting without mechanically contacting the lid; and means responsive to the sensing means for stopping rotation

5,438,817

**OUTDOOR WORKING AUTOMATING SYSTEM**

Tetsuya Nakamura, Tokyo, Japan, assignor to Sakura Rubber Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1993, Ser. No. 132,645

Claims priority, application Japan, Oct. 9, 1992, 4-271836

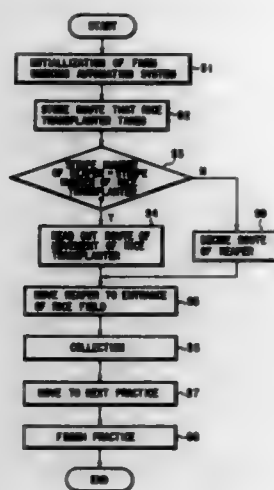
Int. Cl.<sup>6</sup> A01D 45/04

U.S. Cl. 56—10.2 A

11 Claims

1. An outdoor working automating system comprising: a rice reaper including position detecting means for detecting a current position, and control means for controlling the position of said rice reaper so that the current position detected by said position detecting means traces a route data; a rice transplanter including position detecting means for detecting a current position, and storage means for storing the current position detected by said position detecting means; and means for causing said external storage means to store a

route that said rice transplanter takes in rice transplanting, and causing said rice reaper to perform rice reaping automatically by using the position data stored in said storage means as said route data of said rice transplanter.



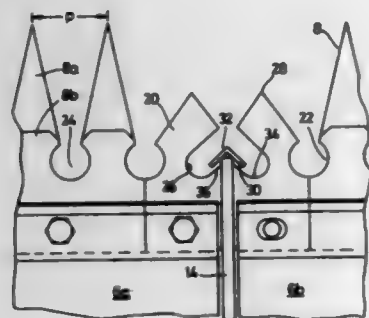
atically by using the position data stored in said storage means as said route data of said rice transplanter.

#### 5,438,818 STRIPPER DRUMS

Keith Shelbourne, and Paul J. McCredie, both of Suffolk, England, assignors to Shelbourne Reynolds Engineering Ltd., Suffolk, England  
PCT No. PCT/GB93/00056, § 371 Date Jul. 14, 1994, § 102(e) Date Jul. 14, 1994, PCT Pub. No. WO93/03642, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 12, 1993, Ser. No. 256,565  
Claims priority, application United Kingdom, Jan. 14, 1992, 9200726

Int. Cl. 6 A01D 41/06, 75/18  
U.S. Cl. 56—220 10 Claims

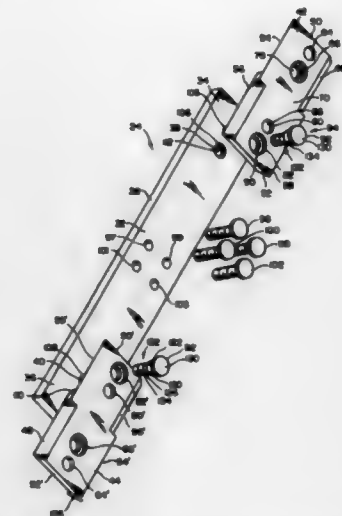


1. A crop stripper comprising a rotary carrier having an axially extending series of stripping teeth, supports for the carrier at the ends of the carrier, said support at least at one end of the carrier being flanked by root portions of the stripping teeth most adjacent the support and comprising a radially outer element which projects radially outwardly of the nearest ends of said flanking tooth root portions, in the region nearer said support the edge profile of said root portions being inclined radially inwardly away from the support whereby crop stems contacting said root portion profiles are deflected away from the support.

#### 5,438,819 BLADE ASSEMBLY FOR A BRUSH CUTTING MACHINE

Jimmie J. Dallman, 3709 99th Dr. SE., Everett, Wash. 98205  
Filed Apr. 28, 1994, Ser. No. 234,670  
Int. Cl. 6 A01D 34/64, 34/73

U.S. Cl. 56—295 20 Claims



1. A blade assembly for a brush cutting machine, the cutting machine having two sides and a crossbar, the crossbar having a top surface, a bottom surface and at least one hole positioned therethrough, the blade assembly comprising:

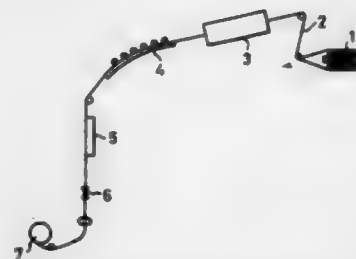
- at least one generally rectangular metal member having a first and second ends, an upper surface and a lower surface, and having at least two cutting edges on the first end, including one forward facing cutting edge and one rearward facing cutting edge, and at least one cutting edge on the second end, including a forward facing cutting edge, the cutting edges each having a bevel;
- an attaching means for attaching the metal member to the bottom surface of the crossbar, the metal member being free swinging relative to the crossbar; and whereby the metal member is rotatable from the first end to the second end and is invertible from the upper surface to the lower surface.

#### 5,438,820 COOLING APPARATUS OF A FALSE TEXTURING MACHINE

Takeichi Nakahara; Hajime Hino; Takashi Ikeuchi, and Tutomu Ogiso, all of Matsuyama, Japan, assignors to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Mar. 21, 1994, Ser. No. 215,079  
Claims priority, application Japan, Jan. 3, 1993, 5-09853  
Int. Cl. 6 D01H 7/92, 7/46

U.S. Cl. 57—290 15 Claims



1. A false texturing machine for treating yarn, the machine comprising:  
a false twisting device for imparting twists to a yarn passing through the machine;

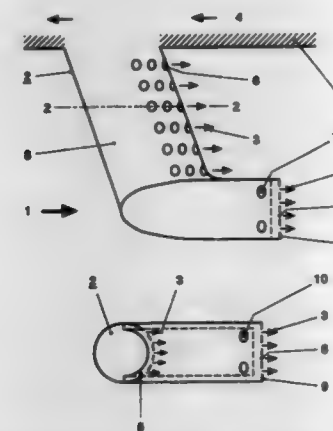
a heating apparatus for heat-setting the twists imparted to the yarn by the false-twisting device, the heating apparatus being disposed upstream from the false twisting device with the twists running along the yarn from the false-twisting device toward the heating apparatus; and  
a cooling apparatus for cooling the yarn, the cooling apparatus being disposed between the heating apparatus and the false twisting device and including:  
at least two yarn contacting surfaces which contact and cool the yarn;  
a non-yarn contacting portion, in which the yarn does not contact the at least two contacting surfaces said non-yarn contacting portion being disposed between said at least two yarn contacting surfaces such that the yarn extends from one yarn contacting surface, across the non-yarn contacting portion, and to the other yarn contacting surface; and  
a pressing member disposed at the non-yarn contacting portion which presses the yarn into said portion in a direction which is generally transverse to said yarn contacting surfaces to reduce ballooning of the yarn within the false texturing machine.

#### 5,438,821 METHOD AND APPLIANCE FOR INFLUENCING THE WAKE OF COMBUSTION CHAMBER INSERTS

Burkhard Schulte-Werning, Basel, Switzerland, assignor to ABB Management AG, Baden, Switzerland  
Filed Mar. 11, 1994, Ser. No. 208,830

Claims priority, application Germany, Mar. 22, 1993, 43 09 131.8

Int. Cl. 6 F23R 3/02  
U.S. Cl. 60—39.02 8 Claims



1. A method for for preventing a flame holder effect in a wake of a fuel nozzle holder and a fuel nozzle attached to an end of the fuel nozzle holder projecting transversely in a main air mass flow in a combustion chamber, comprising the steps of:

- guiding an additional air mass flow through a fuel nozzle holder located upstream of a combustion zone of the combustion chamber;
- blowing the additional air mass flow out of the fuel nozzle holder into the combustion chamber, upstream of the fuel nozzle anti an actual combustion flame zone and in the wake of the pan of the fuel nozzle holder so that a recirculating flow region is minimized to prevent a flame holder effect.

5,438,822  
Patent Not Issued For This Number

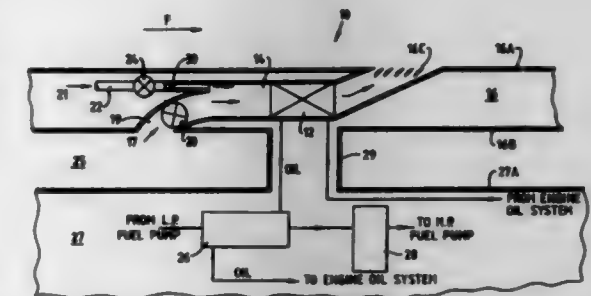
#### 5,438,823 HEAT EXCHANGE APPARATUS FOR GAS TURBINE FLUIDS

Russell A. Loxley, Leicestershire, and Andrew Clarke, Nottingham, both of England, assignors to Rolls-Royce, plc, Derby, England

PCT No. PCT/GB91/02294, § 371 Date Jun. 18, 1993, § 102(e) Date Jun. 18, 1993, PCT Pub. No. WO92/11451, PCT Pub. Date Jul. 9, 1992

PCT Filed Dec. 20, 1991, Ser. No. 81,321  
Claims priority, application United Kingdom, Dec. 21, 1990, 9027782

Int. Cl. 6 F02C 7/14  
U.S. Cl. 60—39.08 11 Claims



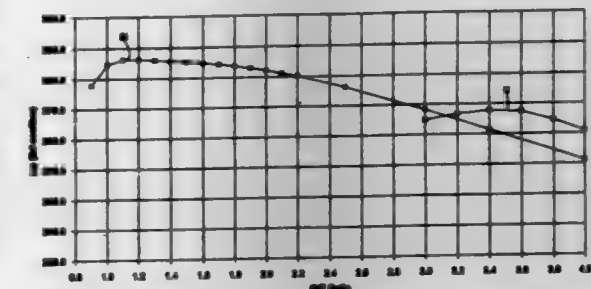
1. A heat exchange apparatus for a combustion engine having a lubrication oil system and a fuel supply system, comprising a first heat exchanger receiving oil from the lubrication oil system to put the oil in heat exchange relationship with a heat exchange medium, a second heat exchanger receiving the oil from the first heat exchanger, and placing the oil in heat exchange relationship with fuel in the fuel system and returning the engine oil to the engine, high and low temperature sources for said heat-exchange medium, and valve means for controlling flow from the high and low temperature sources of the heat exchange medium through the first heat exchanger such that the direction of heat flow between the oil and the heat exchange medium can be changed as necessary to prevent the fuel temperature from straying beyond predetermined limits.

#### 5,438,824 SILICON AS A HIGH ENERGY ADDITIVE FOR FUEL GELS AND SOLID FUEL-GAS GENERATORS FOR PROPULSION SYSTEMS

Leo K. Asaka; William M. Chew; Darren M. Thompson, and Douglas L. May, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 21, 1994, Ser. No. 215,747  
Int. Cl. 6 F02K 9/00

U.S. Cl. 60—251 3 Claims



1. In a propulsion system selected from a gel bipropulsion propulsion system, a hybrid propulsion system, and a ducted rocket propulsion system with each of said propulsion systems having a separate fuel supply system and a separate oxidizer



supply system that cannot interact to yield propulsion unless injected and combined in a combustion chamber, said gel bipropulsion propulsion system comprised of a liquid fuel of monomethylhydrazine, a solid fuel of carbon black, a gellant of hydroxyalkyl-substituted cellulose, and an additive of dimethylurea, and said hybrid propulsion system and said ducted rocket propulsion system having a solid fuel gas generator comprised of a polyfunctional glycidyl azide polymer, a diisocyanate crosslinking agent, and carbon black fuel; the improvement of the specific impulse and the density specific impulse of said fuel system of said gel bipropulsion propulsion system, said hybrid propulsion system, and said ducted rocket propulsion system achieved by including from about 0.5 weight percent to about 70 weight percent a solid high energy material silicon to replace all weight percent of said solid fuel of said carbon black of said gel bipropulsion propulsion system, all weight percent of said carbon black of said hybrid propulsion system, and all weight percent of said carbon black of said ducted rocket propulsion system.

5,438,825

# AIR-COOLED ENGINE FOR POWERING PORTABLE EQUIPMENT

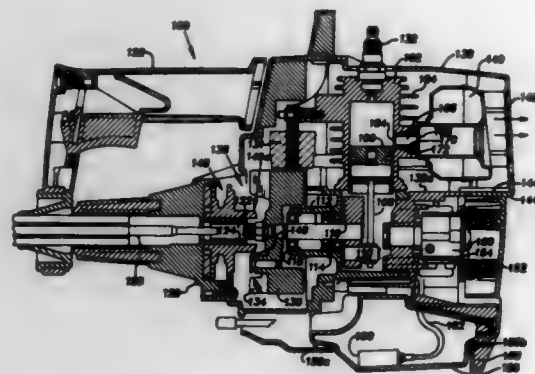
James L. Bloemers, 4814 General Scott PL, Bossier City, La. 71112

Filed Jun. 4, 1993, Ser. No. 72,164

Int. Cl.<sup>6</sup> F01N 7/10

U.S. Cl. 60—272

13 Claims



1. A hand-held, portable work producing apparatus powered by an internal combustion engine comprising:  
a work producing component positionable by a handle manipulatable by a person;  
an air-cooled combustion engine coupled to provide a motive force to the work producing component, the engine including a cylinder made substantially from a metal that is lightweight and provides good heat conductivity, the cylinder having an exterior surface with a plurality of cooling fins across which air is blown for cooling the engine, the cylinder including a wall through which an exhaust port is defined for transferring gases after combustion from inside the cylinder to a muffler adjoining the exterior of the cylinder;  
a unitary sleeve made of a material having less heat conductivity than the metal of the engine, the sleeve being inserted into the exhaust port from the exterior of the cylinder, said sleeve including a flange that extends outwardly from the walls of the sleeve and is in contact with the exterior of the cylinder when the sleeve is fully inserted in the exhaust port, said flange allowing an outer seal to form between the muffler and the sleeve and permitting the muffler to retain the sleeve securely within the exhaust port;  
said muffler being adjacent to and retained against the cylinder by fastening means, the muffler having an inlet cou-

pled to the exhaust port for receiving exhaust gases and acting to retain the sleeve securely within the exhaust port without any additional fastening means for the sleeve; wherein the inner surfaces of the exhaust port narrow near the inside of the cylinder to the dimension of the sleeve so that a portion of the sleeve contacts the surfaces of the exhaust port near the inside of the cylinder to form an inner seal between the sleeve portion and the exhaust port that tends to withstand the vibrational forces of the engine, wherein the sleeve is dimensioned such that walls of the sleeve between said sleeve portion and said flange are spaced apart from inner surfaces of the exhaust port to create an air gap between the sleeve and the inner surfaces of the exhaust port, the inner seal preventing exhaust gases from escaping into the air gap.

5,438,826

# METHOD FOR ADJUSTING THE FUEL/AIR MIXTURE FOR AN INTERNAL COMBUSTION ENGINE AFTER AN OVERRUN PHASE OF OPERATION

Frank Blischke, Stuttgart; Klaus Hirschmann, Leonberg; Lothar Raff, Remseck, and Eberhard Schnabel, Hemmingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

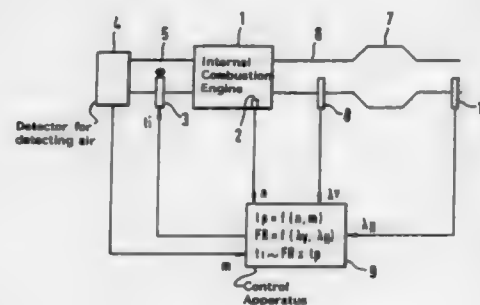
Filed Nov. 1, 1993, Ser. No. 144,009

Claims priority, application Germany, Oct. 31, 1992, 42 36 922.3

Int. Cl.<sup>6</sup> F02D 41/14

U.S. Cl. 60—276

1 Claim



1. A method for adjusting the fuel/air mixture for an internal combustion engine wherein the metering of fuel is interrupted in dependence upon operating parameters, the engine being equipped with a lambda control and a catalytic converter, the lambda control including a lambda probe arranged rearward of the catalytic converter, the method comprising the steps of:  
operating said engine in a transition from a first state wherein no fuel is metered to the engine to a second state wherein fuel is metered to the engine;  
driving said engine when said transition occurs first with a fuel/air mixture having a fuel portion which is increased relative to a stoichiometric composition thereby carrying out an enrichment of said mixture to form a rich mixture; and,  
carrying out said enrichment until said lambda probe registers an exhaust gas composition which is characteristic of a rich mixture.

5,438,827

# DUAL-SENSOR TYPE AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE AND CATALYTIC DIAGNOSIS APPARATUS FOR THE SAME

Hirofumi Ohuchi, and Shinya Fujimoto, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 133,983, Oct. 8, 1993, Pat. No. 5,363,647.

This application Sep. 21, 1994, Ser. No. 308,510

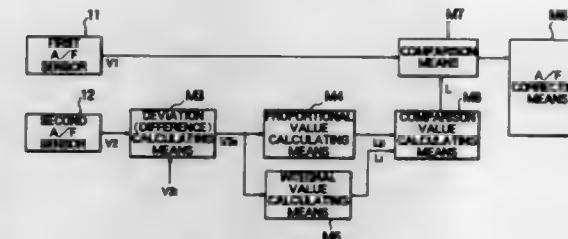
Claims priority, application Japan, Oct. 13, 1992, 4-274337;

Oct. 15, 1992, 4-277444; Oct. 21, 1992, 4-283182

Int. Cl.<sup>6</sup> F01N 3/20

U.S. Cl. 60—276

2 Claims



1. A dual-sensor type air-fuel ratio control system for an internal combustion engine, comprising:  
a catalytic converter disposed within an exhaust pipe of said engine for purifying an exhaust gas;  
a first air-fuel ratio sensor disposed upstream of said catalytic converter for detecting concentration of a particular component of said exhaust gas to thereby generate a first air-fuel ratio signal indicating said concentration;  
a second air-fuel ratio sensor disposed downstream of said catalytic converter for detecting concentration of said particular component of said exhaust gas to thereby generate a second air-fuel ratio signal indicating said concentration;  
deviation calculating means for arithmetically determining a deviation of said second air-fuel ratio signal from a first comparison value;  
proportional value calculating means for arithmetically determining a proportional value which is proportional to said deviation determined by said deviation calculating means;  
integrating means for calculating an integration value corresponding to said deviation;  
comparison value calculating means for arithmetically determining a second comparison value on the basis of said integration value and said proportional value;  
comparison means for comparing said first air-fuel ratio with said second comparison value; and  
air-fuel ratio correcting means for regulating an air-fuel ratio correcting quantity on the basis of the result of the output of said comparison means.

5,438,828

# MANIFOLD TYPE CATALYTIC CONVERTER ARRANGEMENT

Yasuo Fukae, Tokyo, Japan, assignor to Calsonic Corporation, Tokyo, Japan

Filed Sep. 21, 1993, Ser. No. 124,400

Claims priority, application Japan, Sep. 21, 1992, 4-065650 U

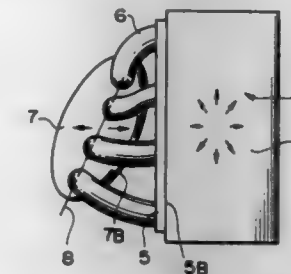
Int. Cl.<sup>6</sup> F01N 3/28

U.S. Cl. 60—302

50 Claims

1. A manifold type catalytic converter arrangement for an internal combustion engine, comprising:  
a flange attached to a cylinder head of said engine, said flange having installation openings formed therethrough at locations corresponding to positions of exhaust ports in said cylinder head of said engine;  
a plurality of branch tubes, a first end of each of said branch tubes being connected to a corresponding one of said installation openings of said flange, second ends of said branch tubes being attached to an upper side of a vessel

and respectively positioned in alignment with each other so as to define a line which is laterally offset from a longitudinal axis of said engine, an offset angle of said line being selected according to a relation between rotational speed of said engine and vibration resonance applied to said vessel, a number of second ends of said branch tubes being at least two; and



a vessel arranged to one side of said engine and containing therein a catalytic carrier for carrying out catalytic conversion, said vessel having an upper side having receiving portions aligned to correspond to positioning of said second ends of said branch tubes.

5,438,829

# AIR COMPRESSION SYSTEM HAVING TWO SEPARATE COMPRESSED AIR ACCUMULATORS

Toshifumi Kubota, and Mitsuhiko Sunaoishi, both of Katsuta, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

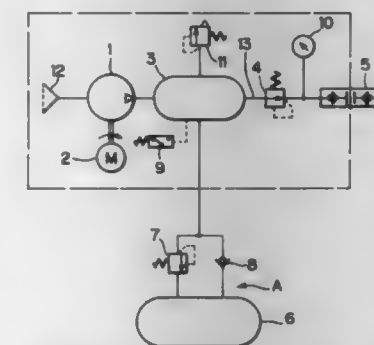
Filed May 12, 1993, Ser. No. 59,368

Claims priority, application Japan, Jun. 5, 1992, 4-145709; Mar. 10, 1993, 5-149488

Int. Cl.<sup>6</sup> F16D 31/02

U.S. Cl. 60—410

2 Claims



1. An air compression system for supplying a compressed air into a pneumatically operated tool, the system including an air compressor having an outlet end and an air accumulator connected to the outlet end of the air compressor, and the improvement comprising:  
the air accumulator comprising a first accumulator and a second accumulator separate therefrom, the first and second accumulators being connected in series with respect to the outlet end of the compressor, and the first accumulator being connected to the pneumatically operated tool;  
means for changing air accumulation to the second accumulator when a pressure of the compressed air accumulated in the first accumulator increases to a predetermined pressure, the changing means comprising a relief valve connected between the first and second accumulators for allowing the compressed air in the first accumulator to flow into the second accumulator when the pressure level in the first accumulator reaches the predetermined pressure;  
a check valve connected between the first and second accu-

mulators for allowing the compressed air accumulated in the second accumulator into the first accumulator when the pressure level in the first accumulator is lower than that in the second accumulator; and  
 a pressure switch connected to the first accumulator for detecting a pressure level and energizing the compressor when the pressure level in the first accumulator drops below a predetermined level, the second accumulator, the relief valve, and the check valve being in a unit connectable to the first accumulator.

5,438,830

## EXHAUST SYSTEM OF INTERNAL COMBUSTION ENGINE

Hiroatsu Matsumura, Ebina, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

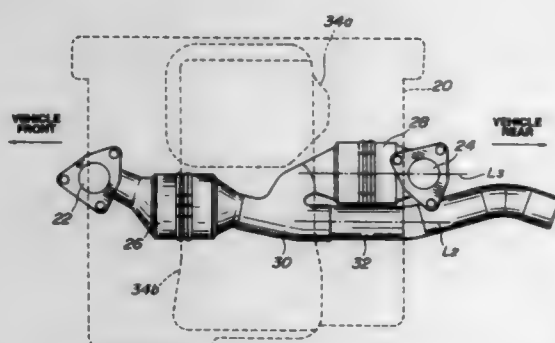
Filed Apr. 28, 1994, Ser. No. 234,360

Claims priority, application Japan, Jun. 16, 1993, 5-145196

Int. Cl.<sup>6</sup> F01N 3/28

U.S. Cl. 60-302

4 Claims



1. An exhaust system of a transverse V-type or horizontal opposed type engine having front and rear cylinder banks, said exhaust system comprising:

front and rear exhaust pipes which are respectively provided for the front and rear cylinder banks;

front and rear catalytic converters, which are respectively connected to said front and rear exhaust pipes, each of said front and rear catalytic converters having an elliptical section;

a joint exhaust pipe which is connected to said front and rear catalytic converters for collecting exhaust gas from said front and rear catalytic converters; and

a combined exhaust pipe which is connected to said joint exhaust pipe, said combined exhaust pipe having a longitudinal axis which is substantially parallel to a longitudinal axis of said rear catalytic converter such that exhaust gas flow in said rear catalytic converter is in the substantially opposite direction to exhaust gas flow in said combined exhaust pipe,

wherein a major axis of the elliptical section of said rear catalytic converter is inclined at a certain angle relative to said combined exhaust pipe.

5,438,831

## 331E1DRIVING APPARATUS

Hideaki Okada, Amagasaki, Japan, assignor to Kanzaki Kokyukoki Mfg. Co., Ltd., Hyogo, Japan

Filed Sep. 24, 1993, Ser. No. 126,189

Claims priority, application Japan, Sep. 30, 1992, 4-068059 U

Int. Cl.<sup>6</sup> F16D 31/02, 39/00

U.S. Cl. 60-445

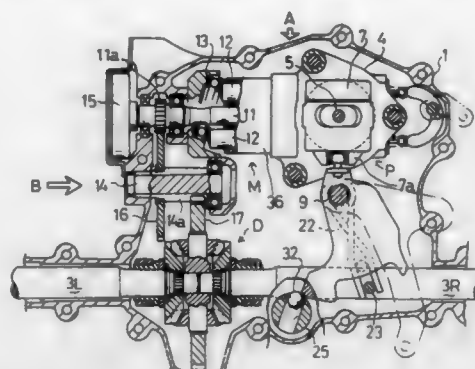
29 Claims

1. An axle driving apparatus comprising:

a housing;

a hydrostatic transmission disposed within said housing, including a variable displacement type hydraulic apparatus, and a movable swash plate having a variable direction of slant, whereby the movement of said movable swash plate controls the discharge direction of oil in said hydro-

static transmission and the volume of flow of oil in said hydrostatic transmission;  
 an operating mechanism disposed within said housing for controlling the movement of said movable swash plate;



a detection means for detecting when said operating mechanism moves said movable swash plate from a first slanting position to a second slanting position; and  
 a switching unit operated by said detection means only when said detection means detects movement of said moveable swash plate to said the second slanting position.

5,438,832

## VARIABLE DISPLACEMENT PUMP WITH

## ADJUSTMENT RESPONSIVE TO DRIVE MOTOR SPEED

Yoshitake Yonekubo, Tokyo; Kenichi Nishiumi; Hisato Naito, both of Kanagawa, and Yoshimi Hasegawa, Chiba, all of Japan, assignors to Kayaba Industry Co., Ltd., Tokyo, Japan

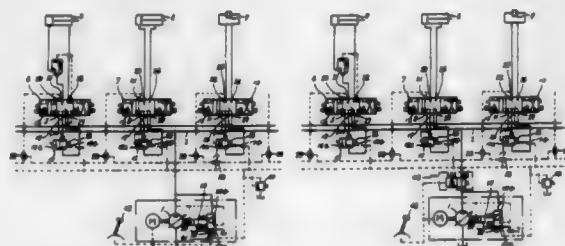
Filed Aug. 31, 1993, Ser. No. 114,613

Claims priority, application Japan, Aug. 31, 1992, 4-255926; Aug. 31, 1992, 4-255927

Int. Cl.<sup>6</sup> F16D 31/02

U.S. Cl. 60-449

2 Claims



1. A control device for an actuator comprising:

a variable discharge pump connected to a power source; change-over valves for controlling actuators;

said change-over valves being connected to said variable discharge pump;

a regulator which is arranged for controlling said variable discharge pump and into which a load pressure of each of the actuators is introduced;

said regulator including a control cylinder for controlling a tilting angle of said variable discharge pump and a valve for controlling said control cylinder;

said valve having a pilot chamber defined on each of both sides thereof;

one of said pilot chambers of said valve being provided with a spring;

said one pilot chamber of said valve being applied thereto the load pressure of the actuators and elastic force of said spring;

the other of said pilot chambers of said valve being applied thereto a discharge pressure of said variable discharge pump, resulting in the discharge pressure of said variable

discharge pump being kept increased in an amount corresponding to the elastic force of said spring as compared with the load pressure of the actuators; and  
 an adjusting mechanism for adjusting the elastic force of said spring in proportion to the number of rotations of said power source.

5,438,833

## MASTER CYLINDER

Kimio Ishihara, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

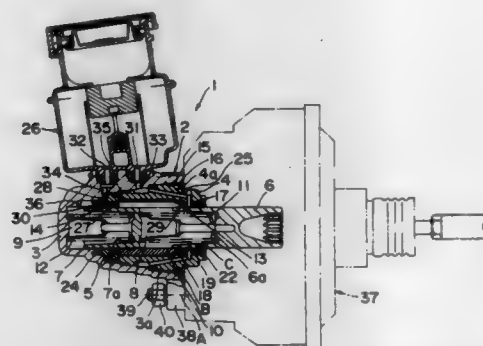
Filed Mar. 29, 1994, Ser. No. 219,362

Claims priority, application Japan, Apr. 16, 1993, 5-089653

Int. Cl.<sup>6</sup> B60T 11/20

U.S. Cl. 60-562

16 Claims



1. In a master cylinder including a cylinder housing having a hollow interior with an opening at one end thereof, a hollow cylindrical cap extending into said hollow interior of said housing and threadably connected to said housing adjacent said opening, a piston guide in said housing, a piston extending into said cap and supported and guided by said piston guide for reciprocating movement in said housing, a pressure chamber in said housing formed by said piston and said hollow cylindrical cap, a fluid reservoir mounted on said housing, an outer circumferential surface on said piston, a hole through said outer circumferential surface of said piston for communicating said pressure chamber with said reservoir at a predetermined position of said piston in said housing, a piston guide sleeve mounted in said housing and having an inner surface engaging said outer circumferential surface of said piston for guiding and supporting said piston, a primary seal disposed in said housing for sealing said outer circumferential surface of said piston, outlet means in said housing communicating said pressure chamber to an operating system, so that when said piston is displaced from said predetermined position thereof toward said interior of said housing said hole passes into said primary seal to interrupt communication between said pressure chamber and said reservoir through said hole and fluid pressure in said pressure chamber is applied through said outlet means to said operation system, the improvement comprising:

an inner circumferential surface on said cap;

said piston guide being integral with said cap and extending radially inwardly from said inner circumferential surface on said cap;

an inner circumferential guiding surface on said piston guide slidably engaging said outer circumferential surface on said piston;

a fluid passage extending through said cap and piston guide having an inner end communicating through said inner guiding surface with said outer circumferential surface of said piston and an outer end communicating with said reservoir;

an outer circumferential surface on said piston guide sleeve engaging said inner circumferential surface on said cap; and

a primary seal recess in said inner circumferential surface on said cap for receiving said primary seal in an inserted position therein, so that said hole in said piston communicates with said inner end of said fluid passage in said cap

at said outer circumferential surface of said piston when said piston is in said predetermined position.

5,438,834

## CLOSE COMBUSTION GAS GENERATOR

Didier Vuillamy, Quincampoix; Etienne Tiet, La Chapelle Reanville, and André Beurnin, Chambly, all of France, assignors to Societe Europeenne de Propulsion, Suresnes, France

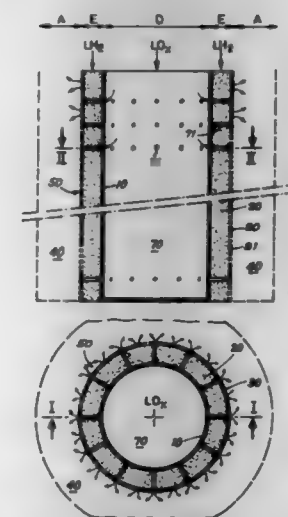
Filed Dec. 21, 1993, Ser. No. 170,819

Claims priority, application France, Dec. 24, 1992, 92 15719

Int. Cl.<sup>6</sup> F23R 3/36

U.S. Cl. 60-753

17 Claims



1. A compact gas generator comprising:

a porous, annularly shaped piece having an associated, axially extending longitudinal axis, said porous piece having a first peripheral face constituting an inlet and a second, opposing peripheral face constituting an injection face; a combustion chamber defined, at least in part, by said injection face, said combustion chamber having associated therewith at least one flame that is located directly adjacent said injection face;

means for feeding a first liquid propellant component axially into said porous piece;

means at said inlet of said porous piece for injecting essentially radially with respect to said longitudinal axis a flow of a second liquid propellant component into the porous piece in such a manner as to cause the first and second liquid propellant components to mix in the porous piece; and

a calibration lining on said injection face serving to inject radially with respect to said longitudinal axis a mixture of said first and second liquid propellant components into the combustion chamber, said calibration lining including a plurality of calibration orifices for modulating the injection speed of said mixture of said first and second liquid propellant components into the combustion chamber where they are ignited adjacent said calibration lining and produce combustion gases within the combustion chamber, which combustion gases flow from said combustion chamber in a direction substantially parallel to said longitudinal axis.



5,438,835

## AIR SEPARATION

Thomas Rathbone, Farnham, England, assignor to The BOC Group plc, Windlesham, United Kingdom

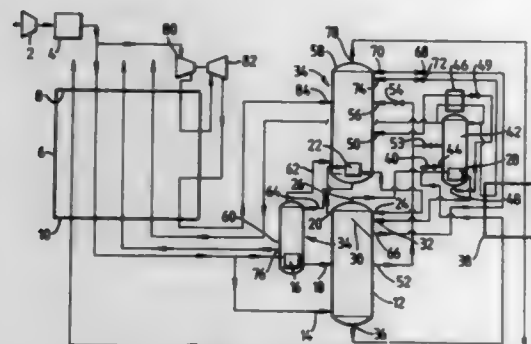
Filed Apr. 21, 1994, Ser. No. 230,667

Claims priority, application United Kingdom, Jul. 5, 1993, 9313839; Mar. 16, 1994, 9405071

Int. Cl.<sup>6</sup> F25J 3/02

U.S. Cl. 62-25

18 Claims



1. A method of separating air, comprising the steps of:
  - a) separating pre-cooled and purified air in a higher pressure rectifier into oxygen-enriched liquid and nitrogen vapour;
  - b) separating a stream of the oxygen-enriched liquid at a pressure between the pressure at the top of the higher pressure rectifier and that at the bottom of a lower pressure rectifier so as to form a liquid further enriched in oxygen and an intermediate vapour;
  - c) separating a stream of the further-enriched liquid in the lower pressure rectifier into oxygen and nitrogen; and
  - d) providing liquid nitrogen reflux for the higher and lower pressure rectifiers, part of the liquid nitrogen reflux being formed by condensing a stream of said nitrogen vapour by indirect heat exchange with liquid from an intermediate mass transfer region of the lower pressure rectifier.

5,438,836

## DOWNFLOW PLATE AND FIN HEAT EXCHANGER FOR CRYOGENIC RECTIFICATION

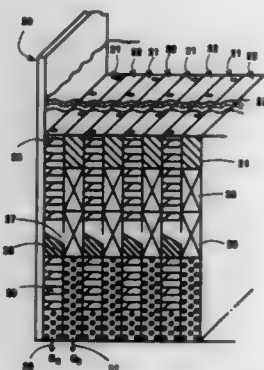
Vijayaraghavan Srinivasan, Williamsville; Michael J. Lockett, and John H. Ziemer, both of Grand Island, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Aug. 5, 1994, Ser. No. 286,233

Int. Cl.<sup>6</sup> F25J 3/00; B01D 3/00; F28F 3/00

U.S. Cl. 62-36

11 Claims



1. A method for vaporizing a liquid by indirect heat exchange with a vapor comprising:
  - (A) providing a heat exchanger having at least one first passage and at least one second passage in alternating sequence;
  - (B) passing liquid into said first passage(s) and down through said first passage(s) through a section comprising means for achieving a well distributed flow of liquid which is a

two stage distribution enhancement means comprising an upper section of perforated hardway fins and a lower section of perforated hardway fins with a gap between the upper and lower sections wherein the perforation area of the hardway fins in the upper section is within the range of from 2 to 15 percent of the hardway fin area in said upper section and the perforation area of the hardway fins in the lower section is within the range of from 20 to 30 percent of the hardway fin area in said lower section;

- (C) passing said well distributed liquid from said first passage(s) into said second passage(s) at an angle within the range of from 30 to 60 degrees from horizontal onto bridge fins located within said second passage(s);
- (D) passing vapor into said first passage(s) below the point where said well distributed liquid is passed from said first passage(s); and
- (E) passing vapor and liquid cocurrently through said first and second passages respectively and vaporizing said liquid in said second passage(s) by indirect heat exchange with said vapor in said first passage(s) during said cocurrent flow.

5,438,837

## APPARATUS FOR STORING AND DELIVERING LIQUID CRYOGEN AND APPARATUS AND PROCESS FOR FILLING SAME

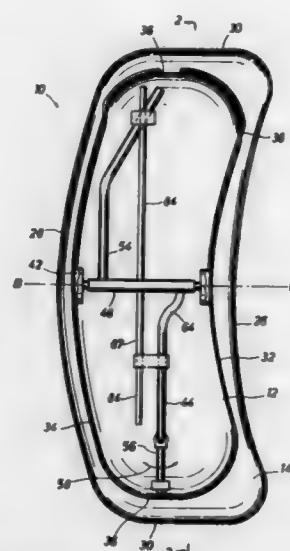
Bruce D. Caldwell, Hitchcock, and Paul D. Duncan, League City, both of Tex., assignors to Oceaneering International, Inc., Houston, Tex.

Filed Oct. 6, 1992, Ser. No. 957,599

Int. Cl.<sup>6</sup> F17C 13/00; F25D 23/12

U.S. Cl. 62-50.1

13 Claims



1. An apparatus for storing and delivering a liquid cryogenic fluid, comprising:
  - an insulated pressure vessel;
  - first means through which liquid cryogen may be supplied to and delivered from the pressure vessel;
  - second means through which a gas may be supplied to the pressure vessel and vented from the pressure vessel;
  - said first means including:
    - intake means having a first section extending through an opening into the pressure vessel, and a second section having an open end, the second section hingedly connected to the first section for swinging about a second axis perpendicular to the first axis;
    - first means mounting the internal portion of said first means for rotating in the vessel about a first axis to which the first section of the intake means is mounted; and

5,438,839

## FREEZING APPARATUS AND METHOD

David G. Wardle, Tadworth, England, assignor to The BOC Group, Inc., New Providence, N.J.

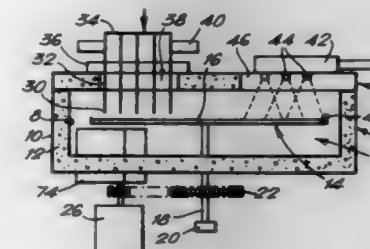
Filed Mar. 4, 1994, Ser. No. 285,961

Claims priority, application United Kingdom, Mar. 26, 1993, 9306301

Int. Cl.<sup>6</sup> F25D 17/02, 25/02; F25C 1/00

U.S. Cl. 62-63

23 Claims



1. Apparatus for at least partially freezing particulate bodies comprising:

- (a) a rotary member having a generally horizontal surface for freezing the particulate bodies;
- (b) dispensing means for dispensing particulate bodies in an unfrozen condition onto the horizontal freezing surface;
- (c) cooling means for directing a liquid cryogen to the horizontal freezing surface to lower the temperature thereof sufficiently so that the unfrozen particulate bodies become attached to the horizontal freezing surface through an ice bond and become at least partially frozen; and
- (d) collecting means for collecting the at least partially frozen particulate bodies from the horizontal freezing surface.

5,438,840

## FIELD HARVEST COOLING SYSTEM

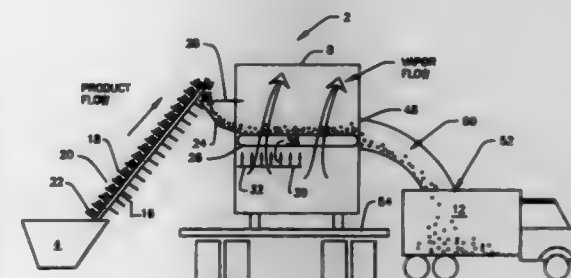
Thomas A. Barber, III, Bethlehem; John Appolonia, Yardley, both of Pa., and William M. Kulik, Cranford, N.J., assignors to The BOC Group Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 213,133, Mar. 14, 1994. This application Apr. 11, 1994, Ser. No. 226,199

Int. Cl.<sup>6</sup> F25D 17/02

U.S. Cl. 62-64

23 Claims



1. A system for chilling harvested foodstuffs at a harvest field site comprising:

- (a) transportation means for transporting the harvested foodstuffs from a harvester to a chilling means;
- (b) chilling means for reducing the temperature of the harvested foodstuffs comprising chilled fluid supply means for supplying a chilled fluid to the foodstuffs, and temperature control means for maintaining said chilling means at a temperature sufficient to reduce the rate of respiration of the foodstuffs passing therethrough; and
- (c) conveying means for conveying the chilled foodstuffs and at least a portion of the chilled fluid out of the chilling means.

the inner wall of the pressure vessel concentric to the first axis being so formed and said internal portion being of such length that the open end of the intake means passes closely to the interior wall as the pressure vessel is caused to incline with respect to a plane passing through said first axis; and

a capacitance gauge having:

- a first section carried by said first section of said intake means for rotation therewith within the pressure vessel;
- a second section carried by said second section of said intake means for rotation therewith within the vessel; and
- means electrically connected to said first section of said gauge and to said second section of said gauge to transmit a signal proportional to the capacitance thereof.

5,438,838

## CHAMBER FOR FREEZE-DRYING BY CRYOSORPTION

Hellmuth Sitte, Seefeld in Tirol, Austria; Klaus Neumann, Bexbach-Saar, Germany; Ludwig Edelmann, Homburg-Saar, Germany; Helmut Haessig, Homburg-Saar, Germany, and Heinrich Kleber, Wien/Strebersdorf, Austria, assignors to Leica AG, Vienna, Austria

PCT No. PCT/EP93/02409, § 371 Date Jun. 1, 1994, § 102(e) Date Jun. 1, 1994, PCT Pub. No. WO94/05996, PCT Pub. Date Mar. 17, 1994

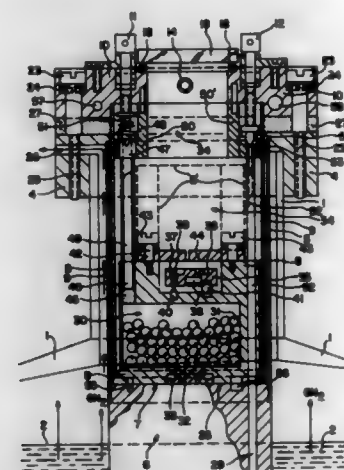
PCT Filed Sep. 6, 1993, Ser. No. 232,151

Claims priority, application Austria, Sep. 8, 1992, 1788/92

Int. Cl.<sup>6</sup> F25D 3/10; F04B 37/08; F26B 5/06

U.S. Cl. 62-55.5

20 Claims



1. A chamber for freeze-drying by cryosorption with liquid nitrogen, which chamber is situated in a Dewar vessel and cools a body of good thermal conductivity, wherein the chamber comprises:

- a cylindrical metal outer walling primarily situated within the neck of the Dewar vessel the lower edge of the cylindrical metal outer walling of the chamber being connected in a vacuum-tight manner to a lower edge of a rotationally symmetric rotary component,
- the rotationally symmetric rotary component having a planar bottom having a contact surface, which planar bottom corresponds with a complementary planar surface on top of a cylindrical body around which liquid nitrogen flows and is cooled by this cylindrical body,
- the rotary component having a chamber for receiving the drying agent for cryosorption and a connection to a drying chamber and
- an upper edge of the cylindrical metal outer walling having a ring connected thereto in a vacuum-tight manner and being situated outside the Dewar vessel at ambient temperature.





5,438,846

**HEAT-PUMP WITH SUB-COOLING HEAT EXCHANGER**

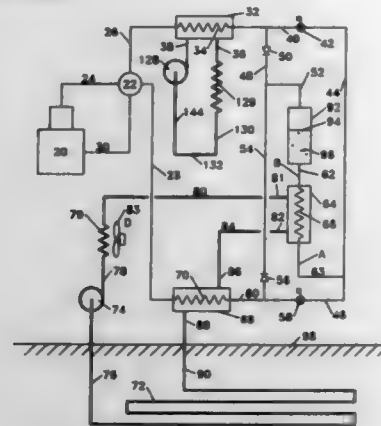
Chander Datta, R.R.#6, Kingston, Ontario, Canada K7L 4V3

Filed May 19, 1994, Ser. No. 246,357

Int. Cl.<sup>6</sup> F25B 27/02

U.S. Cl. 62—238.7

6 Claims



1. A reversible compression type refrigeration system having a first (heating) mode and a second (cooling) mode, a first fluid stream having thermal communication with a heat source/sink, and a second fluid stream, said system comprising first main (service) heat exchanger means having a fluid stream inlet and fluid stream outlet, said first main heat exchanger providing means for evaporating refrigerant and for absorbing heat from the first fluid stream during the first (heating) mode and for condensing refrigerant and for rejecting heat to the first fluid stream during the second (cooling) mode, second main (process) heat exchanger means for evaporating refrigerant and for absorbing heat from the second fluid stream during the second (cooling) mode and for condensing refrigerant and for rejecting heat to the second fluid stream during the first (heating) mode; a compressor having a suction connection and a discharge connection; valve means for connecting the compressor suction connection to the second main (process) heat exchanger and the compressor discharge connection to the first main (service) heat exchanger during the cooling mode and for connecting the compressor discharge connection to the second main (process) heat exchanger and the compressor suction connection to the first main (service) heat exchanger during the heating mode; receiver means for receiving liquid refrigerant from the first main (service) heat exchanger during the cooling mode and from the second main (process) heat exchanger during the heating mode; an expansion device; liquid refrigerant conduit means for conveying liquid refrigerant from the receiver means to the expansion device, and a first sub-cooling heat exchanger positioned in the liquid refrigerant conduit means and subject to the fluid stream entering the first main heat exchanger.

5,438,847

Patent Not Issued For This Number

5,438,848

**PRODUCT FREEZER UTILIZING A STIRLING CYCLE REFRIGERATOR**

Seong T. Kim, and Gwan S. Cho, both of Seoul, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 15, 1993, Ser. No. 166,880

Claims priority, application Rep. of Korea, Dec. 17, 1992, 24714/1992

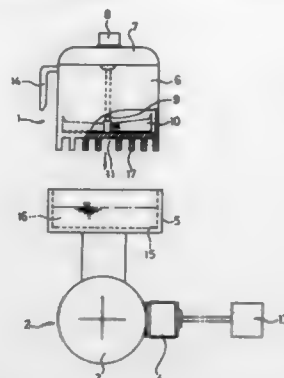
Int. Cl.<sup>6</sup> A23G 9/00

U.S. Cl. 62—342

13 Claims

1. A Stirling cycle refrigerator comprising: refrigerating supplying means including a Stirling freezing unit driven in Stirling cycle, a motor for driving said Stirling freezing unit, and a first heat transmitting part for

emitting refrigeration from said Stirling freezing unit; and refrigerating applying means including a case, a cover covering said case, second heat transmitting part for receiving refrigeration from said first heat transmitting part, and freezing processing means for freezing contents in said case for a desired type,



wherein said refrigerating applying means performs freezing by means of the refrigeration supplied by said refrigerating supplying means.

5,438,849

**AIR CONDITIONER AND HEAT PUMP WITH TETRA FLUOROETHANE-CONTAINING WORKING FLUID**

Yuji Yoshida, Itami; Koji Arita, Osaka, and Masami Funakura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

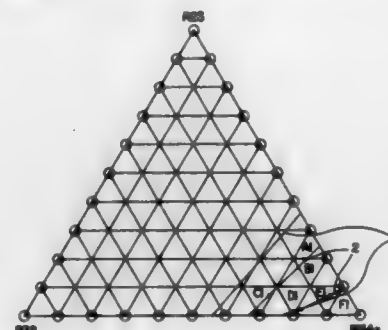
Division of Ser. No. 832,649, Feb. 11, 1992, Pat. No. 5,370,811, which is a continuation of Ser. No. 620,887, Nov. 29, 1990, abandoned. This application Sep. 15, 1994, Ser. No. 305,320 Claims priority, application Japan, Nov. 30, 1989, 1-311154; Nov. 30, 1989, 1-311155; Nov. 30, 1989, 1-311157; Nov. 30, 1989, 1-311167

The portion of the term of this patent subsequent to Dec. 6, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> F25B 1/00; C09K 5/04

U.S. Cl. 62—498

14 Claims



1. A heat pump or air conditioner containing a working fluid, said heat pump or air conditioner having a condenser and evaporator, which working fluid consists essentially of 15 to 95% by weight of tetrafluoroethane and two different fluorinated hydrocarbons having a boiling point not higher than  $-40^{\circ}\text{C}$ . under an atmospheric pressure selected from the group consisting of 1 to 50% by weight of trifluoromethane, 1 to 60% by weight of difluoromethane, 1 to 85% by weight of pentafluoroethane and 1 to 80% by weight of 1,1,1-trifluoroethane, which has a composition in a range between phase equilibrium lines which are obtained when  $0^{\circ}\text{C}$ . is specified as a temperature and the same vapor pressure as that of chlorodifluoromethane at  $0^{\circ}\text{C}$ . is specified as a vapor pressure or a range between phase equilibrium lines which are obtained when  $50^{\circ}\text{C}$ . is specified as a temperature and the same vapor pressure as that of chlorodifluoromethane at  $50^{\circ}\text{C}$ . is specified as a vapor pressure.

5,438,850

**BUTTON JEWELRY DEVICE**

Patsy Keating, 5415 W. 99th Ter., Overland Park, Kans. 66207;

Marty Postlethwait, and Eric Postlethwait, both of 14501 S.

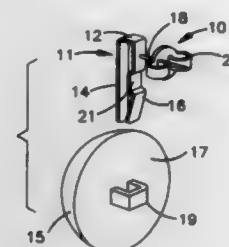
Darnell, Olathe, Kans. 66062

Filed Jul. 22, 1993, Ser. No. 96,038

Int. Cl.<sup>6</sup> A44C 7/00

U.S. Cl. 63—2

15 Claims



1. A device comprising:  
a button having a rear surface;  
an eyelet defined by a spanning member fixedly positioned on said rear surface of said button, wherein said spanning member extends outwardly from said rear surface of said button and spans across a portion of said rear surface of said button between two locations, thereby forming said eyelet;  
a mounting member inserted through said eyelet, wherein said mounting member is supported by said rear surface of said button and engages with said spanning member for rigidly retaining said button with said mounting member; and  
attaching means for attaching said device to an article or portion of the body of an individual.

5,438,851

**BRACELET**

Andreas Geisbuhler, Unterstrasse 8, 3360 Herzogenbuchsee, Switzerland

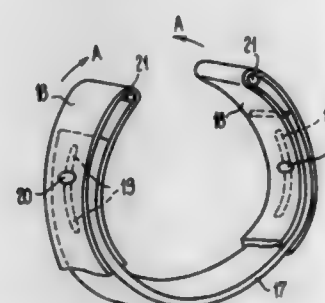
Filed Jan. 29, 1993, Ser. No. 10,806

Claims priority, application Switzerland, Feb. 5, 1992, 00328/92

Int. Cl.<sup>6</sup> A44C 5/00

U.S. Cl. 63—3

7 Claims



1. A bracelet comprising:  
a spring strap having first and second ends and having a generally rectangular cross-section;  
a tubular strap having first and second ends and comprising metal threads; and  
means for connecting the first end of said spring strap to the first end of the tubular strap and for connecting the second end of the spring strap to the second end of the tubular strap such that the tubular strap surrounds said spring strap, said spring strap and said tubular strap each being constructed and arranged so as to change a length of the bracelet,  
wherein said spring strap is a metallic spring strap including

means for adjusting a length thereof and said tubular strap is constructed and arranged to expand and contract.

5,438,852

**SELF-GRIPPING TEXTILE GASKET**

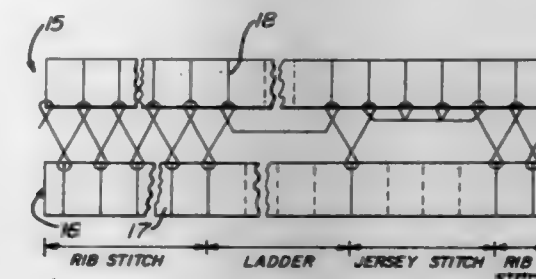
Bruce Ford, Cookeville, Tenn., assignor to The Bentley-Harris Manufacturing Company, Exton, Pa.

Filed Apr. 12, 1994, Ser. No. 226,476

Int. Cl.<sup>6</sup> D04B 1/00; F16J 15/00

U.S. Cl. 66—200

11 Claims



1. A gasket product comprising:  
a bulky knit tape having a first and second side and having a first edge portion, a first edge extending in a walewise direction along the first edge portion, said knit tape having a main body portion extending in a coursewise direction from the first edge, said main body portion being knitted utilizing stitch resulting in a balanced stitch;  
a tubular gasket secured to the main body portion on the first side thereof extending in the walewise direction along a line spaced from said first edge portion;  
the first edge portion having a lip knitted with a plain jersey stitch, said jersey stitch causing the lip to curl inwardly in a coursewise direction onto the second side of the tape so as to precurve the lip.

5,438,853

**LUGGAGE CATCH**

Georg Bartsch, Iserlohn, Germany, assignor to Sudhaus Schloss und Beschlagetechnik GmbH &amp; Co., Iserlohn, Germany

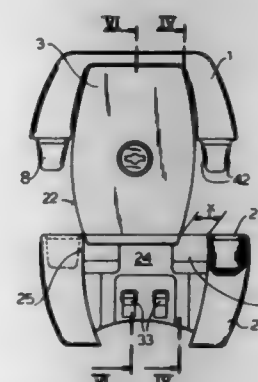
Filed Sep. 30, 1993, Ser. No. 129,411

Claims priority, application Germany, Oct. 1, 1992, 9213230 U

Int. Cl.<sup>6</sup> F05B 65/52; A45C 13/12

U.S. Cl. 70—69

18 Claims



1. A luggage catch comprising:  
a catch part having an edge;  
a tongue pivotally mounted on the catch part, extending past the edge thereof, and having a pair of oppositely outwardly directed sides;  
a strike part having an edge and formed with a seat opening at the strike-part edge and having a pair of oppositely inwardly directed sides generally complementary to and

fittable with the sides of the tongue below the catch-part edge in a closed position of the catch with the edges engaging each other;  
 a slide carried on the tongue; and  
 means including a strike-part retaining formation in the strike part and a tongue-retaining formation on the slide of the tongue engageable with each other in the closed position of the catch for holding the tongue in place in the seat, the slide being displaceable between a holding position with the tongue-retaining formation engaging the strike-part formation and a releasing position out of engagement therewith.

5,438,854

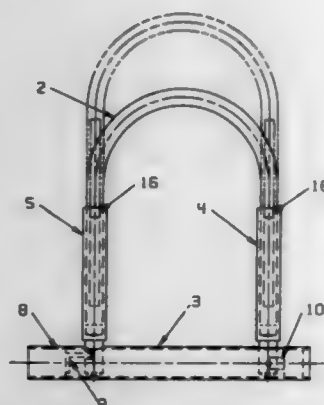
## VARIABLE LENGTH CYCLE LOCK

Mohammad R. Seraj, 13907 Ramona Ave., Hawthorne, Calif. 90250

Continuation-in-part of Ser. No. 46,140, Apr. 15, 1993, abandoned. This application Apr. 19, 1994, Ser. No. 230,015 Int. Cl.<sup>6</sup> E05B 71/00

U.S. Cl. 70—38 A

6 Claims



1. An improved cycle lock, comprising:
  - (a) a U-shaped shackle and a lock bar designed to secure across the open end of the shackle;
  - (b) said shackle formed with a pair of nonflexible legs, each leg having a shackle rod end permanently affixed thereto, said legs of said shackle and said rod ends having connecting means for allowing movement such that the shackle's length is adjustable, a free end of each rod end is adapted to be secured by a retaining means inside one end of the said lock bar, the other of said rod ends formed to engage a lock mechanism in the other end of said lock bar.

5,438,855

## VEHICLE DOOR LOCK DEVICE WITH SUPER LOCK MECHANISM

Takao Ikeda, Utsunomiya, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1993, Ser. No. 94,471

Claims priority, application Japan, Jul. 2, 1992, 4-199097

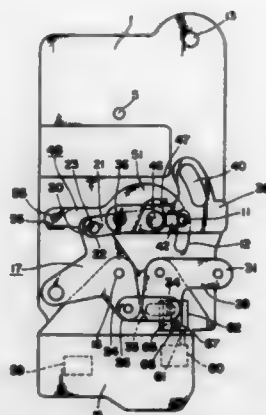
Int. Cl.<sup>6</sup> E05B 47/06

U.S. Cl. 70—279

6 Claims

1. A vehicle door lock device with a super lock mechanism comprising:
  - a latch engaging with a striker;
  - a ratchet preventing the latch from opposite-rotating;
  - an open lever connected to an open handle of the door; said open lever disengaging the ratchet from the latch and opening the door;
  - an inside lock lever connected to a door inside lock member; said inside lock lever displacing to a locked position disengaging a door opening operation of the open lever and an unlocked position enabling the door opening operation of the open lever;
  - a key lock lever connected to a key cylinder of the door; said key lock lever being connected to said inside lock lever

through lost motion means for permitting the inside lock lever to rotate independent of the keylock lever;  
 a rotatable super lock member displaced to a super locked position at which position said super lock member engages with the inside lock lever at the lock position in order to block the inside lock lever from displacement along an unlocking direction and a release position at which position said super lock member is disengaged from the inside lock lever;



a motor displacing the super lock member; and  
 a release protrusion formed on the key lock lever to abut a central portion of the super lock member when the key lock is rotated to unlock and to pivotally displace the super lock member to the release position;  
 wherein engagement of the super lock member to said inside lock lever is not released by a door opening operation of the open lever.

5,438,856

## CYLINDER ASSEMBLY FOR PLATE TUMBLER LOCK

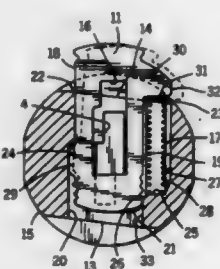
Carl E. Richter, Milwaukee, and Ronald R. Krebs, Fond du Lac, both of Wis., assignors to Strattec Security Corporation, Milwaukee, Wis.

Filed Jun. 3, 1994, Ser. No. 253,756

Int. Cl.<sup>6</sup> E05B 29/04

U.S. Cl. 70—492

9 Claims



1. A cylinder assembly for a plate tumbler lock, comprising:
  - a cylindrical housing defining an external cylindrical surface, opposite ends, a longitudinal axis and a key way disposed along said axis opening to one end of said housing for slidably receiving a key therein, said housing further including a tumbler ward extending radially from said axis and having an open top which opens to said external cylindrical surface, said tumbler ward defined by a pair of opposite side walls, one of said side walls including a tumbler retaining ledge formed therein and the other of said side walls including a first tumbler spring seat formed therein, and each of said side walls including a terminal edge at said external cylindrical surface defining said open top;
  - a plate tumbler disposed in said ward for sliding movement

radially with respect to said axis, said plate tumbler including opposite side edges, one of said side edges including a detent projecting therefrom and the other of said side edges including a leg projecting therefrom defining a second tumbler spring seat;  
 tumbler spring means within said housing located between said first seat and a terminal edge for biasing said plate tumbler outwardly in said ward toward said open top, said tumbler spring means having a lower end engaging the first seat formed in said other side wall and an upper end engaging said second seat formed in said leg; and  
 said plate tumbler slidably moveable in said ward between a non-assembled position and an assembled position wherein said detent engages said retaining ledge and said second tumbler spring seat is spaced from the terminal edge of said other side wall such that the distance between said first and second tumbler spring seats is greater than the distance between said first tumbler seat and the terminal edge of said other wall so that said tumbler snap-fits into and is retained within said tumbler ward without any physical damage to said retaining ledge and said detent by allowing said plate tumbler to move within said tumbler ward upon insertion of said plate tumbler into said tumbler ward.

5,438,857

## LOCK CYLINDER AND KEY AS WELL AS KEY BLANK WITH MATCHED SECURITY DEVICE

Arno Kleinhaeny, Hinwil, Switzerland, assignor to Bauer Kaba AG, Wetzikon, Switzerland

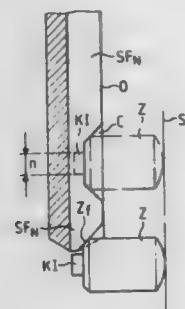
Continuation of Ser. No. 942,365, Sep. 9, 1992, abandoned, which is a continuation of Ser. No. 618,231, Nov. 20, 1990, abandoned. This application Feb. 14, 1994, Ser. No. 200,803

Claims priority, application Switzerland, Dec. 15, 1989, 04517/89

Int. Cl.<sup>6</sup> E05B 27/10

U.S. Cl. 70—493

9 Claims



1. A lock and key blank comprising the combination of a lock having a stator and a rotor with a generally rectangular slot to receive the blade of a matching key blank, said slot having an open end into which said key blank is intended to be inserted, said rotor having a blank control pin protruding into said slot to prevent full insertion into said slot of any key blank not intended for use with said lock, said blank control pin having a contact surface, said stator and rotor having a shear-line and combination tumbler pins selected to clear said shear-line only when a properly coded key for said lock is fully inserted in said slot, said blank control pin being independent of the presence or absence of any combination tumbler pins in said lock and not participating in said combination;
  - a key blank having a generally rectangular blade shaped and dimensioned to enter said slot;
  - first means at a tip end of said blade defining a beveled surface inclined relative to wide sides and intersecting a central bisecting plane of said blade for contacting and displacing combination tumbler pins in lock;
  - second means at said tip end of said blade defining a blank control surface inclined relative to said beveled surface and to said wide sides and intersecting said beveled surface, said

blank control surface being independent of any coding recesses formed on said key blank to cooperate with combination tumbler pins in said lock,  
 said blank control pin being dimensioned and positioned to engage and prevent full insertion of any key blank not having said blank control surface,  
 said blank control surface being operative to engage said contact surface of said blank control pin and radially displace said blank control pin to permit full insertion of said key blank into said slot, the combination of said blank control pin and blank control surface thereby forming an admission control for keys and key blanks into said lock.

5,438,858

## EXTRUSION TOOL FOR PRODUCING A HARD METAL ROD OR A CERAMIC ROD WITH TWISTED INTERNAL BOREHOLES

Arno Friedrichs, Kulmbach, Germany, assignor to Gottlieb Guhring KG, Ebingen and Konrad Friedrichs KG, Kulmbach, both of Germany

PCT No. PCT/EP92/01379, § 371 Date May 2, 1994, § 102(e) Date May 2, 1994, PCT Pub. No. WO93/24190, PCT Pub. Date Dec. 9, 1993

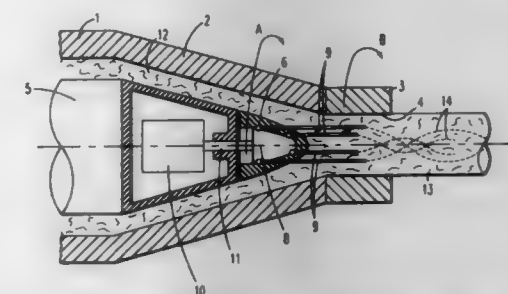
PCT Filed Jun. 17, 1992, Ser. No. 162,137

Claims priority, application Germany, Jun. 19, 1991, 41 20 166.3

Int. Cl.<sup>6</sup> B21C 25/04

U.S. Cl. 72—260

7 Claims



1. An extrusion press tool for producing a hard metal or ceramic bar having at least one helical inner bore, comprising:
  - a press nozzle defining a free opening including an opening piece having a smooth cylindrical channel;
  - a mandrel disposed as a hub body within the press nozzle;
  - a support disposed coaxially on the mandrel;
  - a plurality of elastic filaments secured to the support at positions spaced from the axis of said press nozzle, and extending into the free opening for producing inner bores in an extrudable metal or ceramic material as the material is being extruded through the free opening; and
  - a drive mechanism rotatably driving at least one of said opening piece and said support so as to produce a relative rotation between support and said opening piece, whereby said inner bores are helical inner bores.

5,438,859

## ACCELERATION SENSOR HAVING FAULT DIAGNOSING DEVICE

Muneharu Yamashita, Jun Tabata, Toshihiro Mizuno, and Jiro Inoue, all of Nagakakyō, Japan, assignors to Murata Manufacturing Co. Ltd., Japan

Filed Sep. 24, 1992, Ser. No. 950,478

Claims priority, application Japan, Sep. 24, 1991, 3-243299; Oct. 2, 1991, 3-255284; Nov. 29, 1991, 3-316203; Dec. 27, 1991, 3-346735; Feb. 3, 1992, 4-17627

Int. Cl.<sup>6</sup> G01P 15/09

U.S. Cl. 73—1 D

13 Claims

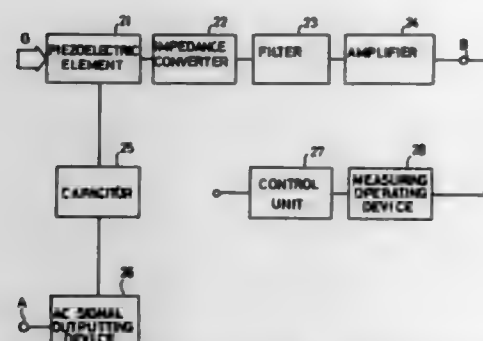
1. An acceleration sensor comprising:
  - an acceleration detecting portion comprising a piezoelectric



element having electrodes on both its surfaces for outputting a signal corresponding to acceleration applied thereto and a supporting base for supporting said piezoelectric element;

said acceleration detecting portion being provided with a pair of detecting portions arranged so as to be brought into contact with said piezoelectric element and spaced apart from each other by a predetermined distance;

a signal processor electrically connected to one of the electrodes of said piezoelectric element and for processing the



electric signal outputted from the piezoelectric element; and

a signal outputting device electrically connected to one of said pair of detecting portions so as to cause a predetermined current to flow between said detecting portions and connected to said signal processor so as to output to the signal processor a state signal representing the state of the acceleration detecting portion,

said signal outputting device outputting said state signal in conformity with the variation of the current flowing between the detecting portions.

5,438,860

#### CUTTER BIT ABRASIVE DETECTING DEVICE OF SHIELD MACHINE

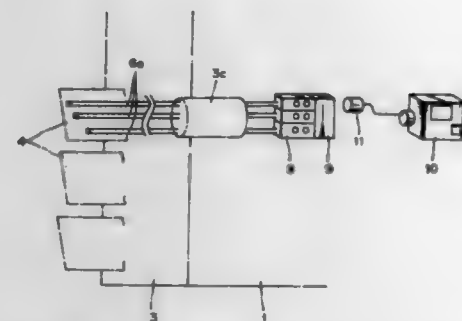
Kazunari Kawai, and Hiroshi Miura, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 13, 1993, Ser. No. 120,725

Claims priority, application Japan, Dec. 18, 1992, 4-091594 U  
Int. Cl.<sup>6</sup> G01N 3/56

U.S. Cl. 73-7

4 Claims



1. A cutter bit abrasion detecting device of a shield machine comprising:

a plurality of cutter bits arranged on a front surface of a cutter head rotatably provided in front of a shield body for excavating a working place;

at least one sensor hole formed in at least one of said cutter bits; and

at least one sensor head inserted within each said sensor hole formed in said cutter bit, each said sensor head comprising a single fiber optic unit folded in a U-shape and accommodated in a casing, said fiber optic unit being a single-core

optical fiber for transmitting light therethrough covered by a polyethylene-coated acrylic resin coating.

5,438,861

#### APPARATUS AND METHOD FOR TESTING FOR HOLES IN A PROPHYLACTIC DEVICE

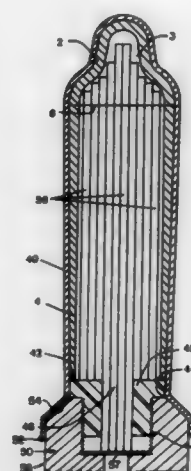
Frederick P. Sisbarro, Wayne, and Glenn W. Thomsen, Cream Ridge, both of N.J., assignors to Carter-Wallace, Inc., New York, N.Y.

Filed Jul. 19, 1994, Ser. No. 277,098

Int. Cl.<sup>6</sup> G01N 3/04, 3/26

U.S. Cl. 73-40

11 Claims



1. A system for testing prophylactic devices for holes comprising:

a hollow mandrel defining a space therein and having an outer shape that conforms to the shape of the device under test, said mandrel having a closed end and an open end; means defining pores in said mandrel such that the average size of the pores near the closed end of the mandrel are substantially less than the average size of the pores near the open end of the mandrel;

sealed mounting means, for support and airtight attachment of a prophylactic device to the base of the body of said mandrel, connected to the Open end of said mandrel;

means for creating a given differential in gas pressure between the space within the mandrel and space outside it; means for disconnecting said means for creating a differential in gas pressure; and

means for detecting a given change in the gas pressure within the mandrel.

5,438,862

#### SYSTEM AND METHOD FOR IN SITU TESTING OF THE LEAK-TIGHTNESS OF A TUBULAR MEMBER

Robert F. Keating, Penn Township, Westmoreland County, and David A. Snyder, North Huntingdon, both of Pa., assignors to Westinghouse Elec Corp, Pittsburgh, Pa.

Filed Feb. 14, 1994, Ser. No. 195,498

Int. Cl.<sup>6</sup> G01M 3/04; F24H 9/16

U.S. Cl. 73-49.2

13 Claims

6. In a nuclear heat exchanger having a plurality of heat transfer tubes disposed therein, a system for in situ testing of the leak-tightness of a predetermined one of the tubes, the predetermined tube having a wall portion having an inner diameter, the system comprising:

(a) an elongate mandrel insertable into the tube, said mandrel having an exterior surface thereon and a first channel therein in communication with a first port and a second port on the exterior surface, said mandrel having a second channel therein terminating in a third pore on the exterior surface intermediate the first port and second port;

5,438,863

#### UNIVERSAL MATERIAL TEST SYSTEM AND METHOD

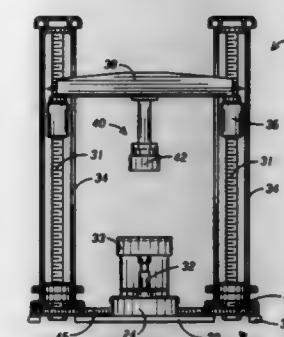
Jeffrey W. Johnson, N. Lawrence, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed May 3, 1993, Ser. No. 56,711

Int. Cl.<sup>6</sup> G01N 11/04

U.S. Cl. 73-54.02

11 Claims



1. A system for determining material properties of a sample comprising:

a testing device, including a base, a load sensing element, a motor and a test apparatus, said test apparatus being adaptable to perform a plurality of different material tests, said motor being coupled to said test apparatus to drive at least a portion of said test apparatus in accordance with a selected test and said load sensing element coupled to said test apparatus to sense a force transmitted by said test apparatus;

control means coupled to said motor for controlling the operation of said motor in response to a signal from said load sensing element; and

processing means coupled to said control means and said load sensing element for processing the results of a test as sensed by said load sensing element.

5,438,864

#### METHOD FOR FLUORESCENT MEASURING THE VOLUMETRIC CAPACITY OF A CELL-ENGRAVED SURFACE

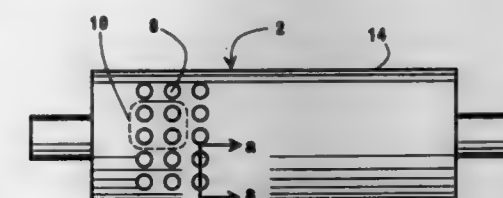
Russell M. Morgan, Indianapolis, Ind., assignor to Praxair S.T. Technology, Inc., Danbury, Conn.

Filed Aug. 25, 1993, Ser. No. 111,767

Int. Cl.<sup>6</sup> G01F 17/00

U.S. Cl. 73-149

10 Claims



1. A method for measuring the volumetric capacity of a surface containing a plurality of engraved cells comprising the steps:

(a) providing a fluorescent fluid having a controlled pre-engineered concentration such that when said fluorescent fluid is excited by radiation, the fluid emits electromagnetic radiation in a linear relationship to volume of the fluid;

(b) dispensing and spreading the fluorescent fluid onto a selected area of a surface defining a plurality of cells so as to fill said cells with a volume of fluorescent fluid;

(c) exciting the fluorescent fluid in said cells with a radiation source to cause said fluorescent fluid in said cells to emit electromagnetic radiation in a linear relationship to the

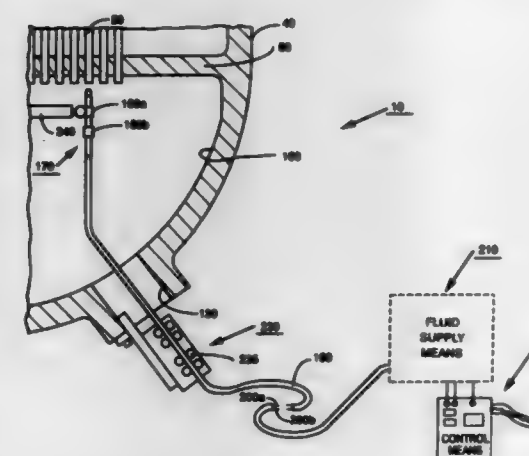
(b) an expandable first bladder and an expandable second bladder surrounding said mandrel and covering the first port and the second port, respectively, for sealingly engaging the inner diameter of the wall portion, so that a sealed annular chamber in communication with the third port and bounded by said first bladder and said second bladder is defined adjacent the wall portion as said first bladder and said second bladder expand to engage the inner diameter of the wall portion;

(c) fluid supply means in fluid communication with the chamber and with said first bladder and said second bladder for supplying a liquid thereto, said fluid supply means including:

(i) a flexible first conduit for conducting the liquid therethrough, said first conduit having a first end thereof connected to the first channel and having a second end;

(ii) a pressurized liquid reservoir connected to the second end of said first conduit for supplying a pressurized liquid through said first conduit and to the first channel, so that the liquid flows through the first channel and out the first port and the second port to expand said first bladder and said second bladder, respectively, to a first predetermined pressure for sealingly engaging said first bladder and said second bladder with the inner diameter;

(iii) a flexible second conduit for conducting the liquid there-



through, said second conduit having a first end thereof connected to the second channel and having a second end connected to the fluid reservoir for supplying the pressurized liquid through said second conduit and to the second channel, so that the liquid flows through the second channel and out the third port to pressurize the chamber to a second predetermined pressure;

(d) a controller connected to said first conduit for controlling the fluid flow rate therethrough in order to maintain the first predetermined pressure in said first bladder and said second bladder, and connected to said second conduit for controlling the fluid flow rate therethrough in order to maintain the second predetermined pressure in the chamber as a breach in the wall portion adjacent the chamber allows the liquid to leak from the chamber;

(e) an accumulator tank in fluid communication with the first conduit and the second conduit for maintaining the pressure in the first conduit and the second conduit;

(f) a flexible protective hose attached to said mandrel and surrounding said first conduit and said second conduit for protecting said first conduit and said second conduit from damage; and

(g) a hose driver engaging said hose for driving said hose and said mandrel connected thereto, so that said mandrel and said hose translate in the tube as said hose is driven.





tory body, being capable of oscillation in at least a first oscillation direction (1) oriented parallel to said major surface of said planar carrier (10), said structural element (30) is supported on said major surface of said planar carrier (10) by a plurality of support strips (31), said structural element (30) is deflectable (2) normal to said major surface of said carrier (10); and further comprising capacitive or piezoresistive detecting means (17, 181; 21, 182) for detecting Coriolis force deflections (2), perpendicular to said major surface of said carrier (10), of said structural element (30), formed from said second layer.

5,438,871

# **GAS FLOW TYPE ANGULAR VELOCITY SENSOR AND METHOD OF CONSTRUCTING SAME**

Takashi Hosoi; Mizuho Doi; Tomoyuki Nishio, and Satoshi Hiyama, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

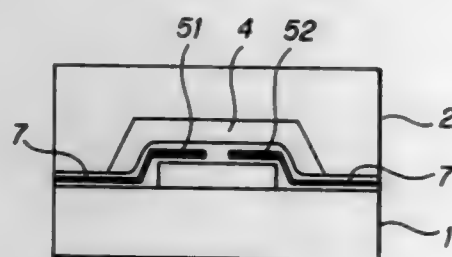
Filed May 29, 1992, Ser. No. 889,817

Claims priority, application Japan, Jun. 19, 1991, 3-245296

Int. Cl.<sup>6</sup> G01P 9/00

U.S. Cl. 73-504.05

4 Claims



1. In a gas flow type angular velocity sensor, of the type for detecting an angular velocity from a change of resistance in each of paired heat wires having temperature-sensitive resistance, when a flow of gas forced into a gas path in a sensor body through a nozzle hole and directed toward the pair of heat wires is deflected by the action of an angular velocity on the sensor body, the improvement comprising:

a first semiconductor substrate having a gas path groove formed thereon;

a second semiconductor substrate having a substantially flat surface; and

each of said heat wires of the pair of heat wires having a first portion mounted on said substantially flat surface and a second portion extending toward the other said heat wire of said pair of heat wires, said second portions of said pair of heat wires being spaced from a portion of said substantially flat surface for forming a single bridge shape over said portion of said substantially flat surface of said second semiconductor substrate, wherein

said first and second semiconductor substrates are bonded to each other to form the sensor body, with said gas path groove of said first semiconductor substrate positioned adjacent to said substantially flat surface of said second semiconductor substrate, and said pair of heat wires extending into said gas path groove.

5,438,872

# **MEASURING METHOD AND APPARATUS USING A LAMB WAVE**

Katsuyuki Kobayashi, Yokohama; Atsushi Tanaka, Kawasaki; Yuichiro Yoshimura, Kamakura; Kiyoshi Kaneko, and Masaki Tokioka, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1992, Ser. No. 900,324

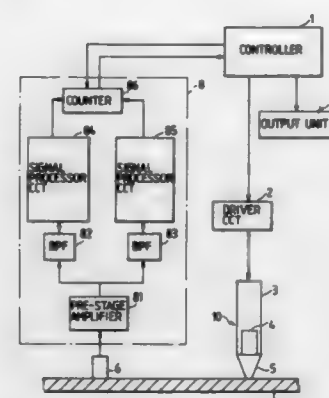
Claims priority, application Japan, Jun. 21, 1991, 3-150046;

Jun. 21, 1991, 3-150047

Int. Cl.<sup>6</sup> G01H 5/00; G01N 29/18

U.S. Cl. 73-597

4 Claims



1. A measuring apparatus for measuring the thickness of a plate material, said apparatus comprising: vibration generating means for generating a lamb wave by applying a vibration to a plate material; detecting means disposed at an arbitrary position on the plate material for detecting the lamb wave which has propagated on the plate material; extracting means for extracting a plurality of lamb wave components having different frequencies from the lamb wave detected by said detecting means; measuring means for measuring a time difference between arrival times to said detecting means of the plurality of lamb wave components extracted by said extracting means; and calculating means for calculating the thickness of the plate material based on the time difference measured by said measuring means and velocities of the plurality of lamb wave components corresponding to the arrival times.

5,438,873

# **FIBEROPTIC SENSOR USING TAPERED AND BUNDLED FIBERS**

Marek T. Wlodarczyk, Bloomfield Hills, and Gang He, Ann Arbor, both of Mich., assignors to Fiberoptic Sensor Technologies, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 87,631, Jul. 1, 1993, and a continuation-in-part of Ser. No. 86,245, Jul. 1, 1993. This application Jun. 8, 1994, Ser. No. 255,411

Int. Cl.<sup>6</sup> G01L 9/00

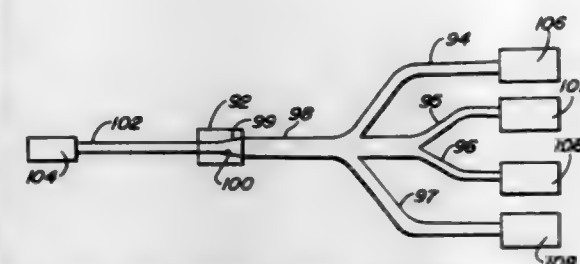
U.S. Cl. 73-705

23 Claims

1. In a fiberoptic pressure sensing system having an optical fiber with a sensing tip at a first end with a pressure sensitive element, the pressure sensitive element modulating a pressure sensing light signal injected into an opposite second end of the optical fiber, the improvement comprising:

a first optical fiber portion formed by the optical fiber with a distal end forming the sensing tip;

a second optical fiber portion adjoining said first portion at a proximal end; and



a tapered fiber segment formed by the optical fiber at an intermediate location so as to light couple said first and second portions together.

5,438,874

# **PRESSURE MEASURING INSTRUMENTS**

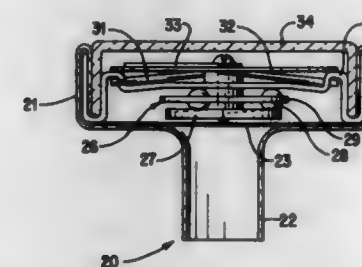
John Hamma, 23 Sunnyside Ct., Milford, Conn. 06460

Filed Mar. 18, 1994, Ser. No. 214,497

Int. Cl.<sup>6</sup> G01L 1/04

U.S. Cl. 73-715

18 Claims



1. A measuring instrument comprising

A. a housing;

B. condition level input means extending from the housing and constructed for cooperative interengagement with a source;

C. a sensing element mounted in the housing in cooperative association with the condition level input means and positioned for movement in a first direction in response to changes in the condition level input means; and

D. a movement/interface assembly

a. mounted in the housing in cooperating association with the sensing element for monitoring the movement of the sensing element;

b. providing a visual indication corresponding to any movement of the sensing element sensed thereby; and

c. comprising a captured roller construction for directly converting the movement of the sensing element into rotary motion proportional to the movement of the sensing element and having an axis of rotation parallel to the first direction thereof;

whereby a measuring instrument constructed with a minimum of parts and an optimum level of accuracy is attained.

5,438,875

# **REMOVING SACRIFICIAL MATERIAL THROUGH TEMPORARY CHANNELS AS A METHOD OF MAKING AN OVERPRESSURE-PROTECTED DIFFERENTIAL PRESSURE SENSOR**

Clifford D. Fung, Mansfield; Kevin H.-L. Chan, Franklin; P. Rowe Harris, East Wareham; John G. Panagou, South Attleboro, and Gary A. Dahrooge, Worcester, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Division of Ser. No. 38,664, Mar. 26, 1993, Pat. No. 5,357,808,

Division of Ser. No. 676,914, Mar. 28, 1991, Pat. No. 5,220,838.

This application Apr. 21, 1994, Ser. No. 231,254

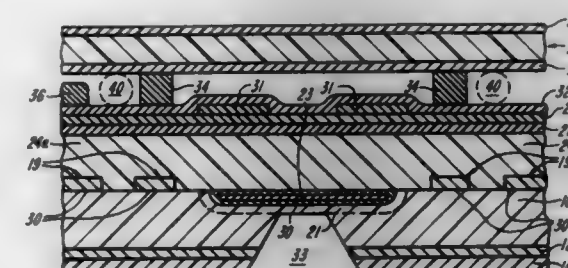
The portion of the term of this patent subsequent to Sep. 6, 2011,

has been disclaimed.

Int. Cl.<sup>6</sup> G01L 9/06

U.S. Cl. 73-721

25 Claims



1. A method of producing an overpressure-protected, differential sensor comprising the steps of forming a cavity in a top surface of a substrate, wherein the cavity has a preselected depth and shape to define a forward pressure stop for an overlying diaphragm, filling the cavity with a sacrificial material, depositing a layer of deformable diaphragm material over the top surface of said substrate and said sacrificial material, forming at least one channel through said diaphragm material to said sacrificial material, removing said sacrificial material through said at least one channel to define the diaphragm overlying the cavity, closing said at least one channel to seal the cavity, and removing substrate material from the bottom side of said substrate to provide a port which provides back pressure access to the underside of the diaphragm.

5,438,876

# **MODULAR DIAPHRAGM PRESSURE SENSOR WITH PERIPHERAL MOUNTED ELECTRICAL TERMINALS**

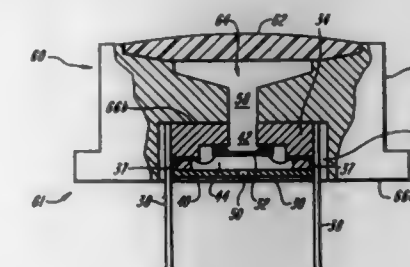
Brian D. Lewis, Los Gatos, Calif., assignor to The Foxboro Company, Foxboro, Mass.

Filed Aug. 5, 1993, Ser. No. 102,554

Int. Cl.<sup>6</sup> G01L 9/04

U.S. Cl. 73-726

16 Claims



1. Pressure sensor apparatus comprising

A. a substrate having a first surface and having a first through passage therein open at said first surface and having a second surface peripheral to said first surface,

and a platform surface opposed to and spaced from said first surface,

- B. a pressure-sensing element having a pressure responsive diaphragm with third and fourth opposed diaphragm surfaces and having at least one electrical contact at which it produces a signal responsive to the deflection of said diaphragm, said sensing element being mounted to said platform surface of said substrate and forming with said substrate a first chamber communicating with the opening of said first through passage at said first surface and bounded at least in part by said platform surface of said substrate and said third surface of said diaphragm,
- C. at least one electrical terminal mounted with said substrate and disposed at least in part external to said peripheral surface, said electrical terminal extending in a direction from said first surface to said platform surface and beyond said platform surface along at least a portion of said peripheral surface, said electrical terminal being arranged for removable and replaceable connection with a further connector element, and
- D. means forming an electrical connection extending between said contact and said electrical terminal, said means including a metalization path within said substrate

5,438,877

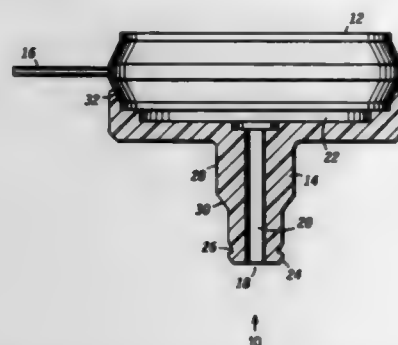
# **PRESSURE SENSOR PACKAGE FOR REDUCING STRESS-INDUCED MEASUREMENT ERROR**

David L. Vowles, Phoenix, and Clem H. Brown, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.  
Filed Jun. 13, 1994, Ser. No. 258,889

Int. Cl.<sup>6</sup> G01L 7/00

U.S. Cl. 73-756

18 Claims



1. A pressure sensor package comprising: a pressure sensor body; and  
an elongated stem having a first end connected to said sensor body, said stem including a connector disposed on a second end of said stem wherein said connector is fixedly mounted to a mounting base, an annular sealing surface disposed on said first end wherein said annular sealing surface presses against a compressible seal, and an orifice disposed at said second end connected to a pressure sensing passage, wherein said seal is compressed when said stem is mounted to said mounting base.

5,438,878

# **SYSTEM FOR DETERMINING STRETCH CHARACTERISTICS OF THERMOPLASTIC ARTICLES**

Max L. Carroll, Jr., Kingsport, Tenn., assignor to Eastman Chemical Company, Kingsport, Tenn.

Continuation of Ser. No. 964,226, Oct. 21, 1992, Pat. No. 5,365,792. This application May 31, 1994, Ser. No. 251,170

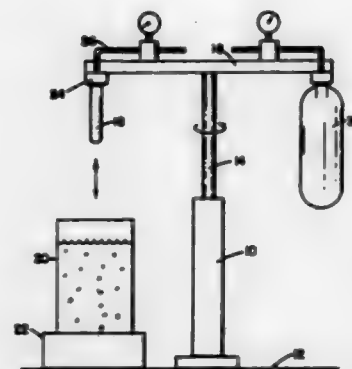
Int. Cl.<sup>6</sup> G01N 3/18

U.S. Cl. 73-788

2 Claims

1. System for analyzing samples of thermoplastic articles for a selected physical property in a manner such that consistent results are obtained which comprises

- a) means for at least partially submerging said articles in a boiling liquid,
- b) means for withdrawing said articles from said boiling liquid after they have been heated to at least their glass transition temperature,



- c) means for stretching said thermoplastic articles at a temperature of at least their glass transition temperature until the onset of strain hardening occurs, whereby a desired property which is, or is related to, the elongation of said articles may be determined.

5,438,879

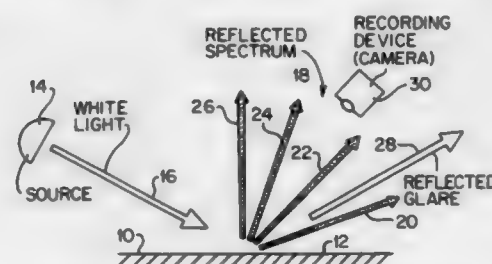
# **METHOD FOR MEASURING SURFACE SHEAR STRESS MAGNITUDE AND DIRECTION USING LIQUID CRYSTAL COATINGS**

Daniel C. Reda, San Jose, Calif., assignor to The United States of America as represented by the Administrator of the national Aeronautics and Space Administration, Washington, D.C.  
Continuation-in-part of Ser. No. 31,972, Mar. 16, 1993, Pat. No. 5,394,752. This application Oct. 20, 1994, Ser. No. 330,144

Int. Cl.<sup>6</sup> G01M 9/00; G01N 21/23, 27/61; G02F 1/13

U.S. Cl. 73-800

9 Claims



1. A method for determining surface shear stress direction and magnitude at every point on a surface, said method comprising the following steps:  
providing a liquid crystal coating on a surface;  
directing a beam of white light perpendicular to said surface onto said surface;  
positioning a color-measuring camera at an oblique-view angle above said surface;  
generating, in a calibration step, a calibration curve of color versus absolute shear magnitude for calibration shear vectors aligned with and directed away from said camera; rotating said camera from the setting used for said calibration step;  
obtaining a plurality of images by said camera along a circumferential arc;  
determining said shear direction from said plurality of images; and  
determining, from the color corresponding to said shear directions, said shear magnitudes from said calibration curve.

5,438,880

# **ELECTROSTATIC LINEAR AIRSPEED TRANSDUCER**

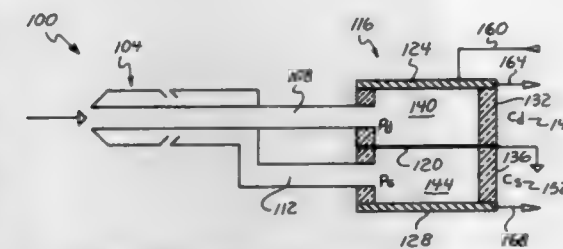
S. John Washburn, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 17, 1994, Ser. No. 245,210

Int. Cl.<sup>6</sup> G01L 9/12

U.S. Cl. 73-861.65

17 Claims



1. An airspeed transducer, comprising:  
a. a pitot tube operable to sense a velocity of an airflow and to provide a dynamic airflow path and a static airflow path;  
b. a differential capacitive pressure sensor having a centrally-located conductive movable diaphragm disposed between a pair of outer rigid conductive plates, the plates being separated from the diaphragm by corresponding first and second insulative spacers such that a first cavity is formed between the diaphragm and the first plate and a second cavity is formed between the diaphragm and the second plate, the first cavity being in fluid communication with the dynamic airflow path, the second cavity being in fluid communication with the static airflow path, a first capacitor being formed by the diaphragm, the first insulative spacer and the first plate, a second capacitor being formed by the diaphragm, the second insulative spacer and the second plate, the diaphragm being operable to deflect away from an at-rest position when there exists a difference between a pressure of a fluid in the dynamic airflow path and the pressure of a fluid in the static airflow path, the diaphragm deflection being operable to change a capacitance value of each of the first and second capacitors; and  
c. signal processing means, responsive to the capacitance values of each of the first and second capacitors, for determining any difference between the capacitance value of each of the first and second capacitors and for providing a voltage to the first plate of a value that establishes an electrostatic attractive force between the first one of the plates and the diaphragm in an amount that causes the diaphragm to assume the at-rest position, the value of the voltage applied to the first plate being linearly proportional to and indicative of the velocity of an airflow at the pitot tube.

5,438,881

# **ARRANGEMENT OF MEASURING DEVICES ON A SEMITRAILER MOTOR VEHICLE**

Kurt Schedrat, Gaienhofen; Lothar Jakob, Blumberg, and Dirk Engles, Tengen, all of Germany, assignors to Georg Fischer Verkehrstechnik GmbH, Singen, Germany

Filed Feb. 16, 1994, Ser. No. 197,215

Claims priority, application Switzerland, Feb. 17, 1993, 489/93

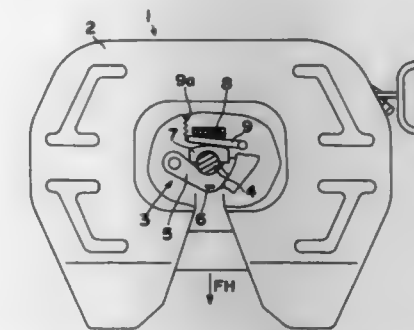
Int. Cl.<sup>6</sup> G01L 5/13

U.S. Cl. 73-862.57

7 Claims

1. An arrangement of measuring devices on a semitrailer motor vehicle having a tractive unit, a semitrailer and a fifth wheel for connecting the tractive unit and the semitrailer, said measuring arrangement comprising means for measuring forces arising between the semitrailer and the tractive unit at connection parts connecting the semitrailer and the tractive unit, said measuring means being disposed between the semitrailer and the fifth wheel, said fifth wheel having a locking

mechanism associated therewith, said locking mechanism including a coupling claw and said measuring means includes



means for measuring tractor forces acting on said coupling claw.

5,438,882

# **ROTATING SHAFT VIBRATION MONITOR**

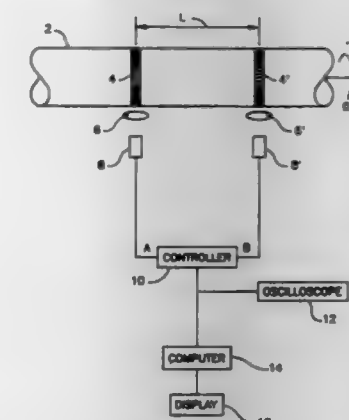
Khosrow Karim-Panahi, Palo Alto; James H. Terhune, and Paul J. Zimmerman, both of San Jose, all of Calif., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 7,929, Jan. 25, 1993, abandoned. This application Sep. 9, 1994, Ser. No. 303,541

Int. Cl.<sup>6</sup> G01L 3/00

U.S. Cl. 73-862.324

14 Claims



1. A system for monitoring an effect of torque on a rotating shaft, comprising:  
first detectable means circumferentially arranged on an outer surface of said rotating shaft at a first axial location thereof and having a property which varies repeatedly about a circumference;  
second detectable means circumferentially arranged on the outer surface of said rotating shaft at a second axial location thereof and having a property which varies repeatedly about said circumference, said second axial location being separated from said first axial location by a predetermined distance;  
first detecting means for outputting a first electrical signal which varies in dependence on a first local value of said repeatedly varying property for a portion of said first detectable means located opposite to a window of said first detecting means;  
second detecting means for outputting a second electrical signal which varies in dependence on a second local value of said repeatedly varying property for a portion of said second detectable means located opposite to a window of said second detecting means; and  
processing means for computing a wave number of a torsional wave propagating axially in said rotating shaft in



dependence on variations in a difference in phase angles between said first and second electrical signals.

5,438,883

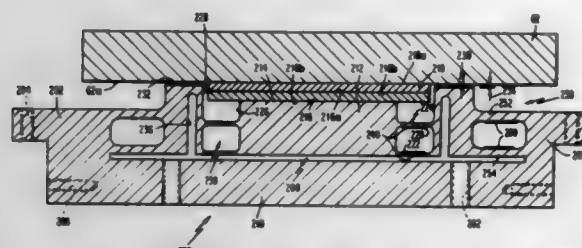
**COMPUTER CONTROLLED HEAT-SEALING MACHINE**  
Jack R. McLean, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 881,283, May 11, 1992, Pat. No. 5,322,586.  
This application Mar. 4, 1994, Ser. No. 205,458

Int. Cl.<sup>6</sup> G01L 1/04

U.S. Cl. 73—862,632

4 Claims



1. In a load cell comprising a solid body material divided into an upper portion and a lower portion by a thin, generally horizontally extending cavity extending through a major portion of the length of said material between opposite ends thereof, the upper portion functioning as a load cell and the lower portion functioning as a supporting portion providing support therefor through the opposite ends, wherein said upper portion includes a center load-bearing portion supported at opposite ends thereof from the opposite end portions of the solid body material through two pairs of juxtaposed thin deflection beams respectively located at opposite ends of the load-bearing portion, said load cell further comprising intermediate bridging portions respectively located at opposite ends of said load-bearing portion, said intermediate bridging portions being connected to said load-bearing portion through said beam pairs to connect said load-bearing portion to the opposite ends of the solid body, the improvement wherein said load cell further comprises at least two second sets of top and bottom beams respectively interconnecting the intermediate portions and thereby the load-bearing portion to the lower supporting portion through the end portions thereof, each second set of top and bottom beams overlying end portions of the cavity, wherein the second beam sets are thicker than the first beam sets whereby pressure is measured accurately over a wide range with said first beam sets providing low pressure measurements until such time as the loaded structure contacts the top surface of the intermediate portions, with said second beam sets then being deflectable into said cavity to provide measurements of high pressures within a high pressure range.

5,438,884

**FLUSH MOUNT FITTING FOR GAS EMISSION SAMPLE CONTAINER**

James M. Suddath, West Bloomfield, Mich., assignor to Bellare Industries, Inc., Royal Oak, Mich.

Filed Nov. 4, 1993, Ser. No. 147,633

Int. Cl.<sup>6</sup> G01N 1/14

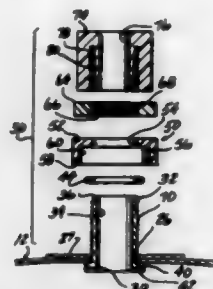
U.S. Cl. 73—864,62

10 Claims

1. A gas emission sample apparatus for receiving and storing gas emissions from test apparatus, the apparatus comprising:  
a container formed of a sealed expansible member having side walls, with an aperture formed in and surrounded by portions of one of the side walls;  
a sleeve having first and second ends and a through bore extending between the first and second ends, an enlarged diameter collar formed at the second end of the sleeve;  
a ring member having a first end with a first aperture formed therein disposable over the sleeve and a side wall extending from the first end to a second end and forming a

hollow bore in the ring member disposable over the collar of the sleeve;

means for removably and fixedly mounting the ring member over the sleeve and the collar such that the portions of the side wall of the container surrounding the aperture in the container are disposed between the first end of the ring member and the collar on the sleeve and an exterior end of



the collar is substantially flush with the second end of the ring member and a major portion of the one of the side walls of the container;  
seal means, mountable over the sleeve and between the ring member and the collar, for sealing the aperture in the container; and  
means for coupling the through bore in the sleeve to an external gas flow path.

5,438,885

**COARSE PARTICLE SNIFFER**

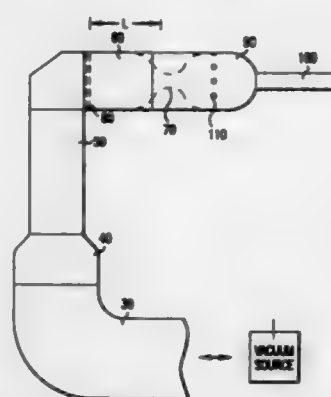
Joseph S. Zelazny, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 12, 1993, Ser. No. 135,522

Int. Cl.<sup>6</sup> B01D 37/00

U.S. Cl. 73—864,71

15 Claims



1. A method of testing and filtering coarse particulate matter using a testing tool fluidly connected to a vacuum source through a vacuum hose, the tool defining an internal orifice fluidly connected to the vacuum source and comprising a fluidizing nozzle having an inlet port of a predetermined diameter and an exit port of a greater diameter; a screen holder located within the internal orifice between the fluidizing nozzle and the vacuum source, the screen holder having a venturi for increasing the speed of air within the internal orifice and a screen of a predetermined mesh size for trapping coarse particulate matter; and an adaptor for connecting the testing tool to the vacuum hose of the vacuum source, the method comprising the steps of:

- locating the testing tool in a holding device containing particulate matter;
- activating the vacuum source to initiate vacuum air flow into the fluidizing nozzle and the internal orifice, allowing particulate matter within the holding device to enter the internal orifice of the apparatus;

(c) vacuuming particulate matter into the internal orifice through the venturi to accelerate the particulate matter and separate accumulated particulate matter prior to passing through the screen; and

(d) filtering out particulate matter of a size greater than the predetermined mesh size with the screen for subsequent visual inspection while allowing particles of a lesser size to pass through the screen and into the vacuum hose.

5,438,886

**VOLUMETRIC MEASUREMENT DEVICE FOR A DISPENSING CONTAINER**

John H. Knowles, Jr., Essex, Mass., and DeeAnn I. Yabusaki, Lodi, Calif., assignors to LittlePoint Corporation, Wakefield, Mass.

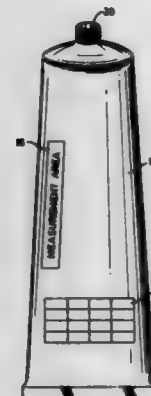
Division of Ser. No. 988,224, Dec. 8, 1992, Pat. No. 5,383,373.

This application Oct. 17, 1994, Ser. No. 324,229

Int. Cl.<sup>6</sup> G01F 13/00

U.S. Cl. 73—865,8

19 Claims



1. An apparatus for dispensing a topical preparation, comprising:

- a container for containing the preparation and having an aperture for metering the flow of the preparation from the container; and
- a measurement area in the form of a geometrically shaped area displayed on the container and corresponding to a particular volumetric dosage of the preparation when the preparation is dispensed through the aperture to cover a like measurement area.

5,438,887

**ELECTRO-HYDRAULIC INTERLOCK SYSTEM FOR A TRANSMISSION**

Gerald P. Simmons, Morton, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Nov. 22, 1993, Ser. No. 155,319

Int. Cl.<sup>6</sup> B60K 41/28

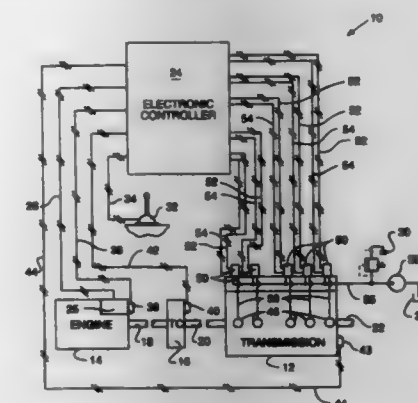
U.S. Cl. 74—335

5 Claims

1. An electro-hydraulic interlock system adapted for use in a control system for a transmission having hydraulically actuated speed and directional clutches, the control system includes an electronic controller receiving energy from a source of electrical energy and producing first and second electrical control signals, a source of pressurized fluid and a reservoir, the electronic controller is operative in response to a command input device to selectively control one of the hydraulically actuated speed or directional clutches in the transmission, the electro-hydraulic interlock system comprising:

- a pilot operated valve having a pressure responsive actuator section and when installed in the control system is interposed in flow controlling relationship between the source of pressurized fluid and the one hydraulically actuated clutch;
- an electro-hydraulic proportional valve having a valving

element operative to control fluid flow thereacross and when installed in the control system is interposed between the source of pressurized fluid and the pressure responsive actuator section of the pilot operated valve and operable in response to a force generated by the first electrical control signal to direct thereacross a pilot signal that is proportional to the first electrical control signal to control movement of the pilot operated valve, the electro-hydraulic proportional valve has a first pressure responsive section responsive during use to the pressurized fluid downstream thereof to bias the valving element in opposition to the force generated by the first electrical control signal and a larger second pressure responsive section that



when installed in the control system is selectively responsive to the pressurized fluid in the one hydraulically actuated clutch and operable to bias the valving element in opposition to the force generated by the first electrical control signal; and

a solenoid operated valve interposed when installed in the control system between the larger second pressure responsive section of the electro-hydraulic proportional valve and the one hydraulically actuated clutch and selectively movable during use in response to the second electrical control signal from the electronic controller to a position providing open fluid communication between the larger second pressure responsive section and the one hydraulically actuated clutch.

5,438,888

**DEVICE FOR COMPENSATING PITCH ERRORS IN WORM GEARS**

Andreas Dickhoff, Kirchheim-Teck, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 4, 1994, Ser. No. 205,987

Claims priority, application Germany, Mar. 10, 1993, 43 07 529.0

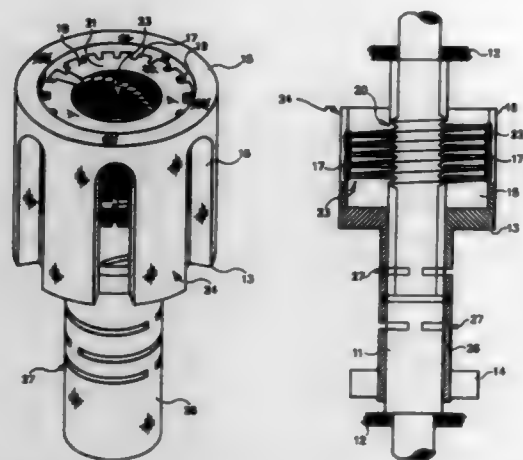
Int. Cl.<sup>6</sup> F16H 55/18

U.S. Cl. 74—459

7 Claims

1. Device for compensating pitch errors in a worm gear comprising a stationarily mounted rotary worm-gear spindle (11) and a nut element (24) axially movable on said worm-gear spindle (11) and connected with an object to be translatorily moved, characterized in that the nut element (24) comprises a plurality of resilient disks (17) accommodated in a transport sleeve (13) and each disk having a radial segment-shaped slot (18) extending through the disk, in that said disks engage the

threads (20) on the outside surface of the worm gear spindle by means of end faces (21) of adjacent disks as defined by said slots



and in that the outer circumferential surfaces of said disks are fixedly connected with said transport sleeve.

5,438,889

**BICYCLE SPEED CHANGE OPERATION ASSEMBLY**  
Koichi Tagawa, Kawachinagano, Japan, assignor to Mory Sun-tour Inc., Osaka, Japan

PCT No. PCT/JP93/01047, § 371 Date Mar. 21, 1994, § 102(e) Date Mar. 21, 1994, PCT Pub. No. WO94/02348, PCT Pub. Date Feb. 3, 1994

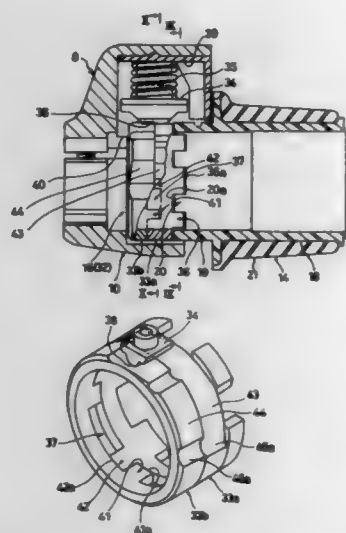
PCT Filed Jul. 26, 1994, Ser. No. 211,354

Claims priority, application Japan, Jul. 28, 1992, 4-201048

Int. Cl.<sup>6</sup> B62M 25/04; B62K 11/14, 23/04

U.S. Cl. 74-475

12 Claims



1. A bicycle speed change operation assembly comprising a speed change operation member rotatably supported at a suitable portion of a bicycle body, and a stepwise retaining mechanism for retaining the speed change operation member stepwise at predetermined rotational positions; the speed change operation member being rotated to pull or pay out a control cable for activating a speed shifter; wherein the stepwise retaining mechanism includes:

a retaining member rotatable integrally with the speed change operation member;  
an engaging member engagable with the retaining member for retaining the speed change operation member at a predetermined rotational position; and  
a regulating member juxtaposed to one of the retaining

member and the engaging member with a predetermined play relative thereto while being engagable with the other of the retaining member and the engaging member for retaining the speed change operation member at a predetermined rotational position.

5,438,890

**CABLE POSITION ADJUSTING STRUCTURE**

Kiyokazu Kato, Shizuoka, Japan, assignor to Suzuki Motor Corporation, Shizuoka, Japan

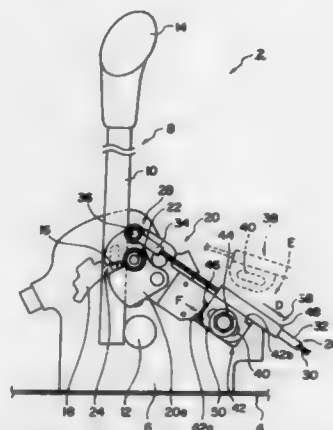
Filed Sep. 20, 1993, Ser. No. 124,338

Claims priority, application Japan, Feb. 26, 1993, 5-063034

Int. Cl.<sup>6</sup> F16C 1/22, 1/08

U.S. Cl. 74-501.5 R

6 Claims



1. A cable position adjusting apparatus for a cable assembly having an inner cable which interconnects an input member to an output member so that the output member is activated in accordance with an action of the input member, and an outer sheath surrounding the inner cable, the adjusting apparatus comprising:

a frame member;  
mounting means attached to the outer sheath at an end thereof for securing the cable assembly to the frame member, said mounting means including a hollow cylindrical portion fixedly secured to and surrounding the outer sheath, a generally rectangular plate portion extending radially from said cylindrical portion and having a plate side wall extending traverse to an axis extending coincident with said inner cable, and an elongated opening within said plate portion extending coincident with said axis for permitting a fastener to pass therethrough to secure said plate portion to said frame member;

receiving means associated with said frame member for slidably supporting said plate portion of said mounting means along said axis extending coincident with the inner cable, said receiving means including a side wall extending traverse to said axis and facing said plate side wall;  
urging means for slidably urging said plate portion of said mounting means along said axis toward said side wall of said receiving means with said frame side wall being disposed against said side wall of said receiving means so that a tension of the inner cable is set to a predetermined value; and  
at least one said fastener for fixedly securing said mounting means to said frame member.

5,438,891

**COLLET TYPE FASTENER REMOVAL TOOL**

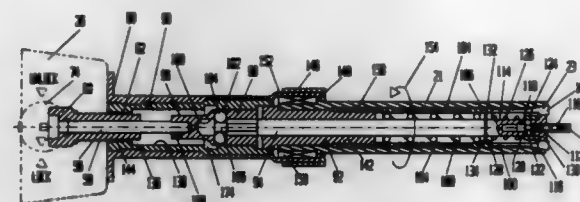
Ronald W. Batten, Torrance, Calif., assignor to VSI Corporation, Torrance, Calif.

Filed Jul. 5, 1994, Ser. No. 270,691

Int. Cl.<sup>6</sup> B25B 21/00

U.S. Cl. 81-56

10 Claims



1. In a driven power tool having a first tool member received concentrically within a surrounding, second tool member and axially moveable therein, drive means to impart relative rotational movement of said first and second tool members, wherein said first tool member is an assembly of a quick disconnect key having a wrenching surface with a distal, annular groove and a key holder having a central recess which receives said key and which has a mating wrenching surface to rotationally index to said key, and wherein said key holder also has a detent recess transversely intersecting said central recess in which is received at least one detent ball which seats in said annular groove of said key to retain said key in said holder, the improvement in quick disconnect means which comprises:

a. a sleeve slidably received about said key holder and moveable between a detent position in which it overlies said detent to recess retain said ball seated in said annular groove and a release position in which it is sufficiently withdrawn from said detent recess to permit said ball to move out of said annular groove of said key;  
b. spring means carried on said holder and engaging said sleeve to urge said sleeve into said detent position;  
c. second detent means comprising:

(1) a receptacle slidably carried within said second tool member and having a second central recess that receives an end of said first tool member;  
(2) second detent means carried by said receptacle to secure said first tool member against axial movement relative to said receptacle;  
(3) release means carried on said second tool member and adjacent said second detent means to release said first tool member and permit sufficient axial movement thereof to project said key beyond the end of said second tool member and accessible to permit movement of said sleeve and release of said key.

5,438,892

**TOOL FOR SREWING MEDICATION VIALS TO IV-BAGS**

Margaret A. Bell, 1520 Mill Lending Rd., Virginia Beach, Va. 23462

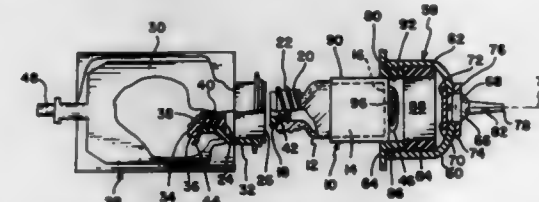
Division of Ser. No. 49,425, Apr. 20, 1993, Pat. No. 5,339,511.

This application Apr. 19, 1994, Ser. No. 229,718

Int. Cl.<sup>6</sup> B25B 13/04

U.S. Cl. 81-120

7 Claims



1. A tool for screwing medication vials with male threaded necks to female threaded IV-bags, said tool comprising:

a socket including a bowl-shaped shell of relative hard material;  
said bowl-shaped shell including an attachment means at an attaching portion thereof for attaching said shell to a rotating tool for rotating said shell about an axis;  
said shell defining a mouth opening along said axis;  
said mouth opening being sufficiently large to define a cylindrical medication vial receiving cavity therein;  
said socket further comprising a tubular shaped resilient lining material disposed over at least a portion of an interior surface in said shell;  
said resilient lining material defining a vial-receiving surface of a size and shape for frictionally receiving a bottom-end portion of a vial with said resilient lining material frictionally engaging said received bottom-end portion for imparting movement from said socket to said vial;  
means within said shell contacting, and adjusting the frictional force exerted by, said tubular shaped resilient lining material onto said vial;  
whereby a bottom-end portion of a vial can be placed in said shell to impinge on said vial-receiving cavity and said attaching means of said shell can be attached to said rotating tool for rotating said socket and said received vial for screwing male threads on the neck of said vial together with female threads on the mouth of an IV-bag.

5,438,893

**OIL FILTER WRENCH**

James F. Rogers, P.O. Box 723, Dallas, Tex. 75221-0723

Continuation of Ser. No. 23,890, Feb. 26, 1993, Pat. No.

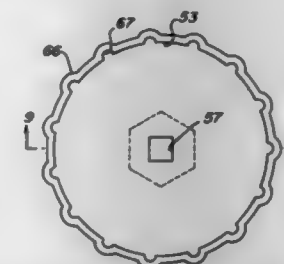
5,353,666. This application Apr. 6, 1994, Ser. No. 223,843

The portion of the term of this patent subsequent to Oct. 11, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B25B 13/00

U.S. Cl. 81-124.4

5 Claims



1. An improved oil filter wrench for use with a canister type oil filter having a generally cylindrical outer extent which extends from a lower end to a second, dome portion of generally polygonal cross-section, the wrench comprising:

a wrench body having an exterior surface, an interior surface and an initially open interior which extends from a first end opening to an oppositely arranged second end opening of the wrench body, the interior surface having at least three engagement surfaces sized to accommodate different sized oil filters, the engagement surfaces being arranged in side-by-side fashion to extend from the first end opening toward the oppositely arranged second end opening of the wrench body;

a separate driver adapter having a complimentary profile for engaging the exterior surface of the first end opening of the wrench body for applying torque thereto when an oil filter is engaged within the second end opening of the wrench body and for engaging the second end opening of the wrench body for applying torque thereto when an oil filter is engaged within the first end opening of the wrench body wherein available axial space within said wrench body is maximized; and

wherein the wrench body initially open interior defined by the at least three engagement surfaces on the interior surface thereof is a generally cylindrical opening which is selectively sized to receive and engage the dome portion



of a canister type oil filter for applying torque to the oil filter.

5,438,894

# **SOCKET WRENCH EXTENSION**

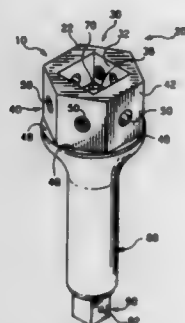
Dan C. Pearce, 1741 S. Hill St., Oceanside, Calif. 92054

Filed Jul. 25, 1994, Ser. No. 280,772

Int. Cl.<sup>6</sup> B25B 13/00

U.S. Cl. 81—177.2

17 Claims



1. A socket wrench extension including: a tool mounting bottom end portion; a shank portion; and a torque receiving top end portion including: a free end face; an axial, drive-receiving recess in said free end face; said drive-receiving recess including a bottom end including a slot for receiving a screwdriver drive.

5,438,895

# **FASTENER AND DRIVING TOOL**

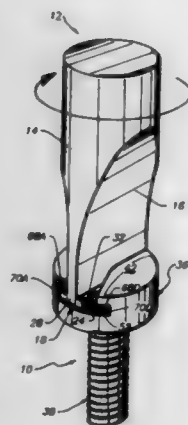
Marvin Bassell, 5600 NW. 59th St., Tamarac, Fla. 33319; David Byron, 585 Queen's Mirror Cir., Casselberry, Fla. 32707, and Robert J. Catanzaro, 2880 NE. 28th St., Fort Lauderdale, all of Fla. 33306

Continuation-in-part of Ser. No. 16,011, Feb. 10, 1993, abandoned. This application Apr. 29, 1994, Ser. No. 236,285

Int. Cl.<sup>6</sup> B25B 23/08

U.S. Cl. 81—451

9 Claims



1. A fastener system, comprising: a driver formed with a substantially rectangular-shaped driving end having a top wall, a bottom surface, opposed ends and opposed side edges perpendicular to said top wall and to said bottom surface, said side edges being spaced from one another to define the width of said driving end and said side edges having a height dimension which defines the height of said driving end between said top wall and said bottom surface; and a fastener having a head connected to a shaft which is insertable within a workpiece, said head being formed with a central slot having a base surface and opposed, upwardly extending side walls located on either side of a longitudinal axis, said central slot having a width greater than said width of said driving end of said driver, said head being formed with at least two undercuts located on opposite sides of said longitudinal axis each extending at an angle into one of said sidewalls formed by said central slot, each of said undercuts forming a substantially truncated pie-shaped upper wall whose width increases from the center of said central slot toward the edge of said fastener head, a bottom wall substantially coincident with said base surface of said central slot and being located beneath said upper wall, and a side wall extending perpendicularly between said upper wall and said bottom wall to define a height dimension of said undercuts; said driving end of said driver being insertable within said central slot of said head of said fastener, said driving end and said fastener head being movable relative to one another so that each of said side edges of said driving end contacts substantially the entire surface area of one of said side walls of said undercuts and so that said top wall of said driving end extends beneath said upper wall of each of said undercuts and said bottom surface of said driving end extends atop said bottom wall of each said undercuts, said height dimension of said driving end and said height dimension of each said undercuts being such that said top wall and bottom surface of said driving end frictionally engage and temporarily interlock with said upper wall and bottom wall of said undercuts, respectively, to frictionally retain said driving end of said driver within said head of said fastener.

central slot having a base surface and opposed, upwardly extending side walls located on either side of a longitudinal axis, said central slot having a width greater than said width of said driving end of said driver, said head being formed with at least two undercuts located on opposite sides of said longitudinal axis each extending at an angle into one of said sidewalls formed by said central slot, each of said undercuts forming a substantially truncated pie-shaped upper wall whose width increases from the center of said central slot toward the edge of said fastener head, a bottom wall substantially coincident with said base surface of said central slot and being located beneath said upper wall, and a side wall extending perpendicularly between said upper wall and said bottom wall to define a height dimension of said undercuts; said driving end of said driver being insertable within said central slot of said head of said fastener, said driving end and said fastener head being movable relative to one another so that each of said side edges of said driving end contacts substantially the entire surface area of one of said side walls of said undercuts and so that said top wall of said driving end extends beneath said upper wall of each of said undercuts and said bottom surface of said driving end extends atop said bottom wall of each said undercuts, said height dimension of said driving end and said height dimension of each said undercuts being such that said top wall and bottom surface of said driving end frictionally engage and temporarily interlock with said upper wall and bottom wall of said undercuts, respectively, to frictionally retain said driving end of said driver within said head of said fastener.

1. A fastener system, comprising: a driver formed with a substantially rectangular-shaped driving end having a top wall, a bottom surface, opposed ends and opposed side edges perpendicular to said top wall and to said bottom surface, said side edges being spaced from one another to define the width of said driving end and said side edges having a height dimension which defines the height of said driving end between said top wall and said bottom surface; and a fastener having a head connected to a shaft which is insertable within a workpiece, said head being formed with a central slot having a base surface and opposed, upwardly extending side walls located on either side of a longitudinal axis, said central slot having a width greater than said width of said driving end of said driver, said head being formed with at least two undercuts located on opposite sides of said longitudinal axis each extending at an angle into one of said sidewalls formed by said central slot, each of said undercuts forming a substantially truncated pie-shaped upper wall whose width increases from the center of said central slot toward the edge of said fastener head, a bottom wall substantially coincident with said base surface of said central slot and being located beneath said upper wall, and a side wall extending perpendicularly between said upper wall and said bottom wall to define a height dimension of said undercuts; said driving end of said driver being insertable within said central slot of said head of said fastener, said driving end and said fastener head being movable relative to one another so that each of said side edges of said driving end contacts substantially the entire surface area of one of said side walls of said undercuts and so that said top wall of said driving end extends beneath said upper wall of each of said undercuts and said bottom surface of said driving end extends atop said bottom wall of each said undercuts, said height dimension of said driving end and said height dimension of each said undercuts being such that said top wall and bottom surface of said driving end frictionally engage and temporarily interlock with said upper wall and bottom wall of said undercuts, respectively, to frictionally retain said driving end of said driver within said head of said fastener.

5,438,896

# **KNIFE PEN FOR PROGRAM-CONTROLLED PLOTTERS**

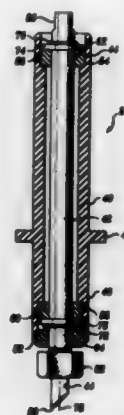
Bill E. Carroll, Oklahoma City, Okla., assignor to AT&T Corp., Murray Hill, N.J.

Filed Sep. 28, 1993, Ser. No. 127,723

Int. Cl.<sup>6</sup> B26D 3/08

U.S. Cl. 83—76.1

7 Claims



7. A knife for mounting in a program controlled plotter, said knife comprising:

a blade;  
a shaft for holding said blade, said shaft having an upper end and a lower end, said lower end of said shaft having a notch for receiving said blade, said lower end of said shaft having a threaded portion for receiving a nut, said nut removably retaining said blade in said notch, said upper end of said shaft having an opposing pair of flats disposed so that said nut may be loosened and tightened by use of two wrenches applied to said nut and said pair of flats, said shaft also having an upper groove disposed in said upper end and a lower groove disposed in said lower end; and an annular shell, said shell having a first land on an upper end and a second land on a lower end, said shell having an upper bearing mounted on said first land and a lower bearing mounted on said second land, for retaining and supporting said shaft in said shell by means of an upper snap ring in said upper groove of said shaft riding on said upper bearing, and a lower snap ring in said lower groove of said shaft riding on said lower bearing so that said shaft rotates in said shell, said shell having a flange for interfacing with said plotter so that said blade moves in response to a program.

upper bearing mounted on said first land and a lower bearing mounted on said second land, for retaining and supporting said shaft in said shell by means of an upper snap ring in said upper groove of said shaft riding on said upper bearing, and a lower snap ring in said lower groove of said shaft riding on said lower bearing so that said shaft rotates in said shell, said shell having a flange for interfacing with said plotter so that said blade moves in response to a program.

5,438,897

# **STRIPPER ARRANGEMENT FOR A PUNCH HOLDER**

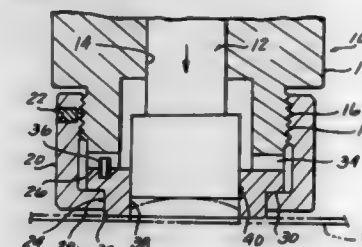
Victor L. Chun, Charlotte, N.C., assignor to Murata Machinery, Ltd., Machine Tool Division, Aichi, Japan

Filed Dec. 29, 1993, Ser. No. 174,827

Int. Cl.<sup>6</sup> B26D 7/18

U.S. Cl. 83—146

4 Claims



1. A stripper arrangement for a punch holder comprising a punch holder body and a punch relatively movable in a bore in said punch holder body, said punch having one end extended out of said punch holder bore at a lower end of said punch holder body to penetrate a workpiece disposed below said punch holder body as said punch holder is driven downwardly into engagement with said workpiece, said punch holder body having an end section at said lower end, said end section formed with an end face and an external thread, a stripper element comprising a steel stripper disc positioned abutting against said end face of said holder body end section, said stripper disc having an opening closely fit to said punch, a retainer sleeve threadably engaging said external thread on said punch holder end section and having an inward lip portion overlying a perimeter flange on said stripper disc to hold the same when said retainer sleeve is advanced along said external thread, said stripper disc thereby fixedly held in abutment against said punch holder end section end face, said stripper disc including a central portion protruding axially beyond said lip of said retainer sleeve, to contact said workpiece as said punch holder is driven downwardly.

5,438,898

Patent Not Issued For This Number

5,438,899

# **MATERIAL-WORKING TOOL CONTROL SYSTEM**

Sigurd Hoyer-Ellefsen, 540 Kay Ter., Boca Raton, Fla. 33432

Continuation-in-part of Ser. No. 819,218, Jan. 13, 1992, Pat. No. 5,265,510. This application Nov. 22, 1993, Ser. No. 156,375

The portion of the term of this patent subsequent to Nov. 30, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> B23D 45/04

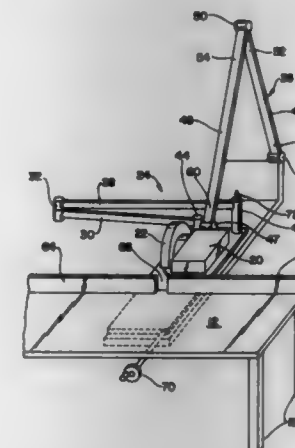
U.S. Cl. 83—471.3

21 Claims

1. A material-working tool control system for use with a work surface, said system comprising: a tool mount; a guide linkage horizontally pivotally connected to said tool mount; a first support joint for operative connection to supporting ground and being operatively connected to said guide linkage, said first support joint providing a substantially vertical first axis of rotation for said guide linkage relative to the work surface, said guide linkage having first means for permitting vertical movement and for permitting movement of said tool mount toward and away from said first axis; a tool support pivotally connected to said tool mount; and a second support joint for operative connection to supporting ground and being operatively connected to said tool support, said tool support extending substantially horizontally from said tool mount to said second support joint, said tool support being pivotable relative to said second support joint about a substantially vertical second axis of rotation, said tool support having second means for permitting movement of said tool mount horizontally toward and away from said second axis of rotation, said second support joint being separated from and supported separately from said first support joint such that said second support joint is not supported by said first support joint, and said first support joint does not bear the weight of the second support joint, said tool support and said tool mount.

upper bearing mounted on said first land and a lower bearing mounted on said second land, for retaining and supporting said shaft in said shell by means of an upper snap ring in said upper groove of said shaft riding on said upper bearing, and a lower snap ring in said lower groove of said shaft riding on said lower bearing so that said shaft rotates in said shell, said shell having a flange for interfacing with said plotter so that said blade moves in response to a program.

1. A material-working tool control system for use with a work surface, said system comprising: a tool mount; a guide linkage horizontally pivotally connected to said tool mount; a first support joint for operative connection to supporting ground and being operatively connected to said guide linkage, said first support joint providing a substantially vertical first axis of rotation for said guide linkage relative to the work surface, said guide linkage having first means for permitting vertical movement and for permitting movement of said tool mount toward and away from said first axis; a tool support pivotally connected to said tool mount; and a second support joint for operative connection to supporting ground and being operatively connected to said tool support, said tool support extending substantially horizontally from said tool mount to said second support joint, said tool support being pivotable relative to said second support joint about a substantially vertical second axis of rotation, said tool support having second means for permitting movement of said tool mount horizontally toward and away from said second axis of rotation, said second support joint being separated from and supported separately from said first support joint such that said second support joint is not supported by said first support joint, and said first support joint does not bear the weight of the second support joint, said tool support and said tool mount.



5,438,900

# **LOW NOISE SAW BLADE**

Erik Sundström, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden

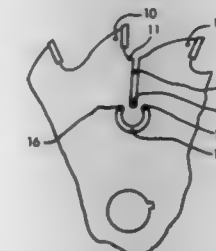
Filed Jul. 2, 1993, Ser. No. 85,084

Claims priority, application Sweden, Jul. 6, 1992, 9202081

Int. Cl.<sup>6</sup> B23D 61/02

U.S. Cl. 83—835

11 Claims



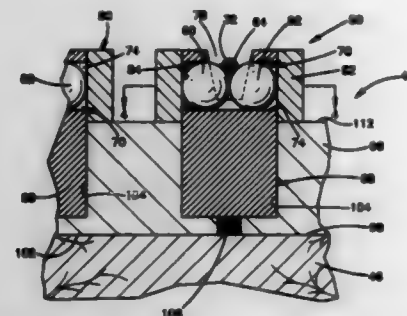
1. A circular saw blade comprising a blade body having teeth and gullets therebetween, at least one linear slot in a blade body portion radially inward of the gullets, the slot having first and second ends and having a width less than the blade body thickness all the way between the ends, a narrow arcuate cutout having two ends and extending at least partially in a radial direction of the blade but not being continuous with the slot, the cutout ends being closer to one of the first and second ends of the slot than any other portion of the cutout.

5,438,901

**STRING SUPPORT FOR MUSICAL INSTRUMENT**  
Robert J. Spornel, 7810 Lake Ave., Cleveland, Ohio 44102  
Continuation of Ser. No. 963,874, Oct. 19, 1992, abandoned.  
This application Nov. 23, 1994, Ser. No. 344,529  
Int. Cl.<sup>6</sup> G10D 3/06, 3/06

U.S. Cl. 84—297 R

30 Claims



1. A stringed musical instrument, said musical instrument comprising a body portion, a neck portion at least partially formed of a first material and connected with an extending outward from said body portion, a head portion at least partially formed of the first material and connected with said neck portion, surface means for defining a plurality of spaced apart openings in the first material adjacent to said head and neck portions, a plurality of tuning devices mounted on said head portion, a plurality of strings each of which extends from one of said tuning devices along said neck portion to said body portion of said instrument, and a plurality of spaced apart string supports mounted on said musical instrument adjacent to a connection between said head and neck portions, each of said string supports of said plurality of string supports being at least partially disposed in one of said openings, each of said string supports of said plurality of string supports including first convex arcuate string support surface means which engages and at least partially supports one string of said plurality of strings and which forms at least a portion of an outer side of a first sphere, a second convex arcuate string support surface means which engages and at least partially supports said one string of said plurality of strings and which forms at least a portion of an outer side of a second sphere, and support means for supporting said first and second convex arcuate string support surface means, said support means being at least partially disposed in one of said openings in engagement with the first material adjacent to said head and neck portions of said instrument to enable vibrations to be transmitted from said first and second convex arcuate string support surface means through said support means to the first material adjacent to said head and neck portions of said instrument, said support means in each string support of said plurality of string supports being spaced from adjacent string supports of said plurality of string supports, each string of said plurality of strings being disposed in engagement with said first and second convex arcuate string support surface means in one of said string supports of said plurality of string supports.

5,438,902

**MEMORY TUNING SYSTEM FOR STRINGED INSTRUMENTS**

Michael V. Baker, 4606 51A Street, Camrose, Alberta, Canada T4V 1T3

Filed Jun. 29, 1993, Ser. No. 83,302

Int. Cl.<sup>6</sup> G10D 3/14

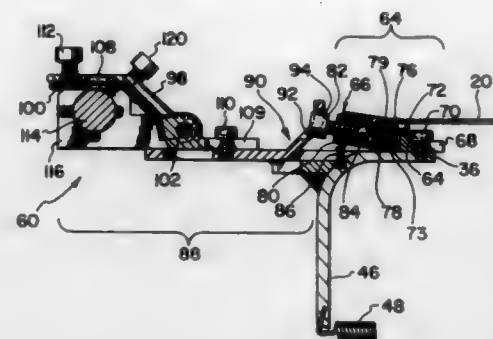
U.S. Cl. 84—312 R

35 Claims

1. A memory tuning system for a stringed instrument, wherein the stringed instrument includes a plurality of strings that are pre-tensioned between two critical contact points, said memory tuning system comprising:

- a frame assembly for connection to said instrument;
- a plurality of string contact members connected to the frame assembly, said plurality of string contact members con-

tacting said strings proximate and outside one of the contact points;  
a plurality of tuning levers each pivotally connected to the frame assembly and each operatively connected to a respective one of the string contact members;



a plurality of separator levers each pivotally connected to the frame assembly and each operatively connected to a respective one of the tuning levers; and  
a cam member rotatable mounted to the frame assembly and contacting the separator levers for pivoting the tuning levers and the separator levers, said cam member having a plurality of spaced apart adjustable projection elements.

5,438,903

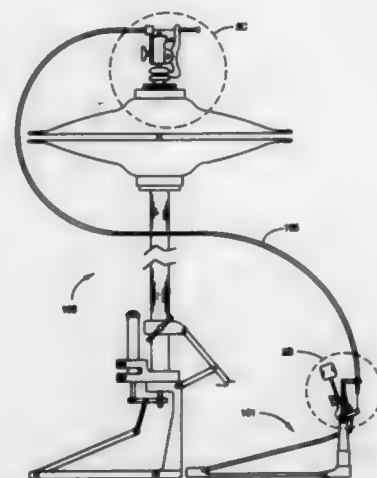
**REMOTELY-OPERABLE HIGH-HAT SPEED CLUTCH**  
William S. Cropek, 2440A Curry Cir., N., Holoman A.F.B., N. Mex. 88330

Filed Jun. 21, 1993, Ser. No. 79,170

Int. Cl.<sup>6</sup> G10D 13/02

U.S. Cl. 84—422.3

11 Claims



1. A remotely-operable high-hat speed clutch for use with a high-hat cymbal apparatus having a vertically-movable central shaft operated by a foot pedal, the speed clutch comprising:

- a clamping element adjustably mountable on said vertically-movable central shaft for supporting said speed clutch on said central shaft;
- an upper cymbal carrier assembly slidably engaging said vertically-movable central shaft for carrying an upper cymbal of a two-cymbal set of said high-hat cymbal apparatus;
- a coupling means attached to one of said clamping element and said upper cymbal carrier assembly and engaging the other of said clamping element and said upper cymbal carrier assembly such that while engaged both are constrained to move with said central shaft; and
- a remotely-operable coupling disengagement means con-

5,438,904

**BRAID STRUCTURE BODY**

Tadashi Uozumi, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

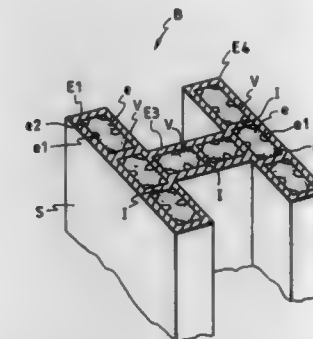
Filed Jan. 25, 1994, Ser. No. 186,150

Claims priority, application Japan, Feb. 8, 1993, 5-019753

Int. Cl.<sup>6</sup> D04C 1/06

U.S. Cl. 87—1

6 Claims



1. A braid structure body constituted from at least one tubular portion composed of side walls surrounding a hollow, at least one intermediate wall disposed in said tubular portion, and reinforcing members disposed in said hollow, said reinforcing members inserted having a suitable number of grooves formed on an outer periphery thereof along the longitudinal direction thereof so that an elongated hole is formed along the longitudinal direction of the braid structure body.

5,438,905

**METHOD AND APPARATUS FOR STABILIZING THE IN-TUBE TRAJECTORY OF A MISSILE**

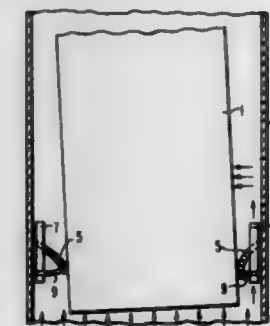
Erik R. Matheson, Sunnyvale, and Jeffrey S. Wade, Mountain View, both of Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 19, 1984, Ser. No. 622,297

Int. Cl.<sup>6</sup> F41F 3/04

U.S. Cl. 89—1.816

8 Claims



8. A method for stabilizing in-tube trajectory of a missile being ejected from a launch tube comprising the steps of: generating a high pressure gas; providing an annular seal between the missile and the launch tube adjacent the trailing end of the missile; delivering the high pressure gas to the launch tube on the trailing end side of the annular seal; and bypassing high pressure gas around the annular seal to the general area adjacent the low pressure side of the seal where the trailing end of the missile is closest to the launch

tube to provide a centering force adjacent the trailing end of the missile to stabilize the in-tube trajectory of the missile during the launch.

5,438,906

**UNITIZED SHOCK ABSORBING PAD WITH LOOPED FIBER RING**

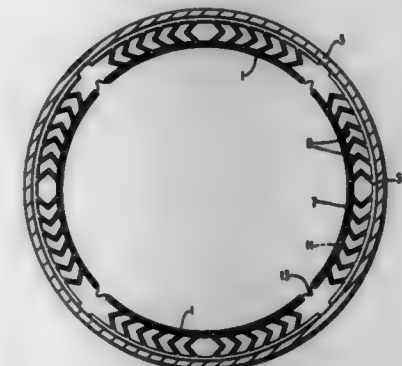
Michael S. Huber, Milpitas, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 13, 1984, Ser. No. 640,426

Int. Cl.<sup>6</sup> F41F 3/052

U.S. Cl. 89—1.816

10 Claims



1. A shock absorbing system to be disposed between a launch tube and a missile said shock absorbing system comprising:

- a first plurality of arcuate sheets which fasten to said launch tube;
- a second plurality of arcuate sheets spaced annularly from said first plurality of arcuate sheets;
- geometrically shaped struts extending between said first and second arcuate sheets;
- a fibrous ring extending between and disposed in said second arcuate sheets;
- said fibrous ring having loops disposed between adjacent second arcuate; and
- said loop being sufficiently long to provide a predetermined amount of preloading of said shock absorbing pads when they are disposed in an arcuate array in the launch tube,

5,438,907

**BLANK FIRING ADAPTOR**

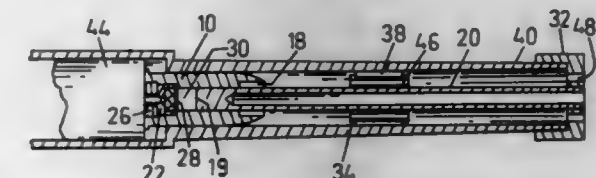
George L. Reynolds, R.R. 1 Box 324, Altona, Ill. 61414, and John M. Miller, Rte. #3 Box 434 Winters Dr., Marietta, Ohio 45750

Filed Aug. 15, 1994, Ser. No. 290,079

Int. Cl.<sup>6</sup> F41A 21/26

U.S. Cl. 89—14.5

6 Claims



1. A blank firing adaptor for a gun having a gun barrel and a bolt for moving cartridges into position for firing, said adaptor comprising a muzzle cap threadably mounted on the end of said gun barrel and having a spigot attached thereto, said spigot extending centrally within said barrel, said spigot having a closed inner end;

- a reusable cartridge body insertable by said bolt of said gun into position for firing, said body having a front portion thereof insertable over said spigot inner end, said cartridge



body having a propellant receiving chamber and a free volume space between said propellant receiving chamber and said spigot inner end, whereby detonation of propellant within said chamber pressurizes said free volume space and drives said cartridge body rearwardly to cycle said gun for another firing and to free said free volume space of pressure from said detonation of said propellant.

#### 5,438,908 REMOVABLE BULLETPROOF APPARATUS FOR VEHICLES

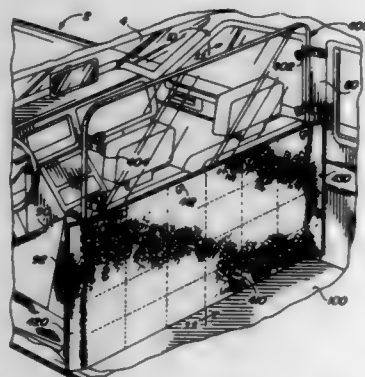
James R. Madden, Jr., 4410 W. Acoma Dr., Glendale, Ariz. 85306

Division of Ser. No. 139,313, Oct. 19, 1993, Pat. No. 5,370,035, which is a continuation-in-part of Ser. No. 792,645, Nov. 15, 1991, Pat. No. 5,271,311. This application Sep. 30, 1994, Ser. No. 316,250

Int. Cl.<sup>6</sup> F41H 5/06

U.S. Cl. 89—36.08

9 Claims



1. Bulletproof apparatus for a vehicle having front doors, and a front seat back, comprising in combination; bulletproof transparent panel means secured to the vehicle and extending upwardly behind the front seat back; bulletproof flexible curtain means secured to the transparent panel means and extending downwardly therefrom adjacent to the seat back.

#### 5,438,909 DEVICE FOR ENERGY TRANSMISSION FOR MECHANICAL CONTROL, IN PARTICULAR FOR THE CONTROL OF BRAKING PRESSURE IN A BRAKE

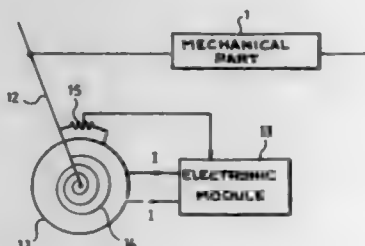
Christian Menard, Villennes s/Seine, France, assignor to Thomson-CSF, Puteaux, France

Continuation of Ser. No. 21,086, Feb. 23, 1993, abandoned. This application Mar. 21, 1994, Ser. No. 214,677

Claims priority, application France, Mar. 10, 1992, 92 02843  
Int. Cl.<sup>6</sup> F15B 13/16; F16K 31/02

U.S. Cl. 91—361

17 Claims



1. Device for energy transmission for mechanical control including at least one rotational actuator fitted with a return spring and means connected to the rotational actuator to transmit a linear movement to a mechanical part, wherein the rotational actuator is moved by a rotational electromagnet to an angular position determined by the average value of a pulsed

current with the rotational electromagnet maintaining the rotational actuator at the angular position during application of the pulsed current, and wherein said device also includes means for removal of magnetizing energy stored in the said rotational electromagnet.

#### 5,438,910 ASSEMBLY COMPRISING A BULKHEAD AND A PNEUMATIC BRAKE-BOOSTER FOR A MOTOR VEHICLE

Jean Pierre Gautier; Ulyse Verbo, both of Aulnay-sous-Bois, and Miguel Perez, Argenteuil, all of France, assignors to Bendix Europe Services Techniques, Drancy, France

PCT No. PCT/FR93/00291, § 371 Date May 6, 1993, § 102(e) Date May 6, 1993, PCT Pub. No. WO93/22171, PCT Pub. Date Nov. 11, 1993

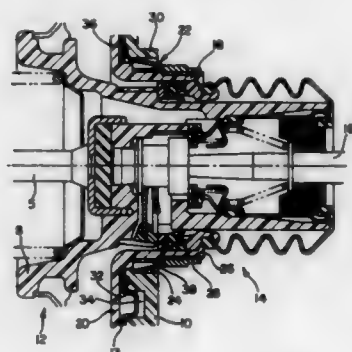
PCT Filed Mar. 24, 1993, Ser. No. 50,246

Claims priority, application France, Apr. 30, 1992, 92 05326

Int. Cl.<sup>6</sup> F15B 9/10

U.S. Cl. 91—369.1

9 Claims



1. Assembly comprising a bulkhead separating an engine compartment from a passenger compartment of a vehicle and a pneumatic booster assisting the braking of the vehicle and comprising essentially a tube into which an operating rod actuated by a brake pedal situated in the passenger compartment penetrates and a closed casing disposed in the engine compartment, the bulkhead being provided with an opening formed for the passage of the tube of the booster, the tube being fastened to a collar which has a diameter substantially smaller than that of the opening, and the collar having a peripheral groove, characterized in that a ring is housed in the peripheral groove and has, at least in part, an elastic edge projecting outwardly, in such a manner that, when the booster is in position in the opening, the elastic edge of the ring forms a spacer between a face of the bulkhead situated in the passenger compartment and a radial wall of the peripheral groove.

#### 5,438,911 CONTROL CYLINDER FOR PNEUMATIC CONTROL DEVICES WITH SIGNAL SWITCHES

Reiner Fiedler, Euskirchen, Germany, and Johann Supanz, Hard, Austria, assignors to Numatics GmbH, Germany and PWB AG, Switzerland

PCT No. PCT/DE93/00221, § 371 Date Jan. 19, 1994, § 102(e) Date Jan. 19, 1994, PCT Pub. No. WO93/18310, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 10, 1993, Ser. No. 146,167

Claims priority, application Germany, Mar. 13, 1992, 42 07 971.3

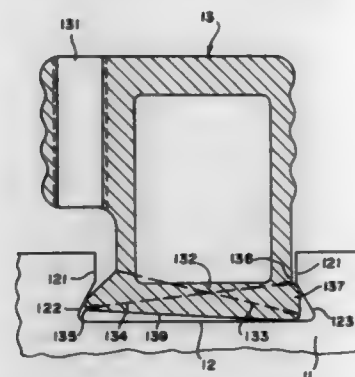
Int. Cl.<sup>6</sup> F01B 25/26

U.S. Cl. 92—5 R

16 Claims

1. A connecting mechanism particularly adapted for utilization in a fluidic control system comprising a control cylinder and a switch housing, said connecting mechanism including a dovetail connection between said control cylinder and said switch housing, said dovetail connection being defined by a male dovetail of one of said control cylinder and switch hous-

ing seated in a female dovetail-shaped channel of the other of said control cylinder and switch housing, said male dovetail being defined by a neck and a foot disposed generally transverse to said neck, said female dovetail-shaped channel being defined by a neck channel portion and a foot channel portion disposed generally transverse to said neck channel portion, said neck channel portion having a transverse dimension which is less than a maximum transverse dimension of said dovetail-shaped channel, said neck being joined to said foot at first and



second transversely spaced radius portions, said foot having transversely opposite first and second nose portions, said first nose portion and said second radius portion being generally diagonally opposite each other and defining a first diagonal distance therebetween, said second nose portion and said first radius portion being generally diagonally opposite each other and defining a second diagonal distance therebetween, and said neck channel portion transverse dimension is less than one of said diagonal distances and is more than the other of said diagonal distances.

#### 5,438,912 HYDRAULIC ROTARY ACTUATOR

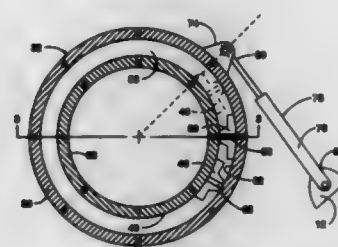
Andrew J. Tonsor, East Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 21, 1994, Ser. No. 310,061

Int. Cl.<sup>6</sup> F01B 13/00

U.S. Cl. 92—54

12 Claims



1. A hydraulic rotary actuator for rotating a first rotatable machine portion relative to a second non-rotatable machine portion, comprising:  
a support member connected to said second machine portion;

an inner ring having a first radially extending vane connected thereto;  
an outer ring having a second radially extending vane connected thereto, said outer ring encircling a first portion of said inner ring and define a circular chamber therebetween, said first and second vanes being positioned within said chamber;  
a bearing assembly supporting said inner ring and said first rotatable machine portion on said support member;  
first and second cover plates enclosing said outer ring and encircling second and third portions respectively of said inner ring to close said chamber;  
a plurality of seals positioned between said first and second cover plates and said inner and outer rings;  
a seal positioned around each of the first and second vanes;  
a torque reaction apparatus connecting said outer ring to said second non-rotatable machine portion; and  
means for supplying pressurized fluid into said chamber on each side of said second vane.

#### 5,438,913 DIAPHRAGM FOR A PUMP WITH PRESSURIZED BEAD

Dirk Budde, Langenfeld, Germany, assignor to Almatec Technische Innovationen GmbH, Germany

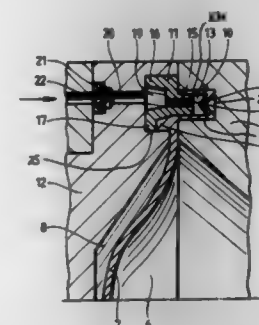
Filed May 6, 1994, Ser. No. 238,833

Claims priority, application Germany, May 6, 1993, 43 14 968.5

Int. Cl.<sup>6</sup> F01B 19/00; F04B 43/02

U.S. Cl. 92—98 R

17 Claims



1. A diaphragm for a pump, in particular a double diaphragm pump for high-purity products, comprising:  
radially offset peripheral annular beads including a grooved bead having a groove located along an interior surface thereof and a second annular bead radially offset from said grooved bead;  
a clamping ring including at least a first portion inserted into the groove of the grooved bead; and  
a port communicating with said groove for providing a pressure medium thereto.

#### 5,438,914 ELECTRIC CIRCUIT FOR CONTROLLING THE HEAT OUTPUT OF HEATING RESISTANCES IN HOUSEHOLD APPLIANCES

Dieter Höhn, Riedstadt, and Michael Steinle, Frankfurt, both of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Germany

Filed Sep. 27, 1994, Ser. No. 313,380

Claims priority, application Germany, Sep. 30, 1993, 9314747 U

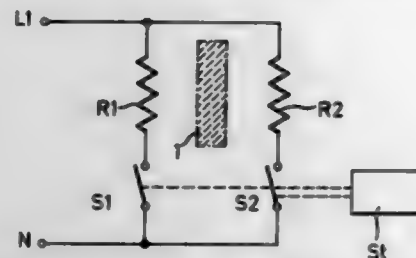
Int. Cl.<sup>6</sup> A47J 37/08; H05B 1/02

U.S. Cl. 99—327

4 Claims

1. An electric circuit on a single-phase power supply system for controlling a heat output of at least two heating resistances which are electrically connected in parallel and are installed in an electric household appliance, wherein control is effected in compliance with flicker standards and without feeding interference back into the power supply system, the circuit com-

prising a switch connected in series with each heating resistance, an electronic energizing arrangement for activating the switches, the electronic energizing arrangement comprising means for activating the switches during a heating phase in a



repetitively asymmetrically cycled manner, such that always only one of the switches is closed and all other switches are open, and such that the switch which is closed at a given time exclusively permits through-passage of full waves from the power supply system.

5,438,915

### TEMPERATURE SENSOR ASSEMBLY FOR AN AUTOMATIC BAKING MACHINE

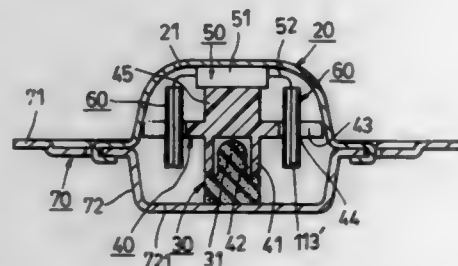
Shang-Hsien Chen, No.27, Sec.3, Chung-Shan Rd., Tan-Tzu Hsiang, Taichung Hsien, Taiwan

Filed Jan. 28, 1994, Ser. No. 187,987

Int. Cl.<sup>6</sup> A21D 8/00; A47J 27/00, 37/00, 43/046

U.S. Cl. 99—331

2 Claims



1. A temperature sensor assembly for an automatic baking machine, said automatic baking machine including an oven and a container disposed within said oven so as to bake bread therein, said oven having a heat device mounted therein so as to heat said container, said temperature sensor assembly comprising:

a shell member attached to an inner wall of said oven and having a heat transfer portion near said container, said heat transfer portion being made of a material which permits heat to transfer therethrough;

a sensor element contacting said heat transfer portion of said shell member so as to detect a temperature of said heat transfer portion, and having a pair of conducting legs respectively adapted to be connected electrically to two conducting wires of said heat device, said sensor element signaling and actuating said heat device to heat said container when the temperature of said heat transfer portion is below a predetermined temperature;

a bias unit biasing said sensor element to press against said heat transfer portion of said shell member; and

a housing member coupling with said shell member so as to retain said bias unit therebetween, said housing member being attached to said inner wall of said oven so as to position said temperature sensor assembly on said oven, wherein said bias unit includes an elongated cushion member, a positioning member and a connection mechanism interconnecting said cushion member and said positioning member, said positioning member having a notch of a semicircular cross-section formed in a surface thereof so as to hold said sensor element in said notch, said cushion member being made of a hard rubber material so as to

push said positioning member to press said sensor element against said heat transfer portion of said shell member.

5,438,916

### COOKING SYSTEM AND ACCESSORIES

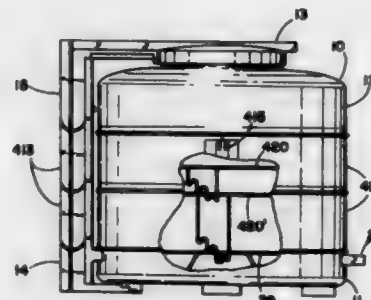
David A. Dornbush, Prior Lake; Steven Alseth, Cologne; Chad S. Erickson, Plymouth, all of Minn.; Theodore H. Rehmeier, Winston, N.C.; N. Philip Sked, Bloomington, Minn., and Robert T. Lee, Clinton, N.C., assignors to American Harvest, Inc., Chaska, Minn.

Continuation-in-part of Ser. No. 2,213, Jan. 8, 1993. This application Mar. 26, 1993, Ser. No. 37,310

Int. Cl.<sup>6</sup> A47J 27/04

U.S. Cl. 99—448

8 Claims



1. A countertop oven, comprising: an upper enclosure member and a lower enclosure member which together form a cooking chamber; a cooking surface formed within the cooking chamber on which food to be cooked may be placed; a plurality of racks disposed within the cooking chamber, each of the racks comprising: a rack surface; and a plurality of legs attached to the rack surface, each of the legs being made of wire and having two straight segments extending downwardly from the rack surface and a connecting segment which connects together the straight segments, the connecting segment being shaped so as to allow the rack surface to be placed at one of a plurality of predetermined distances above the surface.

5,438,917

### DEVICE FOR RIPENING FRUIT

Jacobus Bolkestein, and Cornelis Bolkestein, both of Rotterdam, Netherlands, assignors to Binair Groep B.V., Moerkapell, Netherlands

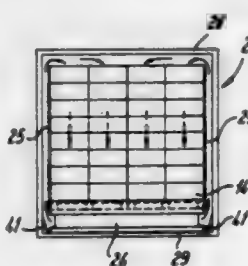
Filed Oct. 13, 1993, Ser. No. 135,729

Claims priority, application Netherlands, Oct. 13, 1992, 9201778

Int. Cl.<sup>6</sup> A23B 7/144; A23L 1/00, 3/00; A23N 15/06

U.S. Cl. 99—476

24 Claims



1. A device for ripening fruit loaded onto a pallet located inside an airtight ripening chamber said device having a ceiling and comprising:

a) an airflow separating means to separate said ripening

chamber into an interior airflow space to accommodate said loaded pallet and an exterior airflow space, said exterior space extending around said interior space in heat-exchanging relationship therewith;

b) an air circulation mechanism positionable above said load or beneath said pallet and having a suction hood connectable in an airtight manner to said airflow separating means to circulate air or other gaseous fluid and create a vertical pressure differential within each said separate space of said chamber to cause a vertical air flow in each of said interior and exterior airflow spaces, said vertical air flows being in opposing directions.

5,438,918

### APPARATUS FOR SEPARATING FOOD CONTENTS

Thomas J. Peters, Denver, Colo., assignor to SSDE Technologies Corporation, Colo.

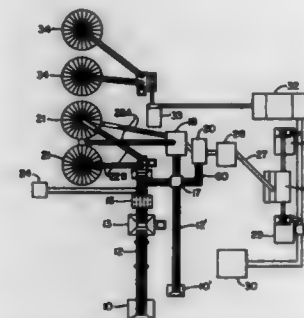
Division of Ser. No. 790,368, Nov. 12, 1991, Pat. No. 5,230,917.

This application Jun. 14, 1993, Ser. No. 77,123

Int. Cl.<sup>6</sup> A23P 1/00; B03C 1/00

U.S. Cl. 99—483

16 Claims



1. Apparatus for separating the food contents from containers, comprising: means for lacerating said containers to expose the food contents therein; spraying means for spraying said containers and food contents to encourage initial separation of said contents from said containers; separating means for mechanically separating said contents from said containers; and means for drying said contents to reduce the percentage moisture level therein.

5,438,919

### EGG SEPARATOR

Olajire Idowu, 1734 Mettler Rd., Lodi, Calif. 95242

Filed Dec. 13, 1994, Ser. No. 354,522

Int. Cl.<sup>6</sup> A23J 1/09; A47J 43/14

U.S. Cl. 99—499

15 Claims

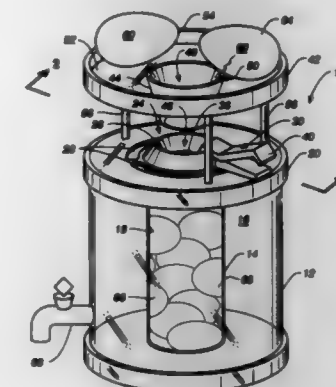
1. A device for separating the yolk and albumen of an egg comprising:

a housing comprising an inner chamber and an outer chamber;

separating means detachably coupled to an upper portion of said housing for receiving an egg and separating the yolk and albumen of the egg, said separating means including retaining means for retaining the yolk therein and causing the albumen to overflow said retaining means and flow downwardly into said outer chamber;

means pivotally coupled to said separating means for selec-

tively dispensing whole yolk retained in said retaining means into said inner chamber; and



funnel means detachably mounted on said separating means, said funnel means positioned above said separating means for directing the egg to said separating means.

5,438,920

### METHOD FOR CALENDERING A PAPER OR AN EQUIVALENT WEB MATERIAL AND A CALENDER THAT MAKES USE OF THE METHOD

Pekka Koivukunnas, and Juha Lipponen, both of Järvenpää, Finland, assignors to Valmet Paper Machinery Inc., Helsinki, Finland

Filed Dec. 16, 1993, Ser. No. 168,521

Claims priority, application Finland, Nov. 24, 1993, FI 935214

Int. Cl.<sup>6</sup> B30B 3/04; D21G 1/00

U.S. Cl. 100—38

26 Claims



1. A method for calendering a web in a calender, wherein the web to be calendered is passed through calendering nips formed by a variable-crown upper roll, a variable-crown lower roll, each of said upper and lower rolls having a stationary roll axle, a revolving mantle spaced therefrom and loading members coupled to said roll axle for deflecting said mantle to load said roll, and by at least two intermediate rolls arranged between said upper roll and lower roll, said intermediate rolls having auxiliary equipment connected thereto, said upper roll, said lower roll and said intermediate rolls being arranged as a substantially vertical stack, comprising the steps of:

applying an adjustable load to the calendering nips by means of at least one of said loading members of said upper roll, said loading members of said lower roll, an externally applied load to said upper roll and an externally applied load to said lower roll, and

relieving the load in the calendering nips produced by the mass of said intermediate rolls and the mass of the auxiliary equipment connected to said intermediate rolls by utilizing, as said intermediate rolls, rolls in which the form



of a natural deflection line produced by the weight of said rolls is substantially equal.

5,438,921

# STENCIL PRINTING DEVICE HAVING AN INK MIXING UNIT

Takanori Hasegawa, Tokyo, Japan, assignor to Riso Kagaku Corporation, Tokyo, Japan

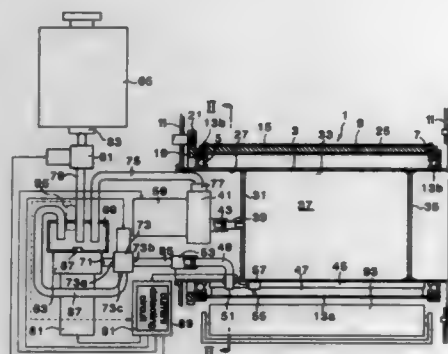
Filed Aug. 22, 1994, Ser. No. 293,590

Claims priority, application Japan, Aug. 24, 1993, 5-209416

Int. Cl.<sup>6</sup> B41F 15/40; B41L 13/04, 13/18

U.S. Cl. 101-116

8 Claims



1. A stencil printing device for carrying out stencil printing by using a printing ink consisting of a mixture of a first liquid and a second liquid, comprising:

- a first liquid storage container for storing said first liquid;
- a second liquid storage container for storing said second liquid;
- a mixing unit for receiving said first liquid from said first liquid storage container and said second liquid from said second liquid storage container, and producing printing ink by mixing said two liquids;
- a cylindrical printing drum for stencil printing having an ink squeegee unit;
- printing ink supply passage means for conducting said printing ink produced by said mixing unit to said ink squeegee unit of said printing drum;
- ink amount detecting means for detecting the amount of the printing ink in said ink squeegee unit; and
- ink supply control means for controlling the amount of the printing ink that is supplied from said mixing unit to said ink squeegee unit according to the amount of printing ink detected by said ink amount detecting means.

5,438,922

# AUTOMATED TEXTILE PRINTING APPARATUS

Henry J. Bubley, Deerfield, Ill., and David Landesman, St. Louis, Mo., assignors to Lawson Screen Products, Inc., St. Louis, Mo.

Filed Oct. 25, 1993, Ser. No. 142,876

Int. Cl.<sup>6</sup> B41L 27/00

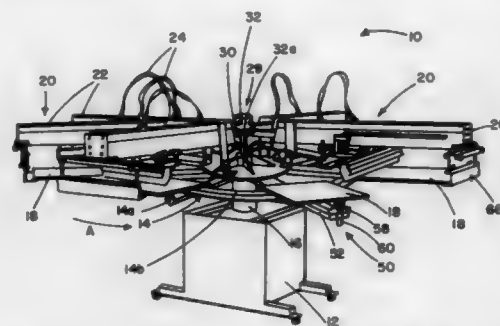
U.S. Cl. 101-123

19 Claims

1. A textile screen printing apparatus of the carousel type having multiple spaced-apart print heads positioned around the center of the apparatus and extending radially therefrom and at least a corresponding number of platens mounted in a substantially horizontal plane around a carousel of the printing apparatus beneath the print heads, the platens being spaced apart at the same distance from one another as the print heads are spaced apart from one another, the apparatus comprising,

- a radially centrally disposed member in contact with each of the print heads for causing all print heads to simultaneously lift together and to simultaneously lower together in relation to the horizontal plane, means for controlling the centrally disposed member for causing all print heads to simultaneously lift and lower,

means for selectively stopping rotational movement of the carousel, a combined flood bar and squeegee ink applicator mechanism connected to each of the print heads, and means for controlling each of the ink applicator mechanisms, wherein each of the multiple print heads of the apparatus is elongated has an inner end extending radially toward the center of the apparatus, and each of the multiple print heads is indirectly pivotally mounted at a point substantially adjacent to its inner end to the apparatus, and further wherein the means for causing all print heads to simultaneously lift and lower in relation to the respective



platens is a heavy spool mounted longitudinally above the center of the apparatus, the spool having an outwardly extending flange which slidably contacts the inner ends of the multiple print heads, and a single fluid cylinder having a piston and the spool being longitudinally connected at a lower end thereof to the single fluid cylinder by the piston, to thereby permit forcibly downward movement of the inner ends of the multiple print heads resulting in pivotal upward movement of radially outward ends of each of the multiple print heads, and to likewise thereby cause gradual pivotal downward movement of the radially outward ends of each of the multiple print heads as the cylinder piston forces the spool upwardly.

5,438,923

# METHOD AND APPARATUS FOR THE PREVENTION OF AEROSOL DEPOSITS IN A ROTARY PRINTING PRESS

Martin H. Schoeps, Güntersleben, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Würzburg, Germany

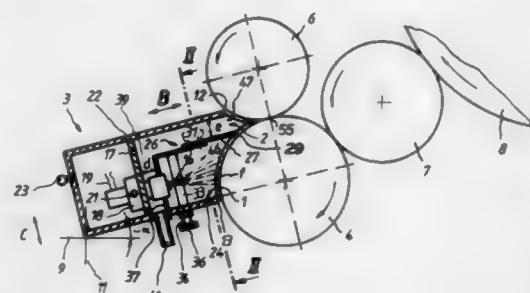
Filed Jan. 25, 1994, Ser. No. 186,336

Claims priority, application Germany, Jan. 25, 1993, 43 01 950.1

Int. Cl.<sup>6</sup> B41L 25/00

U.S. Cl. 101-147

5 Claims



1. An aerosol capturing apparatus in combination with a rotary printing apparatus to capture stray aerosols generated in said rotary printing press by the impact of droplets formed by a droplet generating device and impacted against a receptor roller of said rotary printing press, said droplet generating device being positioned adjacent a circumferential surface of said receptor roller, said receptor roller cooperating with at

least a first additional roller onto which it places a liquid coating applied to it by said droplet generating device, said receptor roller and said at least first additional roller engaging each other along an axially extending contact line, said aerosol capturing apparatus having an aerosol capturing inlet slot, said inlet slot being located adjacent, and extending along said contact line, said inlet slot being positioned to capture said stray aerosols.

5,438,924

# ROTOGRAVURE INKING SYSTEM

Wolfgang Knoll, and Klaus Mages, both of Lamsheim, Germany, assignors to Albert-Frankenthal Aktiengesellschaft, Frankenthal, Germany

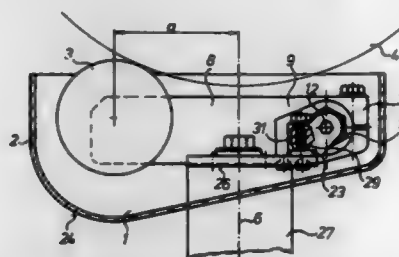
Filed Nov. 23, 1994, Ser. No. 347,242

Claims priority, application Germany, Nov. 27, 1993, 43 40 482.0

Int. Cl.<sup>6</sup> B41F 9/06, 31/07

U.S. Cl. 101-153

9 Claims



1. A rotogravure inking system for a rotogravure printing press, said inking system comprising:

- an ink trough provided with a supply of printing ink;
- a printing cylinder dipping into said printing ink in said ink trough and having a printing surface;
- an inking roller supported in said ink trough and having a jacket surface in contact with said printing surface of said printing cylinder;
- first and second spaced lever arms positioned within said ink trough, each of said lever arms having a first end and a second end, said inking roller being rotatably supported between said first ends of said first and second lever arms, said second ends of said lever arms being pivotally secured to said ink trough; and
- first and second prestressed torsion rods in said ink trough, each of said torsion rods having an outer end connected to said second end of a corresponding one of said lever arms, and an inner end fixedly secured to said ink trough.

5,438,925

# LADDER FOR CLIMBING UP TO AND DOWN FROM WORKING FLOOR OF PRINTING PRESS

Takashi Ohmi, Yokohama, Japan, and Takayuki Baba, Kawasaki, both of Japan, assignors to Tokyo Kikai Seisakusho, Ltd., Tokyo, Japan

Filed Jun. 3, 1994, Ser. No. 253,919

Claims priority, application Japan, Sep. 20, 1993, 5-255261

Int. Cl.<sup>6</sup> B41F 5/00

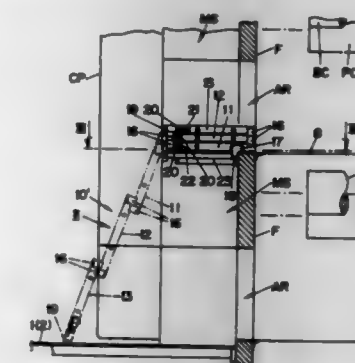
U.S. Cl. 101-212

4 Claims

- 1. A printing press assembly, comprising:
  - (a) a plurality of press units vertically arranged in a plurality of tiers, said plurality of tiers at least including a lower tier and an upper tier above said lower tier;
  - (b) an upper working floor upon which an individual can stand to obtain access to said upper tier;
  - (c) a ladder for climbing up to and down from said upper working floor, said ladder including:
    - (i) a first divided unit having generally parallel side frames and steps between said side frames, and at least one movable member having a mounting portion;
    - (ii) said first divided unit being connected at one end thereof to said at least one movable member which is

movably connected to said upper working floor via said mounting portion,

- (iii) said first divided unit being movable between a first state wherein said first divided unit is stored generally parallel to and proximate said upper working floor and a second state wherein said first divided unit extends downwardly from said upper working floor, wherein when said first divided unit is moved from said first state to said second state said one end of said first divided unit is moved in the direction of an opposite end of said first divided unit at an opposite end of said side frames from said one end,
- (iv) said first divided unit having at least one coupling member proximate said opposite end,
- (v) a second divided unit having generally parallel side frames and steps between said side frames,



(vi) said second divided unit having at least one coupling member located proximate one end thereof and engageable with said at least one coupling member of said first divided unit,

- (vii) said second divided unit being movably connected to said first divided unit such that said second divided unit is movable between a first state wherein said second divided unit is stored generally parallel to and proximate said upper working floor and upon said first divided unit, in said first state of said first divided unit, and a second state wherein said second divided unit extends downwardly from said upper working floor and below said first divided unit with said at least one coupling member of said first divided unit and said at least one coupling member of said second divided unit being engaged together, in said second state of said first divided unit.

5,438,926

# DEVICE FOR MAINTAINING CUT OFF REGISTRATION IN A PRINTING PRESS

Edward Hudyma, 631 Derbyshire La., Bolingbrook, Ill. 60440, and JiaShen P. Lin, 1402 Buena Vista, Wheaton, Ill. 60187

Filed Nov. 4, 1991, Ser. No. 787,491

Int. Cl.<sup>6</sup> B41F 5/04

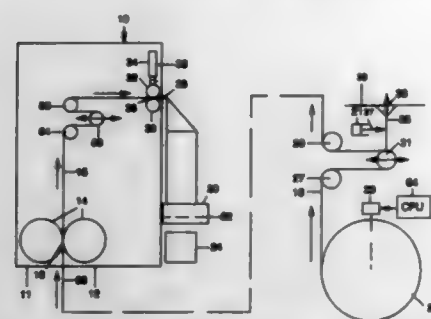
U.S. Cl. 101-227

19 Claims

1. A device for maintaining registration in a printing press, comprising:

- means for cutting a web in the press;
- means for printing the web upstream from the cutting means relative to the direction of movement of the web;
- means for determining the rate of change of speed of the web in the press; and
- means responsive to the determining means for maintaining a selected rate of change of mass flow of the web into the printing means responsive to changes of speed in the press

as determined by the determining means, such that a balance between the mass flow of the web into the printing



means is maintained with the mass flow of the web out of the printing means.

5,438,927

## INK FOUNTAIN ASSEMBLY

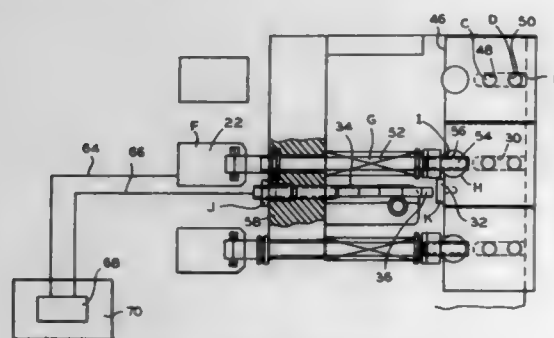
Ronald A. Banike, Orland Park, and Robert F. Bohanek, Clarendon Hills, both of Ill., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Mar. 9, 1994, Ser. No. 208,353

Int. Cl.<sup>6</sup> B41F 31/05, 31/06

U.S. Cl. 101-365

13 Claims



1. An ink fountain assembly, comprising:
  - a fountain roller and a fountain blade assembly positioned in operatively associated relation to said fountain roller, said fountain blade assembly including a fountain base having a key supporting surface and also including a plurality of ink keys on said key supporting surface of said fountain base to extend substantially along the length of said fountain roller, said ink keys each being adapted to be disposed in variably spaced confronting parallel relation to said fountain roller;
  - alignment means for accurately maintaining each of said ink keys in parallel relation to said fountain roller including means operative between said fountain base and each of said ink keys; and
  - drive means for controlled movement of each of said ink keys toward and away from said fountain roller including an actuator operatively interconnected to each of said ink keys on a side opposite a roller confronting surface thereof;
  - said roller confronting surface of each of said ink keys having a blade edge adapted to be variably spaced from said fountain roller by said drive means to control thickness of an ink film to be transferred from said fountain roller;
  - each of said ink keys having parallel side surfaces and a pair of pin-receiving bores lying in a plane intermediate and parallel to said parallel side surfaces and perpendicular to said blade edge, said means operative between said fountain base and each of said ink key including a pin in each of said pin-receiving bores in each of said ink keys disposed in a single corresponding slot in said fountain base for each of said ink keys, each of said slots in said fountain

base also lying in a plane perpendicular to said blade edge of the corresponding one of said ink keys whereby said blade edge of each of said ink keys is maintained parallel to said fountain roller.

5,438,928

## SIGNATURE PANELS

Charles E. Chatwin, Horsham, United Kingdom, and Karen S. Walker, Maidenhead, Great Britain, assignors to Thomas de la Rue & Company Limited, London, England

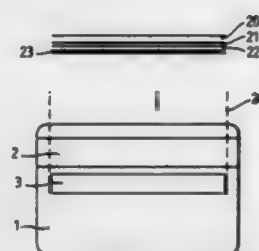
Continuation of Ser. No. 934,654, Jan. 7, 1993, abandoned. This application Jun. 28, 1994, Ser. No. 266,599

Claims priority, application United Kingdom, Jan. 31, 1990, 9016821; Jul. 12, 1990, 9015319

Int. Cl.<sup>6</sup> B41L 47/02

U.S. Cl. 101-369

14 Claims



1. A transfer foil for providing a signature panel on a substrate, the foil comprising:
  - a carrier layer; and
  - a transferable signature panel layer having a signature accepting surface facing said carrier layer comprising a coating composition incorporating a polymeric material supported on the carrier layer, wherein the signature panel layer can be transferred in response to heat and pressure onto a substrate from the carrier layer and on the signature accepting surface of which signature panel layer a signature can be provided, the foil carrying at least one ink, chosen from the group consisting of paste inks, ultra-violet radiation curable inks and electron beam curable inks, placed on or in the signature accepting surface of the signature panel layer by direct letterpress, offset letterpress, or offset lithographic printing, the printed ink transferring with the transferable layer in use.

5,438,929

## PRINTING STAMP

Kin-Sun Wong, and Kam-Hung Wan, both of 3/F., West Wing, Chung Nam Building, 152-158 Johnston Road, Wanchai, Hong Kong, assignors to Kin-Sung Wong, Kowloon and Kam-Hung Wan, Wanchai, both of Hong Kong

Filed Mar. 15, 1994, Ser. No. 212,801

Claims priority, application United Kingdom, Apr. 19, 1993, 9307999

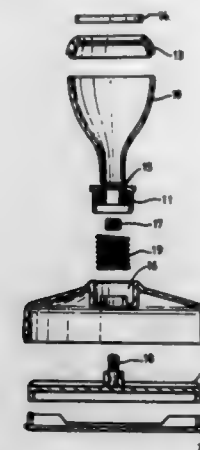
Int. Cl.<sup>6</sup> B41K 1/56

U.S. Cl. 101-405

17 Claims

1. A printing stamp comprising a housing, a stamp mounting member slidably mounted within the housing for movement between an inoperative position and an operative position at which printing can be performed, resilient means for urging said stamp mounting member to said inoperative position, an operating member for moving said stamp mounting member from the inoperative position to the operative position against the urging force of said resilient means, said operating member having an annular groove, and a handle releasably received in said annular groove of said operating member by a friction fit,

so that said handle can be removed at will, said printing stamp being operable between the operative and inoperative positions



both with said handle received in and removed from said annular groove of said operating member.

5,438,930  
MINE

Werner Grossewendt, Ratingen; Klaus Gersbach, Willich, and Joachim Fiebrich, Düsseldorf, all of Germany, assignors to Rheinmetall GmbH, Ratingen, Germany

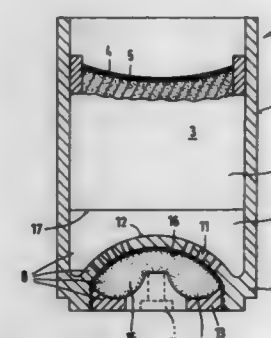
Filed Sep. 7, 1994, Ser. No. 301,907

Claims priority, application Germany, Sep. 8, 1993, 43 30 414.1

U.S. Cl. 102-404

Int. Cl.<sup>6</sup> F42B 23/00

6 Claims



1. A mine having at least one ejectable sub-munitions body disposed in a cup-shaped starting device, and a propulsion device for propelling the sub-munitions body into a selectable altitude range, wherein:
  - the propulsion device forms a part of the cup-shaped starting device at a bottom region of the cup-shaped starting device;
  - the propulsion device comprises a high pressure chamber facing a bottom of the cup-shaped starting device and having a propulsion charge located therein; and an adjoining low pressure chamber facing a bottom of the sub-munitions body; and
  - the high pressure chamber and the low pressure chamber are separated from each other by a perforated plate.

5,438,931

## RAIL ANCHOR REMOVER

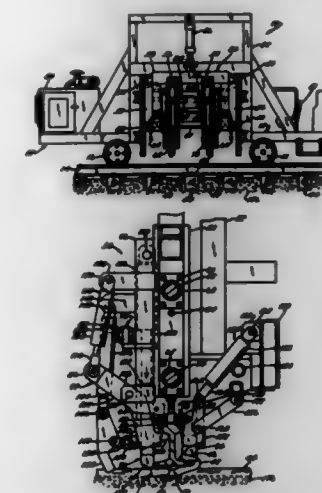
Neal W. Becker, Milwaukee; Jeffrey S. Hon, Waterford, and Robert L. Turner, Racine, all of Wis., assignors to Racine Railroad Products, Inc., Racine, Wis.

Filed Dec. 22, 1993, Ser. No. 172,116

Int. Cl.<sup>6</sup> E01B 29/00

U.S. Cl. 104-17.2

22 Claims



1. An anchor removing machine for removing an anchor from a rail, said rail having a base having field and gauge sides, a head, and a vertical web connecting said head to said base, said anchor having a head engaging said gauge side of said base of said rail, a body extending transversely underneath said base of said rail, and a tail disposed adjacent said field side of said base of said rail, said anchor removing machine comprising:

- A. a frame;
- B. a ram assembly which is mounted on said frame, said ram assembly driving said tail of said anchor beneath said base of said rail;
- C. a kicker assembly which is mounted on said frame, said kicker assembly being movable independently of said ram assembly, and said kicker assembly contacting said tail of said anchor to drive said tail transversely under said rail towards said gauge side of said rail; and
- D. a windrow assembly which is mounted on said frame, said windrow assembly movable independently of said ram assembly and said kicker assembly, and said windrow assembly contacting said head of said anchor to drive said anchor transversely away from said gauge side of said rail.

5,438,932

## RUNNING GEAR FOR A RAILBORNE VEHICLE THAT IS RADIALY ADJUSTABLE THROUGH COMPENSATING LEVERS

Johann M. Lipsius, and Wolfgang Auer, both of Kassel, Germany, assignors to ABB Patent GmbH, Mannheim, Germany

Filed Feb. 28, 1994, Ser. No. 203,280

Claims priority, application Germany, Feb. 27, 1993, 43 06 116.8

Int. Cl.<sup>6</sup> B61F 5/38

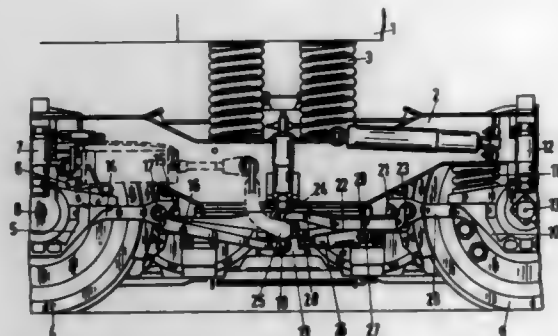
U.S. Cl. 105-168

6 Claims

1. In a railborne vehicle having at least two wheelsets, a running gear, comprising:
  - compensating levers for coupling the at least two wheelsets, said compensating levers each being articulated about a compensating lever pivot point; wheelset axle bearing housings;
  - guide rod configurations disposed between said axle bearing housings and said compensating levers for radial adjustability, said guide rod configurations including guide rods



articulated at said compensating levers at a guide rod pivot point radially spaced from said compensating lever pivot point; and  
at least one damping element connected between one of said compensating levers and one of said guide rod configura-



tions, said at least one damping element being articulated at a respective one of said compensating levers about a damping element pivot point radially spaced from said compensating lever pivot point and opposite said guide rod pivot point.

5,438,933

# **RUNNING GEAR FOR A RAILBORNE VEHICLE WITH RADIAL ADJUSTABILITY**

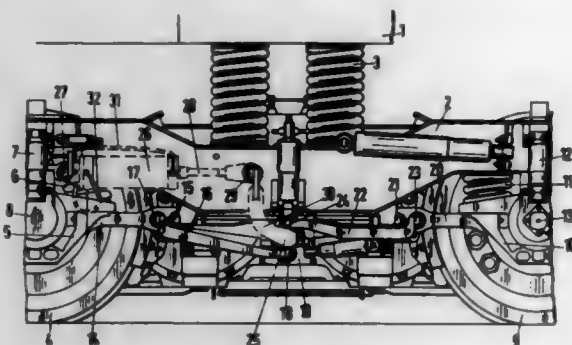
Johann M. Lipaius, and Wolfgang Auer, both of Kassel, Germany, assignors to ABB Patent GmbH, Mannheim, Germany  
Filed Feb. 28, 1994, Ser. No. 203,412

Claims priority, application Germany, Feb. 27, 1993, 43 06 114.1

Int. Cl.<sup>6</sup> B61F 5/38

U.S. Cl. 105-168

7 Claims



1. In a railborne vehicle having at least two wheelsets and wheelset springs, a running gear, comprising:  
wheelset guide rods and compensating levers connecting the wheelsets, said wheelset guide rods and compensating levers radially adjusting the wheelsets through longitudinal forces acting when the running gear travels a curve; and  
at least one independently controlled control cylinder for influencing a rotary motion of at least one of said compensating levers, a radial control of said compensating levers controlling a steering movement of the respective wheelset during travel through the curve, and a control force of said control cylinder, during the travel through the curve, exclusively acting against a horizontal restoring force of the wheelset springs.

5,438,934

# **LIGHTWEIGHT, IMPROVED PERFORMANCE TRUCK**

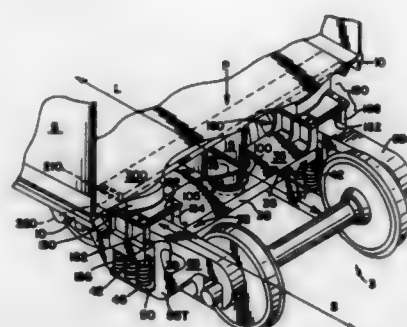
David J. Goding, Palos Park, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Oct. 15, 1993, Ser. No. 138,497

Int. Cl.<sup>6</sup> B61F 5/00

U.S. Cl. 105-199.3

8 Claims



1. A combination of a railcar suspension and a railcar having a railcar body, said railcar suspension system being located on an underside of said railcar body which has a front end, a rear end, a pair of sides and a longitudinal axis, each of said sides including a side rail longitudinally extending between the ends of said railcar body, said railcar carrying a payload and being free of a body bolster, the combination further comprising:

a beam at each said railcar body end, each said beam extending between said railcar body side rails;

a railcar truck disposed at each said railcar body end and in association with a respective said beam, each said truck comprised of a pair of longitudinally spaced sideframes having a top compression member, a bottom tension member, and a central opening therebetween, each of said sideframes supported by a pair of longitudinally spaced wheeled axles transversing said sideframes, said bottom tension member including a horizontally disposed plate attached to said bottom tension member at said central opening for receiving a spring set;

a single connection laterally extending between said respective sideframes, said single connection and said sideframes forming a generally flexible, H-shaped configuration wherein said single connection allows longitudinal movement of said sideframes with respect to each other so as to permutate said H-shaped configuration,

said single connection comprising a bolster of a relatively light weight, said bolster extending into each of said sideframe central openings and free of means for restraining vertical bolster movement, said bolster having a first end, a second end, and a midsection, each of said bolster ends generally constructed as a relatively solid component, each of said bolster ends supported by a respective said spring set and having opposed friction shoe pockets, said bolster midsection constructed as a relatively open component;

first and second sidebearing assemblies located on said bolster ends, each said sidebearing assembly comprised of a railcar body wear plate and a bolster bearing housing, said first sidebearing assembly attached to and coextensive with said first bolster end and said second sidebearing assembly attached to and coextensive with said second bolster end, each of said sidebearing assemblies free of rigid connections with said sideframes wherein each said bearing housing includes a longitudinally disposed passage having a passage width such that a respective said sideframe top compression member longitudinally extends through said bearing passage without contacting said bearing housing, each said bearing housing also having a recessed channel for holding a bearing pad, said bearing pad having a convex lower surface and a planar upper surface, said convex lower surface in communication with said bearing housing recessed channel and said planar upper surface in communication with said railcar body

wear plate, said car wear plate attached to said beam above said bearing housing, whereby said railcar payload is first passed into each said railcar body side rails, then into each said railcar body beam and then into each respective railcar body wear plate before directly entering into each said bearing assembly bearing pads, then through each respective said bearing housing before passing into each of said bolster ends and each of said respective spring sets, wherein said payload is finally transferred into each respective said sideframe bottom tension member spring plate and each respective said sideframe of said truck.

5,438,935

# **RAILROAD CAR HATCH COVER MECHANISM WITH DUAL LATCH POSITIONS FOR SAFELY VENTING HATCH**

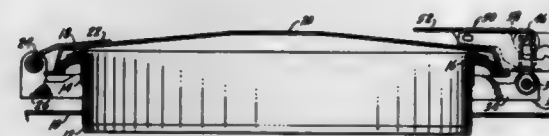
Robert F. Seitz, Batavia, Ill., assignor to Dev-Mark, Inc., Naperville, Ill.

Filed Jan. 4, 1994, Ser. No. 177,320

Int. Cl.<sup>6</sup> B61D 39/00

U.S. Cl. 105-377.11

9 Claims



1. A railroad car hatch cover assembly including a ring defining a car body opening, a peripheral seal attached to said ring, a hatch cover for closing upon said ring and seal to close the car body opening, a hinge adjacent said ring for pivotally mounting said hatch cover, and a cam lock assembly opposite said hinge for securing said hatch cover in a closing position upon said ring and seal,

said cam lock assembly having a locked position in which said hatch cover is closed upon said seal, an initial hatch cover release position in which said hatch cover is movable a limited distance away from said ring and seal, and a full release position in which said cam lock assembly permits full pivotal movement of said hatch cover about said hinge, said cam lock assembly only being movable to a full release position by pushing down on the hatch cover after the hatch cover has first moved to the initial hatch cover release position.

5,438,936

# **CLAMPING TABLE FOR AUTOMOBILES**

Chin-Yang Wang, No. 167, Lane 131, Sec. 2, True Hsing Rd., Panchiao, Taipei,

Filed Nov. 19, 1993, Ser. No. 154,861

Int. Cl.<sup>6</sup> A47B 23/00

U.S. Cl. 108-44

2 Claims

1. A clamping table comprising:

a top shell made of flat shape, said top shell comprising a vertical flange raised around the border thereof, two parallel spring chambers, two first spring means respectively disposed in either spring chamber, a sliding seat formed between said two parallel spring chambers, a first trough and a second trough disposed at one side at right angles, a center shaft, and a plurality of internally threaded mounting rods;

a first clamping plate made to slide on said top shell at one side in a middle thereof, said first clamping plate comprising an end block perpendicularly disposed at one end thereof outside said top shell, an oblong slot near an opposite end thereof, through which said center shaft of said top shell passes, a rack and an elongated rail longitudinally disposed at two opposite sides by the oblong slot thereof; a second clamping plate made to slide on said top shell at a

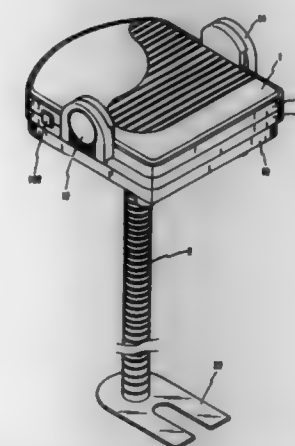
side in a middle thereof opposite to said first clamping plate and in a reverse direction thereto, said second clamping plate comprising an end block perpendicularly disposed at one end thereof outside said top shell, an oblong slot near an opposite end thereof, two parallel rails respectively and bilaterally stopped against the rack and rail of said first clamping plate on the outside, a rack longitudinally disposed at one side by the oblong slot thereof within the parallel rails thereof, and two side wings mounted on said sliding seat of said top shell and respectively stopped against said first spring means at one end; a transmission gear mounted on said center shaft of said top shell and meshed between the rack of said first clamping plate and the rack of said second clamping plate, said transmission gear having a gear shaft inserted through the oblong slot on said second clamping plate;

a ratchet mounted on the gear shaft of said transmission gear and having a set of teeth sloping in one direction;

a stop bar received in said second trough, said stop bar having a rear end terminated to a finger strip extended out of said top shell and an opposite end terminated to a projecting strip with a chamfered edge;

a second spring means received in said second trough and stopped between said stop bar and a wall of said second trough;

a brake bar received in said first trough, said brake bar comprising a stop wedge stopped against the chamfered



edge of said projecting strip of said stop bar, and a pawl engaged into the teeth of said ratchet;

a third spring means received in said first trough and stopped between said brake bar and a wall of said first trough to push said brake bar toward said stop bar;

a bottom shell covered on said top shell over said first and second clamping plates, said bottom shell comprising a plurality of mounting holes respectively connected to said internally threaded mounting rods of said top shell;

a bottom plate comprising a plurality of mounting holes respectively connected to the mounting holes on said bottom shell and the internally threaded mounting rods of said top shell by screws;

a plurality of fourth spring means retained between said bottom plate and said bottom shell to absorb shocks; and wherein when said finger strip of said stop bar is pressed inwards, the pawl of said brake bar is released from said ratchet, and said side wings of said second clamping plate are pushed by said first spring means to turn said transmission gear via the rack of said second clamping plate, causing said first and second clamping plates to move apart from each other in opposite directions thereby extending the pitch between the end blocks of said first and second clamping plates; then moving the end blocks of said first and second clamping plates toward each other causes said ratchet rotated over said pawl and then immediately stopped in position by said pawl as the push force is re-

leased from the end blocks of said first and second clamping plates.

5,438,937

## MOBILE TABLE SYSTEM

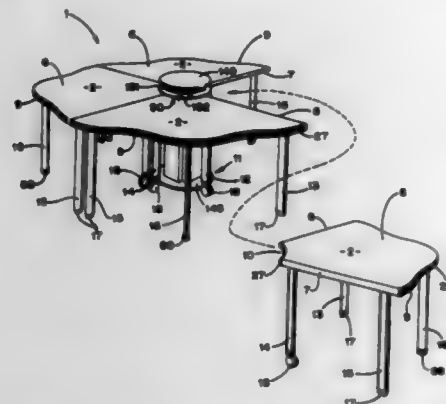
Douglas C. Ball, Senneville, Canada, and Lon D. Scheerhorn, Byron Center, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Jun. 8, 1993, Ser. No. 74,073

Int. Cl.<sup>6</sup> A47B 57/00

U.S. Cl. 108—64

44 Claims



1. A mobile conference table, comprising: a top having a pair of oppositely oriented, mutually tapered side edges configured to abut generally flush with similar side edges of adjacent like mobile tables to create an enlarged substantially continuous open worksurface, an outer marginal edge configured to accommodate a user thereby, and an inner marginal edge with a shape which defines a central space when aligned with similar inner marginal edges of adjacent like mobile tables; said top side edges tapering inwardly toward each other from said outer marginal edge to said inner marginal edge; and a plurality of legs connected with said top and depending therefrom to support said mobile table on a floor surface in a freestanding fashion; first and second ones of said legs having upper ends thereof connected with said top at locations disposed adjacent to said outer marginal edge at opposite sides thereof, and lower ends thereof with feet to abut the floor surface, and third and fourth ones of said legs having upper ends thereof connected with said top at locations disposed adjacent to said inner marginal edge at opposite sides thereof, and lower ends thereof with rollers to permit manual translation of said mobile table across the floor surface in wheelbarrow fashion, so that like mobile tables can be easily reconfigured by a single person to accommodate different groups and meeting activities.

5,438,938

## CART WITH REMOVABLE TRAY ASSEMBLY

Paul K. Meeker, Hiram, and William R. Gibson, Canton, both of Ohio, assignors to Cosco, Inc., Columbus, Ind.

Filed Jan. 14, 1994, Ser. No. 182,445

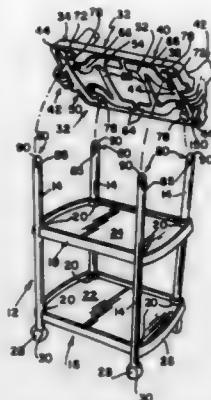
Int. Cl.<sup>6</sup> A47B 7/00

U.S. Cl. 108—91

56 Claims

1. A movable utility cart comprising a frame including a plurality of legs, a removable tray assembly, means for mounting the removable tray assembly to the frame so that the removable tray assembly is connected to the frame, latch means attached to the tray assembly for latching the tray assembly when mounted, and slidable actuation means attached to the tray assembly

for unlatching and latching the latch means to permit removing of the removable tray assembly from the frame so that



a user can lift the removable tray assembly off of the frame to disconnect the mounting means and the frame.

5,438,939

## MANUALLY ADJUSTABLE TABLE SUPPORT SYSTEM

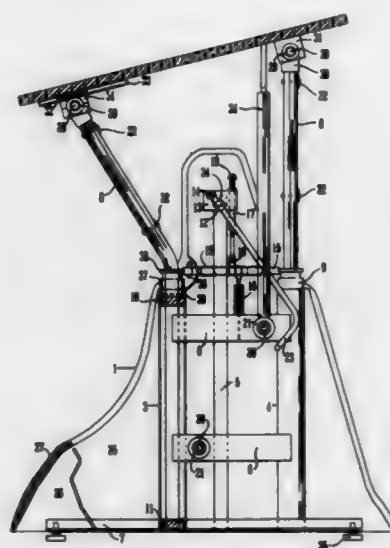
John P. Clarke, 211 Westway Rd., Southport, Conn. 06490

Filed Nov. 25, 1991, Ser. No. 797,392

Int. Cl.<sup>6</sup> A47B 9/00

U.S. Cl. 100—144

10 Claims



1. An adjustable table support system comprising: two separate vertical support units where each unit consists of; a pair of telescopic post members as a means of changing front and/or rear height of an attached surface where telescopic members are attached permanently apart in parallel to each other by cross-bracing members; one or more cross-axle members as a means of linking both vertical support units apart and in parallel to each other where said members are attached laterally across to opposite points of cross-bracing members of each respective vertical support unit; a friction locking device affixed at a point where a smaller diameter moving telescopic post enters a larger diameter non-moving telescopic post of each telescopic member as a means of preventing downward movement of the moving telescopic post; a central bracing member affixed on cross-bracing members and extending vertically between telescopic members to a point above locking devices; a rocker plate rotationally affixed on top of said central bracing member; a friction lock linking member extending across to link to an actuating leverage appendage on each friction locking device as a means for tandem actuation; a lifting member pivotally attached on a central point of the

friction lock linking member extending upward pivotally connecting on a leverage point of the rocker plate as a means of, converting a rotational force of said plate to an up and down force on the friction lock linking members; a common actuating lever extending laterally across to a leverage point on the rocker plate on each vertical support unit as a means of tandemly linking with one lever a movement of all four friction locking devices; a pair of cross-connecting members, each laterally tops of respective front and rear pair of telescopic members providing for a common member for attachment to underside of a surface; a rotating connecting device connecting cross-connecting members at right angles to the telescopic moving posts allowing said posts and cross-connecting members to rotate independently of each other for surface angle changes; a sliding device ultimately connecting to at least one cross-connecting member and an attached surface to allow lateral movement between the two; an enclosure partially enclosing each aforementioned vertical support unit; a means for counter-balancing the weight of an attached surface.

5,438,941

## TENTER FRAME, GUIDE AND DRIVE FOR EMBROIDERY MACHINES

Jürg Henz, Amriswil; Hans Abegglen, and Xuellang Yu, both of Arbon, all of Switzerland, assignors to Saurer Stickssysteme AG, Switzerland

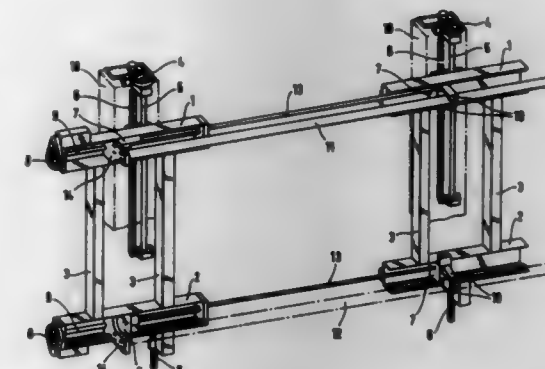
Filed May 20, 1994, Ser. No. 246,512

Claims priority, application Germany, May 20, 1993, 43 16 915.5

Int. Cl.<sup>6</sup> D05C 9/12

U.S. Cl. 112—90

11 Claims



1. An embroidery machine to embroider a fabric mounted in a vertical plane, said machine having fabric shafts for mounting said embroidery fabric, said fabric shafts being arranged in parallel horizontally with respect to the ground, wherein said embroidery machine comprises:

a machine frame;  
a plurality of upper and lower horizontal guides fixed to said machine frame and distributed along said embroidery machine;  
elongated vertical connection elements connecting one of said upper horizontal guides to one of said lower horizontal guides respectively to form several horizontal guide elements;  
several vertical positioning drives, one vertical positioning drive for each of said horizontal guide elements; and  
a plurality of vertical guides mounted stationarily on said machine frame, each of said horizontal guide elements being vertically adjustable in said vertical guides by one of said positioning drives, respectively.

5,438,940

## MANUAL PLANT SETTING DEVICE AND METHOD OF SETTING PLANTS

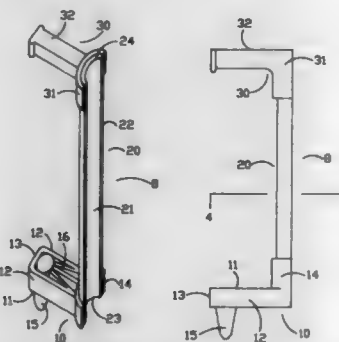
William L. Bristow, Rte. 3, Box 455, Frankston, Tex. 75763

Filed Jul. 26, 1993, Ser. No. 97,648

Int. Cl.<sup>6</sup> A01C 11/02

U.S. Cl. 111—115

19 Claims



1. A manual plant setting device, particularly useful for setting seedling plants in a prepared soil bed, comprising an elongate trough-like main body open along its length, having a longitudinal axis and first and second ends, said main body being curved in cross-sectional configuration and having a concave surface and a convex surface;  
a substantially planar base plate having a longitudinal axis, first and second ends, and upper and a lower faces, said base plate being interconnected at its first end to said convex surface of said main body at the second end of said main body and extending outwardly from said main body with the longitudinal axis of said base plate generally perpendicular to the longitudinal axis of said main body;  
a spud for opening a hole in the soil to receive a plant therein, said spud having a longitudinal axis and first and second ends, and said spud being interconnected at its first end to the lower face of said base plate and extending outwardly therefrom with the longitudinal axis of said spud generally perpendicular to said lower face of said base plate and with the second end of said spud extending beyond said second end of said main body; and  
handle means interconnected to said convex surface of said main body at the first end of said main body and extending outwardly therefrom.

5,438,942

## TURNING ZIGZAG EMBROIDERY MACHINE

Akira Okuno; Takashi Isobe, both of Yokohama, and Keiichi Ito, Tokyo, all of Japan, assignors to Nippon Denpa Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1993, Ser. No. 133,143

Claims priority, application Japan, Oct. 16, 1991, 3-296284; Aug. 20, 1992, 4-244300

Int. Cl.<sup>6</sup> D05B 21/00; D05C 9/06

U.S. Cl. 112—102.5

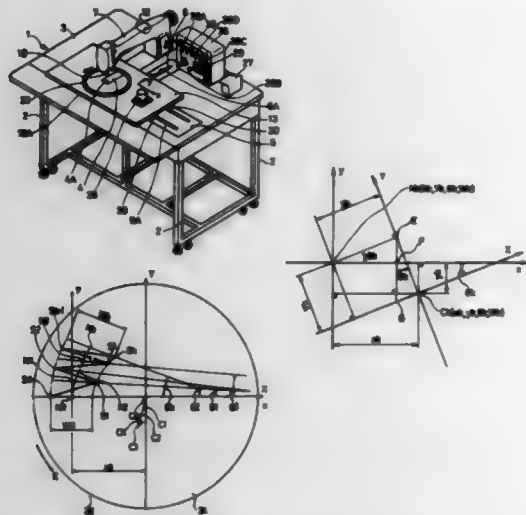
3 Claims

1. A turning zigzag embroidery machine of the type having a base table for positioning a lower embroidery thread thereon, an embroidery machine head located over the base table and arranged to reciprocate an embroidering needle with an upper thread up and down in a confronting position relative to a lower thread and at the same time to impart a rocking motion to said embroidering needle over a predetermined width W, a movable frame provided movably on said base table at a position under said embroidery machine head and driven from a movable frame drive source for movements in directions of x- and y-axes on said base table, and a rotatable frame adapted to hold embroidering cloth in a stretched state within said movable frame and rotated by a rotatable frame drive source on said movable frame to turn said embroidering cloth through a



given rotational angle  $\theta$  within said movable frame, wherein said turning zigzag embroidery machine comprises:

- a data read-in means for reading in input needle center data including said needle rocking width  $W$  of said embroidering needle and said rotational angle  $\theta$ ;
- an arithmetic conversion means for converting said input needle center data including said rotational angle  $\theta$  and said needle rocking width  $W$  into frame center data, wherein said arithmetic conversion means converts needle



center data  $N(\Delta X, \Delta Y, \theta, W)$ , read in through said data read-in means, into frame center data  $C(\Delta x, \Delta y, \theta, W)$  by means of trigonometric functions based on said rotational angle  $\theta$ ; and

an embroidery machine operation control means for controlling operations of said embroidery machine head and said movable and rotatable frame drive sources according to said arithmetically converted frame center data from said arithmetic conversion means.

5,438,943

# GUARD DEVICE FOR SEWING MACHINES

Shigemasa Kato, Kamakura; Shigeki Okawa, Hachioji, and Masafumi Susaki, Chofu, all of Japan, assignors to Juki Corporation, Chofu, Japan

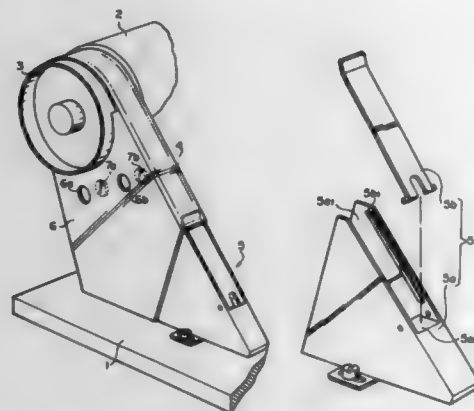
Filed Oct. 13, 1993, Ser. No. 136,455

Claims priority, application Japan, Oct. 13, 1992, 4-071238 U

Int. Cl.<sup>6</sup> D05B 83/00; F16H 57/02

U.S. Cl. 112—261

9 Claims



1. In a sewing machine including a head of said sewing machine disposed on a table of said sewing machine wherein said head being mounted to swing downwardly in a direction opposite to an operator and from a position in which said head

is raised to a position in which said head is collapsed, a motor located downwardly of said table, a pulley fixed to a main shaft of said sewing machine head, and a belt extended between said pulley and a pulley of said motor for transmission of its rotation, a guard device on said table for covering over said belt, said guard device for said sewing machine including a fixed cover for covering over a lower portion of said belt located upwardly of a surface of said table, and a movable cover adapted to cover over at least a portion of said belt not covered by said fixed cover when said sewing machine head is in its raised position and movable following rotation of said sewing machine head between said positions, said fixed cover comprising a channel upwardly opened to have said belt entered thereinto when said sewing machine head is in its collapsed position; an end face disposed on its side opposite to said opening as to engage with said belt entered into said channel when said sewing machine head is in its collapsed position; and an auxiliary cover for covering over said channel when said sewing machine head is in its raised position and opening said channel when said sewing machine head is in its collapsed position, wherein said auxiliary cover is supported on said fixed cover to rotate about a lower end of said auxiliary cover and to engage an upper end of said auxiliary cover with an inside surface of said movable cover.

5,438,944

# SURFACE MOUNTED COLLAPSIBLE MOORING CLEAT AND HOUSING

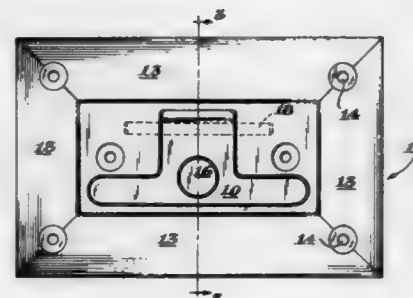
David W. Burke, 809 Taylor St., Bay City, Mich. 48708

Filed Sep. 29, 1994, Ser. No. 320,131

Int. Cl.<sup>6</sup> B63H 21/04

U.S. Cl. 114—218

1 Claim



1. A surface mounted collapsible mooring cleat and housing, said housing having a top surface and a bottom surface and sloping sides, said top surface being routed and adapted to contain a fixed pin and said cleat, said cleat comprising a top portion and a bottom portion, said top portion having generally opposed extending arms, said bottom portion being positionable on said pin and being rotatable about said pin whereby said cleat may be rotated from a non-use position within said housing to a use position extending above said housing, and wherein said bottom portion of said cleat abuts said housing above and below said pin and on opposite sides of said pin when said cleat is in an upright, operative position.

5,438,945

# SLIDE VALVE ASSEMBLY

Paul E. Moody, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 27, 1994, Ser. No. 280,977

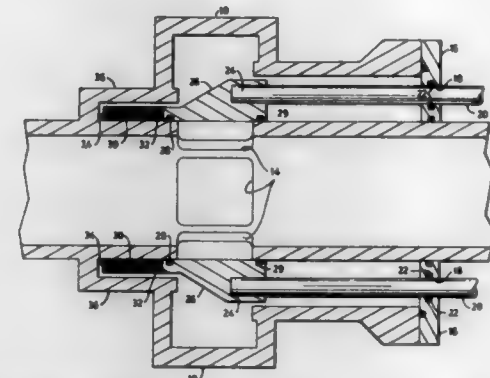
Int. Cl.<sup>6</sup> B63B 1/00

U.S. Cl. 114—238

8 Claims

1. A slide valve assembly comprising:  
a tank adapted to receive and retain fluid under pressure;  
a fluid launch tube having openings therein adapted to be in communication with said tank;

a slide valve head adapted to slidably move between a first position in which said slide valve head covers said openings to prevent fluid flow between said tank and said tube, and a second position in which said slide valve head is removed from said openings to permit fluid flow between said tank and said tube; and



a fluid flow resistance element fixed to said slide valve head, said flow resistance element comprising a series of baffle-like members, and adapted, when covering said openings, to permit frictionally resisted flow of fluid between said baffle-like members.

5,438,946

# PERSONAL JET PROPELLED WATERCRAFT

Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

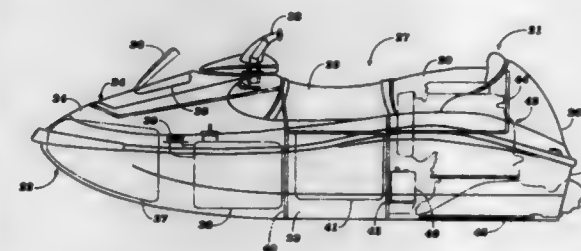
Filed Apr. 28, 1993, Ser. No. 54,401

Claims priority, application Japan, Mar. 23, 1993, 5-064277

Int. Cl.<sup>6</sup> B63B 35/73

U.S. Cl. 114—270

33 Claims



1. A jet propelled watercraft comprised of a hull defining a rider's area at the rear end thereof including a steering control for said watercraft, a seat extending rearwardly of said steering control and adapted to accommodate at least a pair of riders seated in straddle, tandem fashion, the front portion of said seat accommodating a rider operating said control with the rear portion of said seat accommodating a passenger, said seat terminating contiguous to the transom of said hull, and an internal combustion engine and jet propulsion unit positioned rearwardly of said front portion and beneath said rear portion of said seat and forwardly of said transom for propelling said hull.

5,438,947

# INTERNAL PASSAGE UNDERWATER VEHICLE

Isaac Y. Tam, 470 Americana Way, Fairfield, Calif. 94533

Filed Jul. 19, 1994, Ser. No. 277,220

Int. Cl.<sup>6</sup> B63G 8/08

U.S. Cl. 114—312

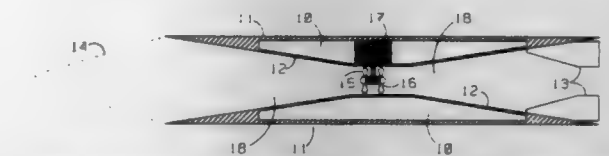
12 Claims

1. An internal passage underwater vehicle comprising: p1 (a) an elongated body means normally longitudinally movable, having the entirety of the lateral boundary of said body means extending lengthwise to substantially cover the entire length of

said vehicle, the entirety of said lateral boundary substantially parallel to the straight moving direction of said vehicle;

(b) internal passage means for channeling water from front of said vehicle to rear of said vehicle, said internal passage means disposed within said lateral boundary;

(c) pump means for pumping water from front of said vehicle to rear of said vehicle through said internal passage means.



5,438,948

# ELASTOMERIC LAUNCH SYSTEM FOR SUBMARINES

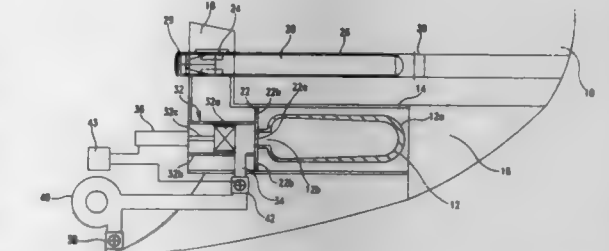
Paul E. Moody, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 22, 1994, Ser. No. 294,456

Int. Cl.<sup>6</sup> B63G 8/28

U.S. Cl. 114—319

13 Claims



1. An elastomeric launch system for providing pressurized fluid to a destination comprising:

a cylindrical bypass tube having a forward end, an aft end and a smooth inner surface, said forward end of said bypass tube being in communication with an ambient pressure liquid medium, and said aft end of said bypass tube being in hydraulic communication with said destination; and

an elastomeric bladder fixed centrally within said bypass tube having a forward end, an aft end, and a wall portion, said forward end being sealed, said aft end having a mouth joined to communicate hydraulically with said destination, and said wall portion acting to seal said bypass tube forward end from said bypass tube aft end by contact between said wall portion and said bypass tube inner surface when said elastomeric bladder is filled with pressurized fluid.

5,438,949

# HYDROSTATIC RELEASE WITH A COMPOSITE PLUNGER ASSEMBLY

Ronald H. Day, Marin County, Calif., assignor to Raftgo Hendry Manufacturing Co., Novato, Calif.

Filed Feb. 1, 1994, Ser. No. 190,774

Int. Cl.<sup>6</sup> B63C 9/22

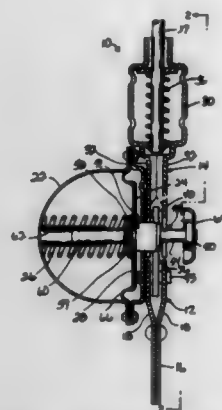
U.S. Cl. 114—367

16 Claims

1. A hydrostatically releasable coupling assembly for releasably securing a buoyant object to a vessel with a lashing strap, said coupling assembly comprising:

a pair of lashing plates;  
cooperative latching means carried by said lashing plates for releasably coupling said lashing plates together, said latch-

ing means being movable between an engaged position for securing said lashing plates together and a disengaged position for separating said lashing plates; and  
a composite plunger assembly coupled to one of said lashing plates for movement between a release position and a locking position, said plunger assembly having a first diameter portion shaped for release of said latching means for movement from said engaged position to said disengaged position when said plunger assembly is in said re-



lease position and a second diameter portion shaped to retain said latching means in said engaged position when said plunger assembly is in said locking position, said second diameter portion being formed of plastic, said plunger assembly further including a metal portion between said first diameter portion and said second diameter portion for substantially minimizing contact between said latching means and said second diameter portion when said latching means is moved from said engaged position to said disengaged position.

5,438,950

## DART BOARD SCORING SYSTEM

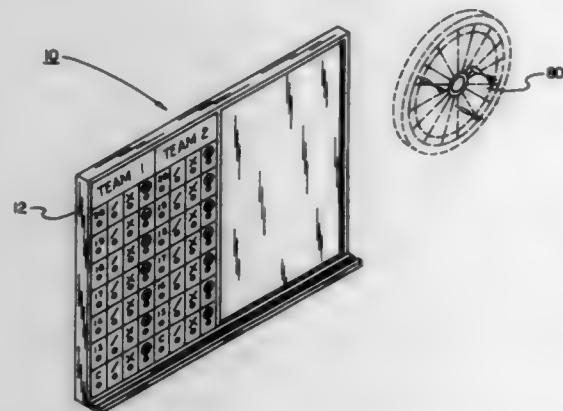
John M. Rodriguez, 36 Elaine Ave., New Bedford, Mass. 02745

Filed Sep. 29, 1994, Ser. No. 314,723

Int. Cl.<sup>6</sup> A63F 7/30

U.S. Cl. 116—222

5 Claims



1. A dartboard scoring system for allowing players to keep score of a variety of dart games comprising, in combination:  
a rigid frame having opposed spaced horizontal upper and lower rails and opposed spaced vertical left and right rails coupled together end-to-end in a rectangular configuration to thereby define an interior, the frame further including a cross rail perpendicularly coupled between the upper and lower rails for dividing the interior into a rect-

angular first holding space and a rectangular second holding space;

- a planar rectangular rigid pegboard extended across and secured to the frame within the first holding space thereof, the pegboard bearing indicia for dividing it into two team zones, each team zone bearing indicia dividing it into a seven row by four column matrix of scoring spaces, each scoring space of each adjacent row of each team zone bearing corresponding indicia indicative of opening and closing score values during a game of cricket, each scoring space further having a mounting hole formed thereon adapted for receiving a scoring marker;
- a planar rectangular rigid chalkboard extended across and secured to the frame within the second holding space thereof, the chalkboard adapted to be written upon with chalk for tallying and indicating a player's score during different dart games;
- a plurality of elongated rigid tee-shaped scoring markers, each scoring marker having a head end and a tip end with the tip end securable in a mounting hole of the pegboard for indicating status of opened, owned, and closed score values during a game of cricket; and
- a rigid elongated lip coupled to the lower rail of the frame and extended outwards therefrom, the lip having a generally concave slot formed therealong with the lip holding scoring markers for use with the pegboard and adapted for holding pieces of chalk for use with the chalkboard.

5,438,951

## METHOD OF GROWING COMPOUND SEMICONDUCTOR ON SILICON WAFER

Akiyoshi Tachikawa; Aiji Jono; Takashi Aigo, and Akihiro Moritani, all of Sagami-hara, Japan, assignors to Nippon Steel Corporation, Japan

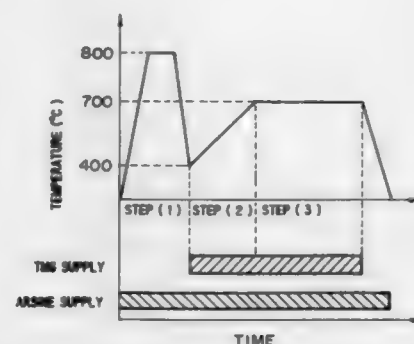
Filed Dec. 20, 1993, Ser. No. 169,204

Claims priority, application Japan, Dec. 21, 1992, 4-357208; Dec. 21, 1992, 4-357209

Int. Cl.<sup>6</sup> C30B 25/02

U.S. Cl. 117—84

7 Claims



1. A method of growing an epitaxial film of compound semiconductor on at least one plane of a silicon wafer, comprising the steps of:

- forming a buffer layer by continuously raising a temperature of said silicon wafer from a first temperature, at which an amorphous layer of said compound semiconductor can be grown, to a second temperature, at which a single crystal layer of said compound semiconductor can be grown, while supplying all raw materials necessary for the growth of said compound semiconductor, whereby said amorphous layer is grown on said silicon wafer, said amorphous layer is rearranged into a single crystal layer, and said rearranged single crystal layer covers said silicon wafer; and
- maintaining said silicon wafer formed with said buffer layer at a temperature at which a single crystal layer of said compound semiconductor can be grown, while supplying all raw materials necessary for the growth of said com-

pound semiconductor, whereby a single crystal layer is further grown on said buffer layer.

5,438,952

## METHOD OF GROWING A SEMICONDUCTOR LAYER AND A FABRICATION METHOD OF A SEMICONDUCTOR DEVICE USING SUCH A SEMICONDUCTOR LAYER

Nobuyuki Otsuka, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

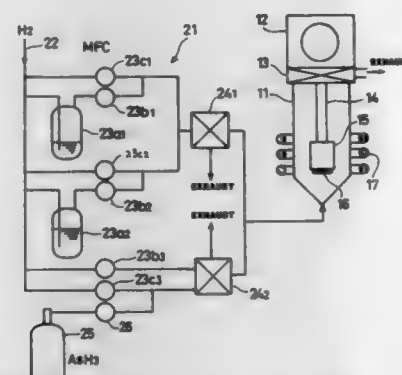
Filed Jan. 31, 1994, Ser. No. 189,147

Claims priority, application Japan, Mar. 24, 1993, 5-065634

Int. Cl.<sup>6</sup> C30B 25/02

U.S. Cl. 117—84

17 Claims



1. A method for fabricating a semiconductor device that includes a crystal layer of a compound semiconductor material, said crystal layer containing a plurality of constituent elements, comprising the steps of:

- (a) supplying an amine-adduct of a first compound that contains a first constituent element of said crystal layer, to a substrate on which said semiconductor device is to be formed, as a first source material of said crystal layer;
  - (b) decomposing said amine-adduct in the vicinity of said substrate such that said first constituent element of said crystal layer is released from said amine-adduct;
  - (c) depositing said first constituent element of said crystal layer, released by said step (b) of decomposing, on said substrate to cause a growth of said crystal layer on said substrate;
  - (d) supplying a second compound that contains a second constituent element of said crystal layer, to said substrate as a second source material of said crystal layer;
  - (e) decomposing said second compound in the vicinity of said substrate such that said second constituent element of said crystal layer is released from said second compound;
  - (f) depositing said second constituent element of said crystal layer, released by said step (e), on said substrate to cause a growth of said crystal layer on said substrate;
- said steps (a) through (c) forming a first process, said steps (d) through (f) forming a second process, wherein said first and second process are carried out repeatedly and alternately with intervening flushing steps.

5,438,953

## CRYSTAL GROWTH APPARATUS

Yoshihira Aoki, Tochigi; Hisashi Yamaguchi, and Glynn Kido, both of Miyagi, all of Japan, assignors to Mitsui Mining &amp; Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1993, Ser. No. 34,481

Claims priority, application Japan, Mar. 19, 1992, 4-092397

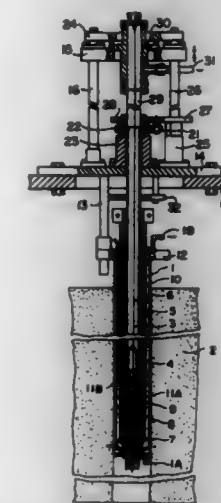
Int. Cl.<sup>6</sup> C30B 11/02, 35/00

U.S. Cl. 117—223

1 Claim

1. A crystal growth apparatus for growing a crystal by unidirectionally solidifying a melt, comprising:  
a vertical magnetic field-generating apparatus capable of establishing a cylindrical, vertical magnetic field space;

a vertical Bridgman furnace arranged within the cylindrical, vertical magnetic field space;  
a base plate positioned above the vertical magnetic field-generating apparatus;  
a heat-generating furnace comprising a water jacket, a quartz tube and a heating element, the heat-generating furnace being arranged at a predetermined position within the cylindrical, vertical magnetic field space and fitted to the base plate through a supporting member;  
a combustion-tube for accommodating a crucible at a predetermined position;



a suspending structure for vertically suspending and supporting the combustion tube;  
a driving structure for driving the suspending structure upward and downward in order to raise and lower the combustion tube within the heat-generating furnace, the driving structure comprising a motor placed at a position such that the motor is not greatly affected by the magnetic field established by the vertical magnetic field-generating apparatus; and  
a guiding structure for guiding the suspending structure during raising and lowering of the combustion tube, the guiding structure and the driving structure being fitted to the base plate.

5,438,954

## METHOD AND APPARATUS FOR EARLY EMBRYONIC IN OVO INJECTION

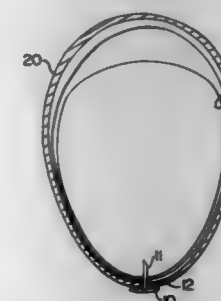
Patricia V. Phelps, Raleigh, and Richard P. Gildersleeve, Cary, both of N.C., assignors to Embrex, Inc., Research Triangle Park, N.C.

Filed Nov. 3, 1993, Ser. No. 146,977

Int. Cl.<sup>6</sup> A01K 45/00

U.S. Cl. 119—6.8

32 Claims



1. An apparatus for administering an active agent to the interior of a bird egg through the shell thereof, comprising:



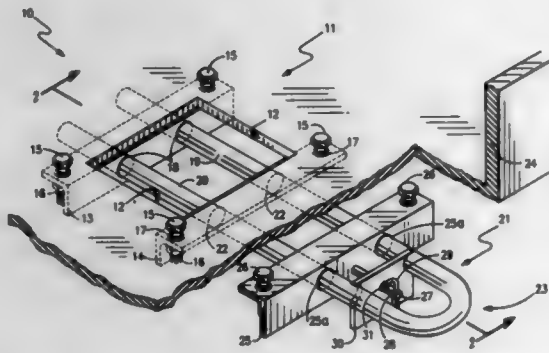
a blocking member having an outer surface and an inner surface formed thereon;  
 an elongate shaft having a distal end, an intermediate portion, and a proximal end, with said proximal end connected to said inner surface of said blocking member;  
 an active agent depot containing an active agent connected to said elongate shaft, wherein said active agent depot is contained within a cavity formed in the surface of said elongate shaft; and  
 seal means connected to said inner surface of said blocking member for sealably bonding said blocking member to the shell of a bird egg with said shaft penetrating through the shell, wherein said seal means comprises a layer of adhesive.

5,438,955

**DRAINAGE GRATE FOR LIVESTOCK TRAILERS**  
 Greg R. Herden, Rte. 1, Box 1133, Bridger, Mont. 59014  
 Filed Nov. 22, 1993, Ser. No. 155,202  
 Int. Cl.<sup>6</sup> A01K 1/00

U.S. Cl. 119—28

15 Claims



1. An improved drainage grate adapted for use with a livestock trailer, comprising:
  - (a) grate housing means adapted to be disposed substantially under a drainage hole that is provided through a portion of the floor of said livestock trailer;
  - (b) grate assembly means adapted for slidable insertion into said grate housing means from a position that is located outside of said livestock trailer and for slidable removal from said grate housing means; and
  - (c) latching means that is located outside of said livestock trailer for maintaining said grate assembly means in a position of cooperation with said grate housing means.

5,438,956

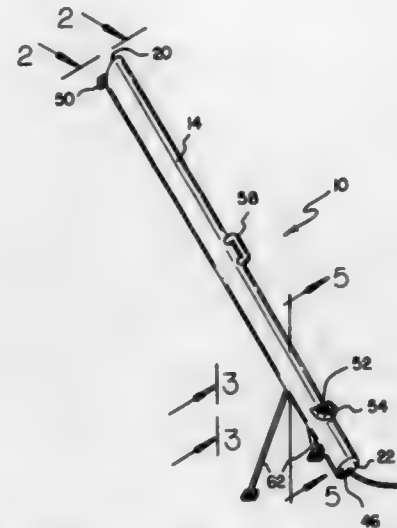
**DEVICE FOR DISPENSING BIRD SEED TO AN ELEVATED LOCATION**  
 Michael Thigpen, 911 San Jacinto St., Lockhart, Tex. 78644  
 Filed Oct. 4, 1993, Ser. No. 130,796  
 Int. Cl.<sup>6</sup> A01K 5/00

U.S. Cl. 119—57.92

2 Claims

2. Apparatus for dispensing particulate material to an elevated location comprising:
  - (a) an elongated tubular member having a central axis and having interior and exterior surfaces and a closed lower end and an open upper end with its peripheral surface forming an acute angle with respect to the axis of the tubular member to form a lower short side and a long upper side of the tubular member;
  - (b) a rotatable axle having a longitudinal axis with an upper end and a lower end and extending along essentially the entire length of the tubular member and rotatable about its axis;
  - (c) an auger mounted within the tubular member and secured to the axle for rotation therewith;
  - (d) a first plate mounted within the tubular member adjacent to the bottom thereof for rotatably receiving the lower end of the axle and a bearing member adjacent to the top of the tubular member for rotatably receiving the upper end of

the axle, the first plate having an upper side and a lower side;  
 a motor within the tubular member and the lower side of the first plate remote from the auger adapted to rotate the axle and auger;  
 an opening in the auger adjacent to the lower end thereof through the long side of the tubular member;



a handle located on the long side of the tubular member adjacent to the center thereof; and  
 support legs rotatably secured to the short lower side of the tubular member between the center and the lower end for supporting the auger at an angle of between about 30 and 60 degrees from the vertical and means to receive the legs in a location parallel with the elongated member when in a storage position.

5,438,957

**BIRD BATH WHEREIN THE BOWL MAY ALWAYS BE FILLED TO THE BRIM**  
 Paul B. Shagoury, 48 Fairmount Ave., P.O. Box 506, Hyde Park, Mass. 02136  
 Continuation-in-part of Ser. No. 92,139, Jul. 15, 1993, abandoned. This application Sep. 27, 1994, Ser. No. 313,555  
 Int. Cl.<sup>6</sup> A01K 39/02

U.S. Cl. 119—69.5

1 Claim



1. A bird bath assembly comprising:
  - (a) a shallow, concave, circular bowl having a smooth, continuous outside surface; said bowl having a straight edge overhanging the perimeter of the bowl; and
  - (b) a hollow, cylindrical, vertical stand, said stand having a frusto-conical upper end terminating in an upper rim, said rim having a diameter of at least 45% of the diameter of the bowl; said stand further including a circular base extending outwardly from a lower end thereof, said base

having a diameter substantially equal to the diameter of said rim; said bowl resting on said rim and supported by said stand, whereby the bowl may be adjustably positioned on the rim such that the bowl can be evenly filled to the brim with water even when the stand becomes tilted.

5,438,958

**PLATFORM SUPPORTED MARICULTURE SYSTEM**  
 John D. Ericsson, 3462 Sycamore Ln., Gulf Breeze, Fla. 32561, and John R. Boad, 102 Grand Heron Dr., Panama City Beach, Fla. 32417  
 Continuation-in-part of Ser. No. 15,484, Nov. 18, 1993. This application May 18, 1994, Ser. No. 189,335  
 Int. Cl.<sup>6</sup> A01K 63/00

U.S. Cl. 119—223

24 Claims



1. An open water mariculture facility for raising a marine species in a body of water having a seabed, comprising:
  - (a) a central support platform capable of resting upon the seabed, said platform further comprising an upper level deck above the high water mark of the open water, said central support platform having first and second sides;
  - (b) first and second arrays of elongated cages laterally emanating from said first and second sides of said central support platform, each of said cages having first, inner and second, outer ends, and side walls therebetween, said first, inner ends of said cages situated near said central support platform, said first, inner ends of said cages in each array situated in closer proximity to each other than said second ends of said cages, each of said ends having ballast tanks for raising or lowering each of said cages under the water or about halfway out of the water independently of one another, and rotating means for independently rotating each of said cages as desired.

5,438,959

**AQUARIUM WITH FULL-WIDTH PLANAR BUBBLE CONDUIT**

Ray Stone; Nancy Stone, both of 1504 Wendy Way, San Jose, Calif. 95125, and Terry Hoppins, 1305 Kimberly Dr., San Jose, Calif. 95118

Filed Sep. 12, 1994, Ser. No. 304,268

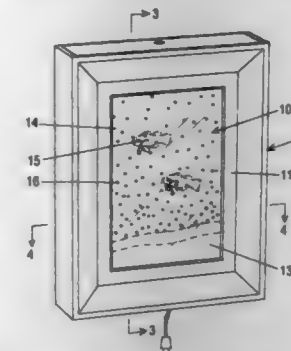
Int. Cl.<sup>6</sup> A01K 63/00

U.S. Cl. 119—248

18 Claims

1. A water current generating apparatus circulating water in a water tank having a predetermined width, comprising:
  - (a) a substantially flat bubble conduit positioned in said water tank, said flat bubble conduit having spaced apart front and back vertical walls and connecting side walls, said front and said back walls extending substantially across said width of said water tank, said bubble conduit receiving an air emitting means for introducing a sheet of rising air bubbles therein;
  - (b) a water intake aperture positioned at a bottom end of said bubble conduit, and

a water return aperture positioned at a top end of said bubble conduit, whereby when said bubble conduit is submerged in water received in said water tank, and said air emitting means is emitting a sheet of rising air bubbles within said bubble



conduit, said rising air bubbles generate an upwardly moving water current within said bubble conduit, said water current circulates water from said water intake aperture, up through said bubble conduit, and out of said water return aperture.

5,438,960

**DETECTION DEVICE FOR SELECTIVELY DISTINGUISHING FROM EACH OTHER A NUMBER OF GROUPS OF ARTICLES OR ANIMALS**

Dirk J. Roosenboom, Haaksberge, Netherlands, assignor to N.V. Nederlandsche Apparatenfabriek NEDAP, De Groenlo, Netherlands

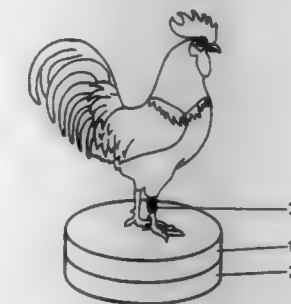
Filed Sep. 21, 1993, Ser. No. 123,966

Claims priority, application Netherlands, Sep. 21, 1992, 9201625

Int. Cl.<sup>6</sup> A01K 29/00

U.S. Cl. 119—713

12 Claims



8. A detection arrangement for automatically distinguishing between types of animals in groups of poultry, said detection arrangement comprising:

antenna means for generating an alternating magnetic field at a predetermined location;  
 at least a first plurality of detection elements which are attachable to a leg of at least a first type of animal, including poultry, and arranged so as to disturb said alternating magnetic field in at least a first manner when attached to said leg of the at least first type of animal and located in said predetermined location;  
 a presence detection device for detecting the presence of any animal, including said poultry, at said predetermined location regardless of whether said any animal is wearing one of said detection elements;  
 a receiver device coupled to said antenna means for detecting disturbances of the magnetic field generated by any one of said detection elements, and also connected to said presence detection device to thereby determine whether an animal located in said predetermined location is wear-

ing a detection element from said at least first plurality of detection elements, said receiver device thus being able to distinguish between types of animals which are not wearing a detection element from said at least first plurality of detection elements and said at least first type of animal.

5,438,961

# METHOD FOR OPERATING A HYDROGEN ENGINE, MOTOR-VEHICLE DRIVE

Walter Peschka, Sindelfingen, and Gottfried Schneider, Stuttgart, both of Germany, assignors to Deutsche Forschungsanstalt fuer Luftund Raumfahrt e.V., Bonn, Germany  
Filed Dec. 14, 1993, Ser. No. 166,710

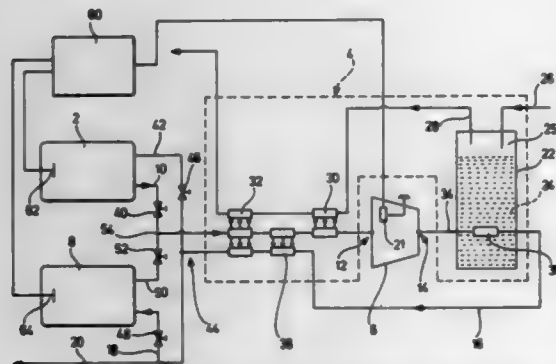
Claims priority, application Germany, Dec. 17, 1992, 42 42 644.11

Int. Cl.<sup>6</sup> F02B 43/08

U.S. Cl. 123—3

24 Claims

charge forming system, and cooling means for reducing the temperature of the fuel pumped by said pumping element.



1. A method for operating a motor-vehicle engine adapted to be driven by hydrogen gas comprising the steps of: storing hydrogen gas at a storage pressure and a storage temperature in a storage means; transferring the hydrogen gas from the storage means to a cooling device; cooling the hydrogen gas with the cooling device to a cryogenic temperature below the storage temperature; compressing the cooled hydrogen gas to an operational pressure above the storage pressure in a compressor operating at a cryogenic temperature; and injecting the compressed hydrogen gas at said operational pressure into the motor-vehicle engine.

5,438,962

# WATER COOLED ENGINE

Yoshihumi Iwata; Akihiko Hoshiba; Junichi Hasegawa, and Yasuhiko Shibata, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan  
Filed Mar. 29, 1994, Ser. No. 219,215

Claims priority, application Japan, Mar. 29, 1993, 5-093603

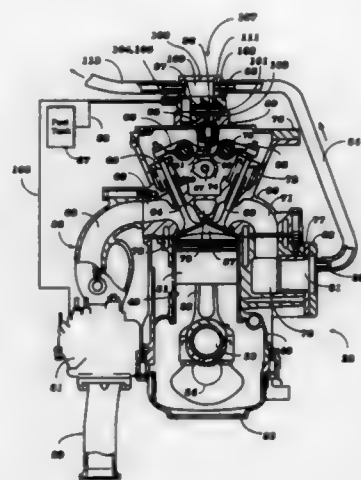
Int. Cl.<sup>6</sup> F01P 1/06

U.S. Cl. 123—41.31

21 Claims

1. An internal combustion engine having a charge forming system, a cylinder head journaling a cam shaft in a valve cham-

ber thereof, a fuel pump having a pump element driven mechanically by said engine cam shaft for pumping fuel for said



5,438,963

# 4-CYCLE ENGINE

Masaki Tsunoda; Shigeaki Kuwabara, and Sadafumi Shidara, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

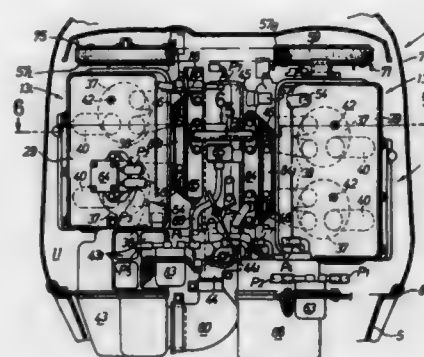
Filed Sep. 28, 1993, Ser. No. 127,553

Claims priority, application Japan, Sep. 30, 1992, 4-262583; Sep. 30, 1992, 4-262587

Int. Cl.<sup>6</sup> F02B 75/22

U.S. Cl. 123—54.4

12 Claims



1. A 4-cycle engine comprising a cylinder block having a substantially horizontal cylinder, a cylinder head coupled to said cylinder block, and a combustion chamber formed in said cylinder head, wherein said engine further includes an intake passage formed in said cylinder head to extend from said combustion chamber and opened into an outer wall of said cylinder head, an intake gas introducing means disposed laterally of said cylinder head to communicate with said intake passage, and a throttle body disposed below said intake gas introducing means and said cylinder to communicate with said intake gas introducing means.

5,438,964

# INTERNAL COMBUSTION ENGINE WITH AN AIR INTAKE SYSTEM

Paul Breidenbach, Bechenheim, Germany, assignor to General Motors Corporation, Detroit, Mich.

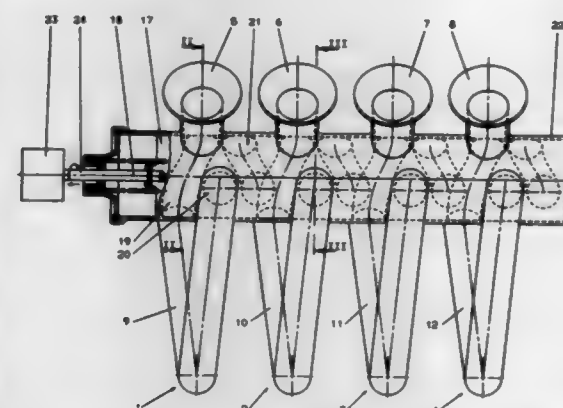
Filed Sep. 26, 1994, Ser. No. 311,978

Claims priority, application Germany, Sep. 29, 1993, 43 33 053.3

Int. Cl.<sup>6</sup> F02B 27/02; F02D 9/02, 9/16; F02M 35/10

U.S. Cl. 123—184.55

7 Claims



1. An intake system for an internal combustion engine comprising an intake pipe having an intake fitting, a coil loop and an end piece, said coil loop having a radius such that said intake fitting and said end piece cross, said intake system further comprising a cylindrical rotary slide valve perpendicular to the plane of said coil loop and disposed in said intake pipe at said location at which said intake fitting and said end piece cross, said cylindrical rotary slide valve operable to vary the length of said intake pipe and to vary the cross section of said intake pipe through axial displacement and through rotation of said valve.

5,438,965

# MACHINES POWERED BY INTERNAL COMBUSTION ENGINES

Tore Aronsson, Mölndal, and Ove Donnerdal, Partille, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

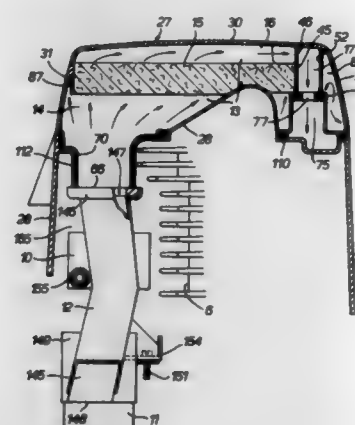
Filed Jan. 19, 1994, Ser. No. 183,404

Claims priority, application Sweden, Jan. 21, 1993, 9300178

Int. Cl.<sup>6</sup> F02B 77/00

U.S. Cl. 123—198 E

22 Claims



1. A machine powered by an internal combustion engine, comprising:  
a working unit; and  
a power unit having a length, a width, and a top, the power

unit including a pre-filter and a main filter for filtering intake air and a motor cylinder;

the pre-filter and the main filter being provided in a closed pre-filter chamber and a closed main filter chamber, respectively, the pre-filter chamber having a length, a width, a bottom, and a top, said pre-filter chamber forming a top portion of the power unit and extending substantially over the entire length and substantially over the entire width of the power unit;

the main filter chamber and the motor cylinder being located under the pre-filter chamber;

the pre-filter comprising a generally horizontal pre-filter body extending over substantially the whole length and width of the pre-filter chamber, and over the main filter chamber and the cylinder;

an expansion and distribution space for intake air being provided in the pre-filter chamber between the bottom of the pre-filter chamber and an underside of the pre-filter body, said expansion and distribution space also forming a space for collecting impurities;

a closed hood space being provided between an upper side of the pre-filter body and the top of the pre-filter chamber; and

a passage extending from said closed hood space down to the main filter chamber located under the pre-filter chamber.

5,438,966

# FUEL INJECTION NOZZLE WITH ADDITIVE INJECTION FOR DIESEL ENGINES

Walter Teegen, Waiblingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE93/00755, § 371 Date Aug. 19, 1994, § 102(e)

Date Aug. 19, 1994, PCT Pub. No. WO94/07020, PCT Pub.

Date Mar. 31, 1994

PCT Filed Aug. 20, 1993, Ser. No. 240,725

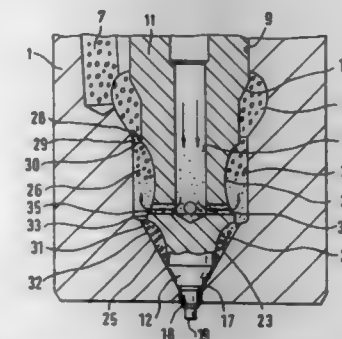
Claims priority, application Germany, Sep. 12, 1992, 42 30

641.8

Int. Cl.<sup>6</sup> F02B 3/00

U.S. Cl. 123—297

7 Claims



1. A fuel injection nozzle for internal combustion engines with additional injection of an additive between a preinjection and a main injection of the fuel, comprising a nozzle body in which a valve seat is formed in an end portion toward the combustion chamber and a pressure chamber is formed upstream thereof; a valve needle is displaceably supported in the nozzle body and urged in a closing direction, said valve needle has a sealing seat (12), which cooperates with the valve seat (17), and a pressure shoulder (13) at a level of the pressure chamber; an antechamber (25), disposed between the valve seat and the pressure chamber (21), for prestoring a preinjection quantity; and having an inlet conduit (7) for the fuel leading to the pressure chamber and an inlet conduit (8) for an additive for temporary storage of a quantity of additive between the preinjection quantity and the main injection quantity, an intermediate chamber (26) is disposed in the flow direction between the pressure chamber (21) and the antechamber (25), said intermediate chamber is made to communicate, via openable throttle restrictions (28, 31), with the pressure cham-



ber (21) and the antechamber (25) for the flow therethrough of the main injection quantity, and the additive discharges into the intermediate chamber via the inlet conduit (8).

5,438,967

## INTERNAL COMBUSTION DEVICE

Yasui Ito, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

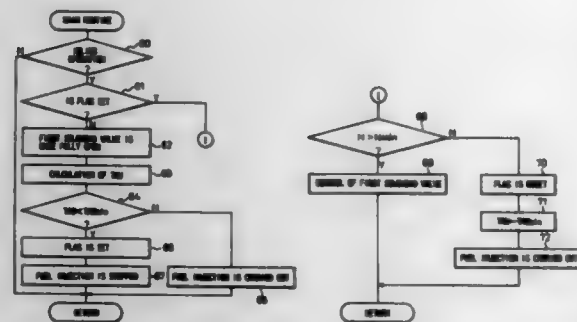
Filed Oct. 20, 1993, Ser. No. 139,973

Claims priority, application Japan, Oct. 21, 1992, 4-283007; Oct. 21, 1992, 4-283018; Nov. 2, 1992, 4-294298; Oct. 1, 1993, 5-246984

Int. Cl.<sup>6</sup> F02M 3/00

U.S. Cl. 123—339.12

17 Claims



1. An internal combustion engine having a combustion chamber, an intake passage and an exhaust passage, the engine comprising:

- fuel injection means for feeding fuel into the engine;
- purge control means for controlling the feeding of fuel vapor into the engine;
- idling speed control means for controlling a fuel injection operation and a purging operation while the engine is idling, wherein the idling speed control means controls the purge control means to carry out the purging operation continuously, the idling speed control means determining a quantity of fuel which, in addition to the fuel vapor fed to the engine via the purge control means, is required to maintain an idling speed of the engine at a desired idling speed and controlling the fuel injection means to feed the required additional quantity of fuel to the engine, and wherein the idling speed control means stops the fuel injection operation when the required additional quantity of fuel becomes smaller than a predetermined minimum fuel injection amount.

5,438,968

## TWO-CYCLE UTILITY INTERNAL COMBUSTION ENGINE

William P. Johnson, Valley Center; Niels J. Beck, Bonita, and James A. Penn, Leucadia, all of Calif., assignors to BKM, Inc., San Diego, Calif.

Filed Oct. 6, 1993, Ser. No. 132,290

Int. Cl.<sup>6</sup> F02M 41/00, 37/04; F02D 7/00

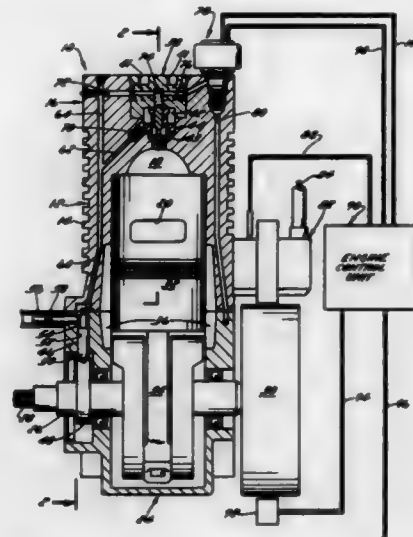
U.S. Cl. 123—446

110 Claims

1. In a two-cycle internal combustion engine, the method of introducing fuel into a cylinder of the engine, which comprises:

- providing an accumulator-type fuel injector in said two-cycle engine arranged for direct in-cylinder injection, said injector having a needle normally spring-biased downwardly to a closed position, an accumulator cavity located so as to provide an upward opening force on said needle when pressurized, and a control cavity above said needle located so as to provide a downward closing force on said needle when pressurized;
- substantially simultaneously pressurizing said accumulator and control cavities with fuel through respective accumulator and control cavity feed conduits to about the same

pressure level above that which would be sufficient for the upward force of accumulator pressure on said needle to overcome said spring biasing but for the downward force of control cavity pressure on said needle; at least partially depressurizing said accumulator cavity feed conduit for a substantial portion of the combustion cycle while preventing unrestricted return fuel flow through said accumulator cavity feed conduit from said accumulator cavity; and



venting fuel pressure from said control cavity via operation of a two-way solenoid-actuated vent valve in communication with said control cavity so that said upward force of accumulator pressure on said needle overcomes said downward forces on said needle and raises said needle to an open position for injection of fuel from said accumulator injector directly into the cylinder.

5,438,969

## HEATING MODULE FOR AN INTERNAL COMBUSTION ENGINE

Klaus Kurr, Weinheim; Karl-Heinz Spies, Birkenau, and Uwe Meinig, Weinheim, all of Germany, assignors to Firma Carl Freudenberg, Weinheim/Gergatr., Germany

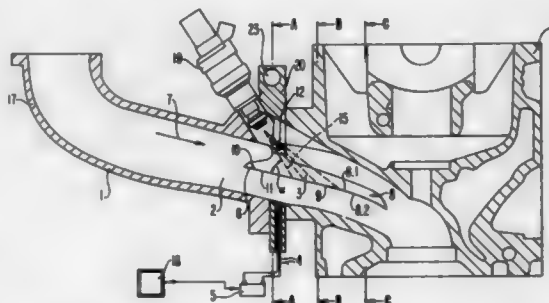
Filed Apr. 29, 1994, Ser. No. 235,350

Claims priority, application Germany, Apr. 30, 1993, 43 14 283.4

Int. Cl.<sup>6</sup> F02M 31/02, 31/12, 31/10

U.S. Cl. 123—549

13 Claims



1. A heating module for an internal combustion engine with fuel injection, said heating module comprising:  
an electrically-heatable heating element, said heating element being arranged in an intake port of said internal combustion engine, said heating element having a trough-shaped cross section, said trough-shaped cross section

being transverse to a direction of air flow in said intake port, said heating element being constructed of a laminated composite, said laminated composite comprising an outer surface of metallic material and a flexible printed conductor of electrically conductive material, said printed conductor and said metallic material being adhesively connected; and  
an electric power supply, said heating element being connected to said electric power supply.

5,438,970

## HIGH TENSION CORD CONNECTOR WITH MISFIRE DETECTING CAPACITOR FOR INTERNAL COMBUSTION ENGINE

Shigeru Maruyama; Yuichi Shimazaki; Masaki Kanehiro; Takuji Ishioka; Shigeki Baba, and Takashi Hisaki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

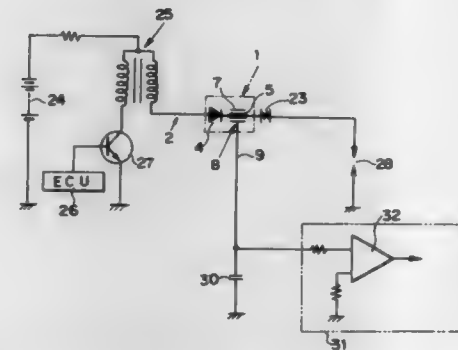
Filed Apr. 29, 1993, Ser. No. 53,691

Claims priority, application Japan, May 1, 1992, 4-139808

Int. Cl.<sup>6</sup> F02P 11/00

U.S. Cl. 123—630

21 Claims



1. A connector disposed at a distal end of a high tension cord for an internal combustion engine, comprising:  
a first conductor comprising a conductive core of said high tension cord covered with an insulation cladding, said first conductor having, at a distal end, a tip;  
a current suppressor with a first and second end wherein said first end of said current suppressor is electrically connected to said tip;  
a conductive connecting member electrically connected to said second end of the current suppressor;  
a connector cover comprising an insulation material disposed around a portion of said first conductor, said current suppressor and a portion of said connecting member; and  
a second conductor provided at said connector cover in such a manner that it is located around said conductive connecting member and is disposed a predetermined distance therefrom such that a capacitor is formed.

5,438,971

## IGNITION COIL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Shigemi Murata; Nobuyuki Sawazaki; Mitsuru Koiwa, and Yutaka Ohashi, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1993, Ser. No. 165,912

Claims priority, application Japan, Jul. 9, 1993, 5-169977

Int. Cl.<sup>6</sup> H01F 3/00; F02P 3/02

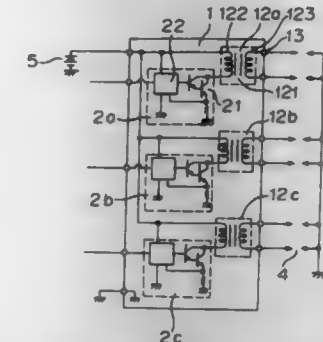
U.S. Cl. 123—634

6 Claims

1. An ignition coil device for an internal combustion engine comprising:

- a plurality of iron cores;
- a plurality of ignition coils having a plurality of primary coils provided around said plurality of iron cores and a plurality of secondary coils magnetically-coupled with

said plurality of primary coils through the plurality of iron cores;  
a single case accommodating the plurality of iron cores and the plurality of ignition coils; and



a plurality of control units, each including a current flow control circuit, accommodated in said case of which number is equal to the number of the plurality of ignition coils.

5,438,972

## MAGNETIC TARGET TOY

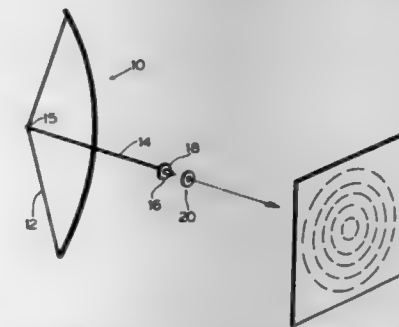
John J. Harbin, 376 Brookdale Avenue, Toronto, Ontario, Canada M5M 1R2

Continuation-in-part of Ser. No. 66,443, May 25, 1993, abandoned. This application Apr. 13, 1994, Ser. No. 226,888  
Claims priority, application United Kingdom, May 21, 1993, 2269543

Int. Cl.<sup>6</sup> F41B 7/08; F41J 3/00; A63B 67/00

U.S. Cl. 124—27

7 Claims



1. Toy magnetic missile, and launcher comprising:  
a mount comprising a forwardly facing surface having a probe forwardly projection therefrom,  
a missile being relatively flat and with forward and rearward missile surfaces; having an aperture, defined by edges, to receive said probe so that said probe supports said missile, said probe and said aperture edges being arranged to allow forward release of said missile from said probe,  
means for providing magnetic coupling between said forwardly facing surface and said missile,  
means for moving said mount and missile together, forwardly, with a predetermined velocity and decelerating it with a force to overcome said coupling and release said missile for motion forwardly from said probe.

5,438,973

## SHAPED BLADES

Frederick Schmid, Marblehead; Maynard B. Smith, Amesbury, and Chandra P. Khattak, Danvers, all of Mass., assignors to Crystal Systems, Inc., Salem, Mass.

Filed Oct. 8, 1993, Ser. No. 133,602

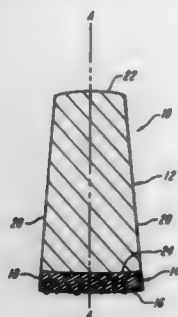
Int. Cl.<sup>6</sup> B28D 1/00

U.S. Cl. 125—18

21 Claims

1. A wire blade comprising a longitudinally-extending core

and abrasive affixed to a longitudinally-extending portion of the outer surface of the core, the blade being characterized in that, in transverse cross-section, the core includes a pair of longitudinally and downwardly extending, diverging side



surfaces, and said longitudinally extending portion of said outer surface extends between the diverging side surfaces a distance substantially equal to the maximum width of said core and defines an edge of said core.

5,438,974

# GUARDS TO PREVENT CHILDREN FROM CONTACTING STOVE CONTROLS

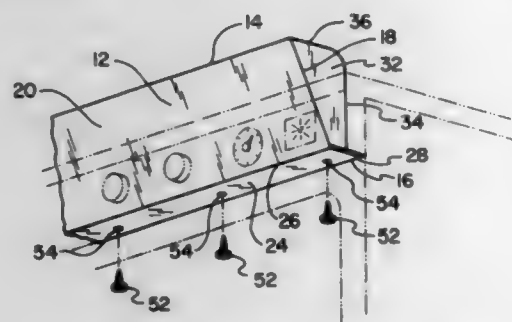
Lucio Maldonado, 1256 Caoba Way, Salinas, Calif. 93905

Filed Mar. 1, 1994, Ser. No. 203,383

Int. Cl.<sup>6</sup> F24C 3/12

U.S. Cl. 126-42

1 Claim



1. A new and improved guard to prevent children from contacting stove controls comprising, in combination:

a planar sheet of metal having long parallel upper and lower edges and short side edges therebetween in a rectangular configuration to form a guard plate;

an attachment plate having long parallel front and rear edges of a length equal to the length of the guard plate, the front edge of the attachment plate being formed integrally with the lower edge of the guard plate and forming an obtuse angle of about 120 degrees whereby when the attachment plate is horizontal, the upper edge of the guard plate extends outwardly from the front edge of the attachment plate and the stove controls when coupled with respect thereto while the lower edge of the guard plate is adjacent to the front edge of the attachment plate and the stove controls when coupled with respect thereto;

a pair of triangular side plates, the triangular side plates having a long vertical rearward edge, and a short upper horizontal edge and a connecting hypotenuse edge therebetween, the hypotenuse edge being formed integrally with the side edges of the guard plate and extending rearwardly at about 90 degrees, the ends of the side plates remote from their short edges being parallel with the short edges;

the upper edge of the guard plate and the horizontal and vertical edges of the side plates being rolled over to form strengthened peripheral edges for strength and safety to preclude cuts from sharp edges;

a plurality of equally spaced holes located along the length of the attachment plate; and  
a plurality of sheet metal screws positionable through the holes of the attachment plate for securement to a lower horizontal surface of an oven above its door to thereby shield the controls of the oven and stove thereabove from inadvertent contact by a child but to allow access thereto from above by an adult.

5,438,975

# DISTAL TIP OF ENDOSCOPE HAVING SPIRALLY COILED CONTROL WIRES

Kunihiko Miyagi, and Toshio Chikama, both of Tokyo, Japan, assignors to Machida Endoscope Co., Ltd., Tokyo, Japan

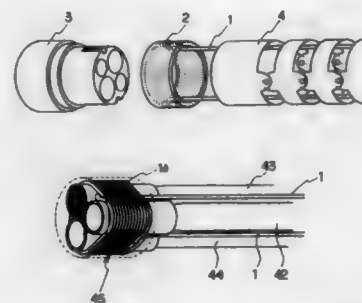
Filed Mar. 22, 1994, Ser. No. 216,044

Claims priority, application Japan, Mar. 24, 1993, 5-064918; Mar. 24, 1993, 5-064919; Mar. 24, 1993, 5-64920; Mar. 24, 1993, 5-064921

Int. Cl.<sup>6</sup> A61B 1/005

U.S. Cl. 600-109

11 Claims



1. An endoscope having a distal tip and a distal tip deflection control mechanism, the mechanism providing control to the distal tip by control wires having distal ends, the improvement characterized in that:

said distal ends of said control wires are spirally coiled to form a cylinder and said cylinder is fitted and secured about an end of said distal tip.

5,438,976

# TEETH PROTECTOR FOR LARYNGOSCOPE BLADE

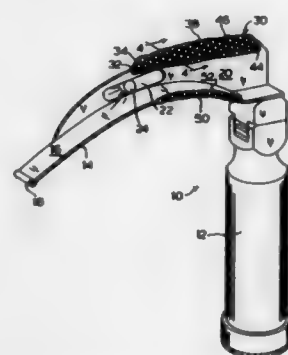
Jeanne L. Nash, 10971 East Rd., Potter Valley, Calif. 95469

Filed Nov. 29, 1993, Ser. No. 158,957

Int. Cl.<sup>6</sup> A61B 1/267

U.S. Cl. 600-186

25 Claims



1. An improved laryngoscope blade for use on a laryngoscope for performing endotracheal intubation of a patient comprising:

a. a laryngoscope blade having a front tip area, a middle portion, a back end and at least one selected surface; and  
b. a teeth protector comprising at least one cushioning device made of a deformable material such that the at least

one cushioning device is capable of being deformed about the at least one selected surface of the laryngoscope blade and retains a deformed shape, the deformable material being adherent along the entire surface thereof such that the at least one cushioning device adheres to the at least one selected surface of the blade about which the cushioning device is deformed when pressed thereupon, the at least one selected surface beginning at the back end of the blade and ending at the middle portion of the blade, the deformable material further being easily removable from the at least one selected surface after use of the blade with the patient.

5,438,977

# SNORKEL AND BUOYANCY CONTROL APPARATUS

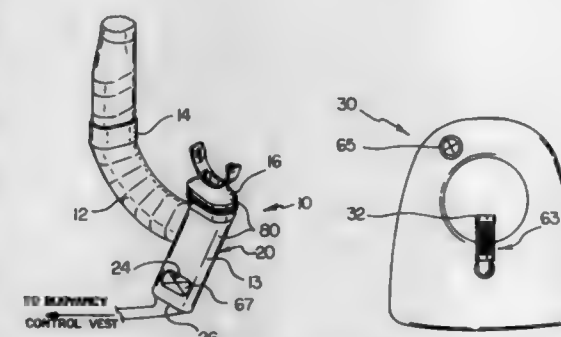
Miguel R. Gomez, 7022 Sunset Ave., Panama City, Fla. 32408, and Rommie H. Brock, 2639 Feral La., Lynn Haven, Fla. 32444

Continuation-in-part of Ser. No. 86,030, Jul. 6, 1993. This application May 9, 1994, Ser. No. 239,578

Int. Cl.<sup>6</sup> B63C 11/08

U.S. Cl. 128-202.14

10 Claims



1. A snorkel and buoyancy control apparatus for a snorkeler, comprising:

a snorkel tube assembly for receiving inhaled air, a mouthpiece/selector valve assembly, connected to said snorkel tube assembly, for receiving inhaled air from said snorkel tube assembly and for selectively directing exhaled air to either a flapper valve assembly or to a buoyancy control vest, said mouthpiece/selector valve assembly including a selector valve assembly and a mouthpiece assembly connected together, said selector valve assembly including a first manually-actuated output port selector assembly which enables selective direction of exhaled air either to a flapper valve assembly or to a buoyancy control vest,

a flapper valve assembly, connected to said selector valve assembly, for permitting one-way flow of exhaled air from inside said selector valve assembly to outside said selector valve assembly, and

a buoyancy control vest, connected to said selector valve assembly, for selectively receiving exhaled air based upon selective operation of said first manually-actuated output port selector assembly.

5,438,978

# DEVICE FOR ENHANCING MOISTURE CONTENT OF INSPIRED AIR IN A CLOSED RESPIRATORY SYSTEM

Walter E. Hardester, III, Mount Airy, Ga., assignor to Web, Inc., Decatur, Ga.

Filed Sep. 23, 1993, Ser. No. 125,474

Int. Cl.<sup>6</sup> A61M 15/00, 16/00; A62B 9/06, 18/08

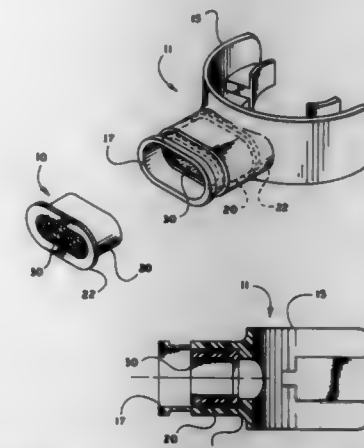
U.S. Cl. 128-201.13

4 Claims

1. An insert device for enhancing moisture content of inspired air in a closed respiratory system, comprising:

a support means for providing a substantially unobstructed passageway for passage of a longitudinal flow of air comprising an elongated, open, hollow shaft open at both ends

adapted for insertion into an airway of a mouthpiece of a closed respiratory system, said support means also having an outer wall and a generally smooth, flat inner wall; and a hollow, elongated, cylindrical layer of porous material having a thickness and a substantially circular cross-section, an inner surface and an outer surface, said outer surface being attached to and lining said inner wall of said support means, said layer of porous material not filling the



passageway of said support means, expired air and moisture passing through said support means passageway, said porous material receiving and retaining water vapor from expired air passing through said porous material, said inner wall of said support means preventing water vapor from passing completely through said layer of porous material, said layer of porous material subsequently releasing the retained water vapor to inspired air passing through said support means passageway.

5,438,979

# NASAL CANNULA SUPPORT

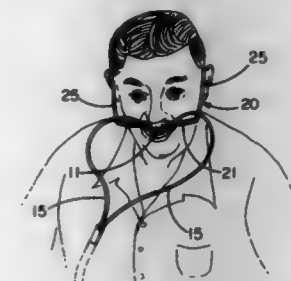
Arthur L. Johnson, Jr., Loves Park, and Tracy K. Stenger, Rockford, both of Ill., assignors to Johnson Enterprises, Inc., Rockford, Ill.

Filed Jun. 17, 1994, Ser. No. 261,392

Int. Cl.<sup>6</sup> A61M 31/00

U.S. Cl. 128-207.18

1 Claim



1. In combination, a support and a nasal cannula assembly designed to be located proximate the nasalabial area of a patient, said assembly comprising a hollow tubular member having opposite ends with gas supply openings, said tubular member being of sufficient length to span the width of an average patient's nostrils, said tubular member having a pair of laterally spaced and hollow extensions extending therefrom and communicating therewith and terminating in gas directing orifices, and elongated flexible tubes connected to and extending from the gas supply openings of said tubular member and adapted for connection to a pressurized source of gas, said support being generally U-shaped and having a non-gas



carrying crossbar extending laterally across the patient's face between the patient's nostrils and upper lip and extending laterally beyond the sides of the patient's head, a pair of non-gas carrying bows molded integrally with and extending rearwardly from said crossbar adjacent the sides of the patient's head and having means for resting on the patient's ears inboard of the auricles thereof, said resting means being molded integrally with said bows, and means for supporting said tubular member on said crossbar in a position to locate said tubular member between the patient's nostrils and under lip and to enable said extensions to fit into the patient's nostrils with said tubes draping downwardly in front of the patient without looping around the patient's head, said support being free of contact with the exterior of the patient's nose above the nostrils thereof.

5,438,980

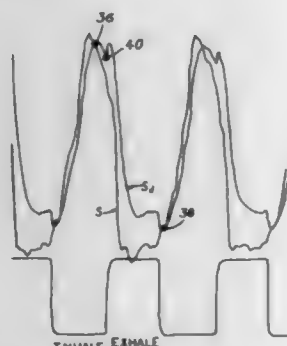
# **INHALATION/EXHALATION RESPIRATORY PHASE DETECTION CIRCUIT**

Steven L. Phillips, Olathe, Kans., assignor to Puritan-Bennett Corporation, Lenexa, Kans.

Filed Jan. 12, 1993, Ser. No. 3,129  
Int. Cl.<sup>6</sup> A61M 16/00

U.S. Cl. 128—204.23

27 Claims



1. An apparatus for detecting the inhalation and exhalation phases of a respiratory cycle having associated respiratory gas flow, said apparatus comprising:

signal production means for producing first and second signals representative of the respiratory gas flow with said signal production means further including means for delaying one of said signals in time relative to the other of said signals; and said signals having respective amplitudes so that one of said signals presents the greater amplitude during at least a portion of one of the phases and so that the other of said signals presents the greater amplitude during at least a portion of the other of said phases; and processing means for processing said signals for determining therefrom the occurrence of said respective phases and for producing outputs representative of said phases.

5,438,981

# **AUTOMATIC SAFETY VALVE AND DIFFUSER FOR NASAL AND/OR ORAL GAS DELIVERY MASK**

John R. Starr, Leechburg; Eric W. Starr, Pittsburgh; William Kaigler, N. Huntingdon; John R. Pajol, Pittsburgh; Pat Devinney, Pittsburgh, and Andrew Serowski, Pittsburgh, all of Pa., assignors to Respiroics, Inc., Murrysville, Pa.

Filed Sep. 30, 1993, Ser. No. 129,950

Int. Cl.<sup>6</sup> A62B 9/02, 18/22, 18/10

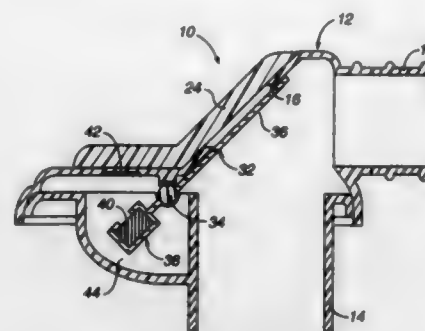
U.S. Cl. 128—205.24

14 Claims

1. Apparatus adapted for use with respiratory equipment, said apparatus comprising, in combination:

- a self-regulating valve device comprising:
- a housing including a primary inlet adapted for connection to a source of pressurized gas, a secondary inlet in communication with an ambient atmosphere, and an outlet; and
- a substantially rigid valve element and means for pivotally

mounting said valve element within said housing, said valve element being operable to open said primary inlet and close said secondary inlet in the presence of a flow of pressurized gas from said pressurized gas source and to open said secondary inlet and close said primary inlet in the absence of said flow of pressurized gas, said valve element comprising a closure portion dimensioned to



cover said primary and secondary inlets and means for counterbalancing said closure portion with respect to said pivotally mounting means; and

- a gas diffuser element comprising:
- means for receiving said outlet;
- means for sealing a region surrounding an inlet of a respiratory mask from an ambient atmosphere; and
- means for diffusing a flow of gas discharged by said outlet.

5,438,982

# **ENDOTRACHEAL TUBE ADAPTED FOR AEROSOL GENERATION AT DISTAL END THEREOF**

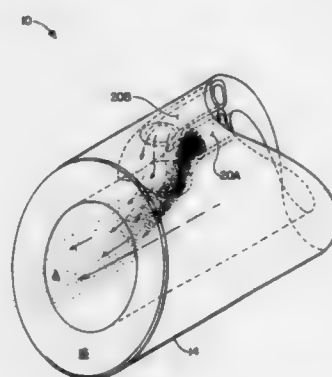
Neil R. MacIntyre, 3920 Wentworth Dr., Durham, N.C. 27707  
Continuation of Ser. No. 849,168, Mar. 10, 1992, abandoned.

This application Oct. 19, 1993, Ser. No. 139,636

Int. Cl.<sup>6</sup> A61M 11/00, 16/10, 15/00; A62B 9/06

U.S. Cl. 128—207.14

34 Claims



1. An endotracheal tube for aerosol delivery of a selected liquid solution to the lungs comprising:

- a tubular member for ventilating a patient comprising a distal end for insertion into the trachea of a patient and a proximal end adapted for introduction of a breathable gas into said tubular member;
- a first conduit for delivery of a selected liquid solution to the lungs having a proximal end terminating adjacent the proximal end of said tubular member and a distal end terminating adjacent the distal end of said tubular member, said first conduit extending substantially along the length of said tubular member; and
- a second conduit for high velocity delivery of a gas having a proximal end terminating adjacent the proximal end of said tubular member and a distal end terminating adjacent the distal end of said tubular member, said second conduit

extending substantially along the length of said tubular member, said second conduit comprising means for directing high velocity gas across a liquid solution exiting the distal end of said first conduit and thereby creating an aerosol.

5,438,983

# **PATIENT ALARM DETECTION USING TREND VECTOR ANALYSIS**

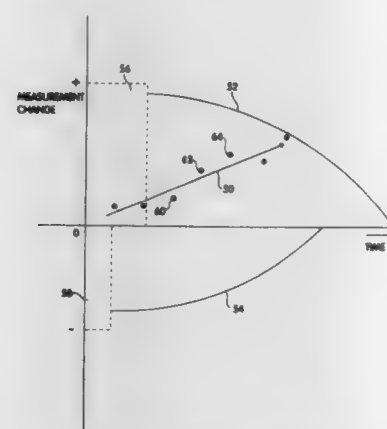
Ronald Falcone, Hudson, N.H., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 13, 1993, Ser. No. 121,002

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—630

9 Claims



1. A patient monitoring system comprising:

- a sensor for measuring values representative of a physiological parameter; and
- a processor coupled to said sensor for processing said parameter values measured by said sensor, said processor comprising:
- means for determining whether said parameter values are within safe zone limits;
- means for initiating calculation of a trend vector when said parameter values go outside said safe zone limits, said trend vector being a function of changes in said parameter values and time;
- means for comparing said trend vector with an alarm limit function; and
- means for issuing an alarm when said trend vector exceeds said alarm limit function.

5,438,984

# **APPARATUS AND METHOD FOR THE COLLECTION OF ANALYTES ON A DERMAL PATCH**

Donald W. Schoendorfer, Santa Ana, Calif., assignor to Sudor Partners, Santa Ana, Calif.

Continuation-in-part of Ser. No. 989,204, Dec. 11, 1992, which is a continuation-in-part of Ser. No. 569,007, Aug. 15, 1990, Pat. No. 5,203,327, which is a continuation-in-part of Ser. No. 241,707, Sep. 8, 1988, Pat. No. 4,957,108. This application Mar. 30, 1993, Ser. No. 39,631

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—632

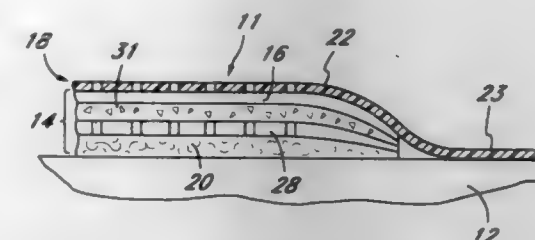
28 Claims

1. A method of collecting and detecting an analyte contained in the perspiration of a subject mammal while minimizing back-diffusion of the analyte into the subject mammal, said analyte having a plurality of ionization states, wherein said analyte exists in an ionized form thereof in at least one such ionization state and in a nonionized form in another such ionization state, said method comprising the steps of:

- a. placing a dermal patch on the outer surface of the skin of said mammal, said patch comprising an absorbent material capable of containing perspiration of said mammal;
- b. passing perspiration through the skin of said mammal into

said absorbent material, thereby passing said analyte into the patch, if said analyte is present in said perspiration;

- c. controlling the ionization state of said analyte in said patch
- d. detecting said analyte in said patch.



so that the ratio of the amount of said analyte in said patch in the ionized form to the amount of said analyte in the nonionized form is greater than 1000; and thereafter

5,438,985

# **AMBULATORY RECORDING OF THE PRESENCE AND ACTIVITY OF SUBSTANCES IN GASTRO-INTESTINAL COMPARTMENTS**

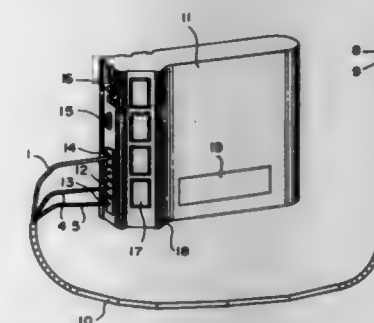
Anders Essen-Moller, Stockholm, Sweden, assignor to Synectics Medical, Incorporated, Irving, Tex.

Filed Jan. 25, 1993, Ser. No. 8,137

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—633

4 Claims



1. A gastro-intestinal catheter comprising:

- (a) a catheter with a tubular body, a proximal end, a distal end, an interior, an exterior, and a head section at the distal end,
- (b) a means for sensing pH that extends through the interior of the body, and
- (c) a means for sensing light absorption and fluorescence by gastro-intestinal contents, this means for sensing light extending through the interior of the body, and communicating to the exterior of the body at or near the distal end of the body, the means for sensing light absorption and fluorescence further comprising:
- (d) a light absorption and fluorescence sensor mounted in the head section, comprising means for sensing light absorption and fluorescence by gastro-intestinal contents,
- (e) an efferent fiberoptic bundle communicating from the proximal end of the body, through the interior of the body, to the light absorption and fluorescence sensor, and
- (f) an efferent fiberoptic bundle communicating from the light absorption and fluorescence sensor through the interior of the body, to the proximal end of the body, the light absorption and fluorescence sensor further comprising:
- (g) a reflector, with a proximal surface and a distal surface, the reflector attached to the distal end of the body by two wires and two springs such that an open space remains between the attached reflector and the distal end of the

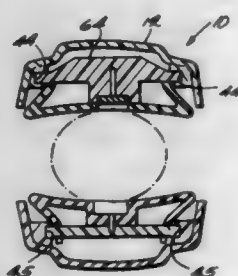
body, with a proximal end of each wire attached to the distal end of the body and a distal end of each wire attached to the reflector and the two springs attached to the distal ends of the wires and the springs running across the distal surface of the reflector.

#### 5,438,986 OPTICAL SENSOR

Daniel Disch, Beaver Dam, Wis.; Christopher G. Chin, Granada Hills, Calif., and Josef K. S. Tan, Waukesha, Wis., assignors to Criticare Systems, Inc., Waukesha, Wis.  
Filed Dec. 14, 1993, Ser. No. 166,761  
Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—633

12 Claims



1. A non-invasive optical sensor comprising:
  - a hinged clothespin-like housing having a pair of opposed faces;
  - a first contact pad having an optical source associated therewith;
  - a second contact pad having an optical detector associated therewith; and
  - releasable means for securing said first and second optical pads to said opposed faces of said housing; said first and second contact pads and said optical source and said optical sensor associated therewith thereby being readily separable from said housing for cleaning or replacement;
  - said releasable means including a first detachable carrier engageable with one of said opposed faces and a second detachable carrier engageable with the other of said opposed faces;
  - said first and second detachable carriers engaging respective detents in said housing adjacent said opposed faces;
  - said housing further including depressable means for selectively disengaging said first and second carrier from said respective detents.

#### 5,438,987

#### IMPLANTABLE LEAD FOR SENSING A PHYSIOLOGIC PARAMETER OF THE BODY

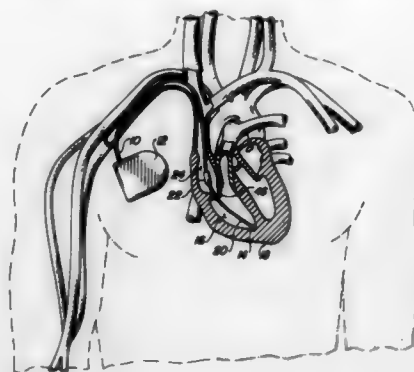
James R. Thacker, Lake Jackson, Tex.; Alvin H. Weinberg, Moorpark, and Shahrman Monddeh, West Hills, both of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.  
Continuation-in-part of Ser. No. 716,032, Jan. 14, 1991, Pat. No. 5,267,564. This application May 28, 1993, Ser. No. 68,454  
Int. Cl.<sup>6</sup> A61B 5/0205

U.S. Cl. 128—634

19 Claims

1. A body implantable sensor, comprising:
  - optical sensing means for sensing a specified characteristic of the body, the sensing means having a first and a second sensor terminal;
  - an optically clear, tubular shell having a D-shape, the shell having a flat surface with the optical sensing means mounted thereon, the shell having two open ends;

two end caps dimensioned to fit into the two open ends of the shell, respectively, each end cap having a channel to



allow one of the sensor terminals to pass therethrough; and means for hermetically sealing the end caps to the shell.

#### 5,438,988

#### PRESSURE-SENSITIVE POLY(N-VINYL LACTAM) ADHESIVE COMPOSITION AND BIOMEDICAL ELECTRODES USING SAME

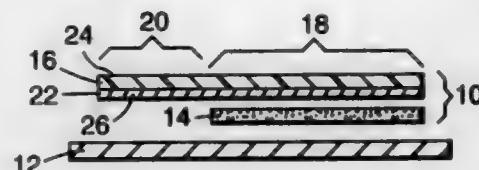
Daniel C. Duan, St. Paul, Minn.; Robert A. Asmus, Hudson Township, St. Croix County, Wis.; Timothy M. Dietz, St. Paul, Minn.; Rosa Uy, St. Paul, Minn., and Olester Benson, Jr., Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Division of Ser. No. 792,422, Nov. 15, 1991, Pat. No. 5,276,079.

This application Oct. 15, 1993, Ser. No. 137,606

Int. Cl.<sup>6</sup> A61B 5/04; A61N 1/04

U.S. Cl. 128—640

7 Claims



1. A biomedical electrode comprising: a field of adhesive conductive medium for contacting mammalian skin and a means for electrical communication for interfacing with the adhesive conductive medium and electrical instrumentation, the adhesive conductive medium adhered to the means for electrical communication and comprising a hydrophilic, pressure-sensitive adhesive composition of swellable, poly(N-vinyl lactam) radiation-crosslinked while in a solid form and an essentially unirradiated plasticizer present in an amount sufficient to form a cohesive, pressure-sensitive adhesive composition.

#### 5,438,989

#### SOLID TUMOR, CORTICAL FUNCTION, AND NERVE TISSUE IMAGING METHODS AND DEVICE

Darryl Hochman, 22933 Edmonds Way, Edmonds, Wash. 98020, and Michael M. Haglund, 1647 N. 197th Pl., Seattle, Wash. 98133

Continuation-in-part of Ser. No. 565,454, Aug. 10, 1990, Pat. No. 5,215,095. This application Jan. 8, 1992, Ser. No. 894,270  
Int. Cl.<sup>6</sup> A61B 5/00; G01N 21/00

U.S. Cl. 128—653.1

9 Claims

1. A method for imaging margins and dimensions of solid tumor tissue located in an area of interest, comprising:
  - a. illuminating the area of interest with a source of electro-

- magnetic radiation (emr) containing wavelengths of emr absorbed by a dye;
- b. obtaining a video signal of the area of interest as a sequence of frames and processing the sequence of frames into an averaged control image, wherein the image is a series of pixels;
- c. administering the dye by bolus injection into vasculature circulating to the area of interest;
- d. obtaining a series of subsequent frames of the area of interest over time and processing the series of subsequent

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- frames into a subsequent averaged image, wherein the image is a series of pixels;
- e. comparing each subsequent averaged image with the processed averaged control image to obtain a series of difference images; and
- f. comparing each difference image for evidence of changed absorption within the area of interest which is the outline of solid tumor tissue, whereby tumor tissue is characterized by faster absorption of and longer retention of the dye.

#### 5,438,990

#### MAGNETIC FIELD SENSOR

John D. Wahlstrand, Shoreview; David L. Thompson, Fridley, both of Minn., and Gary E. Nelson, Balsam Lake, Wis., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 982,132, Nov. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 750,143, Aug. 26, 1991, abandoned. This application Nov. 12, 1993, Ser. No. 150,746

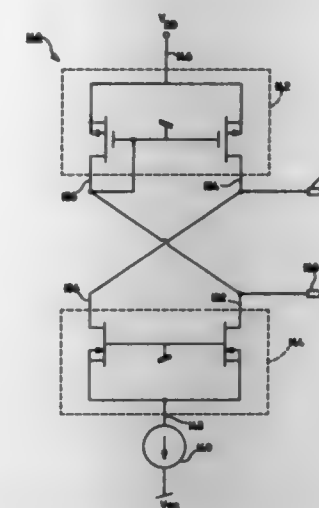
Int. Cl.<sup>6</sup> A61B 5/05

U.S. Cl. 128—653.1

11 Claims

1. A magnetic field sensor for sensing the presence of a magnetic field comprising:
  - (a) a voltage source;
  - (b) a current source;
  - (c) a first split-drain FET having a source and first and second split-drain halves;
  - (d) a second split-drain FET having a source and third and fourth split-drain halves, wherein said first split-drain half is coupled to said fourth split-drain half, wherein said source of said first split-drain FET is coupled to said voltage source and said source of said second split-drain FET is coupled to said current source to allow current to be conducted from said voltage source through said first and fourth drain halves to said current source; and

output means coupled to said first and second split-drain FET's for producing an output signal in response to a



magnetic field applied to said first and second split-drain FET's.

#### 5,438,991

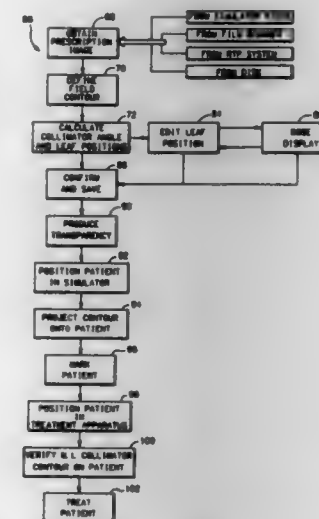
#### METHOD AND APPARATUS FOR CONTROLLING A RADIATION TREATMENT FIELD

Cedric Yu, and John Wong, both of Bloomfield Hills, Mich., assignors to William Beaumont Hospital, Royal Oak, Mich.  
Filed Oct. 18, 1993, Ser. No. 137,568

Int. Cl.<sup>6</sup> A61B 6/00

U.S. Cl. 128—653.1

12 Claims



1. A method of performing radiation treatment on a patient, the method comprising the steps of:
  - positioning the patient on a simulation apparatus;
  - generating a radiological image of a region of the patient;
  - producing a curve on the radiological image defining the location and shape of a desired radiation treatment area;
  - inputting said curve into a host computer;
  - transmitting signals defining said curve from the host computer to a transmissive projection means operable to receive the signals and produce the outline of said curve on the transmissive projection means;
  - projecting light through the transmissive projection means to project the outline of said curve onto the treatment area of the patient;
  - marking the patient's skin to define the treatment area;



positioning the patient on a radiation therapy apparatus; and transmitting a radiation therapy beam from said radiation therapy apparatus onto said patient so that the radiation therapy beam conforms to the curve marked on said patient.

5,438,992

# FLOW-INDUCED ARTIFACT ELIMINATION IN MAGNETIC RESONANCE IMAGES

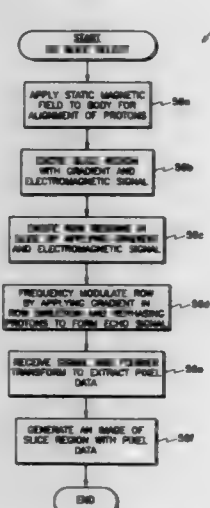
John M. Siegel, Jr., Atlanta; David N. Ku, Decatur; John N. Oshinski, Atlanta, and Roderic I. Pettigrew, East Point, all of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Nov. 1, 1993, Ser. No. 146,393

Int. Cl.<sup>6</sup> A61B 5/055

U.S. Cl. 128—653.2

22 Claims



1. A process for producing magnetic resonance images of fluid flow within a body without signal loss resulting from fluid turbulence, comprising the steps of:

- applying a static magnetic field to said body for alignment of protons within said body;
- isolating a particular region of said body having the turbulent fluid flow by exciting a slice region along the body via applying a slice selection magnetic gradient in combination with a slice selection electromagnetic signal at a frequency which specifies the location of said slice region, and by individually exciting a row region within said slice region with an electromagnetic excitation signal in combination with a row selection magnetic gradient;
- frequency encoding said particular region of said body;
- receiving an electromagnetic echo signal from said particular region; and
- producing an image of the fluid flow within said particular region by processing said electromagnetic echo signal independent of the phase of said electromagnetic echo signal.

5,438,993

# GUIDEWIRE ADVANCEMENT SYSTEM

Arthur S. Lynch, Westwood, and A. Walter MacEachern, Woburn, both of Mass., assignors to Medical Parameters, Inc., Woburn, Mass.

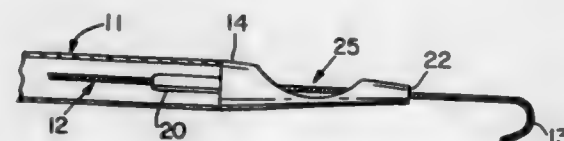
Continuation of Ser. No. 993,414, Dec. 21, 1992, abandoned, which is a continuation of Ser. No. 788,049, Nov. 5, 1991, Pat. No. 5,273,042, which is a continuation of Ser. No. 509,900, Apr. 13, 1990, abandoned, which is a continuation-in-part of Ser. No. 372,047, Jun. 27, 1989, Pat. No. 4,917,094, which is a division of Ser. No. 114,451, Oct. 28, 1987, Pat. No. 4,860,757. This application Apr. 26, 1994, Ser. No. 233,732

The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61B 6/00

U.S. Cl. 128—657

10 Claims



1. A guidewire advancement system comprising: a guidewire having a curved distal tip; a hollow casing housing the guidewire, the casing having an outlet at one end through which the guidewire can be displaced; a holder connecting one end of the hollow casing to a second end of the hollow casing; and a straightening element secured to the hollow casing to receive the guidewire through the outlet, the straightening element having a tube through which the guidewire passes such that the tube has a length and diameter for straightening the curved distal tip, the straightening element further comprising an aperture through which the guidewire can be manually engaged between the casing outlet and an exit point of the tube without intervening mechanical assistance, the aperture being dimensioned to permit manual application of a laterally directed force to the guidewire exposed through the aperture such that the curved distal tip of the guidewire can be straightened by the tube and advanced through the exit point that is adjacent the aperture.

5,438,994

# ULTRASONIC DIAGNOSTIC IMAGE SCANNING

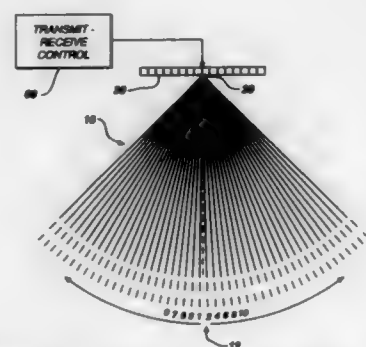
Mikhail Starosta, Snohomish; David N. Roundhill, Bothell, and David W. Rust, Seattle, all of Wash., assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.

Filed Oct. 7, 1994, Ser. No. 319,757

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—661.01

11 Claims

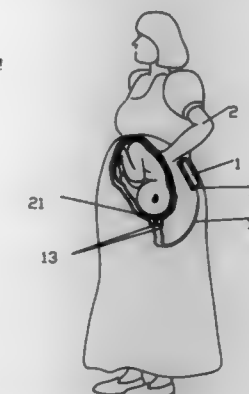


1. A method for scanning an image field with pulses of ultrasonic energy which are transmitted in a plurality of beam directions extending spatially adjacent to each other over said

image field from one lateral extreme of said image field to an opposite lateral extreme, comprising:

- transmitting in a first beam direction and then in a second beam direction which directions are substantially centrally located in said image field; and thereafter transmitting in a third beam direction which is lateral to said first beam direction and then in a fourth beam direction which is lateral to said second beam direction; and then continuing to scan said image field by transmitting in beam directions which are alternately on opposite lateral sides of previously transmitted beam directions.

an electrical wire adapted for connecting between the transducer in its position secured to the wall of the cervix and



an ultrasonic transit time cervimeter in a location exterior to human female's body.

5,438,995

# METHOD FOR OBTAINING TEMPORAL EQUITY WITH VARYING VECTOR LOCATIONS

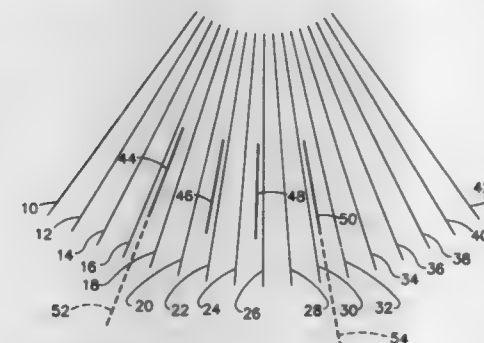
Michael J. Washburn; Stephen M. Peshman, both of New Berlin, and Chandler A. Johnson, III, Oconomowoc, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 22, 1994, Ser. No. 343,155

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—661.01

6 Claims



1. A method for obtaining temporal equity of multiple images for ultrasound imaging equipment, comprising the steps of:

- determining a vector set for each of the multiple images, which includes a vector spacing and image start and stop positions for each of the multiple images, to provide vector sets representative of vectors to be aligned; and calculating a plurality of independent weights for each of the multiple images based on the vector sets; using the plurality of calculated independent weights to determine a firing sequence which provides temporal equity of the multiple images.

5,438,997

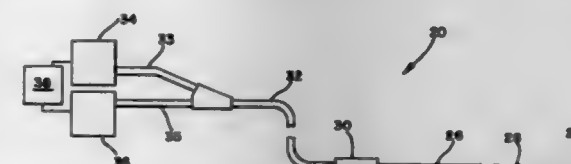
# INTRAVASCULAR IMAGING APPARATUS AND METHODS FOR USE AND MANUFACTURE

Wayne Sieben, 3707 Nokomis, Apt. 6, and Mark J. Whalen, 2001 Ridgewood Dr., both of Alexandria, Minn. 56308 Division of Ser. No. 668,919, Mar. 13, 1991, abandoned. This application Jun. 8, 1992, Ser. No. 895,094

Int. Cl.<sup>6</sup> A61B 8/12

U.S. Cl. 128—662.06

19 Claims



1. A drive cable for use in an imaging device for ultrasonic imaging of small vessels of a patient's body, the imaging device having an elongate member with a distal end positionable within a small vessel of the patient's body and a proximal end positionable outside the body, a transducer located at a distal end of the elongate member and operable to scan the vessel walls, the drive cable being electrically connected to a proximal end of the transducer for conducting pulses to and from the transducer, a signal processor operable to send and receive electrical signals to and from said transducer, the drive cable being electrically connected to the signal processor for conducting pulses to and from the signal processor, and the drive cable further comprising:

- a rotatable outer layered coil assembly;
- a core wire located inside of said layered coil assembly and connected thereto for rotation therewith and wherein said outer layered coil assembly further comprises a plurality of coaxial coil layers around said core wire wherein said plurality of coaxial coil layers comprises three coaxial coil layers around said core wire.

5,438,996

# AMBULATORY, ULTRASONIC TRANSIT TIME, REAL-TIME, CERVICAL EFFACEMENT AND DILATATION MONITOR WITH DISPOSABLE PROBES

W. Scott Kemper, San Diego, and Michael P. Guberek, Encinitas, both of Calif., assignors to Triton Technology, Inc., San Diego, Calif.

Filed Oct. 12, 1994, Ser. No. 322,613

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—661.02

26 Claims

1. A probe for use with an ultrasonic transit time cervimeter, the probe comprising: a transducer in the substantial shape of a three-dimensional, non-planar, body characterized in that ultrasound emissions from the transducer are along a multiplicity of axis in multiple different directions; means for securing the transducer to the wall of the cervix uteri of human female; and





releasably receiving a dissecting tool for rotation of about an axis of the surgical instrument, the dissecting tool having a cutting end and a shaft, the surgical instrument having a base releasably connected to the motor, the improvement comprising:

- a sleeve releasably connected to the base, the sleeve having a longitudinal bore therethrough to rotatably receive and support the shaft of the dissecting tool; and



sleeve connection for selectively permitting axial movement of the sleeve relative to the base and the dissecting tool to vary an amount of protrusion of the cutting end of the dissecting tool from the sleeve, the sleeve connection including:

- a collet secured to the base to receive the sleeve; and
- a collet nut in threaded engagement with the collet to selectively engage the collet about the sleeve to constrain the sleeve against axial movement relative to the base.

5,439,006

#### STEERABLE STYLET AND MANIPULATIVE HANDLE ASSEMBLY

Kenneth R. Brennen, Fridley, and Peter J. Pohndorf, Stillwater, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 751,278, Aug. 28, 1991, abandoned. This application Feb. 3, 1993, Ser. No. 13,126

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—772

8 Claims



5. A stylet and manipulative handle assembly controllable to form selected curvatures in the distal portion of a catheter or lead having a lumen extending therethrough, comprising:

- a flexible, elongated tubular member having proximal and distal portions thereof and having an internal axially disposed lumen;

at least one traction element extending through said lumen and attached to said distal portion of said tubular member and having a proximal end projecting from said proximal portion of said tubular member, at least a portion of said traction element outside said tubular member for a distance along said tubular member; and

manipulative handle attached to said proximal portion of said tubular member and to said proximal end of said traction element for exerting tension on said traction element at said proximal end to form the said tubular element to a desired degree of curvature depending upon the amount of tension and whereby said distal portion of said catheter or lead is similarly curved, wherein said manipulative handle comprises:

- a longitudinal housing having a distal end thereof attached to said proximal end of said tubular element and receiving said proximal end of said traction element there-within;

a reciprocating hinge lever coupled for pivotal motion

with respect to said longitudinal housing and adapted to be disposed transversely therewithin; means for attaching said proximal end of said traction element to said lever; and

slide means coupled to said lever and adapted to slide upon said longitudinal housing for advancing and retracting a free end of said lever and thereby releasing and applying traction to said traction element to release or induce curvature in the distal portion of said elongated flexible tubular member.

5,439,007

#### SUSPENSORY

Albert G. Fischer, Kohlenbankweg 20, 4600 Dortmund 50, Germany

Continuation of Ser. No. 839,252, Mar. 17, 1992, abandoned.

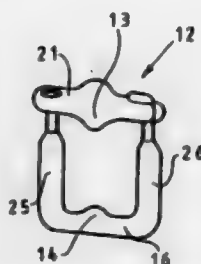
This application Jun. 21, 1994, Ser. No. 262,857

Claims priority, application Germany, Sep. 3, 1991, 41 29 177.8

Int. Cl.<sup>6</sup> A61F 6/02

U.S. Cl. 128—842

19 Claims



1. A suspensory for improving the erection of the human male penis by means of deliberately chocking the backflow of the venous blood, consisting of a rigid, generally rectangular ring composed of two cross bars and two sidebars, which, in use, surrounds the penis as well as the scrotum, and which carries an upper vein compression bulge in the form of one downwardly protruding rounded bulge at the centre of its upper crossbar that presses on the topside of the penis near the abdomen, and a lower vein compression bulge in the form of one bulge protruding upwardly on or adjacent its lower bar that presses on the root of the penis at the backside of the scrotum, whereby these two bulges extend toward each other and are shaped and placed such as to choke all three main veins, the vena dorsalis superficialis and the vena dorsalis profunda penis at the topside of the penis, and the vena profunda penis at the underside of the penis behind the scrotum, including the swell pads and valve flaps contained in these veins, such that the arteries and nerve cords of the penis that run parallel to those choked veins are crowded sideways by said bulges into the empty corners of the rectangular ring so that arteries and nerve cords remain essentially unchoked.

5,439,008

#### INFANT REFLUX RESTRAINT APPARATUS

Karolen C. Bowman, P.O. Box 216, North Wilkesboro, N.C. 28629

Continuation-in-part of Ser. No. 987,663, Dec. 9, 1992, Pat. No. 5,329,934. This application Dec. 22, 1993, Ser. No. 172,566

Int. Cl.<sup>6</sup> A61F 5/37; A61G 7/05; A47D 13/08

U.S. Cl. 128—875

3 Claims

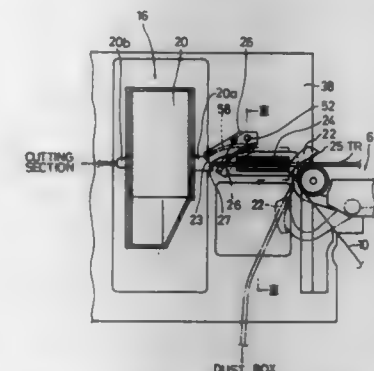
1. An infant reflux restraint apparatus for readily positioning on a support surface such as in an infant crib and comfortably supporting an infant thereon to thereby reduce reflux by the infant through the esophagus thereof, the infant reflux restraint apparatus comprising:

- a wedge-shaped support member for readily positioning an infant on a support surface to thereby support the infant in a reclined position;

a pair of side strips secured to said wedge-shaped support member and positioned on an upper surface thereof, said pair of side strips being spaced-apart in a generally parallel relationship and a sufficient amount so that an infant can be positioned therebetween and having each of said pair of side strips longitudinally extend along an adjacent respective side of an infant;

a head support member detachably connected to an upper end portion of said pair of side strips to thereby support an infant's head when reclined on said wedge-shaped support member, said head support member comprising an elongated padded body portion having a first end strap connected to a first end of said head support member, and having a second end strap connected to a second end of said head support member, said first and second end straps being detachably connected to each other when said elongated body portion has a generally circular shape for comfortably positioning an infant's head thereon and being arranged to transversely and detachably connect to said pair of side strips when said elongated body portion longitudinally extends between said pair of side strips; and

directing the travel of tobacco rod sent out from the entrance and leading the tobacco rod to said exit, said rod



guide being in constant contact with the tobacco rod while a tobacco rod cut end is delivered to said exit.

5,439,010

#### FIBROUS BONDED SHEET MATERIAL

Derek W. A. Ross, Chirnside Duns, United Kingdom, assignor to Dexter Speciality Materials Ltd., Edinburgh, United Kingdom

Filed Dec. 21, 1993, Ser. No. 171,567

Claims priority, application United Kingdom, Jan. 6, 1993, 9300188

Int. Cl.<sup>6</sup> A24B 15/28; B32B 29/06

U.S. Cl. 131—332

13 Claims

1. A fibrous bonded sheet material that comprises (a) a polymeric binder in an amount of from about 0.5 to about 10% by weight, relative to the total dry sheet, (b) a component selected from the group consisting of a wet-strength resin, a cross-linking agent and a mixture thereof, said component being present in an amount of from about 0.03 to about 1.5% by weight, relative to the total dry sheet, and (c) a ketene dimer in an amount of from about 0.0001 to about 0.10% by weight, relative to the total dry sheet, the sheet having an air permeability of at least 4,000 Coresta units.

13. A filter cigarette, in which the filter plug is wrapped in a tube of fibrous bonded sheet material that comprises (a) a polymeric binder in an amount of from about 0.5 to about 10% by weight relative to the total dry sheet, (b) a component selected from the group consisting of a wet-strength resin, a cross-linking agent and a mixture thereof, said component being present in an amount of from about 0.03 to about 1.5% by weight, relative to the total dry sheet, and (c) a ketene dimer in an amount of from about 0.0001 to about 0.10% by weight relative to the total dry sheet, the sheet having an air permeability of at least 4,000 Coresta units.

5,439,009

#### DEVICE FOR GUIDING THE TRAVEL OF TOBACCO ROD IN A CIGARETTE MANUFACTURING APPARATUS

Shigenobu Kushihashi, and Hiroshi Sakamoto, both of Tokyo, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Continuation of Ser. No. 57,040, May 5, 1993, abandoned. This application Jun. 10, 1994, Ser. No. 258,376

Claims priority, application Japan, May 8, 1992, 4-115914

Int. Cl.<sup>6</sup> A24C 5/28

U.S. Cl. 131—84.1

19 Claims

1. A tobacco rod guiding device having an entrance and an exit for guiding tobacco rod traveling in a cigarette manufacturing apparatus, comprising:

- a feed-in-deflector pivotable about a horizontal axis and provided with a first cutting means for cutting the tobacco rod;

a delivery axis for tobacco rod which extends from the entrance to the exit; and a rod guide movable perpendicularly in a horizontal plane relative to said delivery axis to an operating position on said delivery axis, said rod guide

5,439,011

#### COAXIAL FILTER CIGARETTE

Werner Schneider, Quickborn, Germany, assignor to B.A.T. Cigarettenfabriken GmbH, Hamburg, Germany

Filed Jun. 8, 1994, Ser. No. 255,981

Claims priority, application Germany, Jun. 24, 1993, 43 21 069.4

Int. Cl.<sup>6</sup> A24D 1/04

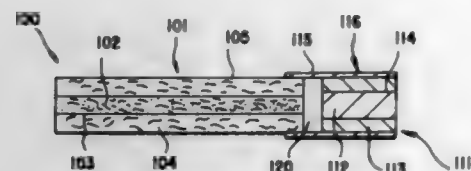
U.S. Cl. 131—360

9 Claims

1. A coaxial filter cigarette comprising

- A) a coaxial rod portion having
  - a) an inner core of a tobacco material smouldering substantially residue-free,
  - b) a wrapper for the inner core,
  - c) an outer jacket consisting of a tobacco material and coaxially surrounding the inner core and its wrapper,
  - d) and an air-permeable wrapper for the outer jacket;
- B) a coaxial filter element having
  - a) a filter core having an air-impermeable wrapper,

- b) a filter jacket coaxially surrounding the filter core and its wrapper and having a diameter corresponding to the diameter of the outer jacket;
- c) an air-impermeable wrapper for the filter jacket serving also to connect the rod portion and the filter element, and



- d) a ventilation zone in the air-impermeable wrapper for the filter jacket;

wherein:

- C) a smoke mixing zone is formed between the rod portion and the filter element for defined variation of the smoke streams leaving the rod portion before the smoke streams flow into the filter element.

5,439,012

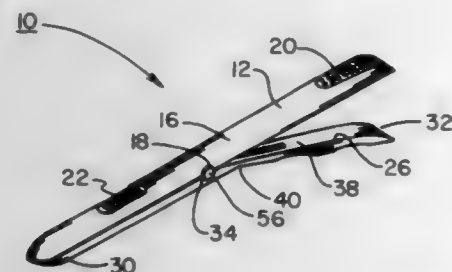
**APPARATUS FOR REMOVING NAIL POLISH WHILE PRECLUDING CONTACT WITH HARSH CHEMICALS AND SKIN IRRITANTS**

Carole L. D'Agostino, 6 E. Patcong Ave., Linwood, N.J. 08221  
Filed Sep. 9, 1994, Ser. No. 303,517

Int. Cl.<sup>6</sup> A45D 29/17; B25B 9/00

U.S. Cl. 132-73

4 Claims



2. An apparatus for removing nail polish comprising:
- a first component of a generally rigid material in an elongated configuration, the first component having an essentially planar lower face and an upper face rounded along its longitudinal axis with a pivot aperture extending laterally through the central extent thereof, the upper surface of the first component being formed with a roughened thumb grip at its leading edge and a roughened finger grip at its trailing edge;
- a second component of a generally linear extent and fabricated of a rigid material, the second component having a forward planar edge positionable parallel with the leading edge of the first component during operation and use, the second component having a second planar upper surface at an angle with respect to the first planar surface and positionable parallel with the rearward planar surface of the first component when in a compressed orientation, the second component being formed with a generally curved lower surface with a pair of longitudinally spaced finger receiving regions on its rearward section and a pivot aperture extending laterally through the central extent thereof; and
- resilient components between said first component and said second component.

5,439,013

**MANICURING DEVICE**

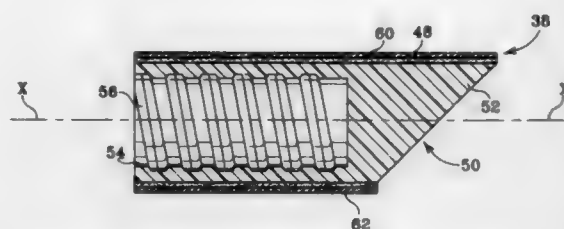
Ursula Hoover, P.O. Box 794, Carmel, Ind. 46032

Filed Jul. 21, 1993, Ser. No. 95,659

Int. Cl.<sup>6</sup> A45D 29/02

U.S. Cl. 132-76.5

18 Claims



1. A manicuring device comprising an elongated handle, a replaceable element removably situated on at least one end of the handle, coupling means coupling the replaceable element to the handle for inhibiting rotation of the replaceable element relative to the handle, the replaceable element having a generally cylindrical outer surface incorporating an abrasive and a diagonal end surface substantially free of any abrasive.

5,439,014

**TOOTHBRUSH WITH TOOTHPASTE RESERVOIR**

Laila B. Moussa, 2255 Van Ness Ave., Suite 201, San Francisco, Calif. 94109

Filed Oct. 27, 1993, Ser. No. 144,068

Int. Cl.<sup>6</sup> A46B 11/04

U.S. Cl. 132-311

13 Claims



1. A toothbrush for dispensing a liquid dentifrice contained therein comprising:
- a longitudinal handle having a hollow interior cavity adapted to contain the liquid dentifrice, an open end in fluid communication with said hollow cavity, and a generally flat head region fluidly coupled to said interior cavity at an opposite end to said open end, said head region having an upper portion and a lower portion;
- a brush element coupled to said upper portion of said head region including a base and a plurality of brush means mounted to said base;
- at least one dispensing hole located in said base of said brush element fluidly coupled to said interior cavity for dispensing said dentifrice; and
- a plurality of pin-sized apertures in said head region of said handle and fluidly coupled to said hollow interior cavity for equalizing the air pressure within the hollow interior cavity without leakage of the liquid dentifrice;
- wherein orienting said upper portion of said head region of the toothbrush substantially downwardly causes the liquid dentifrice to automatically flow within said hollow interior cavity, out through said at least one dispensing hole, and to the brush means.

5,439,015

**CLEANING APPARATUS**

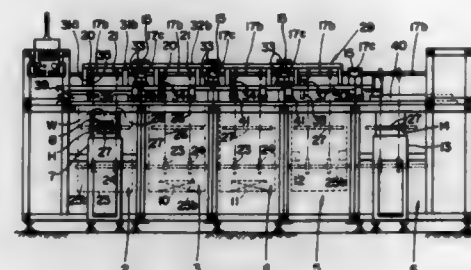
Yoshihide Shibano, 1629-1-12, Oyama-cho, Machida-shi, Tokyo, Japan

Filed Mar. 28, 1994, Ser. No. 218,364

Int. Cl.<sup>6</sup> B08B 3/04

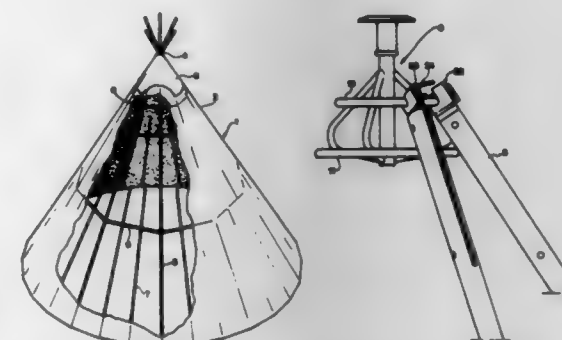
U.S. Cl. 134-66

18 Claims



1. A cleaning apparatus comprising:
- an array of juxtaposed tanks including a cleaning tank;
- a plurality of supports associated with the respective tanks for vertical movement between lower positions in said tanks and upper positions above said tanks, for supporting workpieces processed in the tanks, respectively, said supports enabling sliding movement of said workpieces toward adjacent ones of the tanks;
- lifting and lowering means for lowering the supports into said tanks, respectively, to allow the workpieces to be processed in the tanks, and lifting the supports from the lower positions in said tanks up to the upper positions above said tanks after the workpieces supported on the supports lowered in said tanks are processed in said tanks; and
- feed means for sliding the workpieces supported on said supports onto supports associated with adjacent ones of said tanks while the supports are disposed in said upper positions,
- wherein said feed means comprises a plurality of mobile assemblies positioned above said tanks, respectively, for movement toward adjacent ones of said tanks, a plurality of pressers mounted on said mobile assemblies for pressing the workpieces on the supports toward adjacent ones of said tanks when the mobile assemblies move toward adjacent ones of said tanks while the supports supporting the workpieces are disposed in said upper positions, and actuating means coupled to at least one of said mobile assemblies for moving the mobile assembly to an adjacent one of said tanks while the supports supporting the workpieces are disposed in said upper positions, said mobile assemblies being separably joined between said tanks.

determined mutual position, said interconnection means further comprises a plurality of elongated rigid elements having opposite ends, each of said opposite ends having a first engaging member, each of said rods having second engaging members arranged to enter into engagement with the first engaging members when adjacent rods are interconnected, wherein said interconnection means holds two adjacent rods at a mutual distance defined by the rigid elements; and



wherein each of said first engaging means is comprised of a male member extending substantially perpendicular to the longitudinal direction of the rigid element at the respective element end, each of said second engaging members is comprised of a loop-like female member receiving the male member of the rigid element, said female member being secured to a side of the rod facing one of the adjacent rods.

5,439,017

**COLLAPSIBLE FRAME**

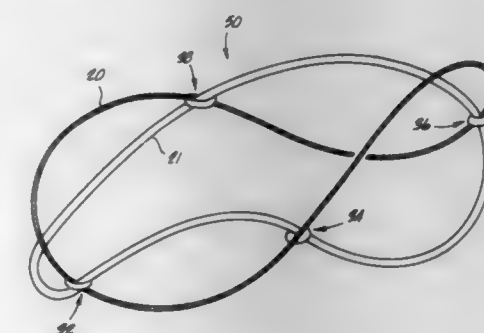
Douglas M. Brown, Monterey, Calif., assignor to Blue Leaf Design, Inc., Monterey, Calif.

Filed Jun. 7, 1994, Ser. No. 254,985

Int. Cl.<sup>6</sup> E04H 15/40

U.S. Cl. 135-126

13 Claims



1. A collapsible frame comprising:
- a first hoop;
- a second hoop attached to the first hoop at generally equally spaced apart first, second, third, and fourth quadrant points, with the first hoop crossing the second hoop at approximately right angles at the first and third quadrant points;
- a first tension member joining the first hoop and the second hoop; and
- a second tension member spaced apart from the first tension member, and joining the first hoop and the second hoop.

5,439,016

**TENT AND METHOD FOR PITCHING THEREOF**

Bengt Grahn, Abmörvägen 47, Moskosel, S-930 86, Sweden

PCT No. PCT/SE92/00209, § 371 Date Apr. 4, 1994, § 102(e)

Date Apr. 4, 1994, PCT Pub. No. WO92/18729, PCT Pub.

Date Oct. 29, 1992

PCT Filed Apr. 2, 1992, Ser. No. 133,062

Claims priority, application Sweden, Apr. 9, 1991, 9101047

Int. Cl.<sup>6</sup> E04H 15/24, 15/34

U.S. Cl. 135-100

11 Claims

1. A substantially cone-shaped tent having a top, said tent comprising:
- a plurality of rods connected to each other in the region of the top of the tent, said rods extending divergently downwardly to a ground surface on which the tent stands, each of said rods forming substantially a generatrix of an imagined cone;
- a substantially cone-shaped tent cloth disposed over and supported by the rods;
- interconnection means interconnecting adjacent rods at a distance from the top of the tent to hold the rods in a



5,439,018

**TENT WITH A QUICK-ASSEMBLE AND COLLAPSIBLE FRAME**

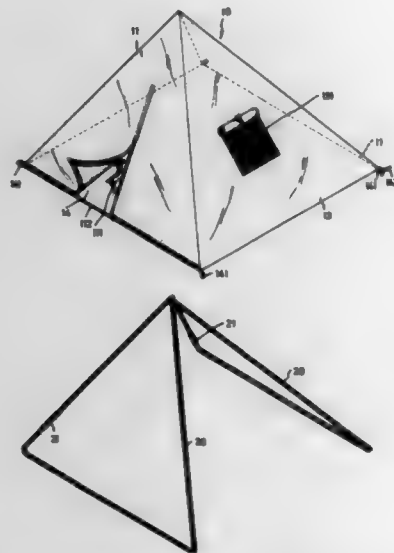
Tzung-Lin Tsai, No. 54-17, Lin 2, Huanya Li, Yen-shui Chen, Tainan Hsien, Taiwan

Filed Jun. 21, 1994, Ser. No. 262,958

Int. Cl.<sup>6</sup> E04H 15/40

U.S. Cl. 135-143

2 Claims



1. A tent comprising:  
a canvas comprising a rectangular floor piece and two pairs of opposite triangular side pieces thereby forming a substantially pyramid-like structure, the rectangular floor piece having a loop at each of four corners thereof;  
a frame comprising two flexible triangular members respectively mounted to three sides of each of one of said pairs of opposite triangular side pieces with top vertices of the triangular members meeting at an apex of the canvas, each of the flexible triangular members being collapsible such that the vertices thereof coincide with one another; and  
a fastening means passing through the loops after the triangular members are collapsed to retain the triangular members in the collapsed position.

5,439,019

**METHOD AND APPARATUS FOR FILLING A WASH TUB OF AN AUTOMATIC CLOTHES WASHER**

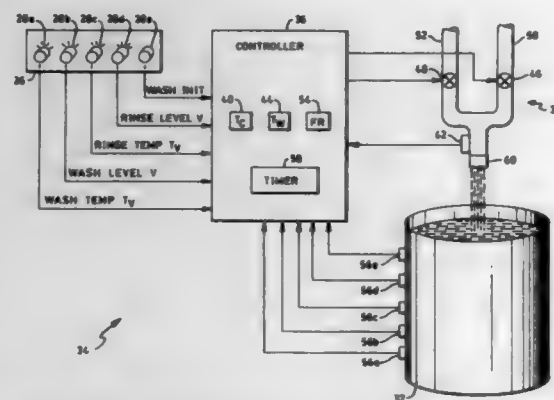
William J. Quandt, Ripon, and Charles O. Tapp, Fond du Lac, both of Wis., assignors to Speed Queen Company, Ripon, Wis.

Filed Oct. 22, 1993, Ser. No. 141,317

Int. Cl.<sup>6</sup> D06F 33/00

U.S. Cl. 137-2

23 Claims



1. In an automatic clothes washer having a wash tub filled by

hot and cold water provided through respective hot and cold water valves, a method of filling the wash tub to a preselected level with water at a preselected temperature, comprising the steps of:

- determining the time to fill the wash tub to said preselected level with a predetermined water flow rate;
- determining respective on times of hot and cold water at predetermined temperatures to provide a mixture at said preselected temperature; and
- turning on said hot and cold water valves in accordance with said respective on times to fill said wash tub to said preselected level with water at said preselected temperature.

5,439,020

**DETERGENT MIXING APPARATUS AND METHOD**

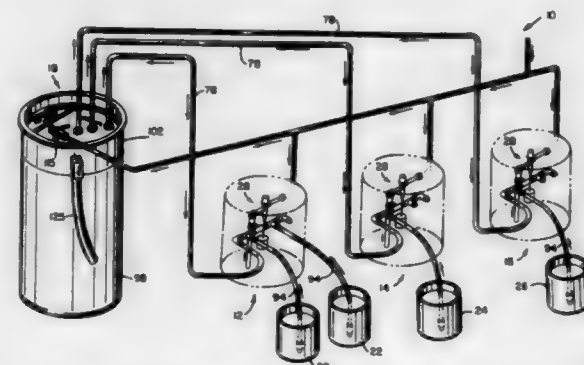
Barton Lockhart, 905 Red Oak La., Corsicana, Tex. 75110

Filed May 27, 1994, Ser. No. 249,961

Int. Cl.<sup>6</sup> B01F 5/04

U.S. Cl. 137-3

7 Claims



1. A method for mixing detergent chemicals comprising the steps of:

- dissolving an inorganic chemical composition in water to form a saturated solution supply;
- providing a plurality of discrete liquid detergent additive supplies;
- serially fluidly connecting at least one of said plurality of liquid detergent additive supplies and said saturated solution supply to a manifold;
- drawing at least one liquid detergent additive and said saturated solution from said manifold and into a flowing stream of water; and,
- transferring said at least one liquid detergent additive and said saturated solution in said flowing stream of water to a holding tank.

5,439,021

**ELECTRO-PNEUMATIC CONVERTER**

Brian J. Burlage; Steven B. Pauller; Stanley R. Good, and Barry L. Gaarder, all of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Clayton, Mich.

Continuation-in-part of Ser. No. 942,758, Sep. 9, 1992, abandoned. This application Aug. 31, 1993, Ser. No. 114,955

Int. Cl.<sup>6</sup> G05B 11/50; G05D 16/20

U.S. Cl. 137-84

16 Claims

1. An electro-pneumatic convertible instrument readily convertible from a pressure transducer to a valve positioner for indicating the position of a valve using a feedback element having a shaft connectable to a valve stem where the feedback element output corresponds to the valve stem position, said instrument comprising:

- an enclosure having a housing defining a hollow interior and including;
- a modular base having a dividing wall and with electrical and pneumatic components mounted thereon on opposite

5,439,023

**SHUT-OFF VALVE FOR LIQUID FUEL**

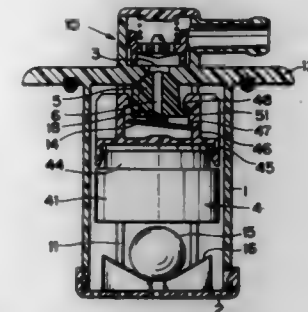
Kazuo Horikawa, Kooriyama, Japan, assignor to Kabushiki Kaisha Mikuni, Japan

Filed Apr. 11, 1994, Ser. No. 226,079

Int. Cl.<sup>6</sup> F16K 17/36

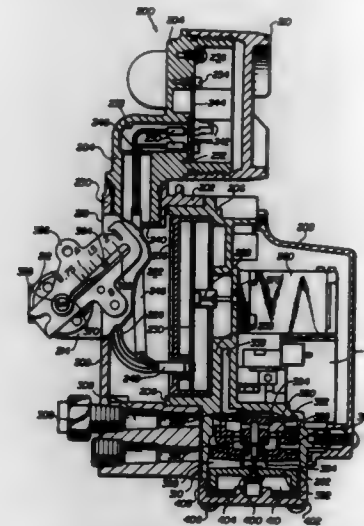
U.S. Cl. 137-202

7 Claims



1. A shut-off valve, for preventing liquid fuel from entering a vapor flow path providing communication between the vapor space of a fuel tank in a vehicle and a vapor storage canister, said shut-off valve closing the vapor flow path responsive to an abnormal inclination of the vehicle and comprising:

- a valve housing having at least one fuel vapor inflow hole and a fuel vapor outflow hole;
- a float, slidably contained within said valve housing, for rising within said valve housing by buoyant force upon liquid fuel entering said valve housing;
- a valve disc, for sealably closing said fuel vapor outflow hole upon being forced upward by said float, said valve disc having a central through-hole;
- a plate-like valve member for engaging said valve disc, in a closed position, to close a lower end of said through hole, responsive to rising of said float;
- pivot means, carried by said plate-like valve member, for allowing said plate-like valve member to pivot relative to said valve disc while in said closed position;
- first engagement means, carried by said float, for engaging said valve disc, responsive to lowering of said float, to limit movement of said valve disc relative to said float, said first engagement means serving to pull said valve disc away from said fuel vapor outflow hole responsive to the lowering of said float; and
- second engagement means for engaging a first single point on the periphery of said plate-like valve member, responsive to the lowering of said float, to pivot said plate-like valve member, about said pivot means, into contact with said valve disc at a second single point on the periphery of said plate-like valve member, opposite said first single point, thereby producing a force couple to disengage said plate-like valve member from said closed position by a levering action.



- in converting the instrument to a valve positioner, said housing portion having one end thereof opening directly into the housing hollow interior for communicating with said hollow interior to enable said feedback element output to be connectable to said electrical components on said modular base and within said electrical compartment via said housing portion and said hollow interior.

5,439,022

**LAVAGE VALVE**

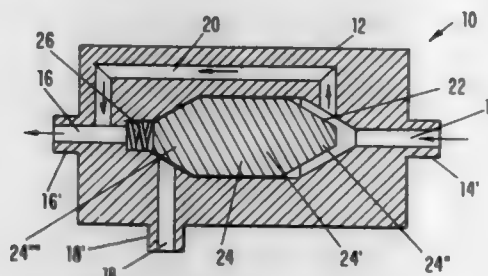
Daniel A. Summers, 5701 Klondike, NE., and Howard Levy, 8708 Camino Dr. NE., both of Albuquerque, N. Mex. 87111

Filed Feb. 14, 1994, Ser. No. 195,926

Int. Cl.<sup>6</sup> F16K 11/02

U.S. Cl. 137-102

13 Claims



1. Valve apparatus comprising:  
a valve body comprising first, second and third orifices and a bypass passageway; a valve member comprising first and second end portions and movable within said valve body; means for biasing said valve member; and  
means for applying pressure to said first end portion, thereby opening said first orifice and said bypass passageway while occluding said third orifice;  
wherein said means for biasing said valve member comprises means for biasing said valve member into occluding said first orifice and said bypass passageway while opening said second and third orifices.

5,439,024

**SANITARY GATE VALVE WITH TAPERED VALVE PLUG**  
Robert D. Zimmerly, Kenosha, Wis., assignor to Tri-Clover, Inc., Kenosha, Wis.

Filed Dec. 9, 1992, Ser. No. 987,670

Int. Cl.<sup>6</sup> F16K 3/00; B08B 9/06, 3/00

U.S. Cl. 137-241

9 Claims

8. A valve assembly comprising  
a valve body having a fluid passage extending laterally therethrough having an inlet end and an outlet end, means at the inlet end and at the outlet end to connect the valve body to a fluid conveying conduit,  
said passage having a bottom surface coplanar with the bottom of said conduit and being free of recesses capable of preventing the drainage of liquids therefrom, the bottom of said conduit and said fluid passage being flat so that

materials conveyed through said conduit cannot collect in the bottom thereof,

an axially extending valve chamber intersecting said passage and disposed perpendicularly to the axis of said passage, said chamber having an flattened oblong cross-section extending substantially along the entire length of said valve chamber with its widest dimension being perpendicular to said passage, said flattened oblong cross section progressively decreasing in dimension toward the bottom of said conduit, the lateral periphery of said cross-section defining a pair of recesses for receiving a valve member slidably fitted in said recesses, an opening being provided into the upper end of the valve body to allow cleaning and sterilization of the upper end of said chamber,

an axially, non-rotationally movable valve member fitting closely within said valve chamber, with its lateral edges slidably and sealingly fitted in said channels, said member having an internal, downwardly tapered, hard core mem-



ber and an elastomeric oblong cross-sectioned outer member enclosing the forward, rearward, lateral and bottom surfaces of the internal member, said interior member having tapered sides and said elastomeric member being provided with sides adapted to slide upwardly and downwardly into contact with the walls of said valve chamber, said elastomeric member having an upper shoulder that engages and seals said chamber during the length of its travel in both the opened and closed directions and a generally flattened bottom surface adapted to engage the bottom of said passage and being complementary to the shape of and dimensioned to close said passage when extended into the closed position wherein it engages the decreasing dimension of said flattened oblong cross section thereby providing a wedge type sealing action therebetween, and,

means to extend and retract said valve member within said valve chamber.

5,439,025

#### FLOAT OPERATED FILL VALVE

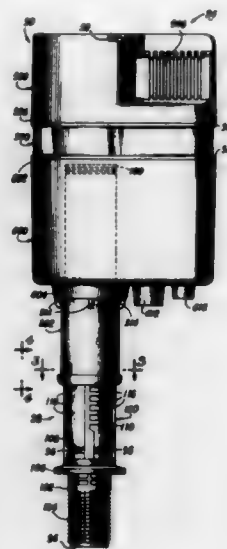
Dwight N. Johnson, 6327 Chorlito Dr., Carlsbad, Calif. 92008  
Continuation of Ser. No. 246,120, May 19, 1994, which is a continuation of Ser. No. 88,817, Jul. 8, 1993, Pat. No. 5,337,781, which is a continuation of Ser. No. 909,386, Jul. 8, 1992, Pat. No. 5,255,703. This application Dec. 28, 1994, Ser. No. 365,346  
Int. Cl.<sup>6</sup> F16K 31/18

U.S. Cl. 137—426

2 Claims

1. A height adjustable tank fill valve comprising:
  - a riser section having a bottom portion adapted to be secured to a wall of the tank and an upper portion;
  - an inlet port in said bottom portion of said riser section adapted to receive a pressurized liquid;
  - a head portion carried at said upper portion of said riser section;
  - valve means in said head portion for controlling flow of pressurized liquid from said inlet port into the tank;
  - said riser section including telescoped flow conduits axially slidable and rotatable relative to one another;
  - a latch flange on one of said telescoped flow conduits and cooperating latch teeth on the other of said telescoped

flow conduits, said flange and a mating one of said teeth defining interfacing lock surfaces disposed generally perpendicular to the axes of said telescoped flow conduits, said lock surfaces being urged toward one another by the force of said pressurized liquid from said inlet port acting



upon said head portion in any position of said valve means; and

an axially extending detent projection on one of said lock surfaces and a mating detent recess on the other of said lock surfaces, said projection being maintained into said recess by the force of said pressurized liquid.

5,439,026

#### PROCESSING APPARATUS AND FLOW CONTROL ARRANGEMENT THEREFOR

Shuji Moriya, Yamanashi; Takenobu Matsuo, and Tsuyoshi Wakabayashi, both of Kofu, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

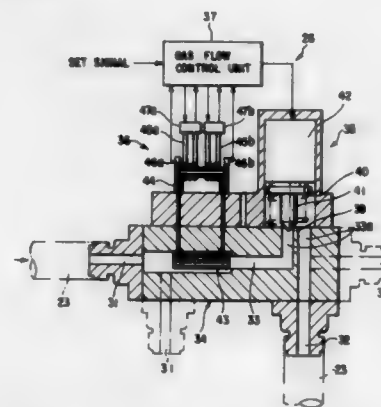
Filed Dec. 10, 1993, Ser. No. 164,545

Claims priority, application Japan, Dec. 11, 1992, 4-353287; Dec. 25, 1992, 4-357986; Dec. 25, 1992, 4-357987

Int. Cl.<sup>6</sup> G05D 7/06

U.S. Cl. 137—486

7 Claims



1. A flow control apparatus comprising:
  - a plurality of flow control units each including a base body having a fluid inlet and a fluid outlet and a flow path for causing the fluid inlet to communicate with the fluid outlet flow adjustment means for adjusting a flow rate of a fluid in the flow path of said base body, flow-rate detection means for detecting the flow rate of the fluid in the

flow path, and flow control means for outputting a flow-rate control signal to said flow adjustment means on the basis of a detection result of said flow-rate detection means to control the flow rate of the fluid to a predetermined value; and

a block-like joint detachably mounted to continue to at least one of the fluid inlet and the fluid outlet of each of said base bodies and having connection ports of fluid pipes communicating with the flow paths of said base body for said flow control units.

5,439,027

#### HIGH PRESSURE REGULATING VALVE

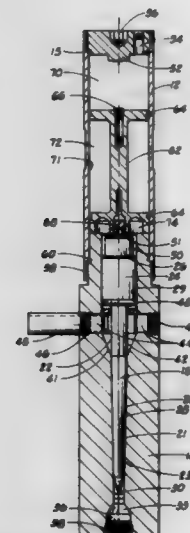
Ken S. Layton, Fayetteville, Ark.; Mark L. Suttle, and Brett L. Tisch, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 21, 1994, Ser. No. 184,725

Int. Cl.<sup>6</sup> F16K 17/02

U.S. Cl. 137—513.5

20 Claims



1. A pressure regulating valve comprising:
  - a) a valve body having a longitudinal axis and a centrally located opening about the axis, the opening having at least a first inlet section and a second section, the second section forming an elongated tapered bore having a preselected taper angle with respect to the longitudinal axis defining a seat surface integral to the valve body, the bore having an inlet at a first end, and at least one discharge opening being in communication with the tapered bore at a preselected position along the valve body;
  - b) a poppet being essentially centered about the longitudinal axis of the valve body and having a first leading tip portion, a second tapered portion, a third portion, and a fourth portion encompassing the remainder of the poppet, the second portion forming an elongated tapered poppet surface having a preselected taper angle with respect to the longitudinal axis which differs from the preselected taper angle of the seat surface in the valve body by a preselected amount, at least a portion of the first and second portion of the poppet being disposed within the second portion of the elongated tapered bore of the valve body thereby defining a flow path therebetween of a predetermined length with respect to the longitudinal axis;
  - c) biasing means for biasing the poppet toward the seat; and
  - d) means for limiting the movement of the poppet from the seat.

5,439,028

#### MODULAR VALVE FOR A BUILDING STANDPIPE

George G. Meyer; Stephen J. Meyer, both of Malvern, and William J. Reilly, Langhorne, all of Pa., assignors to Central Sprinkler Corporation, Lansdale, Pa.

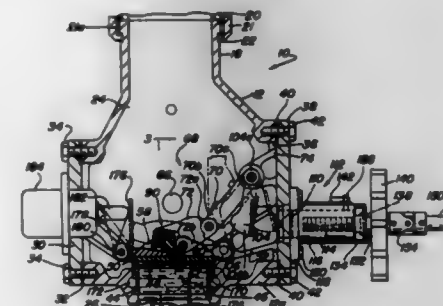
Division of Ser. No. 955,617, Oct. 2, 1992, Pat. No. 5,295,503.

This application Dec. 30, 1993, Ser. No. 176,158

Int. Cl.<sup>6</sup> F16K 37/00, 15/18; A62C 35/58

U.S. Cl. 137—556

31 Claims



1. A valve for a dry piping system, said valve comprising:
  - a valve body including an inlet for being in fluid communication with a fluid source and an outlet for being in fluid communication with an outlet conduit;
  - a passage within said valve body interconnecting said inlet and said outlet for allowing fluid to flow through said valve body between said inlet and said outlet;
  - a valve seat positioned within said valve body in alignment with said passage for allowing fluid to flow therethrough;
  - a clapper positioned within said passage;
  - hinge means interconnected between said valve body and said clapper for allowing said clapper to pivot between a first position wherein said clapper is sealingly engaged with said valve seat to prevent fluid from flowing between said inlet and said outlet and a second position wherein said clapper is spaced from said valve seat to allow fluid to flow from said inlet toward said outlet;
  - a latch positioned proximate said clapper, said latch being movable between a locked position wherein said latch engages said clapper when said clapper is in said first position and an unlocked position wherein said latch is spaced from said clapper when said clapper is in said second position;
  - an actuator member mounted on said valve body and extending into said passage such that said actuator member engages said latch, said actuator member being movable between a set position wherein said latch is maintained in said locked position and an activated position wherein said actuator member is moved to said unlocked position, said actuator member being a double acting piston mechanism having a piston secured to a piston rod, said piston and piston rod being reciprocally mounted within a cylinder, said piston rod being in engagement with said latch, said cylinder having a first inlet for allowing fluid to flow into said cylinder on a head side of said piston and a second inlet for allowing fluid to flow into said cylinder on a rod side of said piston; and
  - force applicator means for applying a first force to said actuator member to move said actuator member from said activated position to said set position and to maintain said actuator member in said set position wherein said clapper



and latch are in said first and locked positions, respectively, and for applying a second force to said actuator member to move said actuator member from said set position to said activated position and to maintain said actuator member in said activated position wherein said clapper and latch are in said second and unlocked positions, respectively.

5,439,029

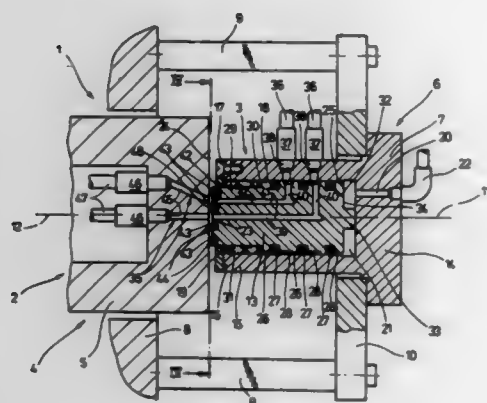
## ROTARY LEADTHROUGH

Willi Becker, Bammental, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany  
Filed Mar. 29, 1993, Ser. No. 38,503  
Claims priority, application Germany, Mar. 27, 1992, 42 10 009.7

Int. Cl.<sup>6</sup> F16L 17/10

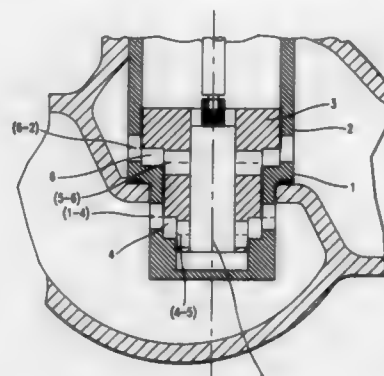
U.S. Cl. 137—580

6 Claims



1. A rotary leadthrough for a printing machine for feeding one of suction or pressurizing medium to a rotor of the printing machine, comprising a stator in which the rotor is rotatable, sealing means disposed between the rotor and stator for providing sealing therebetween regardless of the angular position between the rotor and the stator, said stator adapted to form a cylinder having an axis colinear with said rotor, said rotor forming a journal in said stator, a piston slidably supported in said cylinder between a first position proximal to the rotor and a second position away from the rotor, said sealing means including at least one sealing element contacting said journal in the first position of said piston, wherein in its second position said sealing element is spaced away from said journal, in which second position said piston is stationary relative to said rotor, and piston moving means in operative engagement with said piston for moving it between its first and second position; wherein said piston has a cylindrical surface, a plurality of axially disposed bores in said piston, an equal plurality of circular peripheral channels formed in said cylindrical surface, each peripheral channel fluidly communicating with a respective bore, said cylinder having an inner cylinder surface, a plurality of access channels equal to said plurality of peripheral channels formed in said inner cylinder surface, wherein said access channels are fluidly communicating with a respective peripheral channel when said piston is in its first position.

5,439,030  
REGULATION VALVE FOR HIGH PRESSURE SURGES  
Sebastian Cazarra Pallaruelo, Zaragoza, Spain, assignor to Badain S.L., Laforanada, Spain  
PCT No. PCT/ES93/00013, § 371 Date Oct. 21, 1993, § 102(e)  
Date Oct. 21, 1993, PCT Pub. No. WO93/17265, PCT Pub. Date Sep. 2, 1993  
PCT Filed Feb. 25, 1993, Ser. No. 137,067  
Claims priority, application Spain, Feb. 26, 1992, 9200421  
Int. Cl.<sup>6</sup> F16K 47/00  
U.S. Cl. 137—614.11 5 Claims



1. A high-pressure reducing control valve having an inlet side and an outlet side comprising:  
a valve body cylinder (2) having a plurality of ports (6-2) facing the outlet side of the valve;  
an extended, cup-shaped seat ring (1) having an open top, a closed bottom and a stepped bore comprising a plurality of first steps, the seat ring having a cross-sectional width greater at the top than at the bottom and a plurality of inlet ports located at a particular one of the first steps (1-4) which face the inlet side of the valve;  
a stepped plug (3) inserted into said seat ring and having a top positioned within said valve body cylinder, a hollow body and a middle chamber (5) formed within the hollow body, said hollow body having an open bottom and a stepped exterior comprising a plurality of second steps and whose cross-sectional width is greater at the top than at the bottom and which mates with the stepped bore of the seat ring and the bore of the cylinder respectively, said plug further having a plurality of restriction ports (4-5) located in front of the inlet ports of the seat ring (1-4) and a plurality of restriction ports (3-6) located in front of the outlet ports of the cylinder (6-2); and  
wherein once the plug is inserted into said seat ring a plurality of lower ring chambers (4) are formed between said inlet ports and the inlet ports of the seat ring and a plurality of upper ring chambers are formed between said outlet ports and the outlet ports of the cylinder thereby establishing a fluid path from said inlet ports, through said lower ring chambers (4), through the middle chamber (5), through said restriction ports into said upper ring chambers (6) and out the outlet ports.

5,439,031

## HEAT SHRINKABLE END CAPS

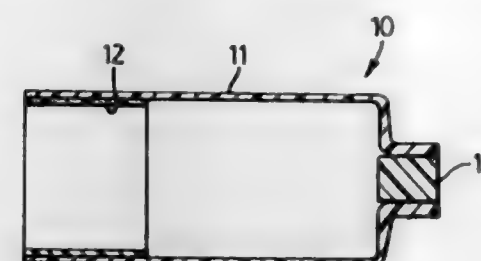
Robert E. Steele, Richmond Hill; Peter Jackson, Etobicoke, and Marcus P. W. Heydrich, Mississauga, all of Canada, assignors to Shaw Industries Ltd., Rexdale, Canada  
Filed Nov. 12, 1993, Ser. No. 150,880  
Int. Cl.<sup>6</sup> F16L 55/10

U.S. Cl. 138—89

25 Claims

1. A heat shrinkable end cap comprising a dimensionally heat unstable tubular member of crosslinked polymeric material, said member shrinking in perimeter on application of heat thereto, and having one end heat recovered to a small perime-

ter relative to an opposite open end of large perimeter, said one end being closed by a discrete plug of polymeric material that tends not to yield under pressure applied by shrinking poly-



meric material at said one end and upon application of said heat and is welded to said one end, said plug having a complex viscosity greater than 10<sup>9</sup> poise when measured at a temperature of 23° C. and a strain rate of 10<sup>-1</sup> radian s<sup>-1</sup>.

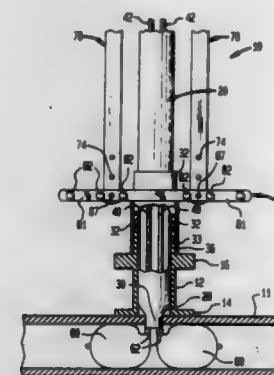
5,439,032

## INFLATABLE GAS PIPELINE STOPPER WITH DUAL AIR BAG

Joseph Petrone, 95 James Dr., Ringwood, N.J. 07456  
Continuation-in-part of Ser. No. 176,043, Dec. 30, 1993. This application Aug. 23, 1994, Ser. No. 294,372  
Int. Cl.<sup>6</sup> F16L 55/12

U.S. Cl. 138—93

20 Claims



1. An inflatable gas pipeline stopper for stopping flow of gas through a gas pipeline comprising:  
a stopper housing having a top and a bottom;  
a pair of rigid air pipes extending into the stopper housing through the top of the housing, the rigid air pipes having upper ends connected to air sources and lower ends;  
an inflatable air bag attached to the lower ends of each of the rigid air pipes within the stopper housing;  
handle means interconnected with the rigid air pipes for inserting and retracting the rigid air pipes through the stopper housing to insert the air bags into a gas pipeline;  
connection means for connecting the stopper housing to a hole tapped in a gas pipeline.

5,439,033

## METHOD OF LINING A BRANCH PIPE

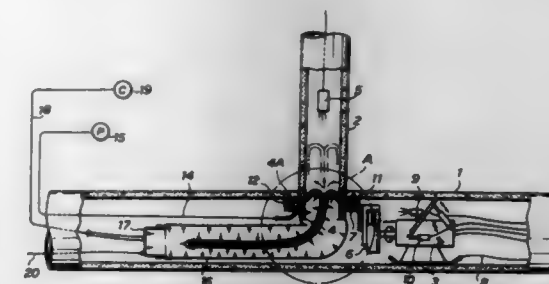
Takao Kamiyama, Hiratsuka; Yasuhiro Yokoshima, Ibaraki, and Shigeru Endoh, Kasukabe, all of Japan, assignors to Shonan Gosei-Jushi Seisakusho K.K.; Yokoshima & Company and Get Inc., all of Japan  
Filed Jul. 14, 1994, Ser. No. 275,112  
Claims priority, application Japan, Sep. 28, 1993, 5-240778  
Int. Cl.<sup>6</sup> F16L 55/16

U.S. Cl. 138—98

14 Claims

1. A method of lining a branch pipe using a branch pipe liner

bag impregnated with a hardenable resin and having a flange at one end thereof, comprising the steps of:  
folding out said flange to mount the same to a fluid pressure sealing nozzle;  
holding a close contact between said flange and said fluid pressure sealing nozzle by vacuum pressure;



everting said branch pipe liner bag and inserting the same from a main pipe into a branch pipe toward the ground by a fluid pressure;  
pressing said branch pipe liner bag onto the inner wall of said branch pipe by a fluid pressure; and  
hardening said hardenable resin impregnated in said branch pipe liner bag which is kept pressed onto the inner wall of said branch pipe.

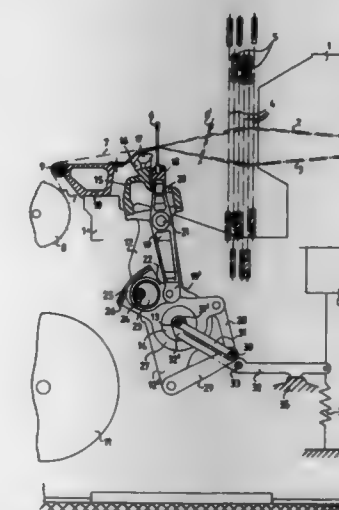
5,439,034

## MECHANISM FOR TRANSMITTING THE SELECTION COMMAND FOR THE REED BEATING POSITION IN A TERRY LOOM

Luciano Corain, Vicenza, and Lucio Sardella, Schio, both of Italy, assignors to Nuovopignone - Industrie Meccaniche E Fonderia S.p.A., Florence, Italy  
Filed Mar. 31, 1994, Ser. No. 221,255  
Claims priority, application Italy, Apr. 7, 1993, MI93A0690  
Int. Cl.<sup>6</sup> D03D 39/22

U.S. Cl. 139—26

2 Claims



1. A terry loom having a fixed part and a mechanism transmitting a selection command for a reed beating position from a closed position to an open position and vice versa, said terry loom comprising:  
a fixed shoulder;  
a loom sley having a rotational axis;  
a body mounted on said rotational axis of said loom sley and hinged to said loom sley;  
a toothed sector supported by said body;  
a cam shaft having a gear wheel engaging said tooth sector; cams keyed onto said cam shaft;  
a reed hinged to said loom sley;

connecting rods connected to a lower portion of said sley and connecting said loom sley to said cams via said gear wheel;

first and second arms pivoted to one another at a common articulated joint and interconnecting said body and said loom sley;

a rocker lever pivoted to said fixed part of said loom, said lever rotating said toothed sector via said first and second arms;

a spring interconnecting the fixed part of the loom and said rocker lever;

a movement selection device connected to said rocker lever and controlling movement of said rocker lever; and

a connecting rod hinging the common articulated joint of said first and second arms to an end of said rocker lever, wherein said end of the rocker lever lies on the axis of rotation of said loom sley when said rocker lever rests against said fixed shoulder and the reed beating position is in the open position.

5,439,035

#### TEMPERATURE AND/OR PRESSURE RESISTANT HOSE

Dal Palu e, acn uAttilio, Rivoli, Italy, assignor to Fabbria Italiana Serrature Torino, S.p.A., Italy

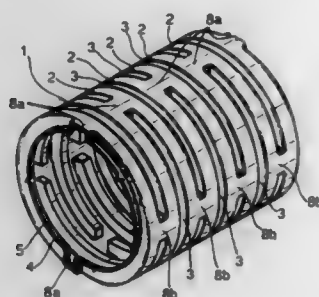
Filed May 20, 1994, Ser. No. 246,848

Claims priority, application Italy, May 21, 1993, TO93U0113

Int. Cl.<sup>6</sup> F16L 9/06

U.S. Cl. 138—121

7 Claims



1. A temperature and pressure resistant hose comprising:

a plurality of circumferential corrugations substantially parallel to one another when said hose is unbent, and said corrugations being separated from one another;

a plurality of grooves with at least one of said grooves separating each adjacent pair of said corrugations; and

a plurality of ribs, each said rib connecting, in a longitudinal direction of said hose, an adjacent pair of said corrugations, wherein each said corrugation is connected to a successive said corrugation by at least one said rib positioned in a first plane and said successive corrugation being connected to a next successive said corrugation by at least one said rib positioned in a second plane;

wherein said ribs in said first plane are angularly offset in relation to said ribs in said second plane; and

wherein said ribs in said first plane and said ribs in said second plane are alternating in said longitudinal direction of said hose between said adjacent pairs of said corrugation, whereby said ribs between one said adjacent pair of said corrugations are angularly offset from said ribs between a next adjacent pair of said corrugations.

5,439,036

#### METHOD AND APPARATUS FOR THE AUTOMATIC CHECKING AND QUALITY DETERMINATION OF TABLETS OR PILLS

Norbert Krümer, Röntgenstrasse 68, 64291 Darmstadt, Germany

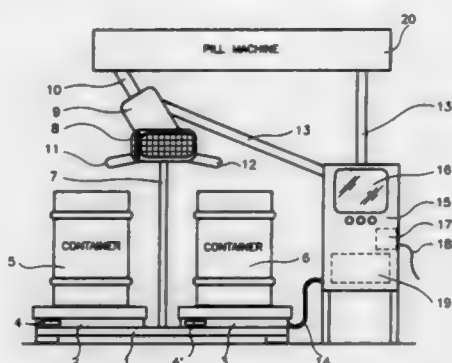
Filed Mar. 29, 1994, Ser. No. 219,115

Claims priority, application Germany, Mar. 29, 1993, 43 09 979.5

Int. Cl.<sup>6</sup> B65B 1/04, 3/04

U.S. Cl. 141—1

20 Claims



1. A method for automatic checking and quality control of tablets or pills comprising

disposing a plurality of containers on a scale;

delivering tablets or pills quasi continuously from a tablet machine or pill machine to a plurality of containers;

monitoring continuously the weight of the momentarily being filled container including contents of tablets or pills;

converting said weight into a corresponding electrical signal;

entering continuously said electrical signal into a computing and control unit within a tablet checking device or a pill checking device;

identifying each container of the plurality of containers;

entering the resulting identification into the computing and control unit;

withdrawing at preset intervals tablet batch samplings or pill batch samplings from a tablet stream or pill stream discharging into the container presently being filled for performing an automatic quality control;

feeding the tablet batch samplings or pill batch samplings to the tablet checking device or pill checking device;

testing and checking the tablet batch samplings or pill batch samplings in the tablet checking device or the pill checking device according to preset quality characteristics;

storing thereby obtained test results in the computing and control unit under association of the test results with the container presently to be filled;

recording the test results onto a recording substrate carrier to render them readable and thereby forming a protocol for the corresponding container.

5,439,037

#### WEFT THREAD DISTRIBUTION DEVICE FOR A SERIES SHED LOOM

Marcel Christe, Rüti, Switzerland, assignor to Sulzer Rueti AG, Rüti, Switzerland

Filed May 6, 1994, Ser. No. 239,100

Claims priority, application European Pat. Off., May 13, 1993, 93810352

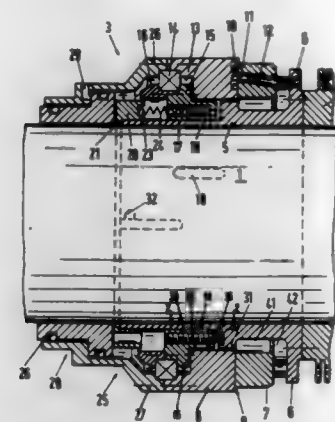
Int. Cl.<sup>6</sup> D03D 47/30

U.S. Cl. 139—28

8 Claims

1. A device for the distribution of weft threads into weft ducts of a rotor of a series shed loom, the device comprising a first part (7) rotating with the rotor (2) and having a number of transfer ducts (11) for the weft thread supply, a second part (8) rotatable with respect to the rotor having a number of connecting ducts (10) for the weft thread supply, at least one rolling

bearing (14) coaxially mounting the first and second parts, means biasing the first and second parts in an axial direction towards each other into an operating position, and at least



three support units (30) forming an at least three-point support between the first and second parts (7, 8) and keeping the first and second parts spaced apart to create a gap (9) between them.

5,439,038

#### CARBONATED BEVERAGE CONTAINERS PRESSURIZING DEVICE

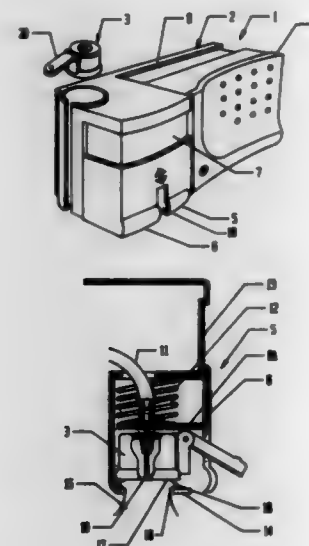
Garrett W. Lewis, Jeffrey M. Jablon, both of San Diego, and James L. Labelle, Murrieta, all of Calif., assignors to Consumer Product Technologies, Inc., San Diego, Calif.

Filed Jul. 2, 1993, Ser. No. 88,068

Int. Cl.<sup>6</sup> B65B 31/00

U.S. Cl. 141—64

20 Claims



7. An apparatus for pressurizing a carbonated liquid container wherein said container includes a spout having a resealable pouring opening, said apparatus comprising:

a pumping station which comprises:

a housing having a back wall;

a movable front panel;

means associated with said housing for slidably holding said front panel in a substantially vertical plane and frontal position in relation to said housing, and for allowing limited translating movement of said front panel toward and away from said back wall;

resilient means for biasing said panel away from said back wall;

a pump mounted between said back wall and said front panel

and positioned to be operated by a translating movement of said front panel;

a cannula connected to said pump and projecting from a section of said housing;

means for resealing said pouring opening, said means for resealing having means for attaching said means for resealing to said spout and a resiliently self-sealing aperture shaped and dimensioned to be penetrated by said cannula; and

wherein the housing of said pumping station comprises means for storing a plurality of said means for resealing.

5,439,039

#### SLABBER WITH FIXED COUNTERKNIFE AND ADJUSTABLE KNIFE AND CLAMP

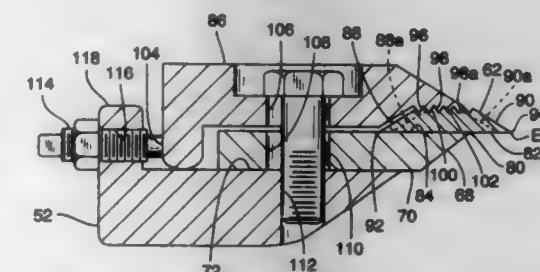
Joseph R. Bradstreet, Jr., Vancouver, Wash.; Keith H. Hewitt, West Linn, and David S. Macey, Gladstone, both of Oreg., assignors to Pacific Saw and Knife Company d/b/a Pacific/Hoe Saw and Knife Company, Portland, Oreg.

Filed Aug. 30, 1994, Ser. No. 298,935

Int. Cl.<sup>6</sup> B27G 13/00

U.S. Cl. 144—220

3 Claims



1. In log-slabbier chipper apparatus,

a log-supporting means having a station occupied by a log being processed;

a power-driven rotor head disposed adjacent one side of the station;

the rotor head and the log-supporting means being relatively movable in a direction parallel to the axis of the log supported by the log-supporting means;

at least one holder mounted on the rotor head;

first and second double-edged knives disposed on the holder with an end of the first knife adjacent an end of the second knife, and with one edge of the first knife facing in the same direction as one edge of the second knife, the one edge of the first knife being movable in a conical cutting path with rotation of the rotor head, and the one edge of the second knife being movable in a planar cutting path with relative movement of the rotor head parallel to the axis of the log;

a first knife-mounting assembly disposed on a first surface of the holder, the first knife-mounting assembly comprising a first counterknife fixedly mounted to the first surface of the holder, and a first knife clamp mounting the first knife on the first counterknife, the first knife being clamped between the first knife clamp and the first counterknife, the first knife clamp being provided with a first abutment surface disposed generally perpendicular to the first surface of the holder;

a second knife-mounting assembly disposed on a second surface of the holder, the second knife-mounting assembly comprising a second counterknife fixedly mounted to the second surface of the holder, and a second knife clamp mounting the second knife on the second counterknife, the second knife being clamped between the second knife clamp and the second counterknife, the second knife clamp being provided with a second abutment surface disposed generally perpendicular to the second surface of the holder; and



first and second adjusting screws threadedly received in the holder, each of the adjusting screws being adapted to exert adjusting pressure on the respective first and second abutment surfaces of the first and second knife clamps to slide the first and second knife clamps with respect to the first and second counterknives, respectively, thereby to adjust the positions of the aforesaid one edges of the first and second knives with respect to the holder.

5,439,040

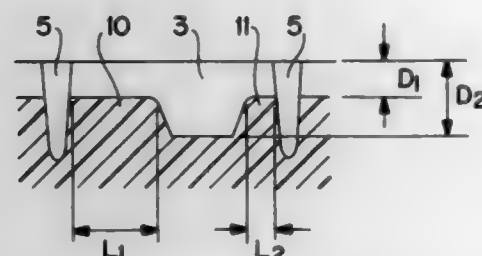
# **PNEUMATIC RADIAL TIRE INCLUDING A TREAD WITH TIE BARS**

Wako Iwamura, and Yasuhiro Narahara, both of Hyogo, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan  
Filed Dec. 16, 1993, Ser. No. 167,093

Claims priority, application Japan, Dec. 16, 1992, 4-353874  
Int. Cl.<sup>6</sup> B60C 11/13, 11/24

U.S. Cl. 152-209 R

4 Claims



1. A pneumatic tire having a tread including at least one straight groove of broad width extending circumferentially around the tread, said at least one straight groove of broad width being provided with a wear indicator, at least one straight groove of narrow width extending circumferentially around the tread, and a plurality of lug grooves extending transversely across the tread, the at least one straight groove of narrow width and the lug grooves combining to form a circumferential row of a first plurality of acute-angled blocks and a circumferential row of a second plurality of acute-angled blocks, each of the first plurality of blocks having a land angle  $\alpha_1$  at the tread surface that is greater than zero degrees but less than 70 degrees ( $0^\circ < \alpha_1 < 70^\circ$ ) to the circumferential direction of the tire, each of the second plurality of blocks having a land angle  $\alpha_2$  at the tread surface that is greater than zero degrees but less than 70 degrees ( $0^\circ < \alpha_2 < 70^\circ$ ) to the circumferential direction of the tire, a first tie bar and a second tie bar located between each of the first plurality of acute-angled blocks and an adjacent one of the second plurality of acute-angled blocks and disposed within the at least one straight groove of narrow width, each of said first tie bars having a circumferential length of  $L_1$  and a depth of  $D_1$ , said tread satisfying the following relationships:

$$L_1 \geq 0.7 \cdot A$$

$$0.1 \cdot D \leq D_1 \leq 0.5 \cdot D$$

$$D - 1.6 \text{ mm} \leq D_2 \leq (D - 1.6 \text{ mm}) \times 0.5$$

$$D_1 \leq D_2$$

wherein

$D_2$  is the depth of the at least one straight groove of narrow width between said first and second tie bars;  
 $D$  is the depth of the straight groove of broad width that is provided with the wear indicator;  
 $A$  is the circumferential length of the side of each of said first plurality of acute-angled blocks that faces the lug groove and which forms the land angle  $\alpha_1$  and wherein each of said second tie bars has a circumferential length of  $L_2$  and

a depth of  $D_2$ , said second tie bars satisfying the following relationship:

$$L_2 \leq 0.7 \cdot B$$

wherein  $B$  is the circumferential length of the side of each of said second plurality of acute-angled blocks that faces the lug groove and which forms the land angle  $\alpha_2$ .

5,439,041

# **VEHICLE TIRE INCLUDING LIGHTWEIGHT STIFFENING SPACER IN EACH SIDEWALL**

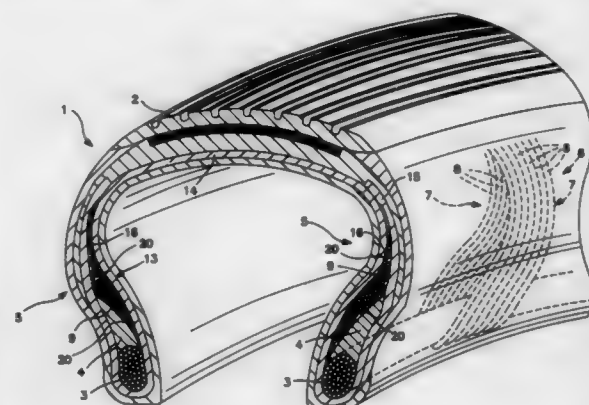
Karl J. Siegenthaler, Rome Ostia, Italy, assignor to Bridgestone/Firestone, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 958,066, Oct. 6, 1992, abandoned. This application Mar. 7, 1994, Ser. No. 207,523

Claims priority, application Italy, Oct. 8, 1991, TO91A0759  
Int. Cl.<sup>6</sup> B60C 9/02, 15/00, 15/06

U.S. Cl. 152-541

5 Claims



in the furnace during said step of dispensing waste gasses, combusting, within the furnace, combustible binder of the core, whereby portions of the core fall from the casting, and heat treating the casting.

5,439,046

# PROCESS FOR PRODUCING THIN SHEET BY CONTINUOUS CASTING IN TWIN-ROLL SYSTEM

Kenichi Miyazawa, Kimitsu; Takehiko Toh, Futtsu; Toshiaki Mizoguchi, Futtsu, and Yoshiyuki Ueshima, Futtsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan  
PCT No. PCT/JP92/01668, § 371 Date Aug. 18, 1993, § 102(e)  
Date Aug. 18, 1993, PCT Pub. No. WO93/11893, PCT Pub. Date Jun. 24, 1993

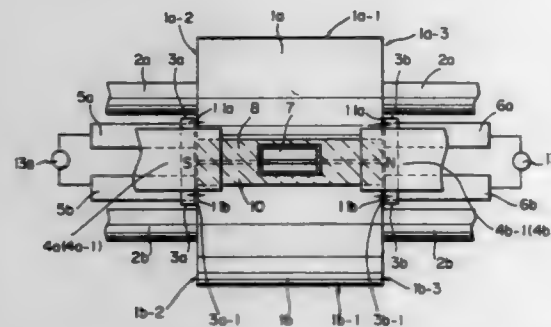
PCT Filed Dec. 18, 1992, Ser. No. 107,693

Claims priority, application Japan, Dec. 19, 1991, 3-337147

Int. Cl.<sup>6</sup> B22D 27/02, 11/06

U.S. Cl. 164—467

16 Claims



1. A process for producing a thin sheet by continuous casting in a twin-roll system, comprising:

- providing a pair of rotatable cooling rolls having respective shafts parallel to each other;
- providing a pair of side gates respectively disposed so as to confront end faces of the cooling rolls, thereby forming a pouring basin for a molten metal, wherein a first gap is provided between a first one of said side gates and respective confronting end faces of said cooling rolls, and a second gap is provided between a second one of said side gates and respective confronting end faces of said cooling rolls;
- supplying molten metal to said pouring basin;
- applying a DC magnetic field to the molten metal within the pouring basin portion in the vicinity of the side gates in a predetermined direction and, at the same time, providing an electrode in sliding contact with the end faces of said cooling rolls to allow direct current (DC) to flow into the molten metal in the vicinity of the side gates, thereby causing electromagnetic force to be generated in the molten metal in the vicinity of the side gates by said DC magnetic field and said direct current; and
- solidifying said molten metal with said cooling rolls to continuously cast a thin sheet of metal; whereby the molten metal is prevented from leaking out from said twin roll system in the vicinity of a corner portion of the molten metal by taking advantage of the electromagnetic force.

9. An apparatus for producing a thin sheet by continuous casting in a twin-roll system, comprising a pair of rotatable cooling rolls having respective shafts parallel to each other and a pair of side gates respectively provided so as to face end faces of the cooling rolls to form a pouring basin portion for a molten metal, wherein a gap is provided between end faces of said cooling rolls and said side gates in their respective faces confronting each other, a magnetic pole for applying a DC magnetic field is provided above and below said each side gate, and

an electrode for applying direct current is provided on said each end face of said cooling rolls.

5,439,047

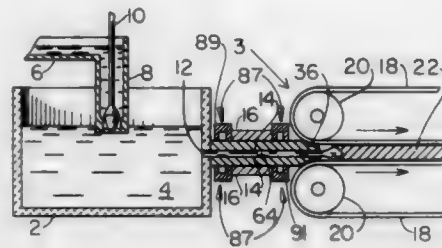
# HEATED NOZZLE FOR CONTINUOUS CASTER

C. Edward Eckert, 260 Lynn Ann Dr., New Kensington, Pa. 15068  
Filed Feb. 7, 1994, Ser. No. 192,250  
The portion of the term of this patent subsequent to Jul. 25, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> B22D 11/10

U.S. Cl. 164—471

23 Claims



1. A method of casting molten aluminum into solidified forms comprising:

- providing a body of molten aluminum;
- providing means for casting solidified aluminum from said molten aluminum;
- providing a nozzle comprised of titanium adapted to flow molten aluminum into said means for casting said solidified aluminum;
- electrically preheating said nozzle before introducing molten aluminum thereto;
- introducing molten aluminum through said electrically preheated nozzle to said casting area; and
- casting said molten aluminum into solidified forms.

5,439,048

# FIXED REGENERATIVE HEAT EXCHANGER

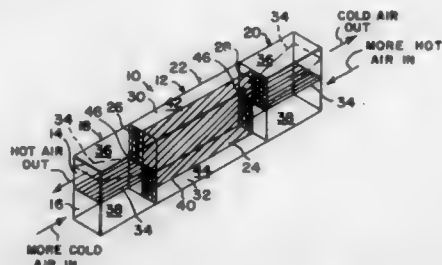
Ramli B. Osman, 221 Boon Lay Place #05-106, Singapore 2264, Singapore, and George Spector, 233 Broadway Rm 702, New York, N.Y. 10279

Filed May 16, 1994, Ser. No. 243,163

Int. Cl.<sup>6</sup> F23L 15/02; F28F 27/02

U.S. Cl. 165—4

1 Claim



1. A fixed regenerative heat exchanger which comprises:

- a heat exchanger unit which is divided into two compartments, horizontally at both end sections and vertically at a middle section;
- a heat exchange matrix housed in said middle section and
- two sets of flow-switching dampers, each said set located between one said end section and said middle section, so that in a first flow configuration, said two sets of dampers are arranged to allow hot air to flow through a left side of said middle section, while cold air flows through a right side of said middle section and in a second flow configuration, said two sets of dampers are arranged to allow hot air to flow through a right side of said middle section, while cold air flows through a left side of said middle section;

wherein each said end section includes a horizontal partition to divide it into two horizontal compartments; and wherein said middle section includes a vertical partition to divide it into two vertical compartments with said heat exchange matrix housed on both sides of said vertical partition and further wherein said horizontal partitions each include a hinge located at one side at said respective dampers, so that said horizontal partitions can be pivotable to adjust the cold air intake and the hot air intake.

5,439,049

# METHOD FOR CONTROLLING SLUGGISH HEATING AND COOLING SYSTEMS FOR BUILDINGS

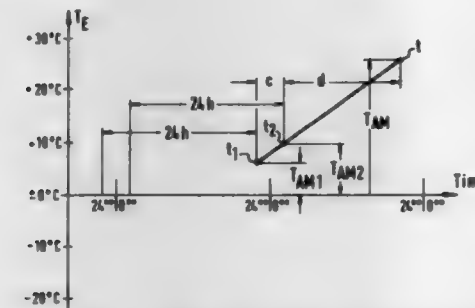
Walter Scheu, Bubenholdenstr. 65, 70469 Stuttgart, Germany  
Filed Aug. 3, 1993, Ser. No. 101,613

Claims priority, application Germany, Aug. 3, 1992, 42 25 622.4; Mar. 16, 1993, 43 09 946.7

Int. Cl.<sup>6</sup> F25B 29/00

U.S. Cl. 165—22

7 Claims



1. A method of controlling a sluggish heating and cooling systems for buildings that reacts due to a high heat capacity with delay to temperature changes, wherein a nominal interior temperature is represented as a function of an external temperature, said method comprising the steps of:

- measuring the exterior temperature;
- extrapolating an average projected temperature value of the exterior temperature based on previously measured exterior temperatures; and
- switching the heating and cooling system based on the average projected temperature value.

5,439,050

# MULTI-POISED CONDENSING FURNACE

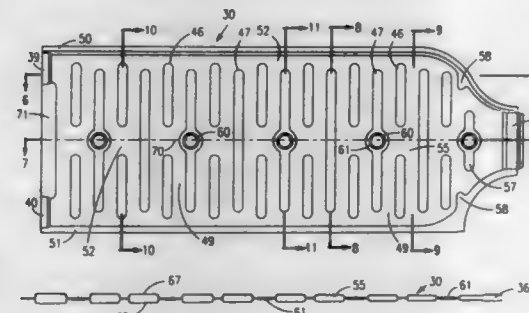
Timothy J. Waterman, Carmel; Larry D. Rieke, Zionsville, and Delbert G. Keys, Greenwood, all of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 9, 1993, Ser. No. 89,697

Int. Cl.<sup>6</sup> F28F 3/12

U.S. Cl. 165—170

26 Claims



1. A condensing heat exchanger stage suitable for use in a multi-poised condensing furnace that includes a heat exchanger housing that is elongated along a central axis,

said housing including top and bottom walls, a pair of opposed side walls and a pair of opposed end walls, an inlet means situated in one end wall and an outlet means situated in the other end wall whereby hot flue gases entering the housing through the inlet means are conducted through the housing and discharged through said outlet means,

a series of spaced-apart flow restrictors laterally-disposed inside said housing between the top and bottom walls to establish laterally-disposed flow passages between said restrictors, axially-disposed flow channels located between the ends of the restrictors and the top and bottom walls for interconnecting the laterally-disposed flow passages, and said top and bottom walls and said side walls of the housing diverging from said one end wall toward said other end wall whereby condensate formed in the housing flows from the inlet means toward the outlet means, regardless of the housing's orientation about its central axis.

5,439,051

# LATERAL CONNECTOR RECEPTACLE

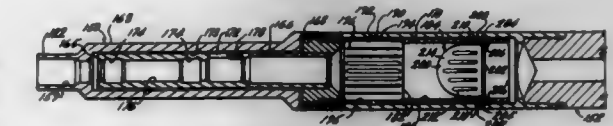
Brian S. Kennedy, Houston; Patrick Zimmerman, The Woodlands, and Alan B. Emerson, Houston, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jan. 26, 1994, Ser. No. 188,381

Int. Cl.<sup>6</sup> E21B 7/06

U.S. Cl. 166—50

26 Claims



1. A lateral connector receptacle (LCR) for completing a wellbore comprising:

- a cylindrical sub including an inner surface and an outer surface, said inner surface including spaced first, second and third sections and wherein;
- said first section includes a smooth seal bore;
- said second section includes orientation structure extending outwardly from said inner surface for orienting a device which is disposed within said cylindrical sub; and
- said third section includes mating structure for attachment to a run-in tool which delivers said cylindrical sub downhole into the wellbore; and
- wherein said sub has opposed first and second ends and wherein said first section is located near said first end, said third section is located near said second end and said second section is sandwiched between said first and third sections.

5,439,052

# PITLESS ADAPTER VALVE FOR WELLS

Earl F. Skinner, 4250 Murphy Rd., Kuna, Id. 83634

Filed Jan. 29, 1994, Ser. No. 189,035

Int. Cl.<sup>6</sup> E21B 34/16

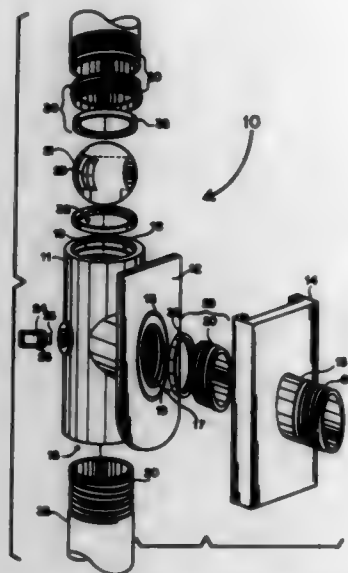
U.S. Cl. 166—88

14 Claims

- A pitless well adapter comprising:
- a housing having a well inlet port, a supply outlet port and a purge outlet port;
- coupling means for fluidly connecting the well inlet port to a well drop pipe;
- coupling means for fluidly connecting the supply outlet port to a supply pipe;
- coupling means for fluidly connecting the purge outlet port to a letdown pipe;
- valve means, being disposed within the housing, for selec-



tively diverting fluid from the well inlet port to the supply outlet port and from the well inlet port to the purge outlet



port, wherein the valve means comprises a three way ball valve.

5,439,053

# REINFORCING SLAT FOR INFLATABLE PACKER

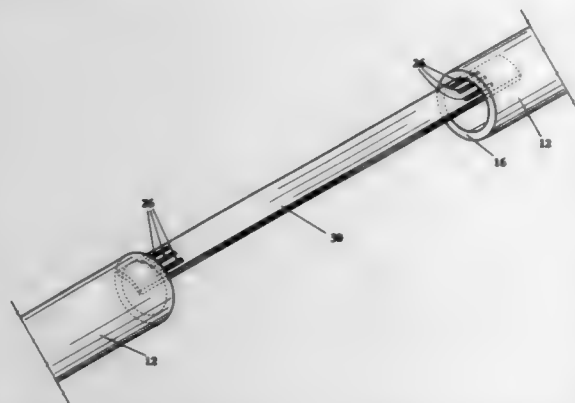
David M. Eslinger, Broken Arrow, and Robert M. Sorem, Tulsa, both of Okla., assignors to Dowell Schlumberger Incorporated, Houston, Tex.

Filed Jul. 13, 1993, Ser. No. 91,789

Int. Cl.<sup>6</sup> E21B 33/127

U.S. Cl. 166—187

4 Claims



1. A reinforcing slat for use in an inflatable packer comprising end portions having an inflatable bladder extending therebetween and reinforcing slats covering at least part of the bladder and extending into the end portions, wherein the slat is elongate and curved about its longitudinal axis and comprises perforations in the part thereof which enters the end portion and which bends around the end portion on inflation of the packer.

## METHOD FOR TREATING A MIXTURE OF GASEOUS FLUIDS WITHIN A SOLID CARBONACEOUS SUBTERRANEAN FORMATION

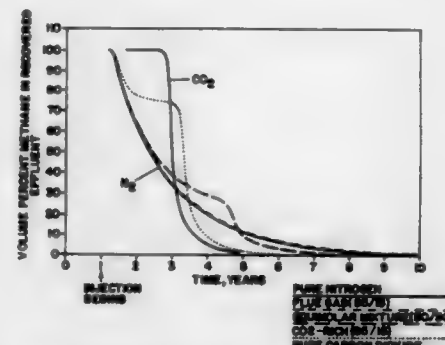
Joseph J. Chaback; Dan Yee, both of Tulsa, Okla.; Richard F. Volz, Jr., Littleton, Colo.; John P. Seidle, Tulsa, Okla., and Rajen Puri, Aurora, Colo., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 1, 1994, Ser. No. 222,743

Int. Cl.<sup>6</sup> E21B 43/16, 43/40, 47/00

U.S. Cl. 166—252

27 Claims



1. A method for fractionating a mixture of gaseous fluids within a coal seam, the method comprising the steps of:

- introducing a mixture of gaseous fluids comprising methane and a stronger adsorbing fluid component into the coal seam; and
- recovering a raffinate, enriched in methane, from the coal seam.

12. A method for recovering methane from a solid carbonaceous subterranean formation penetrated by an injection well and a production well, the method comprising the steps of:

- injecting a desorbing fluid, having a volume ratio of carbon dioxide to other injected desorbing fluid components equal to B, into the solid carbonaceous subterranean formation through the injection well;
- recovering an effluent comprising injected desorbing fluid and methane from the production well;
- monitoring the volume ratio of the carbon dioxide to other injected desorbing fluid components contained in the effluent recovered at the production well; and
- ceasing recovery of the effluent from the production well when the volume ratio of carbon dioxide to other injected desorbing fluid components within the effluent recovered at the production well is greater than 0.5 B and at least 70 percent of the methane available to the production well has been recovered.

5,439,055

## CONTROL OF PARTICULATE FLOWBACK IN SUBTERRANEAN WELLS

Roger J. Card; Jean-Pierre Feraud, and Paul R. Howard, all of Tulsa, Okla., assignors to Dowell, a Division of Schlumberger Technology Corp., Houston, Tex.

Continuation-in-part of Ser. No. 42,978, Apr. 5, 1993, Pat. No. 5,330,005. This application Mar. 8, 1994, Ser. No. 207,976

The portion of the term of this patent subsequent to Jul. 19, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> E21B 33/138, 43/267

U.S. Cl. 166—280

36 Claims

1. A method of treating a subterranean formation penetrated by a wellbore comprising the steps of:

- providing a fluid suspension including a mixture of a sand and a fibrous material, wherein the fibrous material is selected from a group consisting of natural organic fibers, synthetic organic fibers, glass fibers, carbon fibers, ceramic fibers, inorganic fibers, metal filaments and mixtures thereof;

pumping the fluid suspension including a mixture of the

particulate material and the fibrous material through the wellbore; and depositing the mixture of particulate material and fibrous material in the subterranean formation.

14. In a subterranean formation penetrated by a wellbore, a porous pack comprising a particulate material having a size in the range of 10 to 100 U.S. mesh in intimate mixture with a fibrous material, wherein the particulate material is a fracture proppant selected from a group consisting of sand, resin-coated sand, ceramic beads, glass microspheres, synthetic organic beads and sintered minerals.

5,439,056

## COAL SLAG SOLIDIFICATION OF DRILLING FLUID

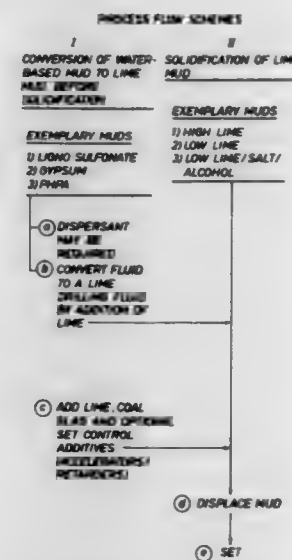
Kenneth M. Cowan, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 28, 1993, Ser. No. 84,660

Int. Cl.<sup>6</sup> E21B 33/138

U.S. Cl. 166—293

13 Claims



1. A method for solidifying a drilling fluid in a borehole, said drilling fluid being a lime mud or a non-lime mud which is converted to a lime mud by addition of lime, comprising: admixing coal slag with said drilling fluid to produce a cementitious slurry; displacing said cementitious slurry into said borehole; and allowing said cementitious slurry to solidify in situ.

5,439,057

## METHOD FOR CONTROLLING FLUID LOSS IN HIGH PERMEABILITY FORMATIONS

Jimmie D. Weaver, and Ronald E. Himes, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 29, 1994, Ser. No. 236,794

Int. Cl.<sup>6</sup> E21B 21/00, 43/25, 43/26

U.S. Cl. 166—295

12 Claims

1. A method for controlling fluid loss in permeable formations penetrated by a wellbore comprising:

- admixing an aqueous fluid with an effective amount of a polysaccharide polymer to viscosify said fluid and an effective amount of a crosslinking agent comprising at least one member selected from the group of borates, titanium IV ions, zirconium IV ions, aluminum III ions and antimony V ions, to create a crosslinked gel structure in said fluid;

shearing said crosslinked gel such that said gel is caused to break into particles having an average diameter in the range of from about 1 mm to about 10 mm;

slurrying said gel particles with an aqueous fluid having a

density similar to the density of the gel particles whereby a suspension of said particles is produced; introducing said suspension into said wellbore and into contact with a face of said permeable formation; and producing a filter cake comprised of said particles of gel upon the face of said permeable formation whereby fluid loss to said formation through said filter cake is substantially reduced.

5,439,058

## METHOD OF CLEANING AN OIL OR GAS WELL

Christophe A. Malbrel, New York, and Reza Hashemi, Sea Cliff, both of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Filed Mar. 11, 1994, Ser. No. 208,744

Int. Cl.<sup>6</sup> E21B 37/06, 43/28

U.S. Cl. 166—300

53 Claims

1. A method of cleaning an oil or gas well comprising: mixing a caustic with saline solution to precipitate hydroxide species; contacting the hydroxide species with contaminants in a well; and contacting a polymeric flocculant with the hydroxide species in the well to form a floc containing the hydroxide species and the contaminants.

5,439,059

## AQUEOUS GEL FLUIDS AND METHODS OF TREATING SUBTERRANEAN FORMATIONS

Phillip C. Harris, and Lewis R. Norman, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

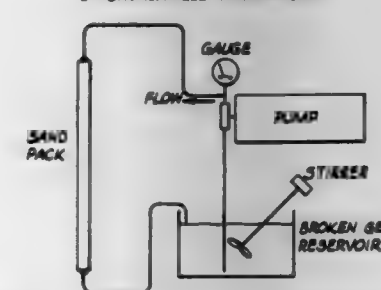
Filed Mar. 8, 1994, Ser. No. 209,381

Int. Cl.<sup>6</sup> E21B 43/267

U.S. Cl. 166—300

16 Claims

APPARATUS FOR TESTING FLOW OF BROKEN GEL THROUGH SAND



1. A method of fracturing a subterranean formation penetrated by a well bore to stimulate the production of hydrocarbons therefrom comprising:

- contacting the formation with a gel fluid under conditions effective to create at least one fracture in said subterranean formation, said gel fluid including: an aqueous liquid;

an organic gelling agent comprising at least one member selected from the group of guar, hydroxypropylguar, carboxymethylguar, carboxymethylhydroxyethylguar, carboxymethylhydroxypropylguar, hydroxyethylcellulose, carboxymethylhydroxyethylcellulose and carboxymethylhydroxypropylcellulose present in an amount sufficient to gel said aqueous liquid; and

at least about 0.05% by weight, based on the weight of said aqueous liquid, of a broken gel fragment stabilizer, said broken gel fragment stabilizer being a dialkyl sulfosuccinate that has dispersing properties sufficient to diminish the propensity of broken gel fragments formed when said gel fluid breaks to agglomerate and prevent the fragments from being entrapped in the formation upon recovery of the fluid from the formation;

breaking the gel fluid whereby broken gel fragments are produced in said aqueous liquid; and

recovering at least a portion of the broken gel fluid including at least a portion of said broken gel fragments formed when the gel fluid breaks, from the formation.

5,439,060

**TENSIONED RISER DEEPWATER TOWER**

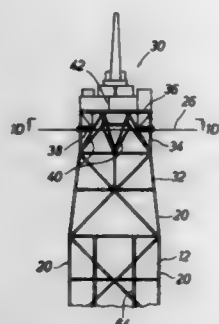
David A. Huete, Spring, Tex.; Peter W. Marshall, Stockfield, England; Denby G. Morrison, and Susan L. Smolinski, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 175,466, Dec. 30, 1993. This application Dec. 16, 1994, Ser. No. 359,328

Int. Cl.<sup>6</sup> E21B 17/01

U.S. Cl. 166—367

24 Claims



1. A tensioned riser deepwater platform for support of hydrocarbon wells of an offshore prospect, comprising:
  - a foundation secured to an ocean floor;
  - a topside facility above an ocean surface;
  - a vertically extending tower jacket secured to the foundation, supporting the topside facility, and defining a riser suspension corridor therebetween;
  - at least one substantially vertically extending production riser suspended in the riser suspension corridor and providing fluid communication between the wells and the topside facility; and
  - a riser support assembly supporting the risers near their upper ends to provide the principal load transfer between the riser and the tower jacket and thereby supporting the risers in tension.

5,439,061

**ADJUSTABLE SURFACE WELL HEAD CASING HANGER**

Norman Brammer, Fyvie Turiff; Calum J. B. Dinnes, Aberdeen; Stanley Hosie, Peterhead, and Trevor W. J. Park, Aberdeen, all of Scotland, assignors to ABB Vetco Gray Inc., Houston, Tex.

Filed Aug. 3, 1994, Ser. No. 285,577

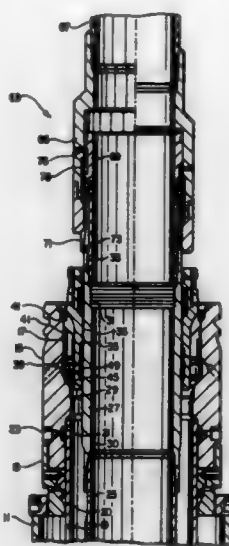
Int. Cl.<sup>6</sup> E21B 43/01

U.S. Cl. 166—368

23 Claims

1. An apparatus for supporting a string of casing extending between a subsea floor location and a surface casing head, the casing head having a bore with an internal load shoulder, comprising in combination:
  - a tubular inner member having an external seal area and a lower end which secures to an upper end of the casing;
  - an outer member having a bore which receives the inner member and an external downward facing shoulder which lands on the load shoulder of the casing head, the outer member having an external seal surface located above the downward facing shoulder;
  - a primary outer seal which seals between the bore of the casing head and the external seal surface of the outer member after the outer member has landed on the load shoulder;
  - engaging means between the inner and outer members for allowing the inner and outer members to be moved axially relative to each other to apply tension to the casing and

for supporting the casing in tension with the outer member landed on the load shoulder; and



inner seal means engaging the external seal area of the inner member and cooperating with the outer seal to seal an annulus surrounding the casing.

5,439,062

**HORSESHOE FOR TREATMENT OF LAME HORSES**

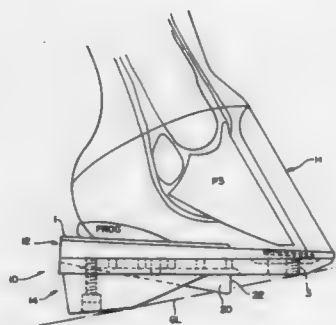
Eugene D. Ovnick, 286 Wishart Rd., Columbia Falls, Mont. 59912

Continuation-in-part of Ser. No. 947,140, Sep. 18, 1992, Pat. No. 5,253,715. This application Oct. 18, 1993, Ser. No. 138,952

Int. Cl.<sup>6</sup> A01L 1/00, 7/02

U.S. Cl. 168—14

41 Claims



37. A horseshoe comprising:
  - (a) a body member having a toe section and rearwardly extending branch members with heel sections at the ends thereof, said body member having a planar upper surface for being mounted on a pad member and a lower surface, and being provided with fullering grooves containing nail holes along the body member branches; and
  - (b) replaceable heel means carried by each of the heel sections of said horseshoe body member each having a raised ground contact means which extends downwardly to provide a ground contact surface sufficient to support a horse's foot with the heel thereof in an elevated position, the raised ground contact means of said heel means angling forwardly and upwardly toward said lower surface of said body member to provide a forwardly-extended ground contact surface; the raised ground contact means having a first forwardly declining ground contact surface generally parallel to the ground contact line of the horseshoe, and a second more sharply declining ground contact

surface extending forwardly from said first ground contact surface to a point of intersection with the lower surface of the shoe body member at about mid-shoe, said first ground contact surface being substantially flat and sufficiently elongated to support the heel of a hoof in an elevated position so as to relieve tension in the flexor tendon of a horse shod with said horseshoe.

5,439,063

**COMPRESSED-AIR SCREW OR BOLT TIGHTENER, ESPECIALLY AN IMPULSE OR A TORQUE SCREW OR BOLT TIGHTENER**

Heinz G. Anders, and Konrad K. Kettner, both of Aalen, Germany, assignors to Cooper Industries, Inc., Houston, Tex.

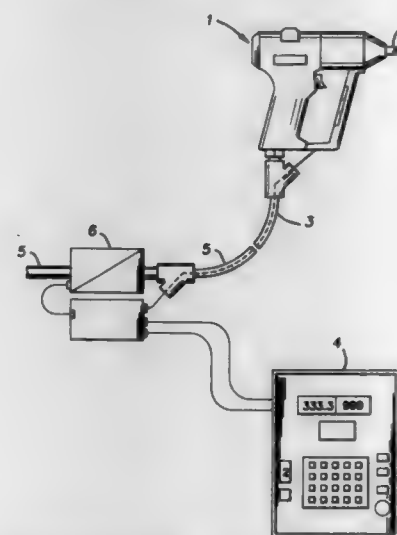
Filed Dec. 17, 1993, Ser. No. 169,463

Claims priority, application Germany Dec. 18, 1992, 4243068

Int. Cl.<sup>6</sup> B23Q 15/12

U.S. Cl. 173—177

6 Claims



1. A compressed-air screw and bolt tightener comprising:
  - a driving shaft for a screwing tool;
  - a driving motor, said driving motor driving said driving shaft;
  - a compressed-air supply line, said supply line providing compressed-air to operate said driving motor; and
  - a pressure-regulating control valve, said control valve constructed and arranged to switch said compressed-air supply to said driving motor on and off, said pressure-regulating control valve further constructed and arranged to regulate the kinetic energy of said driving motor by adjusting the pressure of the compressed-air supply to said driving motor.

5,439,064

**SYSTEM FOR CONTROLLED DRILLING OF BOREHOLES ALONG PLANNED PROFILE**

Bob J. Patton, Dallas, Tex., assignor to Patton Consulting, Inc., Dallas, Tex.

Continuation of Ser. No. 505,895, Apr. 6, 1990, abandoned, which is a continuation of Ser. No. 455,253, Dec. 22, 1989, Pat. No. 5,220,963. This application Oct. 9, 1992, Ser. No. 960,191

The portion of the term of this patent subsequent to Jun. 22, 2010, has been disclaimed.

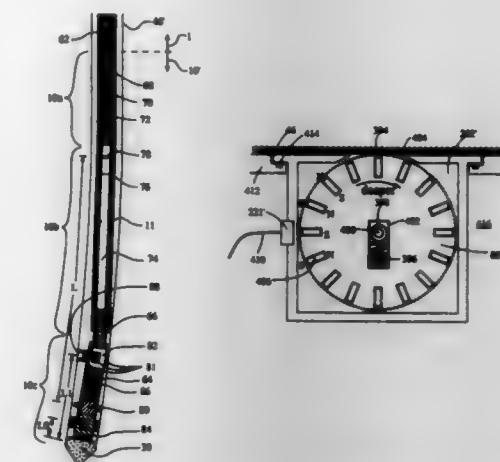
Int. Cl.<sup>6</sup> E21B 7/04, 44/00

U.S. Cl. 175—24

16 Claims

1. A system for drilling a borehole and determining depth of a drill bit within said borehole, comprising:
  - a drill string;

a drill bit carried on said drill string; means for rotating said drill bit; and



downhole means carried on said drillstring for obtaining downhole measured data for determining the depth of said drill bit within said borehole.

5,439,065

**ROTARY SIDEWALL SPONGE CORING APPARATUS**

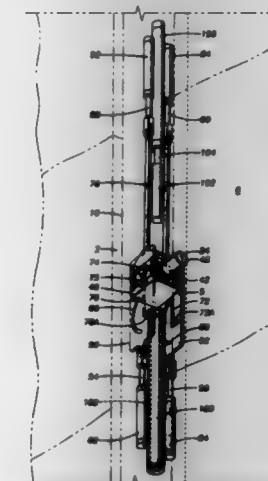
Daniel T. Georgi, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Sep. 28, 1994, Ser. No. 314,247

Int. Cl.<sup>6</sup> E21B 49/00

U.S. Cl. 175—59

9 Claims



1. An apparatus for rotary drilling at least one core sample from the wall of a wellbore penetrating an earth formation, the apparatus comprising:
  - an elongated housing, adapted for traversing the wellbore;
  - a bit box, rotatably mounted within the housing;
  - a rotary coring drill bit rotatably and extendibly mounted within the bit box;
  - a motor, disposed within the housing, rotationally coupled to the bit;
  - a first linkage, disposed within the housing, the first linkage cooperatively attached to the bit box to rotate the bit box so that the bit moves from being substantially in axial alignment with the housing to being substantially perpendicular to the housing;
  - a second linkage rotatably coupled to the bit and movably coupled to the bit box, the second linkage for extending



- the bit axially out of the bit box, so that force is applied by the bit against the wall of the wellbore;
- an elongated receiving barrel disposed within the housing on one side of the bit box, the barrel substantially in axial alignment with the housing;
- an elongated, core extracting plunger disposed within the housing on the other side of the bit box, the plunger extendible to push the at least one core sample out of the bit into the receiving barrel when the bit box is positioned so that the bit is substantially in axial alignment with the housing; and
- a sponge liner, disposed within the receiving barrel, the sponge liner substantially filling an annular space between the inner wall of the barrel and the external diameter of the at least one core sample, the sponge liner substantially in hydraulic communication with the core sample, so that fluids escaping from pore spaces within the at least one core sample are substantially absorbed by the sponge liner.
9. A method of obtaining at least one core sample from the wall of a wellbore penetrating an earth formation, the method comprising the steps of:
- a) positioning a rotary sidewall coring apparatus adjacent to a formation of interest, the apparatus comprising a coring bit and a core receiving barrel having sufficient volume to store a plurality of core samples, the barrel comprising a sponge liner substantially filling an annular space between the core samples and an inner wall of the chamber, whereby fluids which escape from the core sample are substantially absorbed by the sponge liner;
  - b) drilling the core sample by activating the coring bit;
  - c) moving the core sample into the storage chamber.

5,439,066

# METHOD AND SYSTEM FOR DOWNHOLE REDIRECTION OF A BOREHOLE

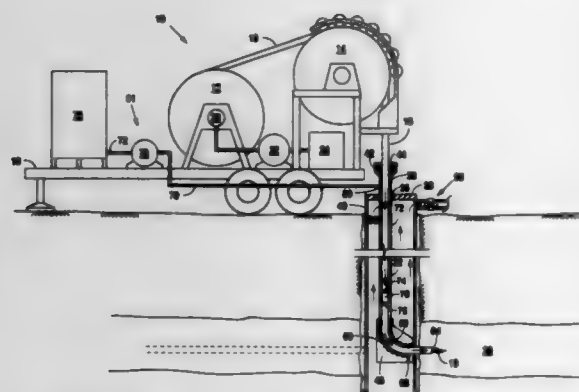
Thomas C. Gipson, Cisco, Tex., assignor to Fleet Cementers, Inc., Cisco, Tex.

Filed Jun. 27, 1994, Ser. No. 266,011

Int. Cl.<sup>6</sup> E21B 7/04

U.S. Cl. 175—61

11 Claims



1. A system for translating the orientation of coil tubing from a generally vertical orientation to a generally horizontal orientation inside a well borehole and downhole of wellhead comprising:
- means for suspending a first conduit inside said well borehole, said suspending means attached at a top section of said first conduit near said wellhead;
- means for injecting a length of coil tubing into said first conduit;
- means for bending said coil tubing from said vertical orientation to said horizontal orientation, said bending means attached to a downhole section of said first conduit; and
- means for hydraulically urging said coil tubing through said bending means, wherein said means for hydraulically

- urging said coil tubing through said bending means further comprises:
- a hydraulic power source in fluid communication with an interior section of said first conduit;
- an upper packer affixed to said top section of said first conduit for hydraulic sealing engagement against an outer surface of said coil tubing;
- an outer coil tubing seal affixed to said outer surface of said coil tubing downhole of said upper packer, said outer coil tubing seal in hydraulic sealing engagement with an inner surface of said first conduit; and
- an opening in said first conduit intermediate of said upper packer and said outer coil tubing seal, said opening for hydraulic fluid in said hydraulic power source to communicate with said interior section of said first conduit between said upper packer and said outer coil tubing seal.

5,439,067

# ROCK BIT WITH ENHANCED FLUID RETURN AREA

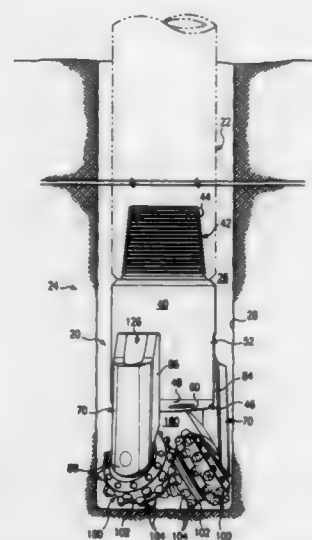
Alan D. Huffstutler, Grand Prairie, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 8, 1994, Ser. No. 287,457

Int. Cl.<sup>6</sup> E21B 10/18, 10/20

U.S. Cl. 175—339

20 Claims



1. A rotary cone drill bit for forming a borehole, comprising:
- a one-piece bit body having an upper portion adapted for connection to a drill string for rotation of said drill bit;
- a number of support arms attached to said bit body and extending opposite from said upper portion, each of said support arms having an inside surface with a spindle connected thereto, each spindle projecting generally downwardly and inwardly with respect to its associated support arm;
- a number of cutter cone assemblies equal to said number of support arms and mounted respectively on one of said spindles; and
- said bit body having a lower portion with a generally convex exterior surface formed thereon to provide enhanced fluid flow between said cutter cone assemblies and said lower portion of said bit body.

5,439,068

# MODULAR ROTARY DRILL BIT

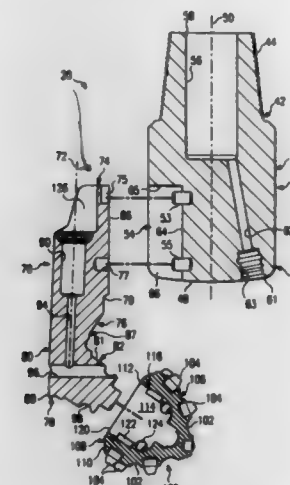
Alan D. Huffstutler, Grand Prairie, and Wesley P. Dietz, DeSoto, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 8, 1994, Ser. No. 287,446

Int. Cl.<sup>6</sup> E21B 10/08, 10/24

U.S. Cl. 175—356

23 Claims



1. A rotary cone drill bit for forming a borehole, comprising:
- a one-piece bit body having an upper portion adapted for connection to a drill string for rotation of said drill bit;
- said bit body having a longitudinal axis corresponding approximately with the projected axis of rotation of said drill bit;
- a number of support arms attached to said bit body and extending opposite from said upper portion each of said support arms having an inside surface with a spindle connected thereto, each spindle projecting generally downwardly and inwardly with respect to its associated support arm;
- each of said support arms having a longitudinal axis extending substantially parallel with the longitudinal axis of said bit body;
- a number of cutter cone assemblies equal to said number of support arms with each cutter cone assembly mounted respectively on one of said spindles;
- said bit body having a lower portion with a generally convex exterior surface formed thereon to provide enhanced fluid flow between said cutter cone assemblies and said lower portion of said bit body; and
- said bit body having a middle portion disposed between said upper portion and said lower portion of said bit body with a number of pockets formed in the exterior of said middle portion for attaching said support arms to said bit body with said number of pockets equal to said number of support arms.
12. A support arm and cutter cone assembly for a rotary cone drill bit having a bit body comprising:
- said support arm having a longitudinal axis extending there-through and an upper end, an inside surface, an exterior surface with a shirttail surface formed as a part thereof and a bottom edge with said inside surface and said shirttail surface contiguous at said bottom edge;
- said support arm having a first side and a second side extending from said inside surface;
- the dimensions of said upper end and the adjacent portions of said inside surface and said first side and said second side selected to allow securing a portion of said support arm within a pocket formed in said bit body;
- a spindle attached to said inside surface near said bottom edge and angled downwardly and inwardly with respect to said support arm;
- said cutter cone assembly having an opening and a chamber

- extending therefrom for mounting said cutter cone assembly on said spindle; and
- means provided on said inside surface of said support arm for alignment and positioning of said support arm within said pocket during fabrication of said drill bit.

5,439,069

# NESTED CART PUSHER

Jimmy A. Beeler, 2867 Cedar St., Sutter, Colo. 95982

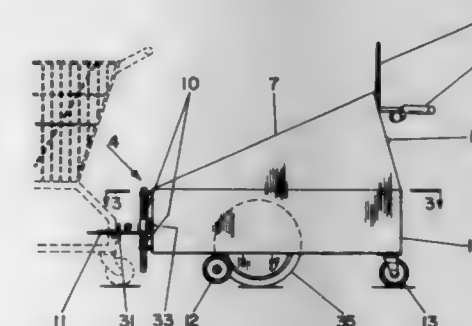
Continuation of Ser. No. 932,226, Nov. 27, 1992, abandoned.

This application Mar. 18, 1994, Ser. No. 214,671

Int. Cl.<sup>6</sup> B62D 5/04

U.S. Cl. 180—11

5 Claims



1. A vehicle for moving a plurality of nestable shopping carts while in a nested position, each cart having a plurality of wheels and a frame which includes a pair of vertically extending rear support members which are laterally spaced apart, the vehicle comprising:
- a main body portion;
- a centrally located drive wheel extending below said body portion;
- a motor connected to said drive wheel for propelling said vehicle;
- a caster for supporting a rearward end of said vehicle;
- a wheel assembly located adjacent to and forwardly of said drive wheel, said wheel assembly including a pair of wheels and means for raising and lowering said pair of wheels into and out of engagement with a supporting surface for moving said drive wheel into and out of engagement, respectively with respect to the supporting surface; and,
- automatic connecting means for connecting said vehicle to a rearmost one of the nested shopping carts, said connecting means including a pair of laterally spaced latch members attached by bracket means to a forward end of said vehicle, each latch member having a U-shaped guide bar with rearwardly extending inner and outer legs, a latching hook overlying an outer leg of the guide bar, the latching hook having a longitudinally extending portion which is pivotally mounted at a rearward end and a hook portion extending outwardly and rearwardly from a forward end of said longitudinally extending portion, said hook portion having a forwardly facing surface for engaging a respective one of the vertically extending rear support members of the cart and a rearwardly facing surface for retaining the respective rear support member, spring means for biasing the latching hook into a latching position, and a separate cable connected at one end to the forward portion of each hook and at an opposite end to a common actuator ring for permitting simultaneous movement of the latching hooks into a release position.

5,439,070

**HYDRAULIC POWER STEERING APPARATUS**

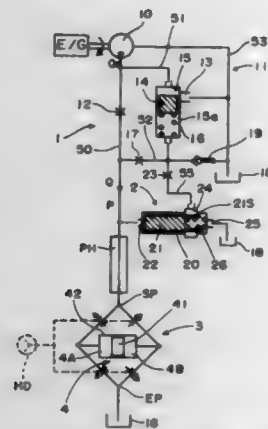
Kyosuke Haga, Anjo; Mikio Suzuki, Hekinan; Yoshiharu Inaguma, Nagoya; Kenichi Fukumura; Hideya Kato, both of Aichi, and Katsuhisa Mori, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan  
Filed Jun. 11, 1993, Ser. No. 75,307

Claims priority, application Japan, Jun. 12, 1992, 4-179108; Jun. 15, 1992, 4-155251; Sep. 29, 1992, 4-283829; Oct. 20, 1992, 4-281676; Oct. 22, 1992, 4-284776

Int. Cl.<sup>6</sup> B62D 5/08

U.S. Cl. 180—141

10 Claims



1. A power steering apparatus having a hydraulic pump for supplying a pressurized fluid, an assist force generation mechanism hydraulically connected to said pump through a supply passage to generate an assist force in response to rotation of a steering wheel, said assist force generation mechanism having a characteristic that a pressure upstream of said assist force generation mechanism increases when said steering wheel is rotated, wherein said power steering apparatus further comprises:

- a metering orifice disposed in said supply passage;
- a bypass passage connected to said supply passage upstream of said metering orifice for bypassing a part of the pressurized fluid from said supply passage to a reservoir or an intake port of said pump;
- a flow control valve disposed in said bypass passage and having a movable spool which is urged by biasing means in a control chamber and is moved in response to a pressure difference across said metering orifice to control the flow rate of the pressurized fluid flowing through said bypass passage;
- a drain passage connected between said control chamber and said reservoir; and
- a drain valve disposed in said drain passage for allowing the flow of the pressurized fluid from said control chamber to said reservoir through said drain passage when the pressure upstream of said assist force generation mechanism is low and for decreasing the flow of the pressurized fluid when the pressure upstream of said assist force generation mechanism increases.

5,439,071

**CHILD'S TOY VEHICLE HAVING A SAFETY DEVICE**

José M Rodríguez-Ferre, Poligono Industrial Derramador, Albacete a/n-03440-IBI, Spain

Filed Dec. 16, 1993, Ser. No. 167,091

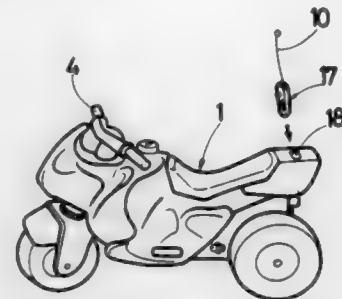
Int. Cl.<sup>6</sup> B60T 7/16

U.S. Cl. 180—167

5 Claims

1. A toy vehicle having a safety device, said toy vehicle including a rolling structure having a seat, an electric motor, a power supply formed by wet or dry wet cells and a handlebar or steering wheel, said safety device comprising:

a receiver circuit powered by the power supply and fixed to said toy vehicle;  
an emitter device remote from said toy vehicle;  
a first pushbutton formed on said emitter device for emitting an electromagnetic signal and enabling said receiver circuit;  
a second pushbutton arranged in series at an outlet of said receiver circuit; and



a functional selection switch formed on said toy vehicle in electrical connection between the power supply and said second pushbutton, said functional selection switch including a receiver circuit supply position in which the toy vehicle is operable only if said first pushbutton is actuated, and a receiver circuit interrupt position in which the toy vehicle is operable independently of actuation of said first pushbutton, wherein said receiver circuit is disabled in the receiver circuit interrupt position and said receiver circuit is enabled in the receiver circuit supply position.

5,439,072

**MODULAR LADDER SYSTEM**

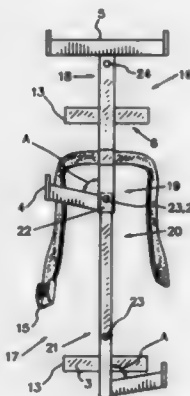
Joseph R. Jenkins, Jr., 12203 Becontree Dr., Baton Rouge, La. 70810

Filed Mar. 17, 1994, Ser. No. 214,835

Int. Cl.<sup>6</sup> E06C 1/10

U.S. Cl. 182—100

6 Claims



1. A portable ladder module for climbing trees, comprising:
- (a) a hollow, primary support member having an upper end and a lower end;
  - (b) a secondary support member, telescopically slidable within said primary support member between a retracted position and an extended position, having an upper end and a lower end;
  - (c) a bottom step attached to said lower end of said secondary support member;
  - (d) a top step attached to said upper end of said primary support member, wherein said top step is sufficiently wide to accept both shoes of a climber;
  - (e) an intermediate step attached to said primary support member between said bottom step and said top step;
  - (f) locking means operatively disposed between said primary

support member and said secondary support member for selectively locking the position of said secondary support member in either a retracted position or an extended position relative to said primary support member;  
(g) means attached to said primary support member and said secondary support member for stabilizing said ladder module against said tree; and  
(h) means attached to said primary support member for holding said ladder module to said tree.

5,439,073

**FOLDAWAY SPLAY-LEGGED STAND**

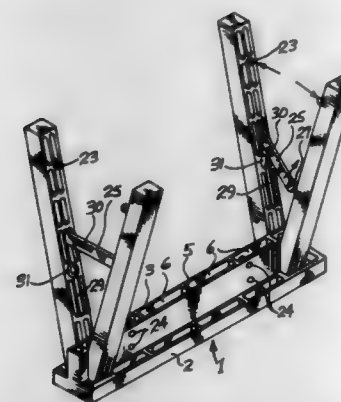
Richard Johnson, P.O. Box 8, Greenbank, Wash. 98253

Filed Oct. 30, 1992, Ser. No. 968,776

Int. Cl.<sup>6</sup> F16M 11/00

U.S. Cl. 182—153

5 Claims



1. In a foldable splay-legged stand including a crosspiece and pairs of legs adjacent to opposite ends of the crosspiece, respectively, the improvement comprising the crosspiece having a slot elongated transversely of the length of the crosspiece, a pivot pin extending transversely of the length of the crosspiece and through said slot, connecting the legs at opposite sides of the crosspiece and being slidable lengthwise of said slot and enabling the legs to be swung into parallel relation to the crosspiece, each leg having a catch pin spaced a substantial distance lengthwise of the leg from its pivot pin, and the crosspiece having a socket complementary to said catch pin and located to receive said catch pin when the leg is swung into parallelism with the crosspiece to hold the leg in folded relationship to the crosspiece.

5,439,074

**FOLDABLE AND PORTABLE TREE STAND**

Christopher L. Trout, and Karl K. Trout, both of 16 Katherine Ave., Ocean View, N.J. 08230

Filed Jun. 30, 1994, Ser. No. 269,012

Int. Cl.<sup>6</sup> A45F 3/26

U.S. Cl. 182—187

1 Claim

1. A foldable and portable tree stand for providing a stationary support on which a user may sit when hunting and scouting game comprising, in combination:

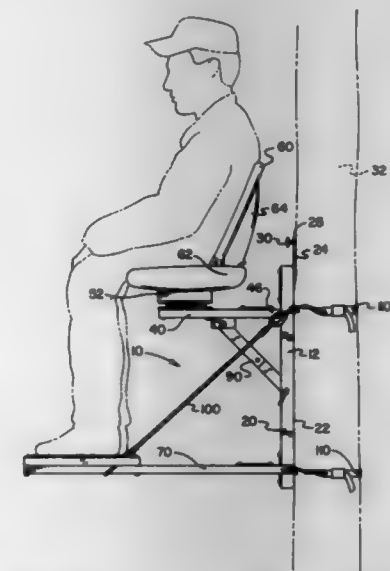
- a rigid base section having two spaced and parallel support rails each having a first end and a second end, a first cross beam coupled between the first ends, a second cross beam coupled between the second ends, with the coupling between the support rails and cross beams defining a rectangular configuration having a support surface and a coupling surface, and an elongated and rigid hook with the hook having a curved end removably secured around the first cross beam and a base end extended upwards therefrom;
- a T-shaped screw disposed through the base end of the hook with the screw adapted for securing the base section to a tree such that its first cross beam is positioned above its second cross beam and its coupling surface is in contact

with the tree, thereby placing the base section in an operable position;

a rigid pedestal having two spaced and planarly aligned upper side rails each having a free end and a base end, the base ends thereof each pivotally coupled to a separate support rail of the base section at a location below the first cross beam, an inner cross beam coupled between the upper side rails near the base ends thereof, and an outer cross beam with a swivel plate secured thereupon coupled between the upper side rails near the free ends thereof, the pedestal adapted to be pivotally positioned in proximity and essentially parallel with the support surface of the base section in a stowed position, the pedestal further adapted to be pivotally positioned at a location perpendicular to the support surface of the base section in an operable position;

a chair having a padded seat and pivotable back rest with the seat pivotally coupled to the swivel plate of the pedestal, thereby enabling the chair to swivel, and the back rest adapted to be pivotally positioned in proximity and essentially parallel with the seat in a stowed position, the back rest further adapted to be pivotally extended positioned upwards from the seat in an operable position for sitting;

a rigid foot rest having two spaced and parallel lower side rails each having a free end and a base end with the base



ends thereof each pivotally coupled to a separate support rail of the base section at a location below the pedestal, a rectangular foot grate coupled between the lower side rails at the free ends thereof, and a cross beam coupled between the lower side rails at a location between the foot grate and the base ends thereof, the foot rest adapted to be pivotally positioned in proximity and essentially parallel with the coupling surface of the base section in a stowed position when the base section is de-coupled from a tree, the foot rest further adapted to be pivotally positioned at a location perpendicular to the support surface of the base section in an operable position;

a pair of rigid, elongated, and spaced braces each formed of two telescopically and adjustably mated segments, each brace further having one end pivotally coupled a separate upper side rail of the pedestal and the other end extended downwards therefrom and coupled to a separate support rail of the base section, the pair of braces adapted to be positioned in a retracted configuration against the support surface of the base section when the pedestal is placed in a stowed position, the braces further adapted to be positioned in an extended orientation when the pedestal is placed in an operable position;

a pair of spaced and flexible bracing cables, each bracing cable having an upper end removably coupled to a sup-



port rail of the base section near a separate base end of the pedestal and a lower end extended through the foot grate and removably and adjustably coupled to a lower side rail of the foot rest, with the pair of bracing cables held taut when the foot rest is placed in an operable position and held loose when the foot rest is placed in a stowed position; and

a pair of adjustable cinch straps with one cinch strap adapted to be removably coupled between the support rails of the base section near the first cross beam thereof in a closed loop configuration about a tree and the other cinch strap adapted to be removably coupled between the support rails of the base section near the lower cross beam thereof in a closed loop configuration about the same tree, the same cinch straps each removably coupled to a support rail of the base section and thereby defining a pair of securement loops adapted for receiving the shoulders of a user therein for carrying the base section and pedestal, chair, and foot rest in their stowed positions when decoupled from a tree.

5,439,075

**ELEVATOR ACTIVE SUSPENSION SYSTEM**

Clement A. Skalski, Avon; John K. Salmon, South Windsor; Boris G. Traktovenko, Avon, and Richard L. Hollowell, Amston, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

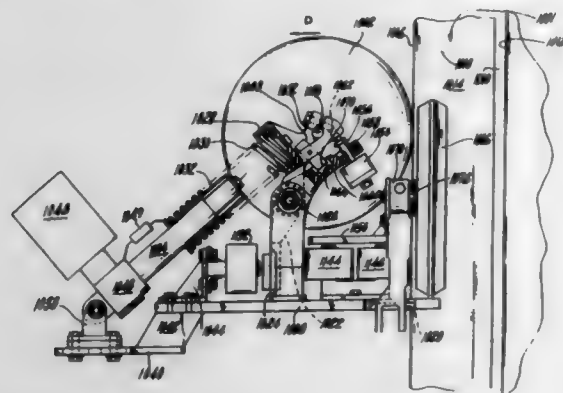
Division of Ser. No. 76,501, Jun. 11, 1993, Pat. No. 5,322,144, which is a continuation of Ser. No. 731,292, Jul. 16, 1991, which is a continuation-in-part of Ser. No. 555,130, Jul. 18, 1990. This application Mar. 9, 1994, Ser. No. 208,416

The portion of the term of this patent subsequent to Jun. 21, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B66B 7/02

U.S. Cl. 187—410

5 Claims



1. An elevator cab assembly guidance system for guiding movement of a cab assembly over elevator guide rails in a hoistway, said guidance system comprising:

- a guide roller assembly mounted on said cab assembly for movement toward and away from an associated one of the guide rails, said guide roller assembly comprising a guide roller mounted thereon for rolling engagement with the guide rail;
- stop means operable to limit the extent of movement of said guide roller in a direction away from the guide rail; and
- adjustment means connected to said guide roller assembly and operable to prevent prolonged contact between said guide roller assembly and said stop means during operation of the elevator.

5,439,076

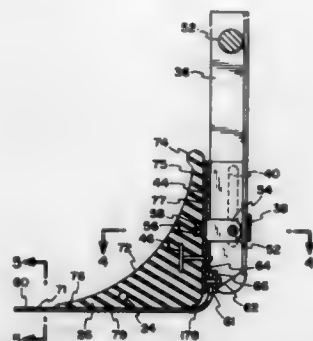
**EMERGENCY BRAKE DEVICE FOR TRUCKS AND THE LIKE**

George A. Percy, Jr., Bel Air, Md., assignor to P.C.T. Inc., Joppa, Md.

Filed Apr. 19, 1994, Ser. No. 229,897  
Int. Cl.<sup>6</sup> B60T 1/00

U.S. Cl. 188—4 R

27 Claims



1. An emergency brake device for stopping the rear wheels of a vehicle, comprising:

- a wedge assembly including a resilient solid wedge, said wedge assembly for operably securing to an underside of the vehicle ahead of a rear wheel, said wedge being adapted to deform to absorb impact forces when engaging with the wheel and the ground during use;
- said wedge assembly being movable from a stored position to an operative position such that said wedge is disposed between the rear wheel and the ground thereby to stop the vehicle;
- said wedge having an arcuate surface for engaging against the wheel when said wedge assembly is in said operative position, said arcuate surface being adapted to deform to the shape of the wheel for maximum contact; and
- said arcuate surface including a longitudinal beaded projection extending across the width of said wedge at an upper end portion of said wedge such that said projection engages the wheel when said wedge assembly is in said operative position.

5,439,077

**BRAKE DISK FOR WHEEL DISK BRAKES**

Xaver Wirth, Munich, Germany, assignor to Knorr-Bremse AG, Munich, Germany

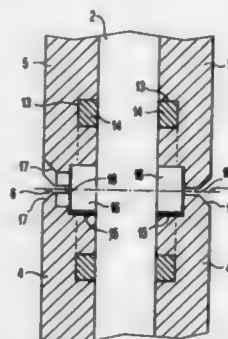
Filed Mar. 18, 1994, Ser. No. 214,692

Claims priority, application Germany, Mar. 19, 1993, 43 08 910.0

Int. Cl.<sup>6</sup> F16D 55/04

U.S. Cl. 188—71.4

15 Claims



1. A brake disk for a disk brake comprising:  
a friction ring having at least two friction ring segments and a first side to be acted upon and a second side not to be acted upon by at least one brake shoe;

ring grooves opening with respect to at least one side of said friction ring and bridging junctures of adjacent ends of said friction ring segments;  
said ring grooves having coaxial walls along an axis of said friction ring and having a depth less than an axial width of said ring segments; and  
a ring body in each of said ring grooves and bridging said junctures for preventing at least radial movement of said ring segments relative to each other.

5,439,078

**PNEUMATICALLY OPERATED SLIDING-CALIPER DISK BRAKE FOR COMMERCIAL VEHICLES**

Haas Baumgartner, Moosburg, and Dieter Bieker, Munich, both of Germany, assignors to Knorr-Bremse AG, Munich, Germany

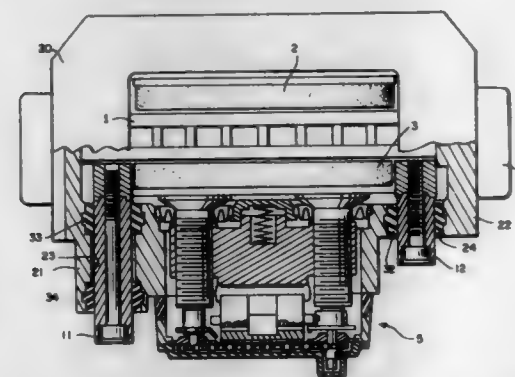
Filed May 2, 1994, Ser. No. 235,883

Claims priority, application Germany, May 4, 1993, 43 14 719.4

Int. Cl.<sup>6</sup> F16D 65/14

U.S. Cl. 188—73.45

16 Claims



1. A pneumatically operated sliding-caliper disk brake for commercial road vehicles, including a sliding-caliper, which reaches around a brake disk, and first and second guide bearings slidably mounting said sliding-caliper on a correspondingly first and second guide members of a vehicle-fixed brake anchor plate to move said sliding-caliper in the axial direction of the brake disk, and further comprising:

- a first elastomer guide bushing in said first guide bearing and having a bearing surface of a first length and an interior bore having a transition fit to the first guide member; and
- a second elastomer guide bushing in the second guide bearing and having a bearing surface of a second length substantially shorter than said first length and an interior bore having a defined play with the second guide member compared to said transition fit.

5,439,079

**AUXILIARY DRUM-BRAKE DEVICE WITH IMPROVED AUTOMATIC CLEARANCE ADJUSTMENT**

Jean Charles Maligne, Aubervilliers, France, assignor to Bendix Europe Services Techniques, Drancy, France

PCT No. PCT/FR93/00504, § 371 Date Jul. 30, 1993, § 102(e) Date Jul. 30, 1993, PCT Pub. No. WO93/25826, PCT Pub. Date Dec. 23, 1993

PCT Filed May 25, 1993, Ser. No. 90,057

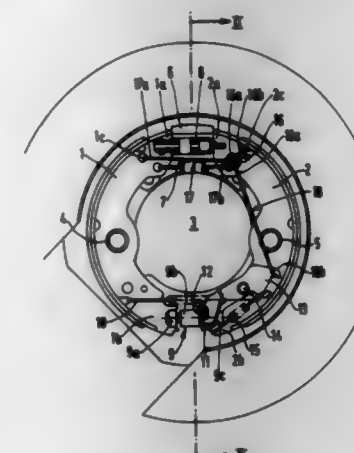
Claims priority, application France, Jun. 5, 1992, 92 06949  
Int. Cl.<sup>6</sup> F16D 65/56

U.S. Cl. 188—79.56

6 Claims

1. A drum-brake device comprising:  
a clevis;  
first and second arcuate brake shoes having respective first and second ends facing one another;  
an expander fastened to the clevis and actuatable to move apart the first ends of the two shoes;  
a spacer of which the length is adjusted by a screw element

and which holds the second ends of the two shoes at a distance from one another; and  
regulation means for regulating the length of the spacer in dependence on the wear of the shoes, said means comprising a toothed wheel fastened to the screw element, a rocking lever which carries a click and is pivoted on the second shoe and which is capable of turning said toothed wheel to lengthen the spacer, and a linkage for actuating the rocking lever, said linkage comprising a second lever



pivoted at a point on the second shoe and two rods connected with said second lever, the first rod having a first end pivoted on a support point and a second end pivoted on said second lever to move the latter in the event of the actuation of the expander, and the second rod having a first end pivoted on the second lever and a second end pivoted on the rocking lever to transmit to the latter the motion of the second lever, characterized in that the support point is on the first shoe whereas the first and second shoes are mounted to float on the clevis.

5,439,080

**PITCH-REINFORCED CARBON FIBER BRAKE DISC AND PYROLYTIC CARBON/RESIN-REINFORCED CARBON FIBER FRICTION PADS**

Ichiro Haneda; Tatsuyoshi Sakurai; Mashiyo Yanagisawa, all of Ueda; Kohei Okuyama, Kanagawa; Kazuo Niwa, and Toshihiro Fukagawa, both of Sakaide, all of Japan, assignors to Nissin Kogyo Co., Ltd., Ueda and Mitsubishi Kasei Corp., Tokyo, both of Japan

Division of Ser. No. 966,954, Oct. 27, 1992, Pat. No. 5,398,784.  
This application Jul. 28, 1994, Ser. No. 281,130

Claims priority, application Japan, Oct. 29, 1991, 3-283257; Oct. 29, 1991, 3-283259; Oct. 29, 1991, 3-283260; Oct. 29, 1991, 3-283261

Int. Cl.<sup>6</sup> F16D 69/00

U.S. Cl. 188—218 XL

4 Claims

1. A disc brake for a vehicle comprising a disc and pads, said disc being rotatable integrally with wheels and the pads which are brought into friction engagement with said disc;  
wherein said disc comprises a baked carbon fiber reinforced carbon composite comprising dispersed bundles of short carbon fibers impregnated with a reinforcing material of primarily a pitch, said pads comprising a baked carbon fiber reinforced carbon composite comprising dispersed bundles of short carbon fibers impregnated with a reinforcing material of primarily a pyrolytic carbon and a thermosetting resin.

5,439,081

**COMPRESSED COOLANT HYDRAULIC BRAKE ROTOR**

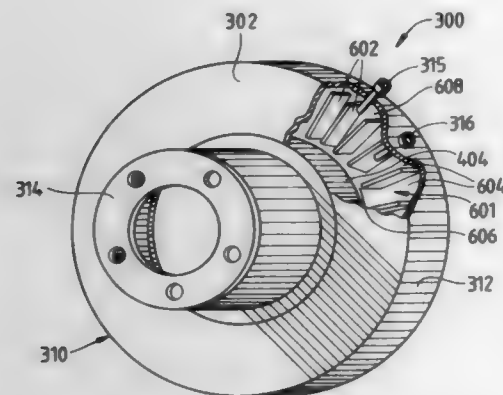
Thomas V. Glass, 200 Glynn Dr., Birmingham, Ala. 35215

Filed Aug. 31, 1994, Ser. No. 299,825

Int. Cl.<sup>6</sup> F16D 65/78

U.S. Cl. 188—264 CC

13 Claims



1. A rotor for an automotive hydraulic brake system which presses a brake pad against a rotating surface mounted to an axle of an automobile, wherein the rotor comprises:

- a first and a second circular flat plate having an inner circumference and an outer circumference, wherein a plate width is defined therebetween;
- a plurality of supporting fins having a fin length smaller than said plate width and a fin width, wherein said fins connect said first and second circular flat plates in a spaced cylindrical relationship defined by said fin width, and wherein said fins are fixedly attached between said first and second circular flat plates in order to define a plurality of fin channels therebetween said plurality of supporting fins, an inner circumference channel along said inner circumference, and an outer circumference channel along said outer circumference, whereby said plurality of fin channels is interconnected with said inner circumference channel and said outer circumference channel, thereby to define a plurality of continuous pathways between said inner circumference and said outer circumference of said first and second circular flat plates;

an inner wall approximating said fin width attached along said inner circumference of said first and second circular flat plates;

an outer wall approximating said fin width attached along said outer circumference of said first and second circular flat plates, wherein said outer wall and said inner wall define an enclosed volume within said first and second circular flat plates;

a coolant medium;

coolant injection means mounted on said rotor for injecting said coolant medium under pressure into said enclosed volume, wherein said coolant medium flows around each of said plurality of supporting fins throughout said plurality of continuous pathways, thereby to fill said enclosed volume;

mounting means for mounting said rotor to the axle of the automobile, wherein said mounting means is attached to said inner wall along said inner circumference, and wherein said coolant injection means is a valve having an open position and a closed position, wherein said open position permits injection of said coolant medium there-through and into said enclosed volume, and wherein said closed position seals said coolant medium inserted under pressure into said enclosed volume against removal therefrom.

5,439,082

**HYDRAULIC INERTIAL VIBRATION ISOLATOR**

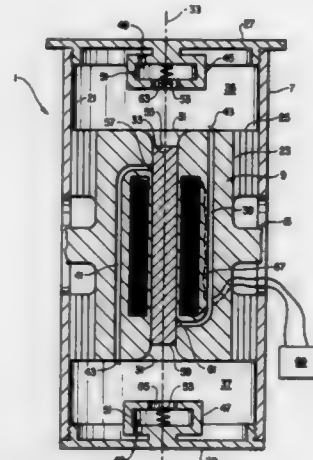
William L. McKeown, Euless; Michael R. Smith, Bedford, and Frank B. Stamps, Hurst, all of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.

Filed Apr. 1, 1994, Ser. No. 221,836

Int. Cl.<sup>6</sup> F16F 7/10

U.S. Cl. 188—379

19 Claims



1. A vibration isolator comprising:

- two chambers;
- a piston operable to vary the volumes of said chambers;
- a tuning passage connecting said chambers;
- a tuning slug slidably disposed in said tuning passage and contacting an inner surface thereof;
- a fluid filling said chambers and any portion of said tuning passage not occupied by said tuning slug; and
- at least one bypass passage providing fluid communication between said chambers, said communication being controlled by said tuning slug.

5,439,083

**CLUTCH**

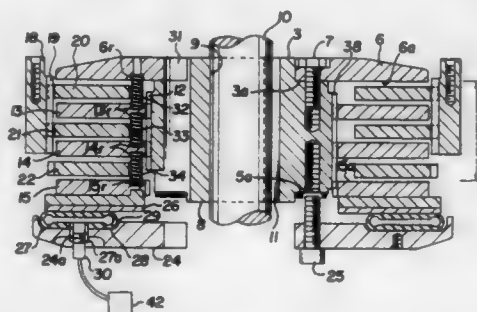
Richard L. Brock, and Tony Abernethy, both of Wichita Falls, Tex., assignors to W. P. T. Power Transmission Corporation, Wichita Falls, Tex.

Filed Apr. 15, 1994, Ser. No. 228,409

Int. Cl.<sup>6</sup> F16D 13/52, 13/70

U.S. Cl. 192—70.2

18 Claims



1. A pneumatic air clutch assembly comprising:

- (a) a hub including a cylindrical wall and a flange at a first end of said cylindrical wall with a substantially flat annular surface, said cylindrical wall having a plurality of splines and defining a longitudinally extending passage for receiving and engaging a drive shaft;
- (b) a driver plate concentrically disposed about said cylindrical wall and splined to said cylindrical wall on said splines;
- (c) a driven element disposed between said flange and said driver plate;

(d) a means to urge said driver plate toward said flange to frictionally engage said driven element;

(e) a removable holding plate secured at a second end of said cylindrical wall for capturing said driver plate, driven element, and said means to urge said driver plates toward said flange on said hub, said holding plates being moveable between an unseated position defining an uncompressed axial length on said hub and a seated position defining a compressed axial length on said hub; and

(f) at least one spline on said cylindrical wall extending substantially over said uncompressed axial length.

5,439,084

**DEVICE FOR A GUIDING SLIDING CALIPER FOR A DISK-BRAKE**

J. Manuel Vila Boluda, Barcelona, Spain, assignor to Bendix Espana S.A., Barcelona, Spain

PCT No. PCT/EP93/01419, § 371 Date Aug. 12, 1993, § 102(e)

Date Aug. 12, 1993, PCT Pub. No. WO94/01693, PCT Pub.

Date Jan. 20, 1994

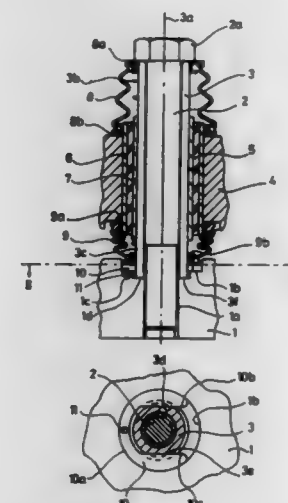
PCT Filed Jun. 4, 1993, Ser. No. 90,065

Claims priority, application Spain, Jul. 10, 1992, 9201426

Int. Cl.<sup>6</sup> F16D 65/14

U.S. Cl. 188—73.44

3 Claims



1. Device for guiding a sliding caliper (4) for a disk-brake, comprising:

- a support (1);
- a screw (2) comprising a head (2a) whose rotation makes it possible to engage this screw in a tapped hole (1a) made in the support in order to securely fasten it to the latter;
- an essentially cylindrical hollow carrier (3) traversed longitudinally and with a small clearance by the screw (2) and axially blocked between the support and the screw head; and first blocking means, suitable for preventing the rotation of the carrier about its longitudinal axis (3a), and interacting with flats (3d, 3e) made on the outer surface of this carrier, characterized in that the flats are made at the end (3c) of the carrier which is turned towards the support and in that the first blocking means comprises: a circular bore (1b) of the support, concentric with the tapped hole (1a) which receives the screw;
- an open ring (10) having a partially circular external profile (10a) housed with a small clearance in the bore of the support, and an internal profile forming two parallel support surfaces (10b, 10c) slidably receiving the flats of the carrier, and
- second blocking means (1c, 11; 1f, 10d) rotationally blocking the ring with respect to the support.

5,439,085

**OSCILLATION DAMPER**

Felix Woessner, Schweinfurt, Germany, assignor to Fichtel &amp; Sachs AG, Schweinfurt, Germany

Continuation of Ser. No. 157,837, Nov. 24, 1993, abandoned,

which is a continuation of Ser. No. 71,944, Jun. 3, 1993,

abandoned, which is a continuation of Ser. No. 738,155, Jul. 30,

1991, abandoned. This application May 6, 1994, Ser. No. 238,806

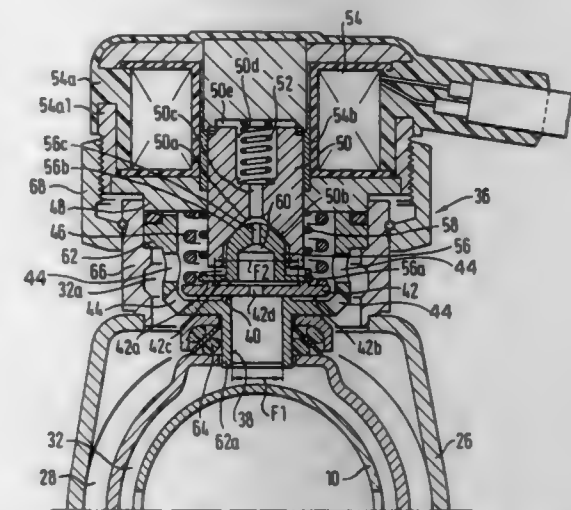
Claims priority, application Germany, Aug. 6, 1990, 40 24

920.4

Int. Cl.<sup>6</sup> F16F 9/46; B60G 17/08

U.S. Cl. 188—299

47 Claims



1. Oscillation damper comprising a cylinder with an axis, a piston rod axially movably guided through at least one cylinder end, a piston connected to the piston rod inside the cylinder, a plurality of fluid chambers having capacities which are variable relative to one another as a function of movement of the piston rod relative to the cylinder and at least one fluid connection between two fluid chambers of said plurality of fluid chambers, wherein in said at least one fluid connection there is provided a control valve unit between two portions of said fluid connection, wherein the control valve unit is constructed with valve passage means to which a first portion is connected, and with a valve control element wherein a valve face on a first side of the valve control element can be resiliently urged toward a maximum closing position so as to reduce a flow cross sectional area defined by said valve passage means and said valve control element, wherein a loading face on a second side of the valve control element which is remote from the first side of the valve control element can be loaded by fluid pressure in an adjacent control chamber, wherein the control chamber is connected to the first portion via throttled fluid path means for permitting fluid communication between the first portion and the control chamber even when the valve control element is in the maximum closing position, wherein the control chamber communicates via control chamber outlet means (12) with the second portion, wherein the control chamber outlet means comprises outlet cross section dimensioning means which is adjustable between a maximum closed condition and a maximum open condition without intermediate conditions, substantially perpendicularly to the loading face on the second side of the valve control element in at least one direction by magnetic force and, in cooperation with the second side of the valve control element, determines the outlet cross sectional area of the control chamber outlet means, the control chamber outlet means being closed to a maximum in the maximum closed condition, and the control chamber outlet means being opened to a maximum in the maximum open condition.



5,439,086

**MECHANICAL CLUTCH**

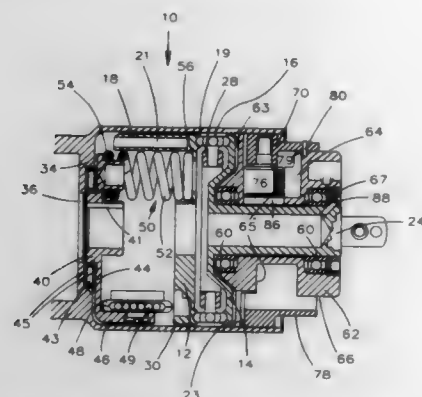
Michael M. Withey, Pearland, and Rob G. Lucas-Dean, Houston, both of Tex., assignors to Oceaneering International, Inc., Houston, Tex.

Filed Dec. 10, 1993, Ser. No. 165,381

Int. Cl.<sup>6</sup> F16D 7/00

U.S. Cl. 192—56 R

13 Claims



1. A mechanical clutch assembly comprising: first means including a first clutch plate which rotates around an axis and having a first face and second face, said second face of said clutch plate having a circle of equally spaced dimples;
- second means including a second clutch plate which rotates around said axis and having a first face and second face, said first face of said second clutch plate being in face-to-face relation to said second face of said first clutch plate and having an identical circle of equally spaced dimples;
- means interposed between said first clutch plate and said second clutch plate including one or more stepper members each having a plurality of equally spaced contact elements which are compressed and fit within corresponding dimples of said first and second clutch plate;
- means for applying an axial force to compress said stepper member between said clutch plates;
- means for applying a torque to one of said clutch plates and the other clutch plate being responsive to said one clutch plate; and
- each stepper member operating in (i) a first mode when the applied torque is less than or equal to the maximum torque threshold due to the axial force on said clutch plates wherein said stepper member remains in the corresponding dimples and the torque from one clutch plate is transferred to the other clutch plate and (ii) a second mode when the applied torque is greater than the maximum torque threshold due to the axial force on said clutch plates wherein said stepper member rotates and elements of each stepper member move to the next dimple which prevents said greater torque from being transmitted to the responsive other clutch plate.

5,439,087

**WET-TYPE MULTI-PLATE FRICTIONAL ENGAGEMENT APPARATUS**

Shigeki Umezawa, Fukuroi, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Dec. 14, 1993, Ser. No. 165,895

Claims priority, application Japan, Dec. 17, 1992, 4-337562

Int. Cl.<sup>6</sup> F16D 13/68

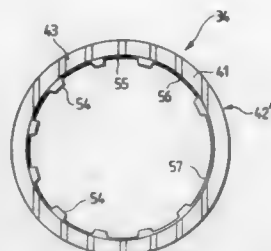
U.S. Cl. 193—70.2

8 Claims

1. A wet-type multi-plate frictional engagement apparatus, comprising:

a plurality of drive clutch plates and a plurality of passive clutch plates, said drive clutch and passive clutch plates being metal plates having wet-type frictional material

attached only on one side and arranged alternately so as to be engageable with each other, and a substantially cylindrical clutch hub supporting said drive clutch plates, wherein splines are formed on a peripheral surface of said



clutch hub and elongated in an axial direction of said clutch hub, radially inwardly projecting teeth are formed on inner peripheries of said drive clutch plates, and said splines and said teeth include cooperable means for uniquely orienting said drive clutch plates in an axial direction.

5,439,088

**AUTOMATIC TRANSMISSION WITH PASSAGES CONNECTING APPLY AND CANCEL CHAMBERS**

Hirofumi Michioka, Fujisawa; Masahiro Yamamoto, Atsugi; Koichi Hayasaka, Hiratsuka, and Yoshinori Mikoshiba, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

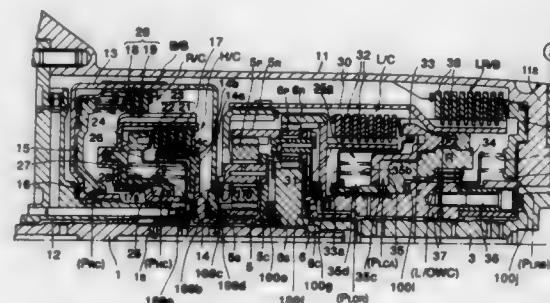
Filed Jan. 29, 1993, Ser. No. 10,811

Claims priority, application Japan, Jan. 30, 1992, 4-015290; Jan. 30, 1992, 4-015291; Jan. 30, 1992, 4-015292; Jan. 30, 1992, 4-015293; Jan. 30, 1992, 4-15294

Int. Cl.<sup>6</sup> F16H 63/02

U.S. Cl. 192—85 AA

7 Claims



1. An automatic transmission having a plurality of friction elements, one of the friction elements being engaged and another of the friction elements being disengaged during a shift operation, the friction elements being disposed around a transmission shaft drivingly connected to an engine crankshaft, the automatic transmission comprising:

a piston pushing the one friction element for the engagement;

means defining a first apply chamber to which operating pressure is applied to stroke said piston for the engagement of the one friction element;

means defining a cancel chamber to which disengagement pressure for disengaging the one friction element is applied, said cancel chamber being disposed opposite to said first apply chamber with respect to said piston, said cancel chamber being formed such that an outer diameter of a pressure receiving surface of said cancel chamber is the same as that of said first apply chamber;

means defining a second apply chamber to which engage-

ment pressure for engaging the another friction element to be engaged is applied;

means defining a passage which communicates with said cancel chamber and said second apply chamber;

the cone frictioned element being operatively connected to a ring gear of a planetary gear set by a third friction element; and

a clutch hub integrally connected with said ring gear and extending from said ring gear in the axial direction to be apart from said ring gear;

wherein said third friction element of the plurality friction elements is disposed on said clutch hub so as to support said ring gear in the radial direction.

5,439,089

**COIN ANALYZER SENSOR CONFIGURATION AND SYSTEM**

Donald O. Parker, 987 3 Mile Rd., Grand Rapids, Mich. 49505

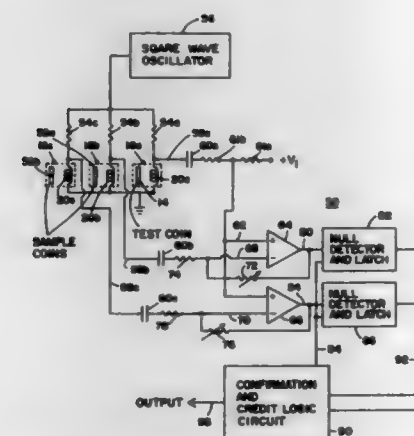
Division of Ser. No. 847,773, Mar. 5, 1992, Pat. No. 5,293,980.

This application Sep. 1, 1993, Ser. No. 115,462

Int. Cl.<sup>6</sup> G07D 5/08

U.S. Cl. 194—317

23 Claims



1. A coin detecting sensor comprising: a generally C-shaped core of ferro-magnetic material including a bight portion and a pair of spaced apart arms extending in a same direction from said bight portion, defining a coin sensing primary air gap between said arms, said core being divided into two core portions separated by a secondary air gap; and a pair of coils, one magnetically coupled with each of said core portions to generate and sense a magnetic flux in said core and across said air gaps when one of said coils is excited with electrical energy.

5,439,090

**IMPROVEMENTS IN OR RELATING TO ESCALATORS**

Alexander Findlay, Auckland, New Zealand, assignor to Escalator Advertising Limited, Auckland, New Zealand

Filed Jul. 15, 1994, Ser. No. 275,401

Claims priority, application New Zealand, Aug. 5, 1993, 248336

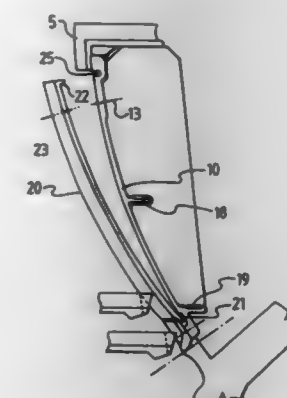
Int. Cl.<sup>6</sup> B66B 23/12

U.S. Cl. 198—333

3 Claims

1. A component for a passenger conveying device such as an escalator or travelator having a plurality of interacting movable steps, each said step (5) having a defined external profile allowing relative movement between adjacent steps, and at least one of said steps having a cover (20) fixed to said step, said cover having an external profile corresponding to the defined external profile of said steps, and said component comprising a backing element (10) under said cover (20), characterised in that said backing element comprises a pre-fabricated plate

having at least one attachment lug (18) formed thereon, and at least one channel (11, 12) complementary to a projecting part



of said cover, by which said cover can be engaged with said element.

5,439,091

**RECIPROCATING LIFT MECHANISM**

Arthur C. Mason, Mt. Clemens, Mich., assignor to Utica Enterprises, Inc., Shelby Township, Mich.

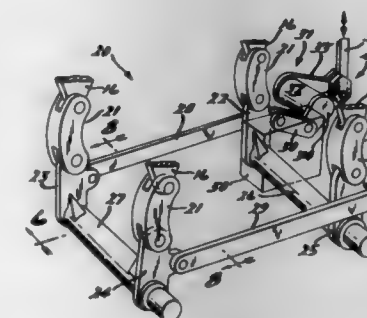
Continuation of Ser. No. 909,084, Jul. 2, 1992, Pat. No. 5,320,208. This application Jun. 13, 1994, Ser. No. 259,015

The portion of the term of this patent subsequent to Jun. 14, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B65G 37/00

U.S. Cl. 198—346.2

4 Claims



1. An apparatus for establishing end of travel dwell points for a workpiece supported by a work table within a given machine cycle time t, defined by a complete displacement stroke from a first predetermined beginning of travel or bottom position to a second predetermined end of travel or top position, said apparatus comprising:

a base;

a mechanical linkage means attached to said base, said mechanical linkage means having at least an input link at one end thereof and an output link at an other opposite end thereof; and

means for providing a first dwell of said output link when said machine cycle time t is at said first predetermined beginning of travel or bottom position of said complete displacement stroke and a second dwell of said output link when said machine cycle time t is at said second predetermined end of travel or top position of said complete displacement stroke.

5,439,892

## CONVEYING ROD LIKE ARTICLES

Kerry Hierons, High Wycombe, England, assignor to Molins PLC, Milton Keynes, England

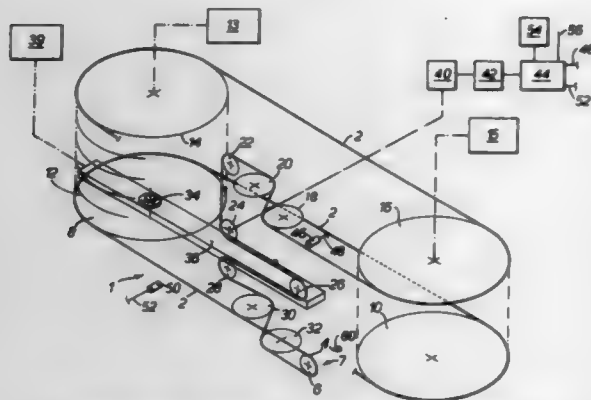
Filed May 28, 1994, Ser. No. 246,697

Claims priority, application United Kingdom, May 22, 1993, 9319656

Int. Cl.<sup>6</sup> B65B 1/00

U.S. Cl. 198—347.3

13 Claims



1. A conveyor system for rod-like articles including a variable capacity reservoir for articles comprising a reversible conveyor for supporting a variable length stream of articles in multi-layer stack formation and for conveying said stream to or from a junction, means movable with the conveyor for generating a signal indicative of direction and distance of movement of the conveyor, means for counting signals generated by said signal generating means, first sensor means responding directly to the stream of articles for generating a full signal when a leading part of said stream on said conveyor reaches a predetermined position, second sensor means responding directly to the stream of articles for generating an empty signal when a leading part of said stream reaches another predetermined position, and means for processing signals from said counting means and from said first and second sensor means so as to generate an indication of the capacity of the reservoir, wherein said processing means comprises means for performing a calculation of the capacity of the reservoir based on distance travelled by the conveyor, and means for correcting said calculation whenever an appropriate signal is received from said first or second sensor means, whereby the indication of the capacity of the reservoir generated by said processing means is corrected, where necessary, whenever said full or empty signal is received.

5,439,893

## APPARATUS FOR UNSCRAMBLING CONTAINERS

Hughes Drewitz, St-Eustache, Canada, assignor to H. G. Kalish Inc., Pointe-Claire, Canada

Filed Feb. 3, 1994, Ser. No. 191,128

Int. Cl.<sup>6</sup> B65G 47/24

U.S. Cl. 198—399

19 Claims

1. An apparatus for successively unscrambling a population of containers, comprising:

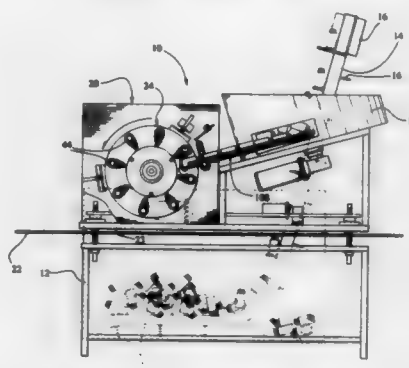
an in-feed station for receiving containers randomly arranged into one of at least two possible longitudinal orientations;

a plurality of container handling stations in a spaced apart relationship movable along a common path of travel for transporting individual containers from said in-feed station to an output station and for altering the longitudinal orientation of selected containers during transport between said stations, each container handling station including:

- a) a first container engaging member;
- b) a second container engaging member movable relative said first container engaging member along a predeter-

mined path of travel between an extended position and a retracted position, in said extended position said second container engaging member clamping a container against said first container engaging member, in said retracted position said second container engaging member being spaced from said first container engaging member by a distance sufficient to release the container from the container handling station; and

c) rotating means for rotating said container engaging members when said second container engaging member is in said extended position about an axis extending



generally along said predetermined path of travel in order to alter the longitudinal orientation of the container held by said container engaging members,

an inspection station along said common path of travel for sensing the longitudinal orientation of individual containers transported along said common path of travel, the rotating means of said container engaging members being responsive to an output condition of said inspection station to rotate selected ones of the containers to a predetermined longitudinal orientation, whereby the containers released at said output station have a uniform longitudinal orientation.

5,439,894

## APPARATUS FOR GROUPING OBJECTS

Jan Hakansson, Estöv, Sweden, assignor to Tetra Laval Holdings &amp; Finance SA, Pully, Switzerland

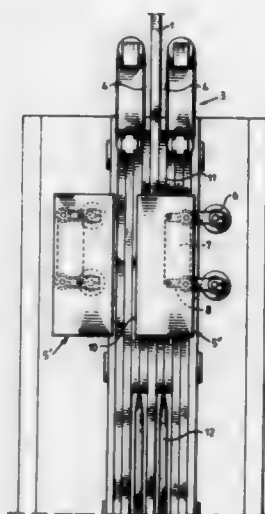
Filed Sep. 13, 1993, Ser. No. 120,080

Claims priority, application Sweden, Sep. 15, 1992, 9202647

Int. Cl.<sup>6</sup> B65G 47/26

U.S. Cl. 198—419.1

23 Claims



1. An apparatus for grouping objects, comprising:

a first conveyor for moving objects in a first direction of travel;

a second conveyor for receiving objects from the first conveyor and for moving objects in the first direction of travel; and

pusher means having a contact surface arranged to move objects from a single stream on the first conveyor to multiple streams on the second conveyor in a direction transverse to the first direction of travel of the first conveyor and the second conveyor, the contact surface moving with the objects in the direction of travel as the objects are moved transversely such that advancement of the objects is unimpeded by the contact surface, wherein the contact surface moves elliptically for its entire path of movement parallel to conveying surfaces of the first and second conveyor means.

5,439,095

## APPARATUS FOR SERIALY CONVEYING RECEPTACLE LIDS

Norbert Lents, Essen, and Karl-Heinz Witt, Recklinghausen, both of Germany, assignors to Krupp Maschinentechnik Gesellschaft mit beschränkter Haftung, Essen, Germany

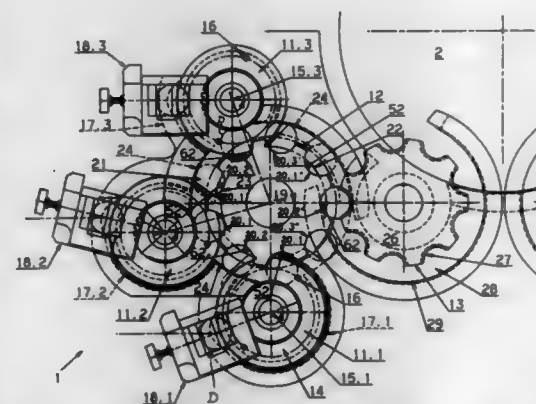
Filed Feb. 23, 1994, Ser. No. 200,496

Claims priority, application Germany, Feb. 27, 1993, 43 06 110.9

Int. Cl.<sup>6</sup> B65G 47/04

U.S. Cl. 198—480.1

5 Claims



1. In an apparatus for serially conveying receptacle lids; each lid having a peripheral shoulder; the apparatus including two lid-advancing wheels each having a plurality of circumferentially spaced peripheral pockets for partially accommodating individual lids therein; said wheels being supported for rotation in a substantially horizontal plane; said wheels peripherally adjoining one another in a border zone for transferring the lids from the pockets of one of said wheels to the pockets of another of said wheels;

a supporting surface situated underneath said wheels for supporting the lids by the shoulders thereof as the lids are advanced by said wheels;

a separate annular guide surrounding said wheels externally of said border zone for retaining the lids in respective said pockets externally of said border zone;

the improvement comprising

(a) a pin mounted on at least one of said wheels at one of the pockets thereof; said pin being held displaceably relative to the wheel carrying said pin; said pin having an upper position for engaging a radially inner part of the lid shoulder to retain the lid in the pocket adjoining pin; said pin having a lower position for releasing the lid shoulder to allow a displacement of the lid relative to said pocket; and

(b) control means for displacing said pin during rotation of said wheels.

5,439,096

## DOUGH SLICE CONVEYING APPARATUS

Teruo Shigematsu, Sano, and Iwami Hirota, Tochigi, both of Japan, assignors to House Food Industrial Co., Ltd., Higashi-Osaka, Japan

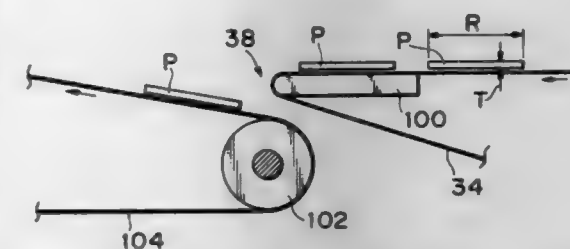
Continuation of Ser. No. 40,007, Mar. 30, 1993, abandoned. This application Aug. 26, 1994, Ser. No. 297,099

Claims priority, application Japan, Oct. 27, 1992, 4-288914

Int. Cl.<sup>6</sup> B65G 47/57

U.S. Cl. 198—606

6 Claims



1. A conveying apparatus for conveying pieces of a dough-like product having a thickness of T and a minimum diameter R, wherein T is between 0.6 and 0.7 mm and R is between 50 and 60 mm, said conveying apparatus comprising:

a front side conveyor belt for carrying pieces of the dough-like product, said front side conveyor belt having a terminal having a reversing part, said reversing part having a knife edge, said knife edge having a front end part curvature of between 2.1 T and 11.7 T; and

a rear side conveyor belt extending downstream of said front side conveyor belt for receiving pieces of the dough-like product from said front side conveyor belt, said rear side conveyor belt having a start end part having a reversing part, said start end part being located beneath and opposite to said terminal of said front side conveyor; and said reversing part of said terminal of said front side conveyor belt and said reversing part of said start end part of said rear side conveyor belt having a space between them of less than 0.1 R.

5,439,097

## LINK FOR CONVEYOR CHAINS

Toshio Takahashi, Toyonaka; Masaaki Ikeda, Daito; Satoshi Kuriyama, Kyoto; Koji Tanaka, Osaka; Shuji Sasamoto, Toyonaka, and Katsutoshi Shibayama, Osaka, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Continuation of Ser. No. 967,781, Oct. 28, 1992, abandoned.

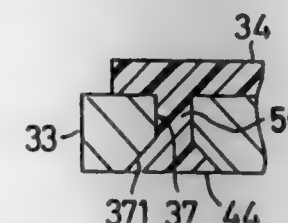
This application May 5, 1994, Ser. No. 238,441

Claims priority, application Japan, Oct. 29, 1991, 3-96204

Int. Cl.<sup>6</sup> B65G 47/84

U.S. Cl. 198—803.01

11 Claims



1. A link assembly for a chain comprising a link portion, a top plate portion having a top surface and a bottom surface made of a predetermined first material, and a plate member made of a different material than said top plate portion and integrally molded to at least the one of the top or bottom surfaces of said top plate portion by a plurality of rivet like locking elements formed integrally with said plate member engaging in openings having an enlarged portion formed in said top plate portion.



5,439,098

**POWERED BELT TURN**

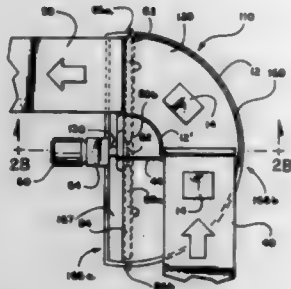
Henri Bonnet, Atlanta, Ga., assignor to United Parcel Service of America, Inc., Atlanta, Ga.

Filed Jan. 3, 1994, Ser. No. 176,772

Int. Cl.<sup>6</sup> B65G 47/80

U.S. Cl. 198—831

9 Claims



1. In a conveyor system, including a feed conveyor and an exit conveyor, a powered belt turn comprising:
  - a disk-shaped, semi rigid transfer sheet supported for rotation along a path of movement;
  - a bed defining a horizontal surface for supporting said transfer sheet along a first segment of said path of movement, said bed comprising a bed edge over which said transfer sheet is bent downwardly such that said transfer sheet travels in a second segment of said path of movement of said transfer sheet, and wherein said exit conveyor is positioned adjacent said bed edge; and
  - a driven, rotatable shaft affixed to said transfer sheet and extending therefrom substantially perpendicular to said second segment of said path of movement of said transfer sheet, whereby said transfer sheet rotates over said bed in correspondence with the rotation of said shaft, and wherein said transfer sheet is positioned to receive objects from said feed conveyor and rotates in conjunction with said shaft to transfer said objects to said exit conveyor.

5,439,099

**CONVEYOR MAT BUILT UP OF SYNTHETIC MODULES AND MODULES FOR SUCH CONVEYOR**

A. J. L. Bos, 's-Gravenzande, and C. P. M. Vermeulen, Rotterdam, both of Netherlands, assignors to MCC Nederland B.V., Netherlands

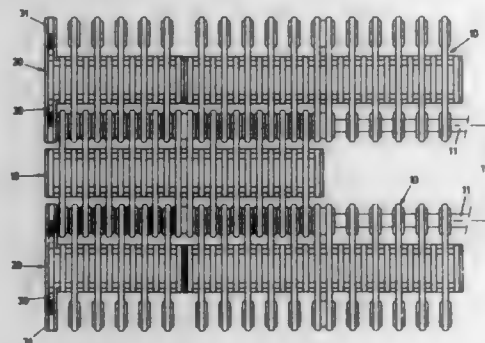
Filed Nov. 16, 1993, Ser. No. 153,600

Claims priority, application Netherlands, Nov. 16, 1992, 9201999

Int. Cl.<sup>6</sup> B65G 17/06

U.S. Cl. 198—853

22 Claims



1. A conveyor mat built up of first and second modules, made in one piece of synthetic material, the width of the first modules being substantially twice the width of the second modules, with the modules, viewed in the longitudinal direction of the mat, being staggered, each module consisting of a plurality of substantially equally spaced-apart hinge plates, each extending over substantially the entire length of the module

and each having hinge loops at the two ends thereof, the hinge plates of a module being coupled by means of at least one transverse rib disposed between the two ends of the hinge plates, the ends of the hinge plates being disposed at a longitudinal side of a module between the ends of the hinge plates of an adjacent module in the longitudinal direction of the mat, the hinge loops of the two modules being substantially in alignment and coupled to each other by means of a hinge pin extending through the hinge loops, there being provided means for locking the hinge pin relatively to the modules, characterized in that the second modules are located exclusively on the two lateral sides of the conveyor mat, a first module always being disposed between two consecutive second modules in the longitudinal direction of the mat, that the end hinge plate disposed at the lateral side of the mat in each second module comprises means for locking the two hinge pins that couple said second module to both first modules adjoining in the longitudinal direction of the mat, and that the first and second modules have such a width that at the lateral sides of the mat, the end faces of the first and second modules are substantially in line.

5,439,100

**PACKAGING SYSTEM FOR DISPENSING CARTRIDGE FOR VOLATILES**

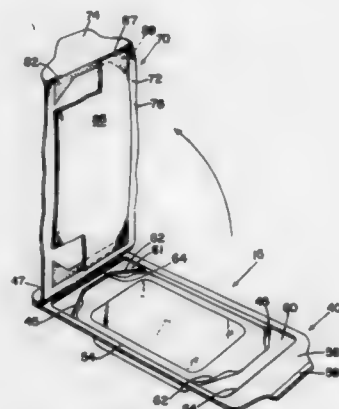
Andrew D. Gordon, Cincinnati, Ohio, and Daniel E. Linkugel, Cold Spring, Ky., assignors to The Dial Corp., Phoenix, Ariz.

Filed May 4, 1993, Ser. No. 57,083

Int. Cl.<sup>6</sup> F17C 13/00

U.S. Cl. 206—0.5

13 Claims



1. A protective packaging system for containing a delivery cartridge for volatile substances such as fragrances, deodorizers, and other air treatment materials, wherein the delivery cartridge includes an active ingredient reservoir with a permeable surface through which substances may move from the reservoir, said packaging system comprising:

- (a) an outer cartridge container having a storage area for receiving said delivery cartridge, and a substantially open top with an outer periphery, said outer cartridge container including a peelable lid having an inner surface and an outer edge which can be attached to said outer periphery to sealingly close said outer cartridge container, said lid being peeled away from at least a portion of said outer periphery during opening procedures; and
- (b) a blotter independently received within said outer cartridge container, said blotter being interposed between said peelable lid of the outer cartridge container and the permeable surface of the delivery cartridge, and said blotter being held in face to face contact with said permeable surface of the delivery cartridge within said packaging system when said lid is in sealed condition.

5,439,101

**CONVERTIBLE ENVELOPE**

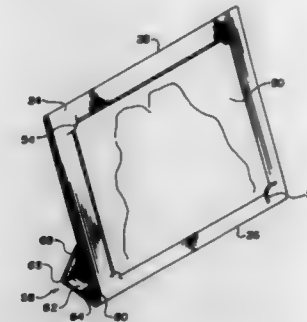
Thomas J. Brink, Conover, N.C., and Jack B. Keable, Hilton-head, S.C., assignors to Waldorf Corporation, St. Paul, Minn.

Filed Jul. 30, 1993, Ser. No. 99,909

Int. Cl.<sup>6</sup> B65D 5/52

U.S. Cl. 206—45.24

26 Claims



1. A convertible envelope comprising:
  - a first panel having a plurality of connection edges and a flap edge;
  - a second panel having a plurality of connection edges and a free edge;
  - a closure flap foldably connected to said first panel along said flap edge, said closure flap including a free edge spaced from said flap edge, at least one tab formed between said flap edge and said closure flap free edge and seal means between said tab and said closure flap free edge for connecting said closure flap to said second panel;
  - a tab receiving slot in said second panel to receive said tab; and means on said first panel for mounting display materials.

5,439,102

**PACKAGE FOR SURGICAL SUTURES**

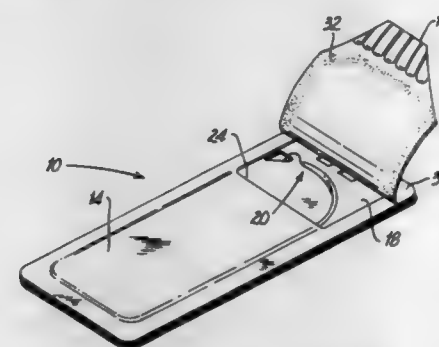
David L. Brown, Wallington; Stanley J. Malinowski, Ridgefield, and J. Larry Hinehline, Fairfield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 911,287, Jul. 9, 1992, abandoned. This application Dec. 21, 1993, Ser. No. 171,202

Int. Cl.<sup>6</sup> A61B 17/06

U.S. Cl. 206—63.3

32 Claims



1. A package for surgical suture comprising:
  - a bottom wall of substantially moisture-impervius material forming a bottom of said package,
  - a top wall of substantially moisture-impervius material forming a top of said package, said top wall having substantially the same dimensions as said bottom wall and being positioned in overlying relation on said bottom wall to form a pocket therebetween, said top wall being secured to said bottom wall by a substantially moisture-impervius peripheral seal;
  - a surgical suture retainer disposed between said top and bottom walls in said pocket;

a die-cut portion in one of said walls for accessing at least a portion of said surgical suture retainer therethrough; at least one suture associated with said surgical suture retainer, such that at least a portion of said at least one suture is positioned within said die-cut portion; and a closure flap of substantially moisture-impervius material overlying at least a portion of said wall from a first end thereof to a position intermediate a second end thereof and sealingly enclosing said die-cut portion along the periphery thereof, said closure flap being secured to said top wall by a substantially moisture-impervius peelable peripheral seal, said closure flap terminating at said intermediate position in a gripping tab portion, whereby said package is opened in a single step by grasping said gripping tab portion and pulling said gripping tab portion from said intermediate position toward said first end.

5,439,103

**PRIZE HOLDING CONTAINER ASSEMBLIES**

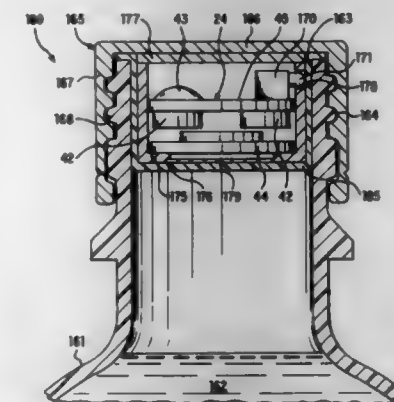
James P. Howes, 122 St. Johns Rd., Wilton, Conn. 06498

Filed May 3, 1994, Ser. No. 238,015

Int. Cl.<sup>6</sup> B65D 23/00

U.S. Cl. 206—217

18 Claims



1. A container assembly, for use in association with liquid, semi-liquid and moist products, constructed for housing a prize award and being randomly distributed with non-prize bearing containers without being detected by the consumer prior to opening thereof, said container assembly comprising:

- A. An outer surface defining shell
  - a. identical in appearance to the product bearing shell normally employed for the liquid, semi-liquid or moist product;
  - b. defining an internal retaining zone; and
  - c. comprising at least one entry portal formed at one end thereof;
- B. closure means cooperatively associated with the outer shell closing the entry portal thereof;
- C. means positioned in the retaining zone for providing the container assembly with the sound, weight and feel of the product normally contained therein;
- D. housing means positioned immediately adjacent the entry portal in cooperating relationship therewith; and
- E. a message delivery system
  - a. mounted in the housing means,
  - b. constructed for providing a prize related audible message to the consumer upon activation, and
  - c. comprising activation means cooperatively associated with the entry portal for preventing the delivery of the prize related audible message when the housing is positioned within the entry portal, and initiating the delivery of the desired audible message upon removal of the housing from the portal;

whereby a prize award holding container assembly for liquid, semi-liquid and moist products is achieved for being randomly distributed with non-prize bearing, product-holding containers

without fear of being detected by the consumer prior to opening thereof.

5,439,104

## EYEGLASS CLEANING STATION

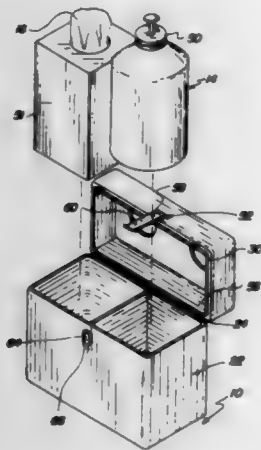
Mariola Wolska-Klis, 1015 Country Side Trace, Louisville, Ky. 40223

Filed Apr. 7, 1994, Ser. No. 224,582

Int. Cl.<sup>6</sup> B65D 69/00

U.S. Cl. 206—233

5 Claims



1. A new and improved eyeglass cleaning station for casual cleaning of eyeglasses comprising:

- a dual compartmented container having laterally adjacent first and second compartments closed on five sides wherein a side forming a top is open,
- a lid member engaging said dual compartmented container thereby providing closure of said compartment tops, and furthermore said lid member is perforated by first and second through holes wherein said first through hole is centrally disposed upon said first compartment and said second through hole is centrally disposed upon said second compartment,
- a supply of dispensable fluid lens cleaning materials housed in a replaceable container disposed within a first compartment and having a container dispensing portion penetrating the first through hole thereby providing external access for dispensing said fluid lens cleaning materials, and
- a supply of disposable tissuelike lens cleaning materials housed in a replaceable container disposed within a second compartment wherein individual tissuelike lens cleaning materials are readily accessible through the second through hole and furthermore being extractable in singular units.

5,439,105

## HINGE-LID PACK

Heinz Focke, Verden, Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Mar. 31, 1994, Ser. No. 220,879

Claims priority, application Germany, Apr. 2, 1993, 43 10 769.9

Int. Cl.<sup>6</sup> B65D 85/10

U.S. Cl. 206—268

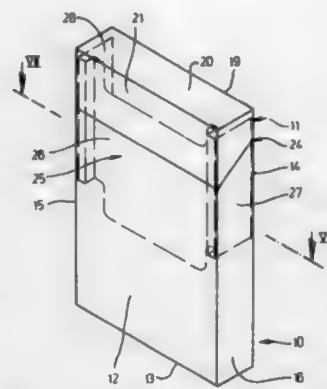
7 Claims

1. A hinge-lid pack made from thin cardboard, and having a pack part (10) and a lid (11) connected pivotably to the pack part, wherein:

- a) a one-piece collar (25) comprising a collar front wall (26) and collar side tabs (27, 28) is arranged in the pack part (10) so that the collar (25) partly projects from the pack part (10) and is surrounded by the lid (11) in a closing position;
- b) the pack part has a pack front wall (12), and two side walls

(15, 16) along inner sides of which the collar side tabs (27, 28) extend; and

c) at least a middle part region of the collar front wall (26) is set back with respect to the pack front wall (12) of the pack part and is arranged inside of the pack part (10) at a distance from the pack front wall (12) and parallel thereto,



so that inside of the pack part (10) two upright chambers (29, 30) are created, each for accommodating at least one article (31, 32), which are separated from one another by the collar front wall (26), one (30) of the upright chambers facing the pack front wall (12) and having a bottom defined by an inner bottom wall of the pack part.

5,439,106

## BUNDLE PACKAGE FOR CIGARETTE PACKS AND PACKAGE BLANK

Heinz Focke, Verden, Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Germany

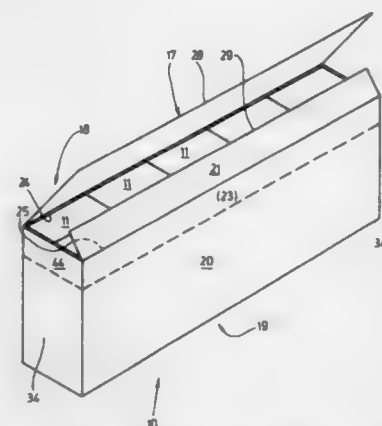
Filed Nov. 13, 1992, Ser. No. 976,206

Claims priority, application Germany, Nov. 15, 1991, 41 37 643.9; Apr. 24, 1992, 42 13 489.7

Int. Cl.<sup>6</sup> B65D 85/10, 5/00

U.S. Cl. 206—273

13 Claims



1. A cuboid bundle package for cigarette cartons, formed from a paper blank (12, 12') which completely surrounds contents of the package and forms a top wall (44a, 44a'), a front wall (20, 20'), a rear wall (18, 18'), a bottom wall (19, 19') and end walls, wherein:

- a) the package comprises a first closing flap (17, 48, attached to the rear wall (18, 18'), for forming the top wall (44a, 44a');
- b) the first closing flap, which comes to rest in the plane of the top wall (44a, 44a') when the package is closed, has a reinforcement sheet (16, 22') which is durably connected over its entire surface with the first closing flap for the purpose of an increased rigidity;
- c) the first closing flap is movable into an opening position for forming a package opening;

d) the package comprises reinforcement strips (15, 23, 38, 40, 15', 23', 38', 40') of the end, rear and front walls, said reinforcement strips being situated on edges which are adjacent to the top wall;

e) the reinforcement strip (15) of the rear wall is formed by a continuation of the reinforcement sheet (16, 22') of the first closing flap; and

f) the reinforcement strips (38, 40, 38', 40') of the edges of the end walls are formed by a continuation of the reinforcement strips (15, 23) of the edges of the front wall (20, 20') or rear wall (18, 18').

13. A blank (12, 12'), made from paper, for forming a cuboid package for cigarette cartons, wherein:

a) within a rectangular basic area of the blank, there is arranged a rectangular bottom wall (19, 19') having a longitudinal extent which is perpendicular to a longitudinal extent of the blank;

b) in a longitudinal direction of the blank there is arranged a rear wall (18, 18') on one side of the bottom wall (19, 19') and a front wall (20, 20') on another side of the bottom wall (19, 19');

c) in the longitudinal direction of the blank, the rear wall (18, 18') is adjoined by a closing flap (17, 48) via a folding line (24), the closing flap being just as long, in a direction transverse relative to the longitudinal direction of the blank, as the rear wall, bottom wall, and front wall, respectively;

d) for forming end walls of the package, the front wall, bottom wall, and the closing flap (17, 48), in longitudinal directions thereof, transverse relative to the longitudinal direction of the blank, are adjoined by end tabs (36, 35, 33, 39, 36', 35', 33', 39') on each side;

e) the closing flap (17, 48) is adjoined, in the longitudinal direction of the blank, by a closing flap reinforcement (16, 22') and a lateral reinforcement (15, 23') which is connected to the closing flap reinforcement (16, 22') via a folding line (30);

f) the lateral reinforcement (15, 23') extends across the entire width of the blank, in the transverse direction thereof and parallel to the rear wall (18, 18'), and has edge tabs (40, 40') parallel to the end tabs; and

g) the closing flap (17, 48) and the closing flap reinforcement (16, 22') are of equal width, in the longitudinal direction of the blank, with a folding line disposed in between, so that, when the closing flap reinforcement is folded onto the closing flap, the lateral reinforcement (15, 23') reinforces the rear wall (18, 18') near the folding line and, at the same time, ones of the end tabs which are adjoined to the rear wall (18, 18') are reinforced by the edge tabs (40, 40').

5,439,107

## SUPPORT FOR A PAIR OF TEXTILE ARTICLES OF FOOTWEAR

Pascale Penet, and Jean-Marie Monnier, both of 9bis, rue du grand chemin, 59100 Roubaix, France

Filed Jun. 16, 1994, Ser. No. 258,618

Int. Cl.<sup>6</sup> B65D 85/18

U.S. Cl. 206—292

8 Claims

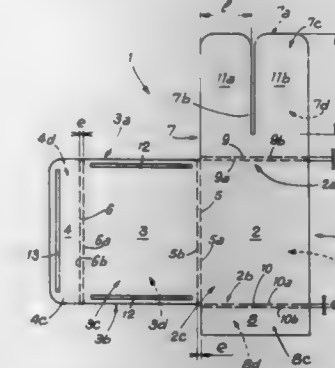
1. Combination of a support and of a pair of textile articles of footwear, comprising:

(1) a support made from a foldable sheet of rigid or semi-rigid material, including:

- (a) a rectangular principal part with two transverse zones of fold which define three foldable sides including a first principal side, a second side, and a third side,
- (b) two lateral flaps which respectively extend, via a longitudinal zone of fold, from each lateral edge of the first principal side, a first one of the lateral flaps which terminating in two adjacent tabs which are transverse with respect to the principal part,
- (c) so that the support forms a closed envelope when the two lateral flaps have been folded over an inner face of

the first principal side, and the second and third sides have been folded down,

(2) a pair of articles of footwear, each article of footwear having an open upper part and a closed lower part corresponding to the foot, the upper part of each article is fitted



over one of the tabs and the lower part of the article is folded against the upper part so that, once the first lateral flap is folded, the articles of footwear are positioned side by side and flat, and when the support is formed into a closed envelope, the second lateral flap overlaps the articles of footwear.

5,439,108

## COMPARTMENTALIZED TOOL BOX

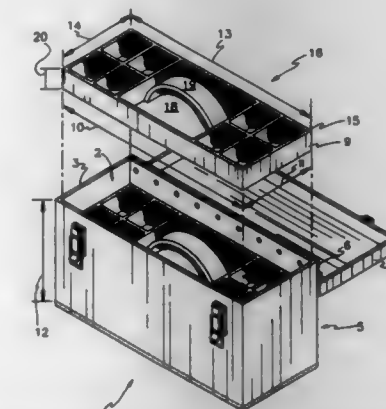
Edward J. Lackie, 157 Vermont Ave., Ft. Myers, Fla. 33905

Filed May 10, 1994, Ser. No. 240,455

Int. Cl.<sup>6</sup> B65D 6/04

U.S. Cl. 206—373

2 Claims



1. A compartmentalized container comprising:

a rectangular tool box having an open top with an inner compartment located therein, said inner compartment of said tool box having a first predetermined length, a first predetermined width, and a first predetermined depth, wherein said first predetermined depth extends from said open top of said rectangular tool box to a bottom thereof; and

a predetermined number of trays, each having an open top with a plurality of compartments located therein, each of said predetermined number of trays having a second predetermined length and width substantially equivalent to said first predetermined length and width, respectively, and each of said predetermined number of trays further have a second predetermined depth equivalent to said first predetermined depth divided by said predetermined number;

wherein each of said predetermined number of trays include a handle;

wherein each of said predetermined number of trays include



a centermost compartment, wherein said handle of each of said predetermined number of trays is located within said centermost compartment; and wherein each of said predetermined number of trays may be stacked within said inner compartment from a topmost tray to a bottommost tray, each of said predetermined number of trays fitting snugly therein preventing any lateral movement of said trays.

5,439,109

## LINE STORAGE DEVICE

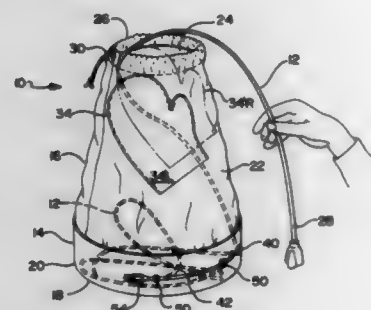
John C. McBride, Athens, Ala., assignor to Bag-It Products Corp., Nashville, Tenn.

Filed Dec. 23, 1993, Ser. No. 174,045

Int. Cl.<sup>6</sup> B65D 85/00

U.S. Cl. 206—388

13 Claims



1. A line storage device comprising: a flexible, elongated element; a base portion; at least one hand receptacle; a body portion extending from said base portion and terminating at a first aperture, said first aperture being operative to accommodate a first end of said elongated element, said body portion having an interior surface and an exterior surface, said base portion and said body portion operatively defining an interior of said device; a second aperture in said body portion, said hand receptacle being located within said interior of said device, said second aperture being operative to provide access to said hand receptacle; and wherein said elongated element is linearly fed into said device and is subsequently deposited within said interior of said device in a random manner.

5,439,110

## TWO-TIERED ARTICLE PACKAGE

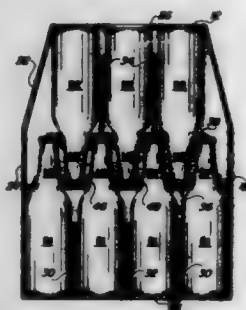
Timothy J. Regan, II, Marietta, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed Jun. 16, 1994, Ser. No. 260,849

Int. Cl.<sup>6</sup> B65D 65/00, 75/00

U.S. Cl. 206—427

12 Claims



1. A package containing articles having a relatively small end portion and an opposite relatively large end portion, comprising:

a carton including side and end panels connected to a bottom panel and a top panel;  
a lower tier of articles and an upper tier of articles, the large end portions of the articles in the lower tier being closely spaced from each other and being adjacent the bottom panel and the large end portions of the articles in the upper tier being closely spaced from each other and being adjacent the top panel;  
the large end portions of the articles in the upper tier being located above the small end portions of the articles in the lower tier and the large end portions of the articles in the lower tier being located below the small end portions of the articles in the upper tier;  
the small end portions of the articles in the upper tier extending between, and being adjacent to, the small end portions of the articles in the lower tier; and  
means for separating the small end portions of the articles in the upper tier from the small end portions of the articles in the lower tier, said means being comprised of an upper sheet containing openings through which the small end portions of the articles in the upper tier extend and a spaced lower sheet containing openings through which the small end portions of the articles in the lower tier extend.  
9. A package containing necked bottles, comprising:  
a carton including side and end panels connected to a bottom panel and a top panel;  
a lower tier of bottles and an upper inverted tier of bottles; the necks of the bottles in the upper tier extending between, and being adjacent to, the necks of adjacent bottles in the lower tier; and  
an upper sheet containing openings through which the necks of the bottles in the upper tier extend and a spaced lower sheet containing openings through which the necks of the bottles in the lower tier extend;  
the neck of each bottle including a cap, the caps of the bottles in the lower tier contacting the upper sheet and the caps of the bottles in the upper tier contacting the lower sheet.

5,439,111

## PACKAGE COMPRISING CONTAINERS IN UNITIZED UPPER AND LOWER TIERS WITH FOLDED DIVIDER

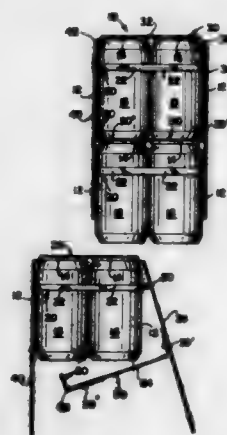
James A. Broskow, Buffalo Grove; William N. Weaver, Northbrook, and Victor G. DiVietro, Naperville, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed May 5, 1994, Ser. No. 238,422

Int. Cl.<sup>6</sup> B65D 75/00

U.S. Cl. 206—430

10 Claims



1. A unitized package, comprising:  
a plurality of substantially identical containers having upper and lower ends and side walls, said containers being arranged in an upper tier and a lower tier; said tier comprising a plurality of such containers disposed in a substantially rectangular

array, and a carrier comprising a single sheet of resilient polymeric material so as to have band segments defining container-receiving apertures with said carrier being applied to said containers of said tier so that said containers are received by said container-receiving apertures and so that said band segments embrace said side walls of said containers of said tier;  
a unitizing sheet folded so as to form a cover panel, a first lateral panel, a second lateral panel, and a divider; said cover panel covering at least a substantial part of said upper ends of at least some of said containers of said upper tier; each lateral panel extending downwardly from said cover panel along and below adjacent ones of said containers of said upper tier, and along adjacent ones of said containers of said lower tier at least as far down as said carrier of said lower tier; said divider being integrally connected at one end thereof to one of said first and second lateral panels of said unitizing sheet; and means defined between said divider and said one of said first and second lateral panels for permitting said divider to be folded with respect to said one of said first and second lateral panels and extend from said one of said first and second lateral panels toward a second one of said first and second lateral panels and be interposed between said lower ends of said containers of said upper tier and said upper ends of said containers of said lower tier; and means for attaching each one of said first and second lateral panels to at least one of said band segments of said carrier of said lower tier so as to unitize said upper and lower tiers of said package.

5,439,112

## BLANK FOR FORMING A TUBULAR ENVELOPE OF CARD FOR GROUPING POTS TOGETHER, AND A PACK MADE IN THIS WAY

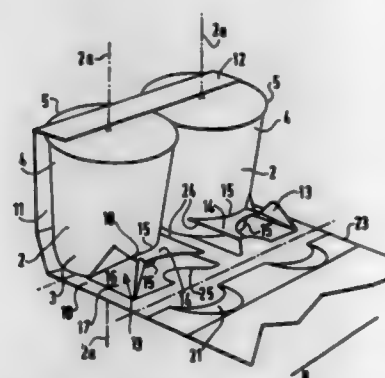
Pascal De Guglielmo, Montgux, and Gérard Beaucote, les Noes Pres Troyes, both of France, assignors to Aries Packaging, Societe Anonyme, Breviandes, France

Filed Mar. 17, 1994, Ser. No. 214,295

Claims priority, application France, Mar. 17, 1993, 93 03083  
Int. Cl.<sup>6</sup> B65D 71/00

U.S. Cl. 206—434

10 Claims



1. A blank of card designed to form a tubular envelope surrounding a plurality of pots arranged in two or more rows and in at least one tier, the blank comprising a plurality of juxtaposed panels connected to one another along mutually parallel longitudinal fold lines, a central panel, two side panels adjacent to the central panel, and two end panels adjacent to respective ones of the two side panels;

cut lines and fold lines being divided on at least one of the panels to define fold-out wedging means in said panel, the wedging means being suitable for projecting from said panel to wedge said pots in a pack comprising the pots surrounding by the envelope, wherein:

- a) the blank includes one or a series of said wedging means on the central panel and disposed symmetrically relative to a longitudinal midline of symmetry parallel to

the fold lines, each wedging means adapted to wedge two facing pots;  
b) each wedging means comprising:  
a wedging wall having two opposite longitudinal edges extending in a generally axially direction and shaped so that in a deployed position of the wedging wall, said longitudinal edges fit snugly against side faces of two facing pots;  
a support wall joined to the central panel along a first transverse fold line and joined at its opposite end to the wedging wall along a second transverse fold line; and  
two wedging flaps joined to the longitudinal edges of the support wall along respective fold lines;  
c) each wedging means being completely formed by cutting and folding the central panel without any additional material.

5,439,113

## BULK CONTAINER

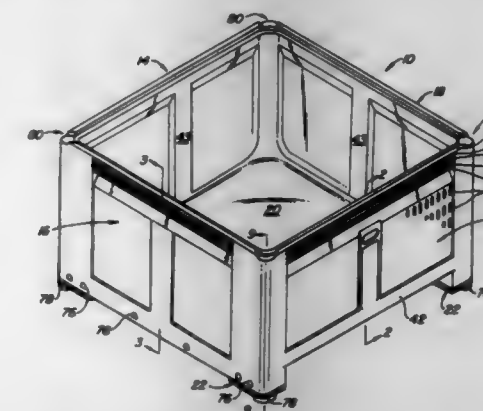
Flemming Elvin-Jensen, West Vancouver, Canada, assignor to MacroPlastics, Inc., Fairfield, Calif.

Continuation of Ser. No. 79,350, Jun. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 73,410, Jun. 7, 1993, abandoned. This application Mar. 2, 1995, Ser. No. 397,539

Int. Cl.<sup>6</sup> B65D 21/00

U.S. Cl. 206—509

22 Claims



1. A bulk container having front, rear, side and bottom sections forming a containment volume with a plurality of corner portions, at least some of said front, rear and side sections having an upper rim portion with an inner edge, an outer edge and a top surface and a plurality of nesting protrusions extending downwardly from said bottom section in association with a majority of said corner portions, said upper rim portion having a plurality of downwardly depending recesses associated to a majority of the corner portions, each said recess extending through the inner edge and the outer edge of said upper rim portion to form a gap therein, said recesses providing a corresponding plurality of nesting recesses formed in association with the upper corner portions so that two containers can be stacked with the nesting protrusions of the upper container received by the nesting recesses of the lower container with a substantially exclusive transfer of vertical load through the corner portions of the lower container.

5,439,114

## APPARATUS FOR SUPPORTING AN ARTICLE WITHIN A CONTAINER

John E. Lingle, Brookfield; David B. Stucker, Hartford, and James E. Pawlik, Kenosha, all of Wis., assignors to Stone Container Corporation, Chicago, Ill.

Filed Aug. 11, 1993, Ser. No. 105,306

Int. Cl.<sup>6</sup> B65D 81/02, 5/28

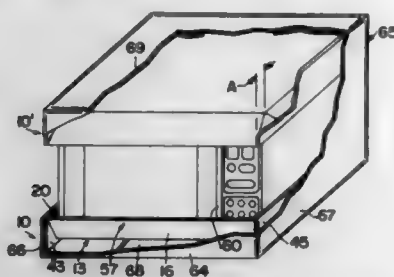
U.S. Cl. 206—586

20 Claims

1. An apparatus, in combination with an enclosing container

and an article, for supporting and positioning said article, when said apparatus and said article are placed within said enclosing container, said container having one or more base walls, each with a plurality of side edges, and a plurality of side walls intersecting with and extending away from said one or more base walls, from positions substantially along said side edges of said one or more base walls, for supporting and positioning said article within said container in shock-isolating spaced orientation relative to said one or more base walls and said side walls, said apparatus comprising:

- a support wall, having a plurality of side edges;
- a plurality of lateral support means operably emanating from said support wall and arranged adjacent to said side edges, so as to substantially surround said support wall,
- said lateral support means being operably arranged relative to said support wall, so as to adjoin and extend away from said support wall, so as to define an open, article receiving enclosure,
- at least one of said lateral support means having a distal edge operably disposed in spaced relation to a respective one of said side edges of said support wall,
- at least one corner support means operably associated with said lateral support means, for engaging and maintaining said lateral support means in articulation relative to said support wall defining said article receiving enclosure; and
- spacer support means, operably emanating from said distal edge of said at least one lateral support means, and positionable so as to extend substantially adjacent to said respective lateral support means, beyond said support wall, when said apparatus is in said container, and so as to operably dispose said spacer support means in a load-bearing



relationship relative to one of said one or more base walls and said support wall, to maintain said support wall and said respective lateral support means in spaced relation to said one of said one or more base walls of said container, and to engage at least one of said one or more base walls and at least one of said side walls of said container, when said article is placed within said article receiving enclosure and said article and apparatus are placed within said container,

said spacer support means further being positionable between said at least one lateral support means and one of said one or more side walls of said container, so as to maintain said support wall in spaced relation to one of said one or more side walls of said container,

said apparatus maintaining said article placed in said article receiving enclosure in spaced relation to said one or more base walls and side walls of said enclosing container.

15. A pair of apparatus, in combination with an enclosing container and an article, for supporting and positioning said article, when said apparatus and said article are placed within said enclosing container, said container having one or more base walls, each with a plurality of side edges, and a plurality of side walls intersecting with and extending away from said one or more base walls, from positions substantially along said side edges of said one or more base walls, for supporting and positioning said article within said container in shock-isolating spaced orientation relative to said one or more base walls and said side walls, each said apparatus comprising:

- a support wall, having a plurality of side edges;
- a plurality of lateral support means operably emanating from

said support wall and arranged adjacent to said side edges, so as to substantially surround said support wall,

said lateral support means being operably arranged relative to said support wall, so as to adjoin and extend away from said support wall, so as to define an open, article receiving enclosure,

at least one of said lateral support means having a distal edge operably disposed in spaced relation to a respective one of said side edges of said support wall,

at least one corner support means operably associated with said lateral support means, for engaging and maintaining said lateral support means in articulation relative to said support wall defining said article receiving enclosure; and

spacer support means, operably emanating from said distal edge of said at least one lateral support means, and positionable so as to extend substantially adjacent to said respective lateral support means, beyond said support wall, when said apparatus is in said container, and so as to operably dispose said spacer support means in a load-bearing relationship relative to one of said one or more base walls and said support wall, to maintain said support wall and said lateral support means in spaced relation to said one of said one or more base walls of said container, and to engage at least one of said one or more base walls and at least one of said side walls of said container, when said article is placed within said article receiving enclosure and said article and apparatus are placed within said container,

said spacer support means further being positionable between said at least one lateral support means and one of said one or more side walls of said container, so as to maintain said support wall in spaced relation to one of said one or more side walls of said container,

said apparatus maintaining said article placed in said article receiving enclosure in spaced relation to said one or more base walls and side walls of said enclosing container,

a first of said pair of apparatus being oriented in an open upright position, in a container and having said article placed within the article receiving enclosure thereof, with a second of said apparatus being inverted and placed upon the top of said article, said two apparatus and said article therebetween being placed within said container, for spacing, cushioning and maintaining the position of at least a portion of said article relative to said enclosing container base wall and side walls thereof.

5,439,115

#### PROCESS FOR SELECTIVE FLOTATION OF COPPER-LEAD-ZINC SULFIDE

Ali-Naghi Beyzavi, Frankfurt; Leo Kitschen, Oberursel; Friedrich Rosenstock, Frankfurt, and Horst Dittmann, Büdingen, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 9, 1993, Ser. No. 149,087

Claims priority, application Germany, Nov. 12, 1992, 42 38 244.0

Int. Cl.<sup>6</sup> B03D 1/02, 1/06; B03B 1/00

U.S. Cl. 209—167

11 Claims

1. A process for selective flotation of a copper-lead-zinc sulfide ore, comprising the steps of:

- (a) grinding a raw copper-lead-zinc sulfide ore to a flotation-separation particle size and slurring said copper-lead-zinc sulfide ore in water to form a suspension;
- (b) adjusting said suspension by a first aeration with air prior to flotation of copper to an oxidation-reduction potential of 70% to 90% of its optimum oxidation-reduction potential and then discontinuing said first aeration;
- (c) conditioning said suspension without aeration, adjusted during step (b), with SO<sub>2</sub>, Ca(OH)<sub>2</sub>, a flotation collecting agent and a flotation frothing agent;
- (d) adjusting said oxidation-reduction potential of said suspension to its optimum for copper transfer to a flotation froth for said suspension, adjusted according to step (b) and conditioned according to step (c), during the flotation

by a second aeration with air dependent upon composition of said ore and in a range of 60 to 340 mV and adjusting a pH of 8.5 to 10.5 therein; and

(e) thereafter in a flotation separation of Cu from said suspension, adjusted according to step (b), conditioned according to step (c), and adjusted according to step (d), removing said froth containing Cu.

5,439,116

#### PROCESS FOR THE RECOVERY OF MICAS BY FLOTATION AND MICAS THUS OBTAINED

Andre Van Lierde, Brussels, Belgium, and Jean-Philippe Beuvelet, Plevin, France, assignors to Mircal, Paris, France

Filed Feb. 2, 1994, Ser. No. 190,552

Claims priority, application France, Feb. 4, 1993, 93 01221

Int. Cl.<sup>6</sup> B03D 1/02

U.S. Cl. 209—167

17 Claims

1. A process for the recovery of micas by flotation from slurried ores containing micas from which the fines have been optionally removed, the process comprising a stage of bringing said slurry into contact with a cationic collector, subjecting said slurry to a flotation stage to form a supernatant containing said micas, and recovering said supernatant for subsequent treatment and optional rewashing, said process being carried out at a pH higher than 6, said stage of bringing the said slurry into contact with said cationic collector being preceded by a stage of bringing said slurry into contact with an activating agent selected from the group consisting of the soluble metal salts of lead, copper, silver and mercury.

5,439,117

#### SYSTEM AND METHOD FOR SEPARATING ELECTRICALLY CONDUCTIVE PARTICLES

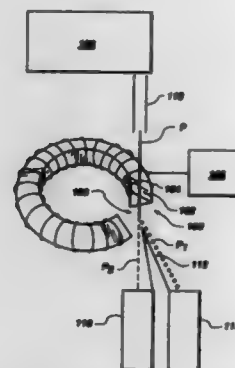
Vladimir L. Saveliev, Salt Lake City, Utah, assignor to Particle Separation Technologies, L.C., Woodland, Utah

Filed Dec. 22, 1993, Ser. No. 172,431

Int. Cl.<sup>6</sup> B03C 1/26

U.S. Cl. 209—212

7 Claims



1. A system for separating a first electrically conductive particulate material from a second material, the system comprising:

- means for localizing a magnetic field at a first location;
- at least one gap in the means for localizing a magnetic field at a first location, the means for localizing comprising an electrical conductor capable of carrying electrical current and thereby inducing a magnetic flux in the gap;
- means for generating a radio frequency signal and applying it to the means for localizing a magnetic field such that an alternating magnetic field of at least one kilogauss is present in the gap, the frequency of the radio frequency signal being determined by the electrical resistivity of the first electrically conductive material and the size of the particles comprising the first electrically conductive material, the frequency of the radio frequency signal being at least 10 kHz;
- means for adjusting the frequency of the radio frequency signal such that the frequency of the radio frequency

signal increases as the size of the particles of the first electrically conductive material decreases, the frequency increasing at least one hundred times for a ten fold decrease in the size of the first particulate material;

means for directing a material stream into the gap, the material stream comprising the first electrically conductive material and the second material, the magnetic field deflecting the path of the first electrically conductive material a different amount than the second material is deflected; and

means for gathering the first electrically conductive particles as they are separated from the material stream.

5,439,118

#### APPARATUS FOR EXTRACTING DOCUMENTS FROM ENVELOPES

Michael E. York, Sicklerville, N.J., assignor to Opex Corporation, Moorestown, N.J.

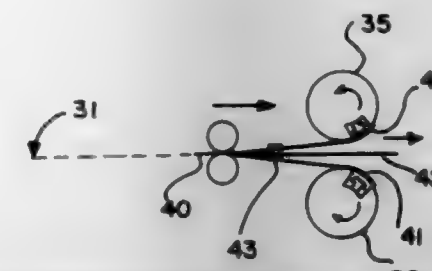
Division of Ser. No. 887,621, May 22, 1992, Pat. No. 5,310,062, which is a continuation-in-part of Ser. No. 363,511, Jun. 8, 1989, Pat. No. 5,115,918, which is a division of Ser. No. 904,966, Sep. 5, 1986, Pat. No. 4,863,037. This application Apr. 23, 1994, Ser. No. 234,674

The portion of the term of this patent subsequent to May 10, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B07C 5/00

U.S. Cl. 209—553

30 Claims



18. An apparatus for extracting contents from a plurality of envelopes, wherein the envelopes are opened along plural contiguous edges, the extracting apparatus comprising:

- a first pair of rollers for receiving the opened envelopes with the contents between the first pair of rollers, wherein the first pair of rollers includes means for engaging opposing faces of each envelope passing between the first pair of rollers and for spreading the opposing faces of the envelope apart to expose the contents; and
- means for separating the contents passing from between the first pair of rollers and the opposing faces of the envelope, for removing the contents from the envelope which contained them.

5,439,119

#### CD STORAGE AND DISPLAY SYSTEM

Tat C. Chow, Kowloon, Hong Kong, assignor to Sin Hing Audio Equipment Manufactory Limited, Hong Kong

Filed Feb. 7, 1994, Ser. No. 192,746

Claims priority, application United Kingdom, May 14, 1993, 9309953

Int. Cl.<sup>6</sup> A47F 7/00

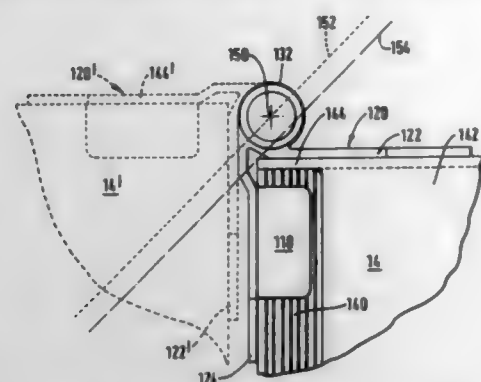
U.S. Cl. 211—49.1

14 Claims

1. A storage clip adapted to receive and retain the corner of a CD-case lying in a predetermined first plane relative thereto and to permit the CD-case so retained to be opened, the clip being adapted to form a stack with a plurality of identical clips such that the clips are rotatable relative to one another about a common axis substantially normal to the said plane, wherein a



second predetermined plane containing the said axis, and making an angle of 45 degrees with the edges of the CD-case so



retained which meet at the said corner, does not pass through the CD-case itself.

5,439,120

## GRAVITY FED MERCHANDISING SYSTEM

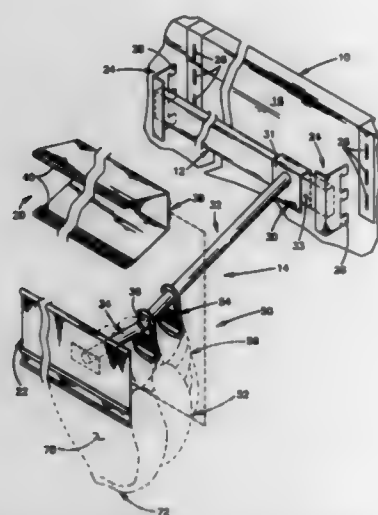
Emory N. Brozak, Strongsville, Ohio, assignor to American Greetings Corporation, Cleveland, Ohio

Filed May 4, 1993, Ser. No. 57,659

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—59.1

19 Claims



1. A product merchandising system comprising: an upright store fixture and at least one hanger arm coupled with said upright store fixture; said upright store fixture having a front side; said hanger arm having

- (i) a gravity slide portion extending forwardly and angularly downward from a location on the front side of the upright store fixture;
- (ii) a stop member disposed on the gravity slide portion near the lower end thereof;
- (iii) a front portion extending forwardly from the lower end of the gravity slide portion; and
- (iv) a support device at the forward end of said front portion;

at least one product/clip combination suspended from said hanger arm, said product/clip combination comprising a product and a clip releasably engaging a predetermined portion of said product, said clip having a hook configured to releasably engage said hanger arm at any location rearward of said support device and to suspend the product/clip combination therefrom; and said hook and said gravity slide portion of said hanger arm being configured to enable a product/clip combination

suspended from said hanger arm to slide downward along said gravity slide portion under the influence of gravity when said hook engages said gravity slide portion, each product/clip combination being removable from the hanger arm by moving the clip laterally relative to the hanger arm thereby to unhook the product/clip combination from the hanger arm.

5,439,121

## LOWERABLE CLOTHES-HANGER SUPPORTING DEVICE FOR WARDROBES

Egidio Agostoni, Zola Predosa, Italy, assignor to AMBOS S.r.l., Bologna, Italy

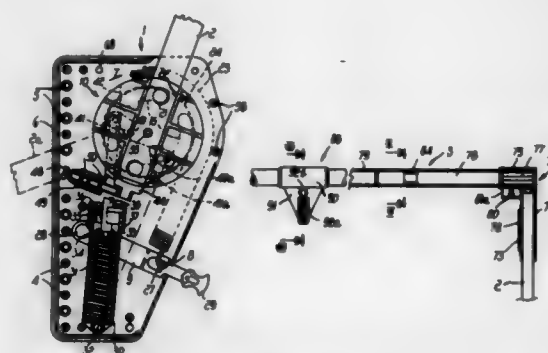
Filed Apr. 18, 1994, Ser. No. 228,632

Claims priority, application Italy, May 11, 1993, B093A0209 U

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—100

11 Claims



1. Lowerable clothes-hanger supporting device for wardrobes, comprising a plate for fixing the device to a side panel of the wardrobe; a disk-like element having an arm that lies on a plane parallel to said plate and to said side panel, said arm having at its end a rail for supporting clothes hangers, and being mounted on said plate so that it can oscillate in said plane between two positions in which the rail is respectively raised and lowered; a first elastic means, placed around said disk-like element to return it to the position in which the rail is raised; a second elastic means, applied eccentrically with respect to the disk-like element so as to apply thereon a moment in the same or opposite direction with respect to the moment applied by said first elastic means around the positions that respectively correspond to the lifting and lowering of the rail; and an actuation rod for lowering and lifting said rail.

5,439,122

## PRODUCT DISPLAY RACK

Arlen R. Ramsay, Roswell, Ga., assignor to Miller/Zell, Inc., Atlanta, Ga.

Filed Jan. 3, 1994, Ser. No. 176,528

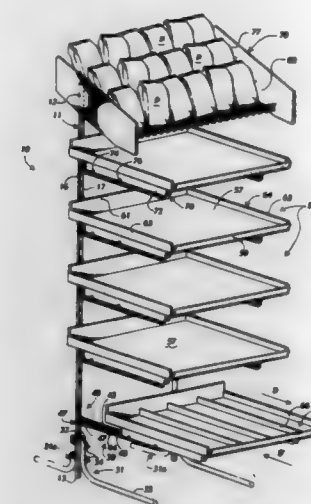
Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—187

14 Claims

1. A display assembly for supporting and displaying products, comprising: upright stanchions spaced from one another each having an upper end and a lower end and a series of bores defined at spaced intervals along the length thereof; a plurality of parallel shelf supports each comprising a substantially U-shaped rod having an open end adapted to engage and fit into said bores defined within said stanchions for mounting said shelf supports to said stanchions, a closed end opposite said open end and spaced upper and lower sections defining a guide along the length of each of said shelf supports, with said shelf supports projecting in a direction normal to the length of said stanchions; and shelf means having a first surface for supporting and displaying products and a second surface opposed from said first

surface, said shelf means being slidably mounted on said shelf supports, said shelf means including guides positioned along said second surface in which said shelf supports are received to mount said shelf means on said shelf



supports and to enable said shelf means to slide along said shelf supports a predetermined distance to provide access to said shelf means for efficient stocking of fresh products rearward of older products displayed on said shelf means.

5,439,123

## DISPLAY SYSTEM

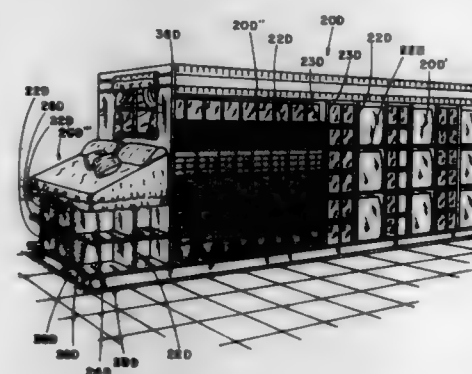
Thomas J. Nook, Grand Haven, Mich., assignor to Harbor Industries, Inc., Grand Haven, Mich.

Continuation-in-part of Ser. No. 101,578, Aug. 3, 1993. This application Jan. 25, 1994, Ser. No. 186,903

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—187

18 Claims



1. A freestanding display system comprising: a plurality of elongated upright dividers having a back edge and sides, said sides including first apertures and said back edge including second apertures; a plurality of shelf supporting fasteners selectively located in said first apertures, each of said shelf supporting fasteners including at least one end protruding from one of said sides; a plurality of shelves each including opposing sides having means for releasably frictionally engaging said protruding ends; a back panel including third apertures alignable with said second apertures; connectors extendable through said third apertures into said second apertures; and retainers located in said second apertures for engaging said

connectors and for securing said dividers to said back panel; whereby assembly of said plurality of shelves to said shelf supporting fasteners with said shelf supporting fasteners engaging said dividers and with said dividers located and secured by said retainers and said connectors to said back panel provides a rigid construction which can be assembled with unskilled labor in a variety of different arrangements.

5,439,124

## CLOSURE UNIT ON FLOWABLE PRODUCT CONTAINER

Elmar Mock, Biel/Bienne, Switzerland, assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

PCT No. PCT/CH92/00188, § 371 Date May 14, 1993, § 102(e) Date May 14, 1993, PCT Pub. No. WO93/05945, PCT Pub. Date Apr. 1, 1993

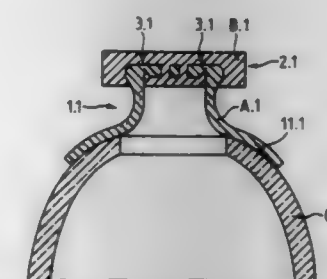
PCT Filed Sep. 11, 1992, Ser. No. 50,417

Claims priority, application Switzerland, Sep. 17, 1991, 2739/91; Sep. 17, 1991, 2740/91

Int. Cl.<sup>6</sup> B65D 1/02

U.S. Cl. 215—40

16 Claims



1. A closure unit made from thermoplastic material for closing a container for the handling and storing of a flowable product, the closure unit comprising:

- a first continuous area made from a basic thermoplastic material; and
- at least a second continuous area made from another thermoplastic material which differs from the basic thermoplastic material in at least one property;
- said first continuous area having a closed sealing surface which is connectable around a container opening in a tight sealing manner with respect to the container material;
- said first and second continuous areas being coupled to one another such that they are separable only as a result of an at least partial destruction of at least one of said first and second continuous areas;
- a pouring part which comprises at least a portion of said first continuous area, and which is at least partly made from said basic thermoplastic material; and
- a closure part for closing said pouring part, said closure part comprising at least a portion of said second continuous area, and said closure part being at least partly made from said another thermoplastic material;
- said basic thermoplastic material and said another thermoplastic material having respective properties such that they can be molded onto one another without coalescing;
- at least one of said pouring part and said closure part having positive engagement means for engaging the other of said pouring part and closure part; and
- said pouring part having at least one sealing surface made from said basic thermoplastic material, and said closure part having at least one sealing surface made from said another thermoplastic material, said sealing surfaces of said pouring part and said closure part, in a closed state of the closure unit, resting on one another and together with said positive engagement means forming a reversible, tight connection of said closure part to said pouring part.

5,439,125

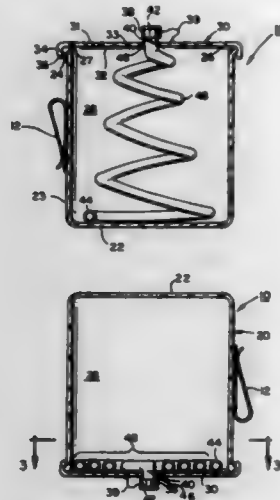
## DRINKING DEVICES

Harry S. Bloch, 871 Green Ridge Cir., Langhorne, Pa. 19053  
Continuation-in-part of Ser. No. 965,681, Oct. 22, 1992, Pat. No. 5,211,298. This application Apr. 20, 1993, Ser. No. 49,467  
The portion of the term of this patent subsequent to May 18, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> B65D 47/00

U.S. Cl. 215—229

15 Claims



1. A drinking device comprising:
  - a container having a base, an upper end opposing the base, an interior and a mouth providing access to the container interior; and
  - a drinking tube having opposing first and second open ends, the first end being held at least proximal the container mouth and at least part of a remaining portion of the drinking tube extending away from the first end in loops extending more than once completely around within the container interior, the second end of the drinking tube being located proximal the base when the device is supported in an upright position on the base and proximal to the upper end of the container when the device is supported in an inverted position with the upper end down and the loops of the remaining portion of the drinking tube being sufficiently flexible to freely collapse and extend axially at least under the weight of the remaining portion of the drinking tube, the remaining portion of the drinking tube being sufficiently resilient to resist collapse of its side wall and to remain in a looped state both when the remaining portion has collapsed axially upon itself and when the remaining portion has extended axially away from the first end.

5,439,126

## ONE-PIECE PLASTICS

Thomas D. Brownbill, Devon, England, assignor to Carnaud-MetalBox plc, United Kingdom  
Continuation of Ser. No. 123,246, Sep. 20, 1993, abandoned. This application Feb. 13, 1995, Ser. No. 387,381

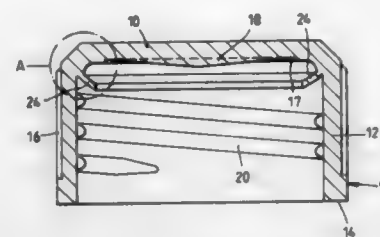
Int. Cl.<sup>6</sup> B65D 53/00

U.S. Cl. 215—344

17 Claims

1. A one-piece closure for a pressurised product container having a mouth-defining rim with an arcuate outer periphery, the closure comprising a body having a generally plane closure panel and depending tubular skirt and providing a mechanical abutment and pneumatic reaction surface within its interior, and a flexible circumferential sealing formation attached integrally to the body and projecting radially inwardly of the closure tubular skirt to a free radially innermost edge, the closure being arranged, when fitted to the container, with said sealing formation positioned against the container rim and urged against the container rim by mechanical and pneumatic

cooperation of the mechanical abutment and pneumatic reaction surface, seal-prevention means opening into an inner volume of said closure for preventing the mechanical abutment and pneumatic reaction surface from forming a seal by conducting product pressure between the mechanical abutment



and pneumatic reaction surface and the sealing formation from the closure inner volume, and the mechanical abutment and pneumatic reaction surface extending substantially steplessly radially of the closure and in the fitted closure lying in opposition to the container rim including the arcuate outer periphery thereof with the sealing formation therebetween.

5,439,127

## CONTROL STATION COVER

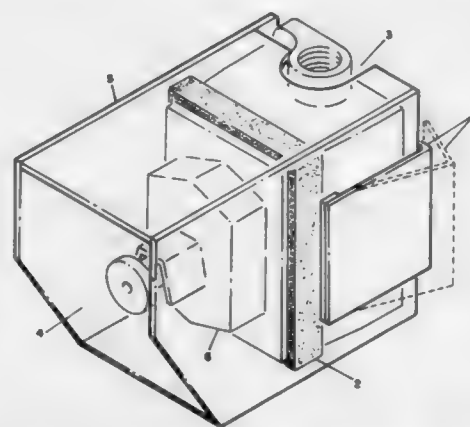
Chris V. Ahlskog, 4206 - 149 Street, Edmonton, Alberta, Canada T6H 5L9

Continuation-in-part of Ser. No. 831,349, Feb. 5, 1992, Pat. No. 5,271,514, which is a continuation of Ser. No. 611,786, Nov. 13, 1990, abandoned. This application Jul. 15, 1993, Ser. No. 97,843  
The portion of the term of this patent subsequent to Dec. 21, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> B65D 25/20

U.S. Cl. 220—3.7

1 Claim





5,439,131

**ASSEMBLY INCLUDING CONTAINER, CLOSURE AND OPERATING MEANS**

Takao Kato, Fujieda, Japan, assignor to Tokuyama Corporation, Tokuyama, Japan

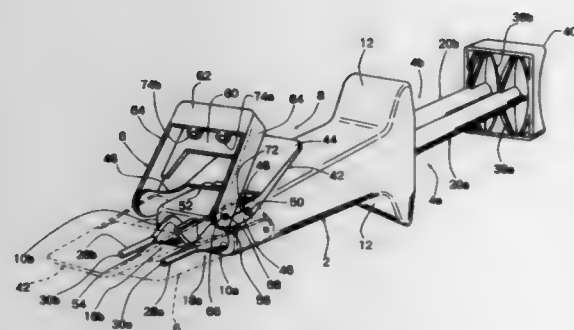
Filed Sep. 22, 1993, Ser. No. 124,639

Claims priority, application Japan, Sep. 25, 1992, 4-280946

Int. Cl.<sup>6</sup> B65D 43/76

U.S. Cl. 220—264

17 Claims



1. An assembly which includes:  
 a container with a discharge opening;  
 a closure that is moveable between a closing position at which said discharge opening of said container is closed and an opening position which is apart from said discharge opening and at which said discharge opening is opened;  
 an operating assembly which includes an operating lever that is pivotable with respect to said container on a mount that is fixed in position relative to said container;  
 said closure being pivotably mounted on said operating lever; and a pivotal axis of said operating lever relative to said container and a pivotal axis of said closure relative to said operating lever are substantially in parallel with each other; and a center axis of said discharge opening extends substantially perpendicularly to the pivotal axis of said operating lever relative to said container and substantially perpendicularly to the pivotal axis of said closure relative to said operating lever;  
 said operating assembly and said closure being dimensioned and arranged with respect to said container such that, when said operating lever is moved in a closing direction to a predetermined final position in order to move said closure from said opening position to said closing position, said closure is brought together with said operating lever to a turning position which is opposed to said discharge opening and which features said operating lever being at a first angular position with respect to said closure, and upon a modification in the relative position of said operating lever and closure wherein the first angular position is changed to a second angular position, said closure is moved substantially in the direction of the center axis of said discharge opening from said turning position to said closing position, and when said operating lever is turned in an opening direction from said predetermined final position in order to move said closure from said closing position to said opening position, said closure is brought from said closing position to said turning position and is then moved together with said operating lever.

5,439,132

**DUAL COVER PACKAGE**

Michael P. Gorlich, Hilton Head Island, S.C., assignor to World Class Packaging Systems, Inc., Hilton Head Island, S.C.

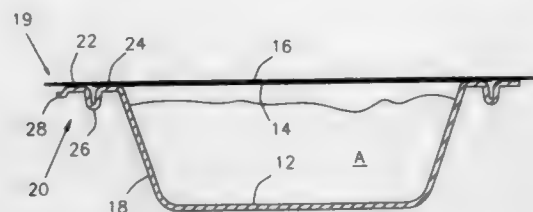
Continuation-in-part of Ser. No. 64,700, May 20, 1993, Pat. No. 5,348,752. This application Mar. 31, 1994, Ser. No. 221,194

The portion of the term of this patent subsequent to Sep. 20, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B65D 41/00, 51/18

U.S. Cl. 220—359

10 Claims



1. A package comprising:  
 a tray;  
 a flexible first membrane sealed to said tray; and  
 a flexible second membrane sealed to said tray over said first membrane, said membranes being secured to separate locations on said tray such that said membranes are substantially coplanar with one another, said second membrane being removable from the tray independently of said first membrane; wherein said membranes substantially continuously contact one another.

5,439,133

**PAPERBOARD CARTON-LINER ASSEMBLY WITH BALANCING MEANS**

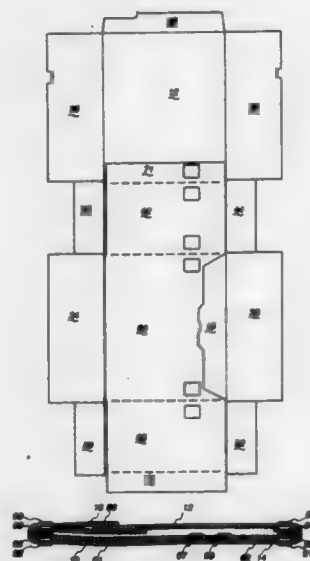
James L. Stone, Grand Rapids, Mich., assignor to Packaging Corporation of America, Evanston, Ill.

Filed May 24, 1994, Ser. No. 248,481

Int. Cl.<sup>6</sup> B65D 5/56

U.S. Cl. 220—418

29 Claims



1. A carton-liner assembly, comprising:  
 a carton including opposing top and bottom walls, opposing front and back walls, and opposing side walls;  
 a liner constructed and arranged for placement within said carton and including a front panel and opposing side panels for fitting said liner within said carton, said front panel having an outer surface adjacent to an inner surface of said carton front wall; and  
 first balancing means, integral with said liner, for increasing the thickness of the assembly in regions spaced from rela-

tively thick portions of the assembly while the assembly is in flattened tubular form during production so as to counterbalance said thick portions of the assembly, thereby improving stackability of the assembly while the assembly is in flattened tubular form.

5,439,134

**FOOD STORAGE AND DELIVERY DEVICE**

Kieichiro Tsuda, Kanagawa; Seitsuo Kin, Tokyo, and Toru Kajimura, Mie, all of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

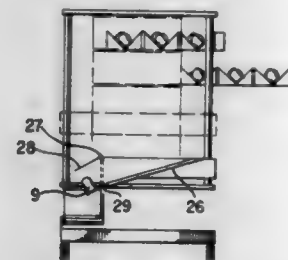
Filed Apr. 4, 1994, Ser. No. 221,967

Claims priority, application Japan, Apr. 6, 1993, 5-078384

Int. Cl.<sup>6</sup> G07F 11/58

U.S. Cl. 221—75

6 Claims



1. A food storage and delivery device, comprising:  
 a reservoir having spiral type storage and delivery sections arranged horizontally and vertically, each storage and delivery section extending in a longitudinal direction and having a tray and a rotatable spiral structure positioned on the tray contact thereto so that solid food items are held between pitches of the spiral structure and delivered in one direction, said tray receiving the food items thereon and having an inner side with a V-shape, said spiral structure being positioned in the V-shape inner side, and being able to disassemble from the tray,  
 a holding and transferring section situated adjacent to the reservoir for receiving the food items from the storage and delivery section, said holding and transferring section holding the food item transferred from the storage and delivery section temporarily and transferring the food item to a delivery portion,  
 an ascending section for moving the holding and transferring section, and  
 a controlling section for controlling the storage and delivery sections, the holding and transferring section and the ascending section such that after positioning the holding and transferring section to one side of the storage and delivery sections at a predetermined vertical level by means of the ascending section based on a delivery command, the food item is delivered from the storage and delivery section to the holding and transferring section to hold the food item temporarily, and after positioning the holding and transferring section to a vertical level corresponding to the delivery portion, the temporarily held food item is delivered to the delivery portion.

5,439,135

**GOLF TEE DISPENSING DEVICE**

V. E. Schrader, and Davis W. Simpson, both of San Antonio, Tex., assignors to Nifty-Lift, Inc., San Antonio, Tex.

Filed Feb. 9, 1994, Ser. No. 193,956

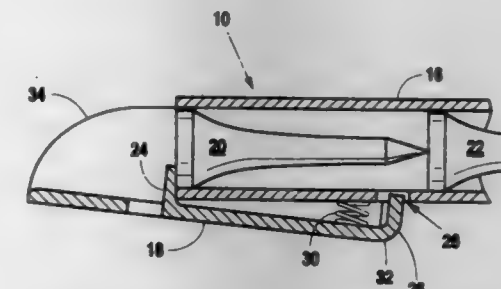
Int. Cl.<sup>6</sup> B65G 59/00

U.S. Cl. 221—251

4 Claims

1. An apparatus for storing, retaining, and dispensing golf tees for use during play of the game of golf, comprising:  
 dispensing tube, said dispensing tube having a diameter appropriate for the passage of a standard sized golf tee easily therethrough, said dispensing tube having a length sufficient to retain at least one standard sized golf tee

therein, said dispensing tube closed at a first end and open at a second end;  
 spring disposed within said dispensing tube, said spring having a first end in contact with said first end of dispensing tube and a second end extending through said dispensing tube towards said second end of said dispensing tube; dispensing mechanism pivotally attached to said second end of said dispensing tube said dispensing mechanism comprising:  
 a first stop tab movable between a first position partially obstructing said second end of said dispensing tube and a second position clearing said second end of said dispensing tube; and



- a second stop tab movable between a first position, wherein said second stop tab is removed from an aperture in a wall of said dispensing tube and a second position, wherein said second stop tab projects through said aperture in said wall of said dispensing tube in a manner that interrupts a flow of said golf tees through said tube upon release;  
 wherein standard sized golf tees are insertable in said dispensing tube in a manner that said spring forces said golf tees towards said second end of said dispensing tube and in which said dispensing mechanism alternately prevents release of said golf tees and permits release of said golf tees from said dispensing tube.

5,439,136

**MERCHANDISE PUSH-OUT DEVICE FOR VENDING MACHINES**

Hisashi Chatani, Ashiya, and Hiroyuki Haruna, Hiyogo, both of Japan, assignors to WADA Metal of America Corp., Rome, Ga.

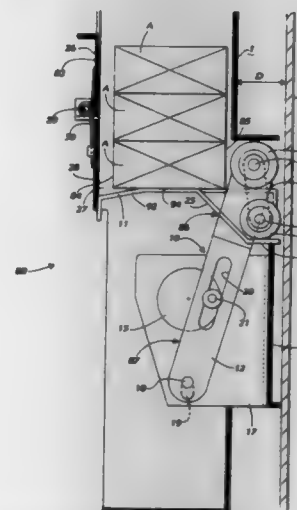
Filed Aug. 10, 1993, Ser. No. 103,921

Claims priority, application Japan, Aug. 12, 1992, 4-056733 U

Int. Cl.<sup>6</sup> B65G 59/00

U.S. Cl. 221—258

15 Claims



1. A merchandise push-out device for a vending machine

with vertically stacked merchandise, wherein said push-out device pushes forward a lowermost piece of merchandise stacked in a merchandise stocker, said device comprising:

- means for pushing the lowermost piece of merchandise forward, wherein said pushing means includes a push-out member; and
- means for supporting at least one remaining piece of stacked merchandise in a substantially horizontal position as the lowermost piece of merchandise is being pushed forward, wherein said supporting means includes:
  - said push-out member; and
  - a support member linked to said push-out member, wherein said support member is collapsible in a horizontal direction with respect to said push-out member when said push-out member is in a waiting position ready to push the lower most piece of merchandise.

5,439,137

# METHOD FOR FORMING AN EXTEMPORANEOUS MIXTURE OF AT LEAST TWO LIQUID OR PASTY COMPONENTS, AND PRESSURIZED CAN FOR IMPLEMENTING SUCH A METHOD

Jean-Francois Grollier, Paris, and Daniel Bauer, le Raincy, both of France, assignors to L'Oreal, Paris, France

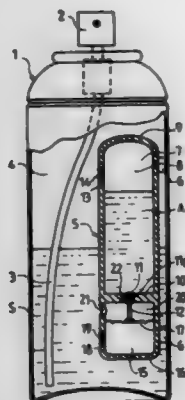
PCT No. PCT/FR93/00347, § 371 Date Dec. 1, 1993, § 102(e) Date Dec. 1, 1993, PCT Pub. No. WO93/21085, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 6, 1993, Ser. No. 157,032

Claims priority, application France, Apr. 9, 1992, 92 04341 Int. Cl.<sup>6</sup> B67D 5/52

U.S. Cl. 222—1

6 Claims



1. A method of forming an extemporaneous mixture of at least two liquid or pasty components isolated from each other during storage comprising:

- placing a first component in an aerosol can pressurized by a propellant gas;
- disposing a resupply capsule in said aerosol can, said capsule comprising a chamber containing a propellant under relatively high pressure, a valve provided in a wall of said chamber, and means for controlling said valve depending on the value of the ambient pressure of said can relative to a reference pressure;
- introducing a second component into the pressurized chamber;
- installing said capsule formed in the aerosol can;
- pressurizing said aerosol can with a propellant gas sufficient for the valve to remain in a closed position during storage;
- actuating a dispensing head of said aerosol can with said can in an inverted position so that only said propellant gas escapes from said aerosol can through said dispensing head to bring about a reduction in the pressure of the aerosol can; and
- having said valve control means cause said valve to open due to the decreased pressure of said aerosol can and allowing said second component to escape from said cap-

sule and to mix with said first component in said aerosol can to form a mixture of the first and second components.

5,439,138

# DOSAGING DEVICE AND METHOD OF DOSAGING

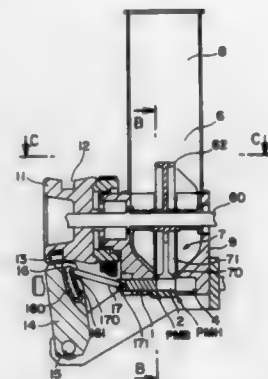
Michel Deal, St-Remy-en-Rollat, France, assignor to Sedepra, Paris, France

Filed Dec. 23, 1993, Ser. No. 172,586

Claims priority, application France, Dec. 31, 1992, 92 16052 Int. Cl.<sup>6</sup> B67D 5/52

U.S. Cl. 222—1

11 Claims



1. A method of volumetrically dosaging a powdered or granulated product, utilizing
  - a dosaging slide sliding in a groove between a top dead center and a bottom dead center,
  - a delivery piston sliding within a transfer chamber in communication with said groove at the top dead center, and
  - a screen capable of covering said groove,
 and in establishing an operating cycle as follows:
  - partially defining a unit volume by the dosaging slide having moved back to the bottom dead center selected, allowing the delivery piston to close the communication between the groove and the transfer chamber,
  - maintaining the groove open for the time necessary for the product introduced into the groove to completely fill the unit volume,
  - isolating the said unit volume by covering said groove by said screen,
  - causing the delivery piston to move back so that it uncovers the groove,
  - advancing the dosaging slide up to its top dead center in order to transfer the product out of the unit volume,
  - thereupon, while maintaining the dosaging slide stationary, causing the propulsion surface of the dosaging slide to be scraped by the delivery piston by advancing the latter until it closes the communication between the groove and the transfer chamber in order to expel the said unit volume,
  - and repeating the operating cycle in order to expel as many unit volumes of product as desired.

5,439,139

# TOY WATER GUN

Virginio Brovelli, Taino, Italy, assignor to Lanard Toys Limited, Hong Kong, Hong Kong

Filed Jan. 31, 1994, Ser. No. 189,583

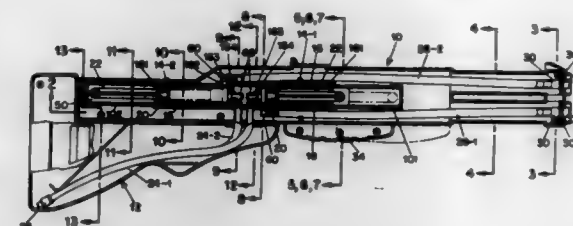
Int. Cl.<sup>6</sup> A63H 3/18

U.S. Cl. 222—79

20 Claims

1. A toy water gun comprising an elongated housing, a water reservoir attached to the housing, a first water pump received in the housing, a second water pump received in the housing, each water pump having an elongated cylinder having a first end and a second end and a longitudinal axis, a piston movable along the cylinder in sealing relation to the cylinder walls, and a piston rod coupled to the piston and extending out of the first end of the cylinder, an intake conduit for each water

pump leading from the water reservoir to the second end of the respective cylinder and having a one-way intake valve that permits water to be drawn into the respective cylinder on an intake stroke of the respective piston, a discharge conduit for each water pump leading from the second end of the respective cylinder and including a one-way discharge valve that permits water to be discharged from the respective cylinder on a delivery stroke of the respective piston, a nozzle connected to each discharge conduit and affixed to the housing, an operating



handle received on the housing for movement relative to the pump cylinders and coupled to the piston rods of both water pumps so as to simultaneously move the piston of one water pump along its delivery stroke and the piston of the other water pump along its intake stroke when moved in one direction and simultaneously move the piston of said one water pump along its intake stroke and the piston of said other water pump along its delivery stroke when moved in another direction.

5,439,140

# METHOD OF AND APPARATUS FOR DISPENSING BATCHES OF SOAP LATHER

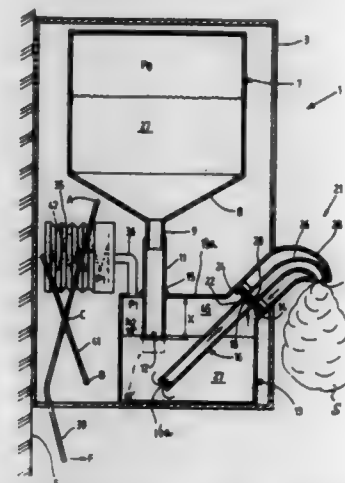
Paul Meyer, Kreuzlingen, Switzerland, assignor to Steiner Company, Inc., Chicago, Ill.

Division of Ser. No. 18,735, Feb. 17, 1993, Pat. No. 5,398,845. This application Nov. 21, 1994, Ser. No. 342,891

Int. Cl.<sup>6</sup> B67D 5/00

U.S. Cl. 222—110

3 Claims



1. A dispenser for batches of lather, comprising first, second and third vessels for first, second and third supplies of liquid soap, said second vessel including a lower portion for said second supply, an upper portion for a first body of air and a first outlet for evacuation of liquid soap from said lower portion to said third vessel, said third vessel including a lower portion for said third supply, an upper portion for a second body of air and a second outlet for evacuation of liquid soap from said lower portion of said third vessel; a lather generator fluidly connected to said lower portion of the third vessel through said second outlet and defining a mixing chamber having a third outlet; said second vessel having a nipple in communication with said upper portion thereof and carrying said lather generator; means for repeatedly compressing said

second body of air to thus expel successive quantities of liquid soap from said third vessel into said mixing chamber and to admit compressed air from said second body of air into said mixing chamber to form successive batches of lather which are expelled through said third outlet; and means for replenishing said second and third supplies from said first supply by gravity flow from said first vessel upon expulsion of a quantity of liquid soap from said second and third vessels.

5,439,141

# DUAL LIQUID SPRAYING SYSTEM

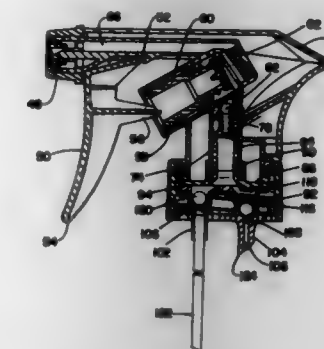
Gregory Clark, Westport, and Stanley I. Mason, Jr., Weston, both of Conn., assignors to Scott Paper Company, Delaware County, Pa.

Filed Jul. 21, 1994, Ser. No. 278,467

Int. Cl.<sup>6</sup> B67D 5/52

U.S. Cl. 222—136

13 Claims



1. A manifold for use with a hand-held pump spray head allowing the spray head to draw simultaneously from a first reservoir containing a chemical concentrate and a second reservoir containing a diluent at a predetermined ratio, said manifold comprising:

- (a) a lower housing including a substantially disk-shaped member with a concentrate valve body socket and a diluent valve body socket projecting therefrom, each of said concentrate valve body socket and said diluent valve body socket having an open end, an inlet port and an outlet port, said outlet ports opening into a mixing chamber;
- (b) an upper housing connected to said lower housing, said upper housing enclosing said open ends to form a concentrate check valve chamber and a diluent check valve chamber;
- (c) a biased check valve means residing within said concentrate check valve chamber, said biased check valve means preventing the pumping of the concentrate when the second reservoir is spent.

5,439,142

# TILTING SERVING DEVICE

John M. Robertson, 8805 Charring Cross Rd., Louisville, Ky. 40222, and Norma Sydnor, 107 Gardner La., Louisville, Ky. 40205

Filed Dec. 3, 1993, Ser. No. 160,779

Int. Cl.<sup>6</sup> B65D 83/00

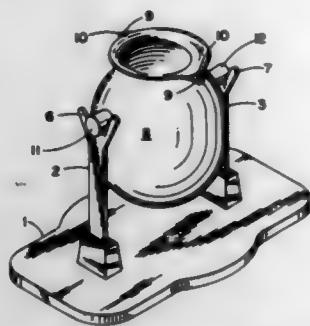
U.S. Cl. 222—164

14 Claims

1. A tiltable serving device for storing and dispensing a liquid comprising
  - a container for storing a liquid therein and for dispensing said liquid therefrom, said container having an open, upper end,
  - a pour spout attached to an upper end portion of said container for guiding the flow of said liquid as said liquid is poured from said container, an end portion of said pour spout defining a cornerless hole therethrough which has an opening on an upper surface of said pour spout which lies parallel to a flow path of said liquid along said pour



spout, said hole being sized so that a majority portion of the liquid being poured from said container along said pour spout flows over an end of said pour spout while a



minority portion of said liquid flows through said hole, and means for tilting said container for pouring said liquid from said container along said pour spout.

5,439,143

## DISPENSING VALVE FOR PACKAGING

Paul E. Brown, Midland, and Timothy R. Socier, Essexville, both of Mich., assignors to Liquid Molding Systems, Inc., Midland, Mich.

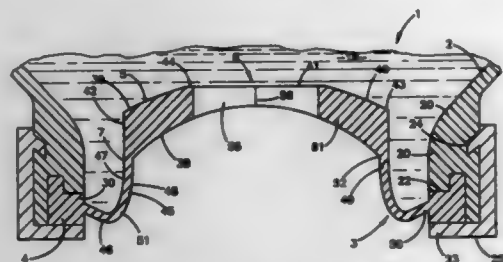
Continuation of Ser. No. 39,896, Mar. 30, 1993, Pat. No. 5,339,995, which is a continuation of Ser. No. 804,086, Dec. 6, 1991, Pat. No. 5,213,236. This application May 10, 1994, Ser. No. 240,264

The portion of the term of this patent subsequent to May 25, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> B67D 5/06

U.S. Cl. 222—185

52 Claims



1. A dispensing package for fluid products, comprising: a container shaped to retain a selected fluid product therein, and having a discharge opening; and a dispensing valve for controlling the flow of the fluid product from said container, having a marginal portion sealing about the discharge opening of said container, and a head portion including a central area with an orifice which opens to permit fluid flow therethrough in response to a predetermined discharge pressure within said container, and closes to shut off fluid flow therethrough upon removal of the predetermined discharge pressure; said head portion having an exterior surface which interfaces with ambient environment and has at least at outer portions thereof an inwardly curving arcuate side elevational shape defined by a first radius, and an interior surface which interfaces with the fluid product in said container and has at least at outer portions thereof an inwardly curving arcuate side elevational shape defined by a second radius, which is greater than said first radius, such that said exterior and interior surfaces converge toward the central area of said head portion to provide a tapered construction with reduced thickness adjoining said orifice.

5,439,144

## LIQUID SOAP DISPENSING SYSTEM

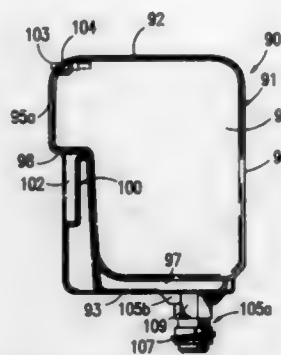
Charles R. Holzner, Chicago, Ill., assignor to Steiner Company, Inc., Chicago, Ill.

Filed Dec. 27, 1993, Ser. No. 173,210

Int. Cl.<sup>6</sup> B67D 5/42

U.S. Cl. 222—189.06

13 Claims



1. A soap cartridge for a liquid soap dispensing system including a housing and a discharge mechanism carried thereby for movement between a normal rest configuration and an actuating configuration for dispensing repeated doses of liquid soap, said soap cartridge having a wall, a receptacle having an aperture therein positioned in the wall of the soap cartridge, a plastic filter in sliding contact within said receptacle and having a sealing mechanism connected to said filter movable between a sealing position wherein said sealing mechanism seals said aperture and a filtering position wherein said sealing mechanism is away from said aperture and said filter establishes an air path between the inside and outside of said soap cartridge, said filter being compressed within and by said receptacle such that upon repeated dispensing of doses of liquid soap from the cartridge, a vacuum which results therefrom inside said cartridge does not exceed 12" of water.

5,439,145

## APPARATUS FOR DISPENSING LIQUID FROM AN INVERTED CONTAINER

Paul Salkeld, Redditch; Andrew Gibbs, Leamington Spa, and Robert Tansley, Stratford-Upon-Avon, all of England, assignors to EBAC Limited, United Kingdom

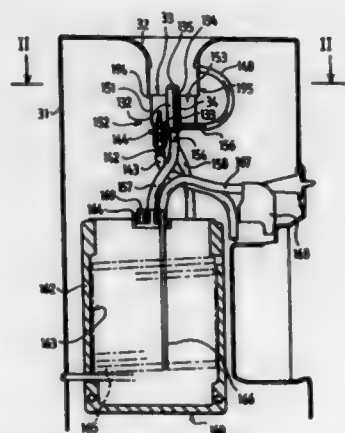
Continuation-in-part of Ser. No. 96,254, Jul. 26, 1993, Pat. No. 5,361,942, and Ser. No. 96,255, Jul. 26, 1993, abandoned. This application Jun. 29, 1994, Ser. No. 267,502

The portion of the term of this patent subsequent to Nov. 8, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B67D 5/58

U.S. Cl. 222—189.09

7 Claims



1. Liquid dispensing apparatus for dispensing liquid from an

inverted container having a neck through which the liquid is discharged, the apparatus comprising:

- a housing provided with a mounting arrangement for receiving and supporting an inverted container thereon, said mounting arrangement defining an opening for receiving the container neck;
- a body which includes a feed tube for insertion into the neck of the liquid container to conduct liquid therefrom;
- mounting means within said housing for releasably holding said body, said mounting means being arranged to positively support said body within said housing and below said opening such that said feed tube projects upwardly to a level adjacent said opening for being received in the neck of the container, said body being releasably held by said mounting means;
- conduit means connected for conducting liquid from said feed tube, said conduit means comprising a flexible tube; and
- a discharge valve for controlling the discharge of water from the container, the discharge valve comprising a pinch valve which is arranged to act on said flexible tube, said body and conduit means including said flexible tube thereby being removable for replacement during a maintenance operation whilst said pinch valve remains in situ.

5,439,146

## DISPENSING DEVICE FOR DISPENSING FLUID SUBSTANCES SUCH AS MUSTARD, KETCHUP, AND THE LIKE

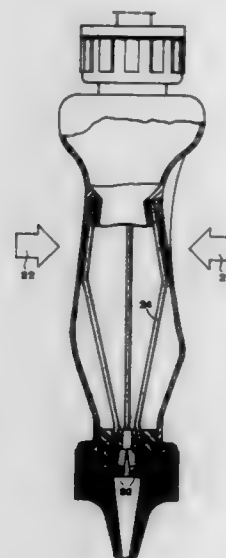
Jan-Anders Niss, Smultronvägen 1, Malung S-782 34, Sweden  
PCT No. PCT/SE92/00326, § 371 Date Dec. 13, 1993, § 102(e)  
Date Dec. 13, 1993, PCT Pub. No. WO92/22234, PCT Pub. Date Dec. 23, 1992

PCT Filed May 19, 1992, Ser. No. 162,120

Claims priority, application Sweden, Jun. 12, 1991, 9101790  
Int. Cl.<sup>6</sup> B65D 37/00

U.S. Cl. 222—207

20 Claims



19. A dispensing device for flowable substances comprising: a tubular member of flexible material having an inlet end adapted for receiving a flowable substance from a conduit means through which said substance is conducted to said tubular member, and an outlet end; a discharge opening connected to said outlet end of said tubular member; valve means for regulating flow of said substances from said tubular member out through said discharge opening, said valve means comprising a plurality of valve parts mounted

in cooperating mating relationship with respect to each other for relative movement between a closed position for cutting off flow through said valve means and an open position for facilitating flow through said valve means; and elongate operating members connected to said valve parts and located inside said tubular member for mechanically operating said valve means towards said open position by pressure on said tubular member.

5,439,147

## CONTAINER FOR INTRODUCING CONCRETE INTO FORMWORK

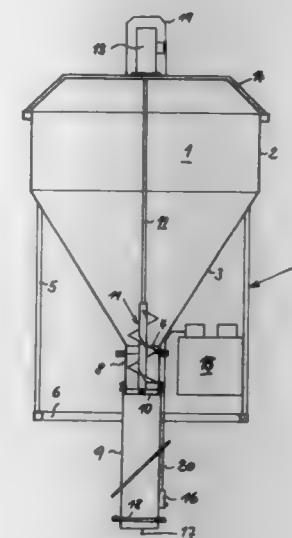
Lothar Bitschnau, Bartholomäberg, Austria, assignor to MST-BAU GESMBH, Fussach, Austria

Filed Dec. 9, 1993, Ser. No. 164,386

Claims priority, application Austria, Dec. 22, 1992, A2540/92  
Int. Cl.<sup>6</sup> G01F 11/20

U.S. Cl. 222—333

7 Claims



1. A concrete container for introducing concrete into formwork, the container comprising a vessel having a top and a bottom, a support frame for supporting the vessel, the vessel being open at the top thereof and having a downwardly and inwardly tapering lower portion, the lower portion defining an outlet opening, a pipe section connected to the outlet opening, and a distributing hose for introducing concrete into formwork connected to the pipe section, further comprising a screw mounted within pipe section, a motor for driving the screw, the motor for driving the screw being mounted on the vessel, a current source for the motor mounted on the support frame, actuating members for controlling the current source, the actuating members being mounted at an opening of the distributing hose, the pipe section having a length, the screw having an axial length which corresponds to or is slightly greater than the axial length of the pipe section, the screw having an average pitch selected smaller than 45° for preventing concrete from flowing out of the vessel when the screw is not rotating.

5,439,148

**DISPENSING SYSTEM FROM A CONTAINER UNDER PRESSURE**

Johannes W. J. Driessen, Leidschendam, Netherlands, assignor to B.J. Driessen & Zn. B.V., The Hague, Netherlands  
PCT No. PCT/NL92/00026, § 371 Date Oct. 14, 1993, § 102(e) Date Oct. 14, 1993, PCT Pub. No. WO92/13780, PCT Pub. Date Aug. 20, 1992

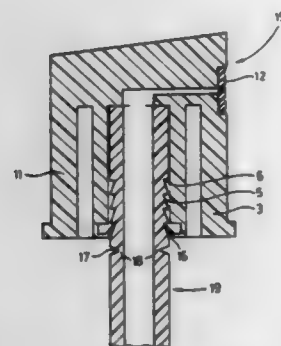
PCT Filed Feb. 5, 1992, Ser. No. 98,323

Claims priority, application Netherlands, Feb. 6, 1991, 9100208

Int. Cl.<sup>6</sup> B65D 83/00

U.S. Cl. 222-402.1

10 Claims



1. A dispensing system for a medium which is under pressure, comprising a separately provided spray nozzle for a container which contains said medium, said spray nozzle being adapted to be fixed irreversibly to a supply device of said container, wherein parts of the spray nozzle and the supply device, which together establish fluid communication, have at least one weakened portion to facilitate rupturing upon an attempt to remove said spray nozzle from the container.

5,439,149

**STORAGE CASE FOR A MOTORCYCLE**

Hubert Walter, Penzberg, and Horst Von Hagen, Iserlohn, both of Germany, assignors to Bayerische Motoren Werke AG, Munich, Germany

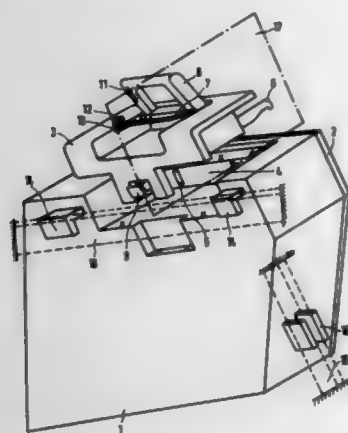
Filed Feb. 3, 1994, Ser. No. 191,044

Claims priority, application Germany, Feb. 3, 1993, 43 02 949.3

Int. Cl.<sup>6</sup> B62J 7/00

U.S. Cl. 224-32 R

20 Claims



1. A motorcycle storage case comprising:  
a basic housing,  
a lid covering an access opening of the basic housing, and  
a constructional unit fastened to the basic housing, said constructional unit including:  
a carrying handle,

and a movable holding angle engageable with a vehicle frame member,  
wherein said carrying handle is mechanically coupled to the holding angle so that movement of said carrying handle to a storage position moves the holding angle to a case holding position.

5,439,150

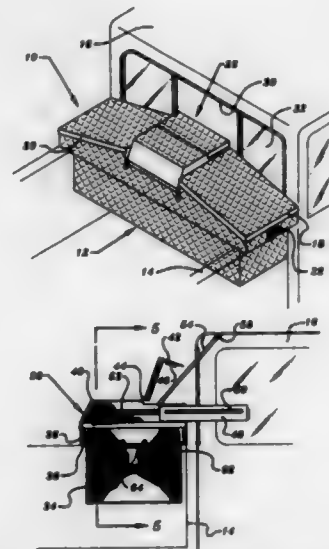
**REAR WINDOW ACCESSIBLE PICK UP TRUCK STORAGE BOX**

Kurt R. Trahms, 2624 April Dawn Way, Gambrills, Md. 21054  
Filed Oct. 21, 1993, Ser. No. 138,991

Int. Cl.<sup>6</sup> B60R 9/00

U.S. Cl. 224-404

8 Claims



1. A rear window accessible pickup truck storage box for use with a truck having a bed and a rear window, said storage box comprising:  
a main body which can be secured to a portion of said bed, said main body having a center area and an interior;  
at least one access lid means pivotally coupled to said main body for facilitating access to said interior of said main body;  
and,  
a center compartment assembly means pivotally coupled to said center area of said main body for facilitating access to said interior of said main body, wherein said center compartment is pivotally arranged to open towards said rear window, wherein said center compartment assembly means comprises an enclosure pivotally coupled to said main body, said enclosure having a pair of opposed interior surfaces, said enclosure further having an enclosure lid pivotally coupled thereto, wherein said lid can be opened to allow insertion and removal of articles within said enclosure, and further wherein said enclosure can be pivoted to allow access to said interior of said main body, wherein said center compartment assembly means further comprises a briefcase having a pair of sides; a pair of elongated projections, one of said projections being secured to each of said sides; and a pair of channels, one of said channels being secured to each of said opposed interior surfaces of said enclosure, wherein said projections can be slidably engaged to said channels to support said briefcase within said enclosure.

5,439,151

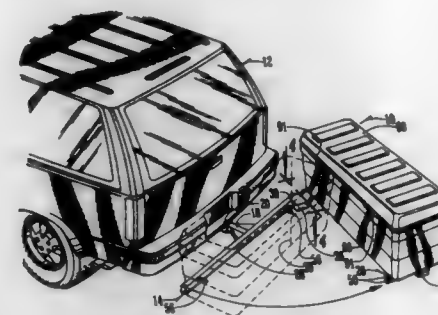
**CARGO CARRIER ATTACHMENT FOR A VEHICLE**

Kenneth C. Clayton, 3811 - 150th St., Brooklyn, Iowa 52211  
Filed Jun. 1, 1994, Ser. No. 252,402

Int. Cl.<sup>6</sup> B60R 9/058

U.S. Cl. 224-509

15 Claims



1. A cargo carrier for a vehicle, comprising:  
a swingably openable frame spaced outwardly apart from the vehicle and mounted adjacent and normally generally parallel to the vehicle, the frame including an elongated front jaw member having opposite first and second ends and a U-shaped rear jaw member having a first end pivotally attached along a generally vertical pivot axis to the first end of the front jaw member for angular relative movement between open and closed positions in a substantially horizontal plane, the rear jaw member having a second end releasably secured to the second end of the front jaw member so as to define a space between the jaw members upon the pivoting of the rear jaw member to the closed position; and  
a container for holding cargo releasably secured to at least one of the jaw members of the frame and having a base portion extending into the space between the jaw members and an upper portion protruding from the frame in the closed position of the jaw members.

5,439,152

**EXTENDABLE CARRIER RACK FOR PICK-UP TRUCKS**

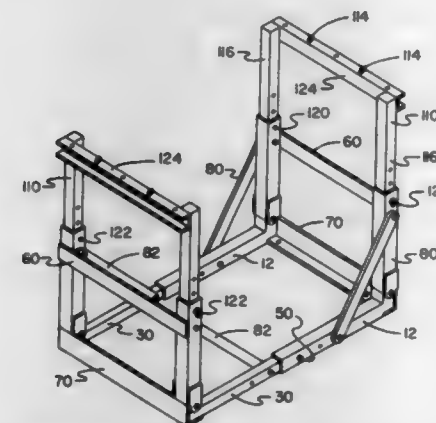
Samuel Campbell, 636 E. 92nd St., Brooklyn, N.Y. 11236

Filed May 16, 1994, Ser. No. 243,260

Int. Cl.<sup>6</sup> B60R 9/045

U.S. Cl. 224-405

2 Claims



1. An extendable carrier rack for pickup trucks for holding and supporting items thereon from a bed of a pickup truck for transporting from one location to another comprising, in combination:

a pair of rigid, generally tubular and L-shaped base legs, each base leg having a horizontal outer side rail pivotally coupled to an outer support rail adapted to be extended

upward, thus creating an upper free end, a lower free end, and a corner therebetween;

a pair of rigid, generally tubular and L-shaped extension legs, each extension leg having a horizontal inner side rail pivotally coupled to an outer support rail adapted to be extended upward, thus creating an upper free end, a lower free end, and a corner therebetween with the lower free ends of the extension legs each telescopically mated with a separate lower free end of a base leg;

a pair of rigid lower rail pins with each lower rail pin extended through a separate outer side rail of a base leg and the correspondingly mated inner side rail of an extension leg for allowing the telescopic and horizontal extension of each extension leg from its correspondingly mated base leg to be set;

a pair of rigid cross rails with one cross rail horizontally extended between and coupled to the upper free ends of the base legs and the other cross rail horizontally extended between and coupled to the upper free ends of the extension legs;

a pair of rigid and L-shaped bottom rails with one bottom rail horizontally extended between and coupled to the corners of the base legs and the other bottom rail horizontally extended between and coupled to the corners of the extension legs;

a first pair and a second pair of rigid braces with each brace of the first pair angularly extended between and coupled to a separate outer side rail and the adjacent outer support rail of a separate base leg and each brace of the second pair extended between and coupled to a separate inner side rail and the adjacent outer support rail of a separate extension leg, whereby the base legs, extension legs, cross rails, bottom rails, and braces in combination define a pedestal having a rectangular base section and an upwardly extended legged section adapted to be placed in and secured to a bed of a truck;

a sheet of plywood coupled to the base section of the pedestal for defining an extended working surface when the base section of the pedestal is positioned upward and the legged section is positioned downward;

a pair of rigid and u-shaped holding legs each having squared-off corners, each holding leg having a horizontal top rail with a pair of spaced eyelets coupled thereto and a pair of inner extension rails extended downwards from the top rail and terminated at a pair of lower free ends with the lower free ends of one holding leg telescopically mated with and extendable from the upper free ends of the base legs and the lower free ends of the other holding leg telescopically mated with and extendable from the upper free ends of the extension legs; and

a first pair and a second pair of rigid upper rail pins, each upper rail pin of the first pair extended through a separate outer support rail of a base leg and the correspondingly mated inner extension rail of a u-shaped holding leg for allowing the telescopic extension of the first holding leg from the base legs to be set, each upper rail pin of the second pair extended through a separate outer support rail of an extension leg and the correspondingly mated inner extension rail of a u-shaped holding leg for allowing the telescopic extension of the second holding leg from the extension legs to be set, whereby the extension of the holding legs from the pedestal define a rack adapted for holding items thereon with the items further adapted to be secured with a pair of lines through the eyelets for securing the items to the rack for transport.



5,439,153

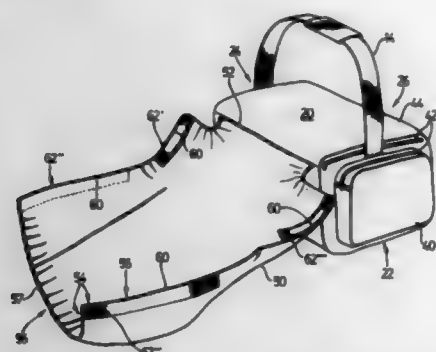
## ALL WEATHER COVER

Douglas Murdoch, Santa Rosa, Calif., and Uwe Mummenhoff, Toronto, Canada, assignors to Daymen Photo Marketing Ltd., Scarborough, Canada

Continuation-in-part of Ser. No. 974,028, Nov. 20, 1992, abandoned. This application Oct. 6, 1993, Ser. No. 130,143 Int. Cl.<sup>6</sup> A45C 15/00

U.S. Cl. 224-151

12 Claims



1. A bag to be carried by a human being, said bag comprising a housing having upper, lower, side, front and back surfaces and at least one compartment having at least one openable flap having closure means thereon for attachment to at least one of said surfaces of said bag, a harness attachable to said bag to assist in carrying said bag and a cover,

said cover constructed of a flexible water resistant material and having a hinged edge portion and a free edge portion, said hinged portion connecting said cover to said bag, said bag comprising a closable pocket adapted to contain said cover when said cover is folded and said hinge portion located within said pocket, and wherein said cover is adapted to substantially enclose said bag on at least the top surface and said at least one surface of said bag having said openable flap thereon while not covering said harness, said free edge portion of said cover including an elasticized portion for conforming said cover on said bag when unfolded and placed on said bag.

5,439,154

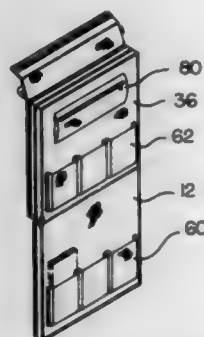
## DIAPER BAG

Anna Delligatti, 1185 Lewis Ter., West Deptford, N.J. 08096 Filed May 2, 1994, Ser. No. 236,120

Int. Cl.<sup>6</sup> A45C 13/30; A45F 3/02, 3/14; B65D 33/14

U.S. Cl. 224-205

1 Claim



1. A diaper bag for holding diapers and accessories used for baby care comprising, in combination:

three essentially rectangular compartments, each compartment having a hollow interior bounded by opposed first and second upwardly extending side walls with opposed peripheral top and bottom edges and opposed peripheral side edges extended therebetween, each compartment having a zipper disposed thereon and extended peripherally across the side edges and top edge creating a pivotal

connection along the bottom edge between the first and second side walls and enabling the first side wall to be pivoted away from the second side wall and extended downwards when the zipper is opened, whereby defining an extended configuration allowing access to the side walls within the compartment, and enabling the first side wall to be pivoted towards the second side wall and retracted upwards when the zipper is closed, whereby defining a retracted configuration preventing access to the side walls within the compartment, with the compartments stacked side-by-side in sequence and defining a first compartment, third compartment, and second compartment therebetween, with the first side wall of the second compartment coupled side-by-side with the second side wall of the first compartment creating a first common side wall, and the second side wall of the second compartment coupled side-by-side with the first side wall of the third compartment creating a second common side wall and the first side wall of the first compartment having a first pile type fastener positioned remote from the interior and coupled adjacent to the top edge thereof;

an essentially rectangular and planar pad having an edge pivotally coupled to the first side wall of the first compartment adjacent to the bottom edge and remote from the interior thereof for allowing the pad to be extended for supporting a baby's body when changing diapers thereon, the pad having a second pile type fastener coupled thereto on an edge remote from the pivotal connection with the first compartment, the pad adapted to be foldable in portions and positioned adjacent to the first side wall so as not to extend beyond the periphery thereof when the second pile type fastener is coupled with the first pile type fastener;

a first sequence of three rectangular pockets disposed within the first compartment and coupled to the first side wall thereof, each pocket having an opening with three sealed peripheral edges, the pockets positioned such that when the first compartment is placed in the extended configuration, the opening of the pockets face upwards, and when the first compartment is placed in the retracted configuration, the opening of the pockets face downwards with each pocket adapted for holding baby diapers therein;

a second sequence of three rectangular pockets disposed within the first compartment and coupled to the first common side wall, each pocket having an upwardly extending opening and three sealed peripheral edges with each pocket adapted for holding baby diapers therein;

a sealable pouch disposed within the first compartment and coupled to the first common side wall above the second sequence of pockets, the pouch adapted for holding ointments, baby wipes, safety pins, and other miscellaneous baby care accessories therein;

a third sequence of three rectangular pockets disposed within the second compartment and coupled to the first common side wall, each pocket having an opening and three sealed peripheral edges, the pockets positioned such that when the second compartment is placed in the extended configuration, the openings of the pockets face upwards, and when the second compartment is placed in the retracted configuration, the openings of the pockets face downwards with each pocket adapted to hold a washcloth, towel, burping cloth, and other miscellaneous baby care accessories therein;

a fourth sequence of three rectangular pockets disposed within the second compartment and coupled to the second common side wall, each pocket having an opening and three sealed peripheral edges with each pocket adapted for holding a washcloth, towel, burping cloth, and other miscellaneous baby care accessories therein;

a fifth sequence of six sealable and extended rectangular pockets disposed within the third compartment and coupled to the second common side wall, each pocket having a sealable opening and three sealed peripheral edges, the pockets positioned such that when the third compartment

is placed in the extended configuration, the sealable openings on the pockets face upwards, and when the third compartment is placed in the retracted configuration, the sealable openings on the pockets face downwards with each pocket adapted for holding a baby food container therein;

a sixth sequence of five pockets disposed within the third compartment and coupled to the second side wall thereof, each pocket having an upwardly extending and generally sealable opening, with one pocket adapted for holding a container of baby food cereal and the other pockets adapted for holding baby bottles;

an essentially rectangular securement flap having one edge connected to the top edge of the third compartment near the second side wall thereof and a third pile type fastener connected thereto on edge remote from the pivotal connection with the third compartment, the third pile type fastener adapted to be coupled with the second pile type fastener to place the diaper bag in a transportable configuration; and

a shoulder strap having a first end, second end, and intermediate portion therebetween, the first end and second end offset and coupled to the securement flap, whereby allowing the intermediate portion to be extended upwards to define a loop adapted to be placed over a user's shoulder for carrying the diaper bag in the transportable configuration, the shoulder strap further having adjustable means coupled thereto for allowing the length of the shoulder strap to be adjusted and a shoulder pad coupled thereto adapted for cushioning a user's shoulder when the diaper bag is carried.

5,439,155

## CARTRIDGE FOR SURGICAL FASTENER APPLYING APPARATUS

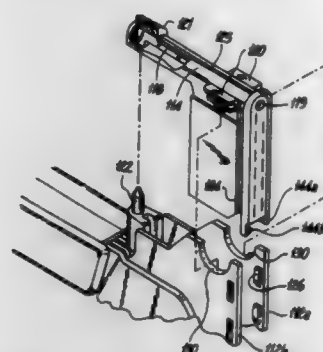
Frank J. Viola, Sandy Hook, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 133,697, Oct. 7, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 350,583

Int. Cl.<sup>6</sup> A61B 17/068

U.S. Cl. 227-176

6 Claims



1. An apparatus for applying surgical fasteners, comprising: a jaw mechanism including a first jaw member having a cartridge member containing a plurality of fasteners, and a second jaw member;

advancing means for approximating said first jaw member and said second jaw member to position tissue therebetween;

driving means for driving said fasteners from said cartridge member;

registering means for positioning said cartridge member on said first jaw member;

first receiving means disposed on said first jaw member complementary to said registering means for receiving said registering means;

aligning means for positioning said cartridge member with respect to said first jaw member;

second receiving means disposed on said first jaw member

5,439,156

## SURGICAL ANASTOMOSIS STAPLING INSTRUMENT WITH FLEXIBLE SUPPORT SHAFT AND ANVIL ADJUSTING MECHANISM

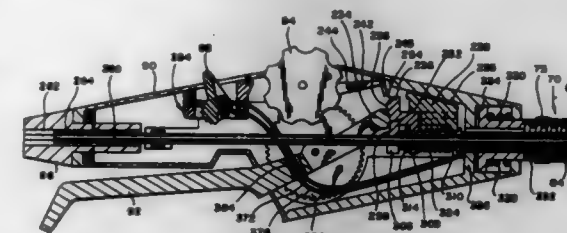
Richard L. Grant, Cincinnati, Ohio; Michael Lang, Andover, Mass.; Philip J. Churchill, North Potomac, Md., and W. Thompson Lawrence, Lexington, Mass., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 71,280, Jun. 2, 1993, Pat. No. 5,312,024, which is a division of Ser. No. 832,299, Feb. 7, 1992, Pat. No. 5,271,543. This application Feb. 1, 1994, Ser. No. 189,346

Int. Cl.<sup>6</sup> A61B 17/115

U.S. Cl. 227-179

6 Claims



1. A surgical stapling instrument for applying a plurality of surgical staples to tissue, comprising:

a stapling head assembly including a staple holder for receiving a plurality of surgical staples arranged in a circular array, an anvil for clamping the tissue against said staple holder, and a staple driver for engaging and driving the staples from said staple holder into the tissue and against said anvil;

an actuator handle assembly remote from said stapling head assembly and including cable operated first actuator means for moving said anvil over a first distance relative to said staple holder to open and close said stapling head assembly, second actuator means for adjusting the gap between said anvil and said staple holder over a second distance to adjust the staple height to be produced, wherein said second distance is less than said first distance and third actuator means for actuating said staple driver to drive the staples into the tissue and against said anvil;

a shaft assembly including a longitudinal support shaft for mounting said stapling head assembly on said actuator handle assembly; and

wherein:

said stapling head assembly is pivotable on an axis perpendicular to the longitudinal axis of said support shaft.

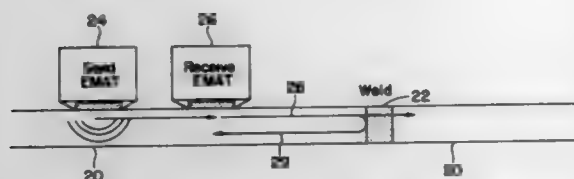
5,439,157

**AUTOMATED BUTT WELD INSPECTION SYSTEM**  
Daniel P. Geier, Lynchburg, and Kenneth R. Camplin, Forest, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 18, 1994, Ser. No. 276,136  
Int. Cl.<sup>6</sup> G01N 29/10; B23K 31/00

U.S. Cl. 228—9

12 Claims



1. An automated weld inspection system for non-destructively examining a butt weld used to join two coils of sheet metal end-to-end, the inspection system comprising:  
a computer control unit for coordinating the making of a weld by a welding apparatus and the examining of the weld by the weld inspection system;  
a transport apparatus having a first and a second electromagnetic acoustic transducer (EMAT) attached to and housed within the transport apparatus;  
an edge detection sensor affixed to the transport apparatus in proximity of either the first or the second EMAT;  
a data acquisition unit for receiving, storing, displaying and analyzing information provided from the computer control unit and for transmitting information to the welding apparatus; and  
a calibration means for making checks of and adjustments to the weld inspection system.

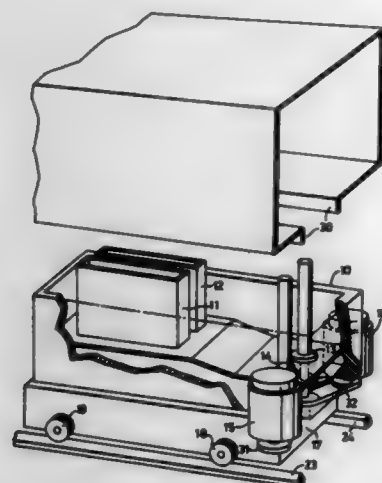
5,439,158

**ATMOSPHERE CONTROLLED SOLDERING APPARATUS WITH INCORPORATED SOLDER PUMP**  
William Sund, 8 Amos Crescent, Downsview, Ontario, Canada M3H 3X9

Filed Feb. 22, 1994, Ser. No. 199,953  
Int. Cl.<sup>6</sup> B23K 1/00

U.S. Cl. 228—37

8 Claims



1. A wave soldering apparatus comprising a controlled atmosphere chamber, a soldering station including a solder pot having a bottom wall and side walls containing liquid solder sealed to said chamber, at least one solder nozzle in said station supplied with a flow of liquid solder by a solder pump, drive means for said pump comprising a rotatable shaft passing through a stand pipe sealed to said bottom wall, said stand pipe extending above the level of said liquid solder in said pot, means to move components to be soldered into said chamber and over said at least one solder nozzle and in contact with said

liquid solder, characterized in that said at least one solder nozzle, said pump and all liquid solder surfaces are enclosed within said chamber.

5,439,159

**LEAD FRAME RETAINING APPARATUS**

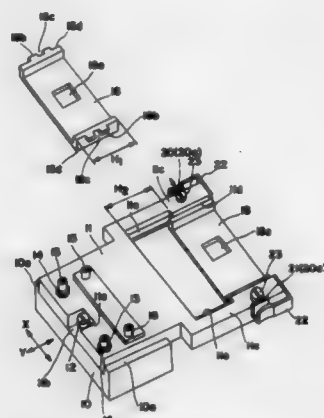
Takashi Takeuchi, Higashiyamato, and Sugiura Kazuo, Aki-shima, both of Japan, assignors to Kabushiki Kaisha Shin-kawa, Tokyo, Japan

Filed Aug. 18, 1994, Ser. No. 292,715

Claims priority, application Japan, Aug. 18, 1993, 5-223934  
Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 228—49.5

4 Claims



1. A lead frame retaining apparatus comprising a frame retainer detachably mounted to a frame retainer holder, characterized in that:  
said frame retainer is provided with guide projections on both sides of said frame retainer, and positioning cut outs are formed in said guide projections; and  
said lead frame retainer holder is provided with retainer guides for guiding said guide projections of said frame retainer in the frame retainer holder, pin holes formed in said retainer guides at positions corresponding to said positioning cut outs of said frame retainer, positioning pins provided in said pin holes of said frame retainer holder so as to be able to enter into said positioning cut outs of said frame retainer, spring members which urge said positioning pins toward said frame retainer, and eccentric pins which move said positioning pins in a direction of said pin holes of said frame retainer holder.

5,439,160

**METHOD AND APPARATUS FOR OBTAINING REFLOW OVEN SETTINGS FOR SOLDERING A PCB**

Angelo R. Marcantonio, Princeton, N.J., assignor to Siemens Corporate Research, Inc., Princeton, N.J.

Filed Mar. 31, 1993, Ser. No. 40,809

Int. Cl.<sup>6</sup> B23K 1/00

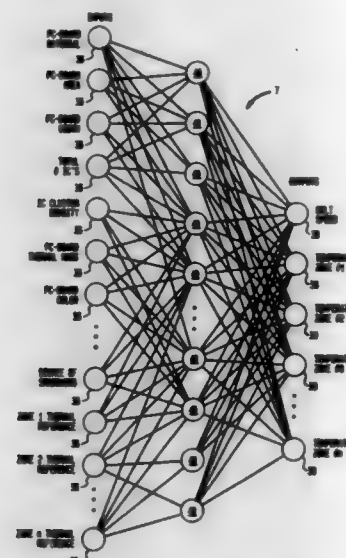
U.S. Cl. 228—102

19 Claims

1. A method for determining a reflow oven temperature profile for soldering a printed circuit board (PCB), comprising the steps of:  
configuring said oven with a predetermined number of temperature zones, and range of associated conveyor belt speeds for conveying PCB's through said oven;  
determining thermal characteristics for each one of a representative plurality of different samples of printed circuit boards typical of a range of printed circuit boards that may be run through said reflow oven;  
combining said thermal characteristics for each sample PCB with identifiable physical characteristics thereof, for obtaining identifying and distinguishing input features for each sample PCB;

determining for each sample PCB the belt speed, and temperatures of said temperature zones, respectively, for obtaining acceptable soldering, said temperatures and belt speed being designated as output features for each associated sample PCB board;  
training a neural network by sequentially and iteratively applying said input features to input nodes of said neural

a base member;  
holding means for holding the second member thereon;  
heat generation means for applying heat to the first member; and  
pressurization means for pressing said heat generation means against the first member and the second member;  
said holding means, said heat generation means and said pressurization means being disposed mechanically separately from said base member.



network, respectively, and applying said output features to output nodes of said neural network, respectively, for each sample PCB; and  
applying input features of a non-sample PCB to said trained neural network, for obtaining as outputs from said neural network a desired belt speed, and temperature settings for each zone of said oven, for setting up said oven to solder said non-sample PCB.

5,439,161

**THERMOCOMPRESSION BONDING APPARATUS, THERMOCOMPRESSION BONDING METHOD AND PROCESS OF MANUFACTURING LIQUID CRYSTAL DISPLAY DEVICE**

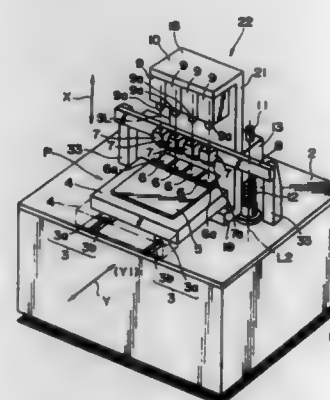
Norio Kawatani, Kanagawa; Iwao Ichikawa, Tokyo; Kazuaki Suzuki, and Yukio Yamada, both of Tochigi, all of Japan, assignors to Sony Corporation, Japan

Filed Sep. 7, 1994, Ser. No. 301,389

Claims priority, application Japan, Sep. 8, 1993, 5-247438  
Int. Cl.<sup>6</sup> H01L 21/603

U.S. Cl. 228—180.21

9 Claims



1. A thermocompression bonding apparatus for bonding a first member to a second member by thermocompression bonding, comprising:

5,439,162

**DIRECT CHIP ATTACHMENT STRUCTURE AND METHOD**

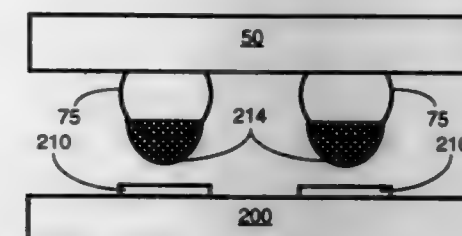
Reed A. George, Lake Worth; John P. Cheraso, Boynton Beach, and Douglas W. Hendricks, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1993, Ser. No. 82,568

Int. Cl.<sup>6</sup> H05K 3/34

U.S. Cl. 228—180.22

14 Claims



1. A method of attaching an integrated circuit to another circuit, the integrated circuit having a multiplicity of bumps attached directly to the integrated circuit for soldering the integrated circuit to the other circuit, each bump being substantially spherical and having a diameter ranging from substantially two to six mils, said method comprising the steps of:  
dipping the bumps into a flux compound to a depth of substantially one mil, wherein the flux compound adheres to a dipped portion of each bump; and  
dipping the bumps into an eutectic solder compound after said step of dipping the bumps into the flux compound, wherein the solder compound adheres to the flux compound and does not substantially adhere to the bumps or the integrated circuit, the multiplicity of bumps being partially covered with a solder portion.

5,439,163

**METHOD OF JOINING TWO ALUMINUM TUBULAR MEMBERS**

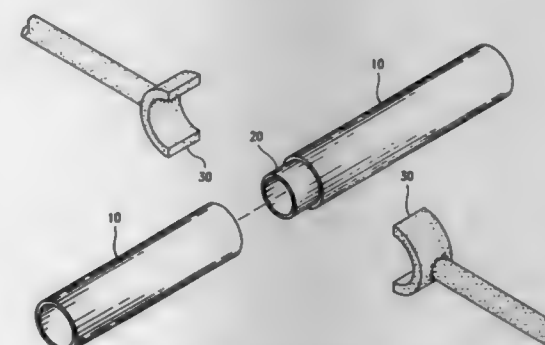
Jung-Ching Peng, P.O. Box 82-144, Taipei, Taiwan

Filed Jan. 13, 1994, Ser. No. 181,315

Int. Cl.<sup>6</sup> B23K 31/02

U.S. Cl. 228—189

1 Claim



1. A method of joining two aluminum tubular members comprising steps of:



inserting an iron ring member into a first aluminum tubular member, with part of the iron ring member extending out of the first aluminum tubular member; put a second aluminum tubular member on to the part of the iron ring member extending out of the aluminum tubular member; heating a pair of molds having a less width than the iron ring member to a temperature of 660 degrees centigrade; and applying the molds on the place where the two aluminum tubular members are joined together so as to melt the two aluminum tubular members together.

5,439,164

## METHODS FOR JOINING COPPER OR ITS ALLOYS

Yo Hasegawa, Nara; Masahiro Nagasawa, Hirakata, and Masahide Tsukamoto, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

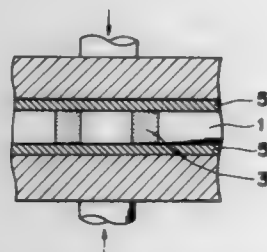
Filed Jun. 4, 1993, Ser. No. 71,400

Claims priority, application Japan, Jun. 5, 1992, 4-145276; Sep. 8, 1992, 4-239064; Jan. 12, 1993, 5-003127

Int. Cl.<sup>6</sup> H05K 3/34

U.S. Cl. 228—194

6 Claims



1. A method for joining at least two contacting surfaces of Cu or Cu alloy by diffusing Cu atoms into an opposite metal surface from the Cu or Cu alloy surface, which comprises: providing the contacting surfaces with a layer selected from the group comprising a noble metal thin layer, a metal oxide remover layer and a conductive paste layer mainly consisting of a Cu or Cu alloy particles and the metal oxide remover; and pressing the contacting metal surfaces at a temperature higher than about 170° C. whereat the Cu atoms at interface of the Cu or Cu alloy surfaces to be joined can be diffused, to give a joined metal body.

5,439,165

## METHOD FOR FORMING A STAINLESS STEEL COOKING UTENSIL WITH A DECORATED BASE

Ferdinando Cartossi, Baveno, Italy, assignor to Cartossi S.r.l., Ornavasso, Italy

Filed Feb. 4, 1994, Ser. No. 191,556

Claims priority, application Italy, Feb. 11, 1993, MI93A0249

Int. Cl.<sup>6</sup> B23K 20/00

U.S. Cl. 228—265

26 Claims



1. A method for forming a stainless steel cooking utensil with a decorated base, the utensil being of the type comprising a stainless steel vessel, to the base of which there is applied an intermediate layer of a good heat conducting metal, this intermediate layer being covered externally by an outer covering

layer of stainless steel, the method comprising the following steps:

- 1) positioning a plate of a metal of good thermal conductivity and of suitable thickness on the outer face of the base of the vessel;
  - 2) positioning a stainless steel covering layer on said plate;
  - 3) heating the assembly to a temperature close to but less than the melting point of the metal of said plate; and
  - 4) applying an impact pressure to the assembly to achieve permanent connection between the various constituent elements of the base; and
- said method further comprising providing between said steps 2) and 3) a further step 2') consisting of positioning on the stainless steel covering layer at least one sheet portion of a metal with a melting point not less than that of the constituent metal of the plate of good thermal conductivity, the sheet portions being suitably shaped and positioned on the covering layer to obtain the required design.

5,439,166

## RECLOSABLE PACK MADE FROM PLASTIC FOIL

Heinz Focke, Verden, Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Germany

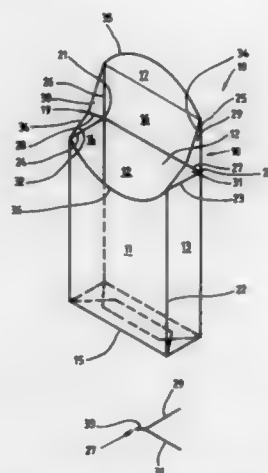
Filed Mar. 16, 1994, Ser. No. 213,764

Claims priority, application Germany, Mar. 16, 1993, 43 08 343.9

Int. Cl.<sup>6</sup> B65D 75/08

U.S. Cl. 229—87.05

8 Claims



1. A reclosable pack (10) made from plastic foil, comprising a front wall (11), a rear wall (12), and foldable side tabs (18, 19) which, for opening and closing, are foldable along predetermined folding lines (27, 28), the side tabs (18, 19) being subdivided into tab parts (29, 31; 30, 32) by the folding lines (27, 28), wherein regions of the tab parts (29, 31; 30, 32) adjacent to one another in the region of the folding lines (27, 28), for increasing a restoring force in the direction of a closing position of the tab parts (29, 31; 30, 32), are durably connected to one another by bonding.

5,439,167

## PACKAGE MADE OF CARDBOARD

Heinz Focke, and Martin Stiller, both of Verden, Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

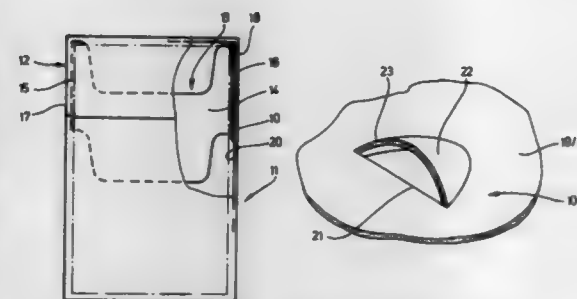
Division of Ser. No. 991,539, Dec. 15, 1992, Pat. No. 5,336,154. This application May 31, 1994, Ser. No. 250,923

Claims priority, application Germany, Dec. 17, 1991, 41 41 678.3

Int. Cl.<sup>6</sup> B65D 5/66

U.S. Cl. 229—160.1

14 Claims



1. A hinge-lid pack for cigarettes which is made of thin cardboard, said pack comprising:

- a) a lower box part (11) having box side panels (17, 18);
- b) a hinge-lid adjoining a top of said lower box part (11);
- c) a projecting collar (13) inserted into said lower box part (13); and
- d) collar side walls (15, 16) abutting an inside of said box side panels (17, 18) in an upper region thereof, and partly projecting therefrom,
- e) said box side panels (17, 18) having inwardly directed projections (10) which are directed into the inside of the pack and which support said collar (13) and said collar side walls (15, 16),
- f) each projection (10) being formed by an inwardly directed convexity (22) having an upper edge (23) which supports the collar (13),
- g) said upper edge (23) extending transversely relative to an upright direction of the pack, and being separated from a corresponding and also transversely extending punch cut (21) in each side panel (17, 18),
- h) said convexity (22) downwardly merging into said side panel (17, 18).

5,439,168

## PAPER BOX HAVING STRIP-SHAPED INLET

Do W. Kim, Seoul, Rep. of Korea, assignor to Dae Young Packing Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jul. 11, 1994, Ser. No. 272,479

Claims priority, application Rep. of Korea, Apr. 21, 1994, 94-8398 U; May 31, 1994, 94-12174

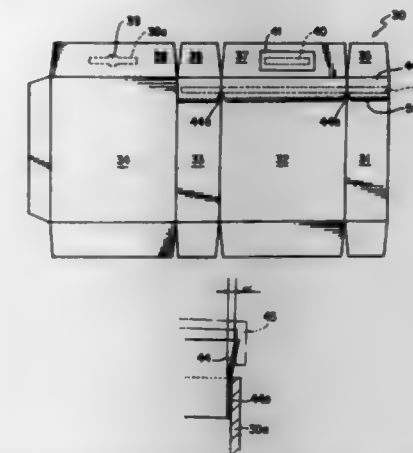
Int. Cl.<sup>6</sup> B65D 5/54

U.S. Cl. 229—225

5 Claims

1. A paper box comprising:
- four vertical wall members, top members extended from upper ends of the vertical wall members, bottom members extended from lower ends of the vertical wall members, all said members having an inner surface;
  - a tear tape portion integrally formed at upper portions of three vertical wall members selected from the four vertical wall members, said tear tape portion having a tear tape;
  - a lid part, separable from the three selected vertical wall members by operation of the tear tape; and
  - a strip shaped inlet having a lower end, said strip shaped inlet attached to the inner surfaces of the three selected vertical wall members such that the tear tape portion is covered

with the inlet so as to ensure watertightness against the tear tape portion, the tear tape portion attached along the



lower end to the inner surfaces of the three selected vertical members of the paper box.

5,439,169

## TEMPERATURE REGULATING CONTROL DEVICE AND METHOD OF MAKING THE SAME

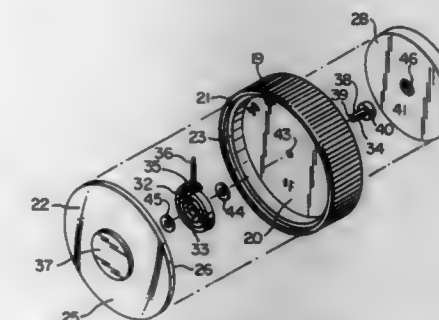
Peter Rübel, Lauf-Schönberg, Germany, assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 12, 1994, Ser. No. 180,895

Int. Cl.<sup>6</sup> G01K 5/00

U.S. Cl. 236—94

5 Claims



1. In a temperature regulating control device comprising a housing means, a rotatable knob carried by said housing means for selecting a temperature said control device is to tend to maintain, and an ambient temperature sensing means carried by said knob for indicating the ambient temperature being sensed by said temperature sensing means, said knob having an axis of rotation and having a chamber therein, said temperature sensing means being carried in said chamber of said knob, said temperature sensing means comprising a spiraled bimetallic means, said temperature sensing means having a hub, said spiraled bimetallic means having outer end means and inner end means, said inner end means being carried by said hub and said outer end means comprising an indicator means, said knob having a side thereof that faces said housing means, the improvement wherein said side of said knob has opening means therethrough that is coaxial with said axis of rotation and that leads to said hub so as to permit rotatable adjustment of said hub relative to said knob by the insertion of a suitable tool into said opening means to engage said hub therewith.

5,439,170

## ILLUMINATED WATER FOUNTAIN

Samuel Dach, 22 Havatzelet Hasharon, 44280 Kfar Saba, Israel

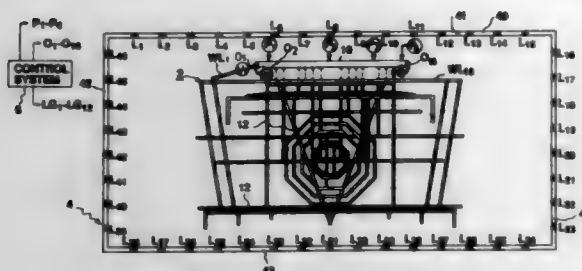
Filed Nov. 17, 1993, Ser. No. 153,067

Claims priority, application Israel, Jul. 23, 1993, 106461

Int. Cl.<sup>6</sup> F21P 7/00

U.S. Cl. 239—18

13 Claims



1. An illuminated water fountain of modular construction, comprising:
  - a distribution manifold having a plurality of input ports and a plurality of output ports;
  - a plurality of pumps connected to said input ports of the distribution manifold;
  - a plurality of modular water line units connected to said output port of the distribution manifold according to a desired array each water line unit carrying a plurality of water discharge nozzles to produce a desired pattern of water discharges;
  - each modular water line unit including a valve controlling the supply of water to said nozzles of its respective unit to thereby control the pattern of water discharges thereby;
  - an illumination system for illuminating the pattern of water discharges;
  - a source of musical sounds;
  - and a control system for controlling the water valves and illumination system in accordance with said musical sounds.

5,439,171

## TRACTION MAT FOR VEHICLES

Ian K. Freund, Queensland, Australia, assignor to Kulak Technologies Pty. Ltd., Queensland, Australia

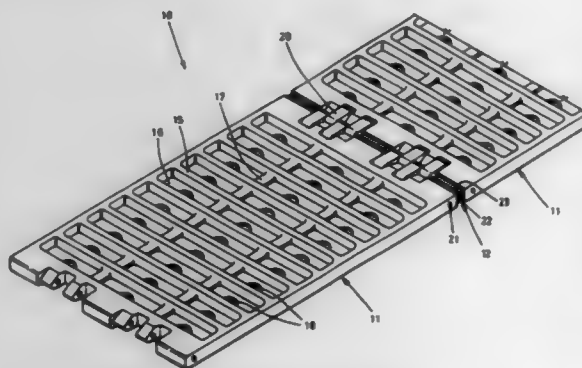
Filed Feb. 22, 1994, Ser. No. 198,403

Claims priority, application Australia, Feb. 22, 1993, PL7430

Int. Cl.<sup>6</sup> B60B 39/12

U.S. Cl. 238—14

8 Claims



1. A traction mat for vehicles including:
  - a plurality of substantially planar panels formed of flexible resilient material, each panel having an upper surface engageable by the vehicle's tires, a first set of slots open to one end of the panel and a second set of slots open to an opposite end of the panel, the first and second sets of slots being transversely offset;
  - a plurality of link assemblies of flexible material, each link

assembly hingedly interconnecting an adjacent pair of the panels and enabling the panels to be folded in a stacked arrangement, each link assembly having a first set of links receivable in the first set of slots on one of the panels and a second set of links received in the second set of slots in a second of the panels; and

hinge pin means to connect the first and second sets of links to the first and second panels respectively.

5,439,172

## PLANAR SAMPLER FOR A LIQUID VOLATILE MATERIAL AND METHOD

John Comyn, Huncote, and Derek A. Bishopp, Saxmundham, both of Great Britain, assignors to The Beautiful Bouquet Company Limited, England

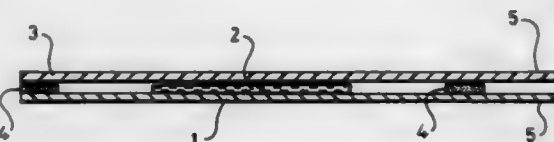
Filed Nov. 23, 1993, Ser. No. 156,578

Claims priority, application United Kingdom, Nov. 24, 1992, 9224600; Aug. 13, 1993, 9316885

Int. Cl.<sup>6</sup> A61L 9/00

U.S. Cl. 239—34

14 Claims



1. A generally planar sampler for a liquid volatile material, which sampler comprises:
  - a. a planar substantially vapour proof barrier base layer having applied directly to a selected area of a first face thereof a fluid material containing a liquid volatile material;
  - b. a planar substantially vapour proof barrier cover layer applied directly and without an intermediate layer over at least said selected area of said first face of the base layer;
  - c. a seal between at least the periphery of said base and cover layers whereby there is formed a substantially vapour proof enclosure for said volatile material, said seal being separable whereby a user can separate at least part of said cover layer from said base layer so as to expose at least part of said first face of said base layer directly to the atmosphere and allow the liquid volatile material to be released by volatilization from said base layer, said seal also being reformable upon replacement of said cover layer so as to prevent further release of said volatile material.

5,439,173

## AEROSOL GENERATOR

J. David Waldrop, P.O. Box 488, Valdosta, Ga. 31601

Continuation of Ser. No. 650,261, Feb. 4, 1991, abandoned, which is a continuation of Ser. No. 265,527, Nov. 1, 1988, Pat. No. 4,992,206. This application Jan. 19, 1993, Ser. No. 6,667

The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.

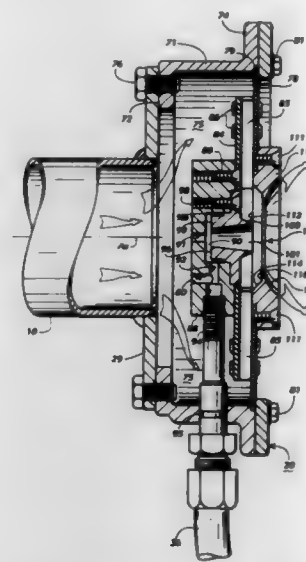
Int. Cl.<sup>6</sup> B05B 7/10, 15/02; C09K 3/30

U.S. Cl. 239—112

4 Claims

1. An aerosol generator for dispensing minute quantities of liquid in a primary airstream to form a fog having finely divided droplets of liquid entrained therein, comprising: an air blower for producing an airstream, a duct communicating with said blower for receiving said airstream, said duct having an outlet end, a nozzle connected to said outlet end and through which said airstream passes, a first passageway connected to said nozzle for introducing liquid into said nozzle for being entrained by said airstream, said passageway communicating with said airstream so as to exert a pressure air against said liquid in said passageway, a liquid storage tank, a control unit, a 3-way solenoid valve, a first conduit connected between said

storage tank and said control unit for delivering liquid from said tank to said 3-way solenoid valve when said control unit is in one position, a second conduit leading from said 3-way solenoid valve to said passageway for delivering liquid from said 3-way solenoid valve to said passageway, when said 3-way solenoid valve is in a first position, a third conduit connected



between said tank and said 3-way solenoid valve for directing return liquid from said passageway and said second conduit to said tank, when said 3-way valve is in a second position, an auxiliary tank for containing a solvent, means for delivering said solvent to said 3-way solenoid valve for being delivered via said second conduit into said passageway for flushing said passageway.

5,439,174

## NUTATING SPRINKLER

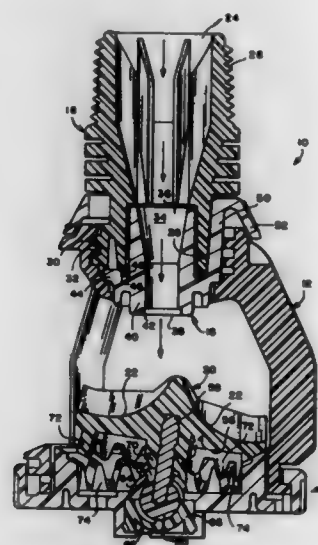
Frederick J. Sweet, College Place, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed Mar. 15, 1994, Ser. No. 212,938

Int. Cl.<sup>6</sup> B05B 3/02

U.S. Cl. 239—222.17

12 Claims



1. In a sprinkler comprising a body portion having a nozzle at one end and a cap assembly at an opposite end; said cap assembly secured to said body portion and supporting a spray plate located downstream of said nozzle, said spray plate having a plurality of stream distributing grooves formed on one

side thereof configured to cause said spray plate to rotate when struck by a stream emitted from said nozzle; the improvement comprising a universal joint for supporting said spray plate in said cap assembly such that a center of said spray plate is caused to wobble in one direction of rotation; and respective sets of gear teeth on said cap assembly and said spray plate arranged for progressive partial engagement in said one direction, and wherein said respective sets of gear teeth are configured to cause said spray plate to advance relative to said cap assembly in an opposite direction of rotation.

5,439,175

## CLEANING DEVICE FOR A TUBE

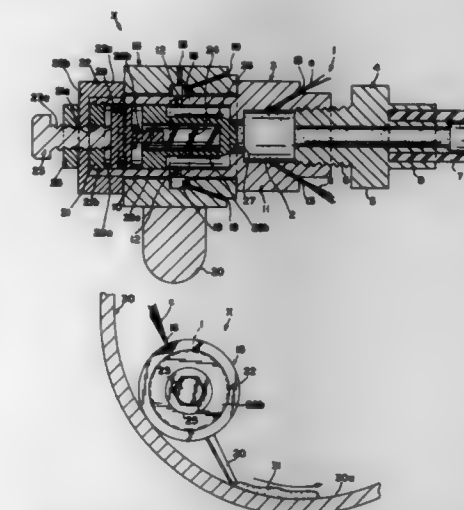
Shinzou Katayama, 570-1 Oaza Kawano, Yoshikawa-machi, Kitakatsushika-gun, Saitama-ken, Japan

Filed Feb. 22, 1994, Ser. No. 200,042

Int. Cl.<sup>6</sup> B08B 9/04

U.S. Cl. 239—246

6 Claims



1. A cleaning device for a tube comprising:
  - a nozzle supporting body including a main flow path in a shaft axial direction, said nozzle supporting body having at least one injection hole for self-propelling said nozzle supporting body in an oblique direction and communicating with the main flow path formed on an upstream side of said nozzle supporting body to which a hose is connected, and a liquid supply path that communicates with the main flow path formed on a secondary side of a bearing portion for supporting a tubular revolving body having at least one injection hole for an unbalanced force; a slide valve internally provided at the secondary side of the nozzle supporting body and biased constantly in a valve seat direction by a spring member; a screw body adapted for closing an opening portion on a front end side of the nozzle supporting body; and a valve limiting member provided at the screw body and adapted for adjusting a spring force of the spring member so that the slide valve can be moved away from the valve seat in correspondence with a pressure of a pressure medium flowing into the upstream side.

5,439,176

## LAWN-GARDEN SPRINKLER HAVING A TRIPOD SUPPORT STRUCTURE

Eugene Bussiere, 59 Beechwood Dr., Danville, N.H. 03819

Filed Jul. 14, 1994, Ser. No. 274,769

Int. Cl.<sup>6</sup> B05B 15/06

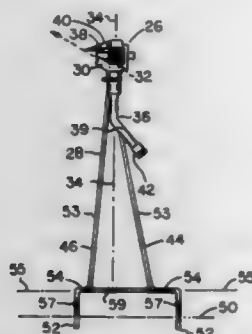
U.S. Cl. 239—276

6 Claims

1. A lawn-garden sprinkler comprising:
  - a sprinkler head having a hollow vertical spindle and a spray



nozzle rotatably mounted on said spindle for rotation in a horizontal plane around the spindle axis;  
means for supporting said sprinkler at an elevated position above ground level;  
said supporting means comprising a water supply pipe having an upper end connected to said hollow spindle, and a lower end spaced above the ground surface;  
a tripod having an upper end connected to said water supply pipe so that the upper end of the water supply pipe constitutes a vertical extension of the hollow spindle;



said water supply comprising an upper section extending vertically on the spindle axis, and a lower section at an acute angle to said upper section;  
said tripod comprising three support rods;  
one of said support rods having an upper end connected to the lower section of said water supply pipe, the other two support rods having upper ends connected to the upper section of said water supply pipe;  
each support rod having a lower terminal end seatable on the ground surface; and  
the lower terminal ends of said support rods being located equidistant from the spindle axis.

5,439,177

#### DISCHARGE HEAD FOR DISCHARGE APPARUSES SUCH AS MANUAL PUMPS FOR DISCHARGING MEDIUM THERE THROUGH

Lothar Graf, Rielasingen/Worblingen; Peter Pfeiffer, Gaienhofen, and Ernst Buhr, Radolfzell, all of Germany, assignors to Ing. Erich Pfeiffer GmbH & Co. KG, Germany  
PCT No. PCT/EP91/00455, § 371 Date Nov. 16, 1992, § 102(e) Date Nov. 16, 1992, PCT Pub. No. WO92/15660, PCT Pub. Date Sep. 17, 1992

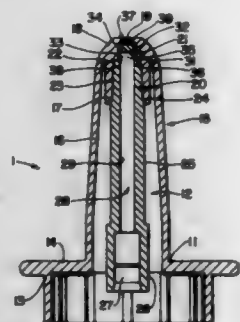
PCT Filed Mar. 12, 1991, Ser. No. 930,414

Claims priority, application Germany, Mar. 14, 1990, 40 08 070.6

Int. Cl.<sup>6</sup> B05B 11/00

U.S. Cl. 239—333

19 Claims



1. A discharge head (1) for operating a discharge apparatus (2) for discharging a medium, said discharge head (1) comprising:

a body (11) providing an outer member (16) and a holding member (17) freely projecting within said outer member (16), said outer member (16) having a circumferential

inner surface, and said holding member (17) having a circumferential outer surface substantially free of contact with respect to said inner surface;  
a discharge outlet (19) for expelling said medium therethrough, said discharge outlet (19) including a discharge duct having an inner discharge duct end; and  
an elongated operating shaft (12) providing a component separate from said body (11), and defining a shaft length extension including first and second length extensions, said operating shaft (12) having connecting means (27) for operably connecting said discharge head (1) with an operating member (9) of the discharge apparatus (2) for effecting discharge of said medium by operating the operating member (9) through said operating shaft (12), said operating shaft (12) having first and second shaft end sections (20, 26) defining said first and second length extensions, said first shaft end section (20) engaging said holding member (17) in a manner seated entirely over said first length extension, thereby providing a remaining length section (25, 26) of said operating shaft (12) defining a remaining length extension, said first length extension being shorter than said remaining length extension, and a turbulence device (37) being provided and including a turbulence member (34, 38) for guiding the medium in varying directions, and said turbulence member (34, 28) being provided by said first shaft end section (20).

5,439,178

#### PUMP DEVICE INCLUDING MULTIPLE FUNCTION COLLAPSIBLE PUMP CHAMBER

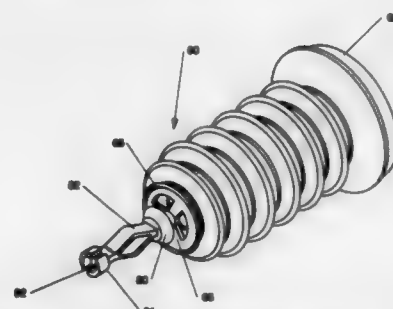
Robert J. Peterson, Loveland, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 82,001, Jun. 24, 1993, Pat. No. 5,303,867. This application Feb. 28, 1994, Ser. No. 203,913

Int. Cl.<sup>6</sup> B05B 11/02, 1/34

U.S. Cl. 239—333

20 Claims



1. A manually operated dispensing device for pumping a liquid from a supply container and spraying the liquid through a discharge orifice comprising:

- a housing for sealingly mounting the dispensing pump to the supply container, the housing including a portion of a liquid passage providing fluid communication from the supply container downstream to the discharge orifice;
- a swirl chamber, including a swirl channel and a discharge orifice, defining the terminal portion of the liquid passage, the swirl chamber being delineated by a first functional element including the discharge orifice and a second functional element;
- an inlet valve located within the liquid passage, the inlet valve being closed to prevent fluid flow therethrough during periods of positive downstream pressure and being open to permit fluid flow therethrough during periods of negative downstream pressure;
- an outlet valve located downstream of the inlet valve within the liquid passage, the outlet valve being open to permit fluid flow therethrough during periods of positive upstream pressure and being closed to prevent fluid flow

therethrough during periods of negative upstream pressure;  
(e) a collapsible pump chamber defining a portion of the liquid passage downstream of the inlet valve and upstream of the outlet valve, the collapsible pump chamber including the second functional element of the swirl chamber as an integral component thereof.

5,439,179

#### METHOD AND APPARATUS FOR FRAGMENTING A BLOCK OF FROZEN VEGETABLE TISSUE

Richard Nolin, Repentigny, and John Dery, Montreal, both of Canada, assignors to Johnson & Johnson Inc., Canada

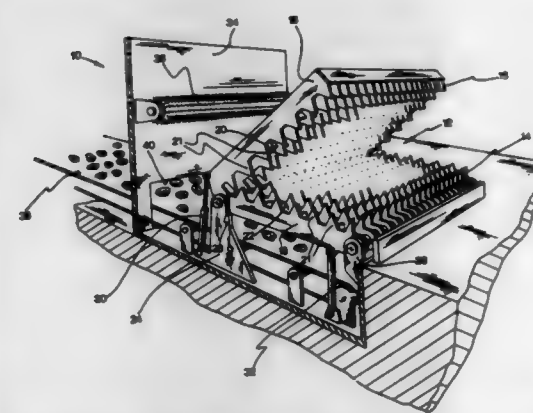
Filed Apr. 2, 1993, Ser. No. 43,174

Claims priority, application Canada, Apr. 7, 1992, 2065506

Int. Cl.<sup>6</sup> B27K 9/00; B02C 1/06, 1/10

U.S. Cl. 241—28

29 Claims



1. A method for fragmenting a block of frozen vegetable tissue without causing wide-spread damage to the vegetable tissue at a fiber level, comprising the steps of:

- loading the block of frozen vegetable tissue between a pair of support members having a plurality of elongated crossing members defining therebetween discharge apertures; and
- applying localized pressure to a multiplicity of discrete areas of said block of frozen vegetable tissue in registry with discharge apertures of said support members, whereby reducing to fragments said block of frozen vegetable tissue which egress said support members through said discharge apertures.

5,439,180

#### READILY INSTALLED UNIVERSAL SEWAGE GRINDER PUMP

Thomas R. Baughman, Clifton Park; Clark A. Henry, Scotia; Andrew P. Sleasman, Gansevoort; William R. Schouten, Castleton, and Gene A. Rougeux, Boiceville, all of N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed May 11, 1993, Ser. No. 60,430

Int. Cl.<sup>6</sup> B02C 18/40

U.S. Cl. 241—36

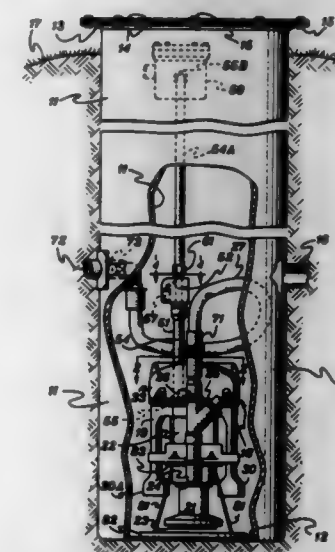
34 Claims

20. An integral, readily installed, universal sewage grinder pump assembly comprising:

- an integral, liquid-tight outer housing for supporting within a single liquid-tight containment vessel an electric motor driven grinder pump wherein the pump has a grinder unit on a suction intake side thereof for shredding and pulverizing liquid sewage collected in a collection tank, and discharging ground sewage from a discharge outlet of the pump at an increased pressure; normal high and normal low liquid level sensing and control means supported within said integral liquid-tight outer housing for deriving on-off switching electric control signals for controlling normal on-off operation of the motor driven pump;
- high liquid level alarm sensing and control means supported within said integral outer housing for sensing abnormally

high fluid level alarm conditions in the collection tank and deriving an output alarm control signal for redundantly energizing the motor driven pump upon sensing a high liquid level alarm condition in the collection tank and for providing a remote high level alarm indication to an accessible operator location for informing an operator of the assembly of the high level alarm condition;

liquid level sensing diving bell means supported on said integral housing and having at least one lower open end exposed to the liquid in the collection tank for deriving



liquid level indicating signals for application to said normal high and normal low liquid level sensing and control means and to said high liquid level alarm sensing and control means; and  
dynamically operable liquid level safety cutoff valve means mounted within said sensing diving bell means for cutting off access of liquid fluid to said normal high and normal low liquid level sensing and control means and to said high liquid level alarm sensing and control means upon the liquid level in the sensing diving bell means exceeding a predetermined level.

5,439,181

#### CHEVRON DEVICE LIMITING MILL DISCHARGE IN A FLUID BED SYSTEM

Robert M. Williams, 16 La Hacienda, Ladue, Mo. 63124

Continuation of Ser. No. 214,988, Mar. 21, 1994, abandoned.

This application Sep. 29, 1994, Ser. No. 320,108

Int. Cl.<sup>6</sup> B02C 23/08

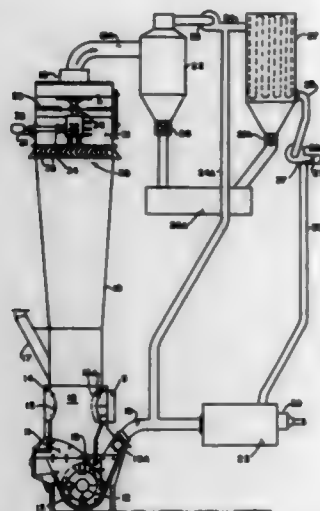
U.S. Cl. 241—79.1

1 Claim

1. Material reducing apparatus comprising:

- a column defining a path for the movement of reduced material;
- material reducing rotary mill hammers positioned in said column for throwing material out into said column at the tip velocity of the hammers;
- a reduced material sizing assembly in said column spaced from said material reducing mill hammers and in alignment with the directional path of the material thrown by said hammers;
- outlet means adjacent said material sizing assembly and on the side thereof remote from said material reducing mill hammers; and
- a structure in said path for reduced material to occupy a position to intercept material thrown at said reduced material sizing assembly, said structure extending across said column to present a series of side by side angularly shaped passages in advance of said material sizing assembly.

bly, said passages each defining angularly and interconnecting related passages sized to pass properly reduced material and said angularly shaped passages obstructing



the passing of material of an improperly sized reduction, said improperly sized material being thus intercepted for return to said rotary mill.

5,439,182

# EQUIPMENT/APPARATUS WITH ONE HORIZONTAL AUGER FOR CUTTING UP AND MIXING OF FIBROUS PRODUCTS USED FOR THE PREPARATION OF ANIMAL FEED

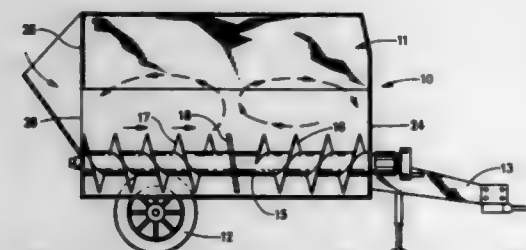
Giuseppe Sgariboldi, Camairago, Italy, assignor to Sioux Automation Center, Inc., Sioux Center, Iowa

Filed Dec. 3, 1992, Ser. No. 64,241

Int. Cl.<sup>6</sup> B02C 19/22

U.S. Cl. 241-260.1

6 Claims



1. An apparatus for mixing of fibrous product for preparation of animal feeds, comprising:

- a hopper having a bottom portion formed by a vertical wall and oblique wall joined together by a half-cylindrical bottom wall;
- a single auger disposed axially along an auger axis in said bottom portion within a region formed by a cylindrical bottom wall, said auger having a first blade section and a second blade section with said first and second blade sections having opposite blade directions; and
- a partition affixed to said auger intermediate between said first and second blade sections for rotation therewith such that rotation of said auger is operative to advance fibrous product against said partition and wherein rotation of said partition is operative to cause the fibrous product to be moved away from said auger and recirculated in said hopper.

5,439,183

# REFINER SEGMENT

Nils G. Virving, Hålsjöby, Sweden, assignor to Sunds Defibrator Industries Aktiebolag, Sweden

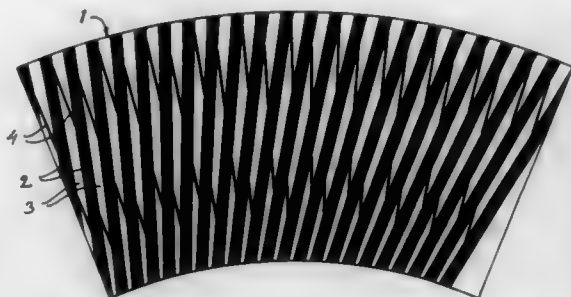
Continuation of Ser. No. 116,403, Sep. 3, 1993, abandoned. This application Dec. 28, 1994, Ser. No. 365,065

Claims priority, application Sweden, Jun. 17, 1993, 9302092

Int. Cl.<sup>6</sup> B02C 7/12

U.S. Cl. 241-296

4 Claims



1. A refiner segment for use in disk refiners for the treatment of lignocellulose-containing materials, said refiner segment having a radius and including an upper surface, an alternating pattern of pluralities of bars extending upwardly from said upper surface of said refiner segment to a predetermined bar height, and intermediate grooves having a predetermined groove width therebetween, and a plurality of dam members disposed in said intermediate grooves and extending upwardly from said upper surface of said refiner segment to said predetermined bar height, each of said dam members being arranged at a predetermined angle of less than about 30° with respect to said radius of said refiner segment, said dam members extending across said entire predetermined groove width of said intermediate grooves at said predetermined bar height.

5,439,184

# PRECISION WINDING METHOD AND APPARATUS

Winfried Pöppinghaus, Bad Sooden-Allendorf, and Peter Siebertz, Hamminkeln, both of Germany, assignors to Georg Salm GmbH & Co. KG, Eachwege, Germany

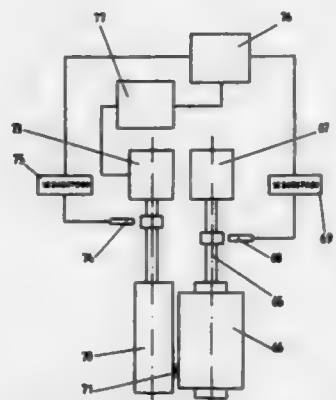
Filed Mar. 15, 1993, Ser. No. 31,637

Claims priority, application Germany, Mar. 16, 1992, 42 08 395.8

Int. Cl.<sup>6</sup> B65H 54/38

U.S. Cl. 242-18.1

8 Claims



1. A method of precisely controlling the reeling of a ribbon-like or filamentary material fed to a bobbin winder, the material being wound on the bobbin with precision winding, comprising the steps of continuously:

- recording the numerical value of the angular rotation of the bobbin as impulses with a first sensor;
- recording the numerical value of the angular rotation of

- the traversing thread guide as impulses with a second sensor;
- adding the impulses recorded by the first sensor in a first counter;
- adding the impulses recorded by the second sensor in a second counter;
- comparing the ratio of the sums of the impulses added in the first counter and the sums of the impulses added in the second counter against a range of preselected bobbin ratios;
- synchronizing the angular rotation of the bobbin with the angular rotation of the traversing thread guide; and
- regulating the angular rotation of the traversing thread guide so that the ratio of the sums of the impulses from said first and second sensors corresponds to a range of predefined bobbin ratios during the entirety of the winding of the material on the bobbin.

5,439,185

# BOBBIN HOLDER

Zenzaburo Tsukumo, and Shinsuke Tsukumo, both of Osaka, Japan, assignors to Zen Giken Co., Ltd., Osaka, Japan

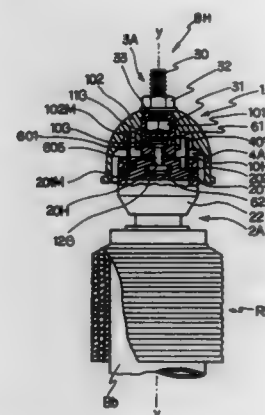
Continuation of Ser. No. 949,829, Jan. 14, 1993, abandoned. This application Jun. 27, 1994, Ser. No. 266,316

Claims priority, application Japan, May 21, 1991, 3-145353

Int. Cl.<sup>6</sup> B65H 49/02

U.S. Cl. 242-130.2

2 Claims



1. A bobbin holder comprising:

- a rotor portion for suspending a roving-containing bobbin including means for mounting a bobbin on said rotor portion for rotational movement by a bobbin-rotating torque which varies in proportion to the outer diameter of said bobbin as roving is withdrawn therefrom;
- a setting structure including means for securing said bobbin holder to a suspension creel;
- a suspending mechanism for rotatably and pivotably connecting said rotor portion to said setting structure including a pivot member having means at one end for suspendingly securing said pivot member to said rotor portion and means at the other end for suspendingly securing said pivot member with respect to said setting structure, at least one of said means being a conically-formed step portion operative to accommodate pivotal movement between said rotor portion and said setting structure, and an engaging bore portion provided in each of said rotatable body and said setting structure for receiving said ends of said pivot member; and
- means for suspendingly securing said rotor portion to said pivot member, including

- a substantially cylindrical wall forming an open chamber at an upper end of said rotor portion, said wall containing an annular recess formed therein;
- a substantially cylindrical block received in said chamber, said block containing a sloping surface having an upper

end cooperating with said recess to define a groove having three substantially rectangularly disposed sides, and a C-shaped snap ring formed of resilient wire material received in closely-fitted disposition in said groove.

5,439,186

# METHOD AND APPARATUS FOR ATTACHING OR DETACHING A FILMSTRIP TO A FILM CARTRIDGE

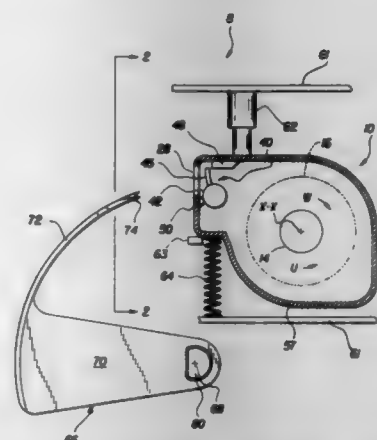
Thomas C. Merle, and Dale W. Ryan, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1993, Ser. No. 171,790

Int. Cl.<sup>6</sup> G03B 1/00

U.S. Cl. 242-348.1

18 Claims



1. A mechanism for attaching a filmstrip to a film cartridge having a take-up spool rotatably mounted therein, said cartridge having an access opening for allowing film to be inserted or removed from within the cartridge, comprising:

- first means for positioning the film cartridge in a first orientation;
- an attachment tool rotatably mounted to said mechanism for movement about a pivot point, said attachment tool having a generally arcuate guide member;
- means for moving said attachment tool from a non-engaged position to a first engaging position such that a portion of the attachment tool extends into said access opening;
- means for releasing the film cartridge from said first orientation;
- biasing means for biasing said film cartridge in a predetermined direction, said attachment tool, when in said first engaging position, orients said cartridge in a second orientation;
- means for engaging the filmstrip to said attachment tool; and
- means for moving said tool to a second engaging position for engaging the filmstrip to said spool.

5,439,187

# METHOD AND DEVICE FOR TAKING UP TOILET PAPER

Akira Shimizu, Fuji, Japan, assignor to Shimizu Machinery Co., Ltd.; Masukoh Paper Co., Ltd., both of Shizuoka and Hiroshi Genda, Tokyo, all of Japan

Continuation of Ser. No. 909,838, Jul. 7, 1992, abandoned. This application Sep. 13, 1993, Ser. No. 119,529

Int. Cl.<sup>6</sup> B65H 18/02

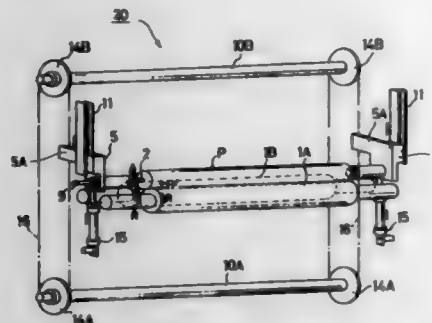
U.S. Cl. 242-541.7

5 Claims

3. A device for taking up toilet paper, comprising: take-up shaft means for rotatively taking up toilet paper in a roll, said take-up shaft means including a take-up shaft; first and second support means positioned parallel to and in operative contact with said take-up shaft, for generating support contact pressure against an entire length of the



take-up shaft as toilet paper builds up around said take-up shaft at an initial level; and  
driving means for rotating said take-up shaft, and, for moving said take-up shaft means away and parallel relative to said first and second support means so as to maintain uniform supportive contact pressure against the entire length of the take-up shaft as the toilet paper builds up around the take-up shaft at the initial level, the driving means being further for moving said take-up shaft means vertically away relative to said first and second support means, wherein



said driving means includes first and second drive devices operatively connected at opposing ends of the take-up shaft, the first and second drive devices being operatively connected to each other so as to synchronizingly maintain the take-up shaft in supporting contact parallel with said first and second support means, and a common drive means operatively connected to the first and second drive devices at opposing ends of the take-up shaft, for controlling parallel movement of the first and second drive devices relative to each other so as to maintain the take-up shaft substantially horizontal and in uniform supporting contact parallel with said first and second support means.

5,439,188

## CONTROL SYSTEM

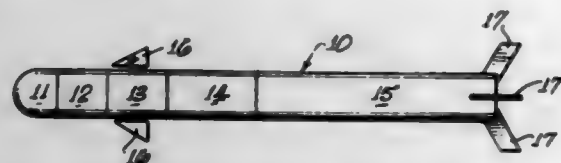
Herbert D. Depew, Jr., and Robert J. Ernst, Jr., both of Los Altos, Calif., assignors to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Sep. 4, 1964, Ser. No. 395,112

Int. Cl.<sup>6</sup> F42B 10/14, 15/01

U.S. Cl. 244—3.21

14 Claims



1. A control system adapted to effect flight control of a rolling missile, said control system comprising a target seeker head mounted at the forward end of a missile shell and having means for generating electrical signals in accordance with the relative positions of the missile and an associated target, a plurality of fixed area lift producing variable incidence control surfaces adapted upon launch to extend from within said missile shell into the missile's airstream, means for extending said control surfaces from within said shell and locking same in the extended position, actuator means engaged with said control surfaces and operable to vary the incidence of said control surfaces twice during each revolution of the missile when energized by electrical control signals, electronic means connected to said seeker head and said actuator means to receive the electrical signals from said seeker head and transform them into said actuator electrical control signals, whereby the incidence angle of the control surfaces is selectively varied during

that portion of the missile's roll necessary to keep the missile on a target intercept course.

5,439,189

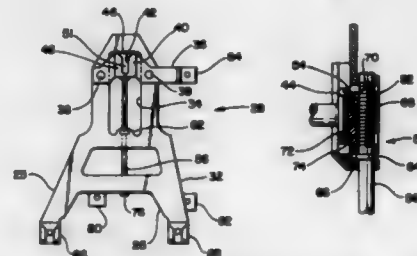
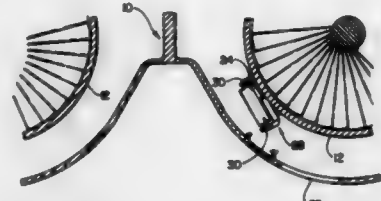
BLIND MOUNT FOR AN ENGINE EXTERNAL UNIT  
Walter H. Wiley, Palm Beach Gardens, and David L. Sanford, Stuart, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1993, Ser. No. 170,573

Int. Cl.<sup>6</sup> B64D 27/00

U.S. Cl. 244—54

10 Claims



1. Means for removably mounting an engine component to the case of an engine that is adapted to be mounted in an aircraft comprising an elongated bracket having means for mounting said bracket to said case, said elongated bracket having at one end a clevis defining a pair of support arms adapted to releasably support a pedestal attached to the engine component, movable means attached to said clevis for securing said pedestal in position, torquing means supported to said elongated bracket having a tool engagement end remotely spaced from said moveable means operatively connected to said movable means for positioning said movable means to engage and disengage said pedestal for attaching and releasing said engine component, said torquing means being engagable from an access opening formed in a wall of said aircraft, said elongated bracket including a pair of axially extending arms each of which include hook means attached to the ends thereof adapted to engage complementing pedestals formed on said engine component to releasably support said engine component whereby the operator can free himself from holding said engine component in place during installation and removal of said engine component.

5,439,190

## MEDIUM-EARTH-ALTITUDE SATELLITE-BASED CELLULAR TELECOMMUNICATIONS

Michael Horstein, Los Angeles; Peter H. Cress, Manhattan Beach, and Roger J. Rusch, Palos Verdes Estates, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 890,510, May 28, 1992, which is a continuation-in-part of Ser. No. 688,412, Apr. 22, 1991, abandoned. This application Oct. 12, 1993, Ser. No. 134,030

Int. Cl.<sup>6</sup> B64G 1/10

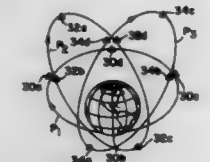
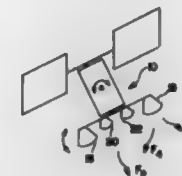
U.S. Cl. 244—158 R

7 Claims

1. A method of controlling the communication of a plurality of telecommunication satellites in a cellular telephone communication system, comprising the steps of:

determining a sequence of different focal directions for at least one antenna on each of said satellites over a predetermined orbital period, said focal direction being adjusted at a rate which is varied during said predetermined orbital

period, the rate of focal direction adjustment for each of said satellites being related to others of said satellites during at least a portion of said orbital period; and



periodically transmitting command signals to each of said satellites from at least one planetary-based control station which provides the information needed by said satellites to implement said sequence of focal directions.

5,439,191

## RAILGUN THRUSTER

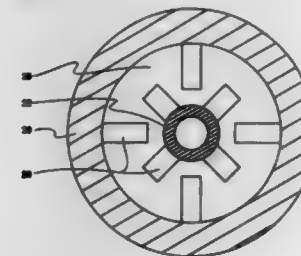
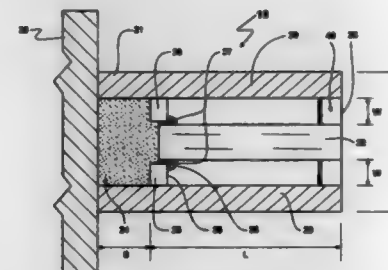
Steven P. Nichols, and William F. Weldon, both of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Feb. 16, 1993, Ser. No. 17,524

Int. Cl.<sup>6</sup> B64G 1/26

U.S. Cl. 244—169

31 Claims



1. A satellite thruster system comprising:

at least one thrust terminal;

at least one railthruster connected to each thrust terminal by a mounting bracket, each railthruster including:

first and second spaced apart electrodes extending along a central axis together defining a bore having a muzzle end and a plasma initiation end, a length of said bore being equal to a distance between said muzzle end and said plasma initiation end and a width of said bore being equal to a spacing between said first and second electrodes at said muzzle end, an aspect ratio of said bore exceeding 3:1;

said first and second electrodes being coaxial; and a pulse generator for supplying pulsed electrical energy to each railthruster; and  
an electrical connection between said second electrode and said mounting bracket, said plasma initiation end being between said electrical connection and said muzzle end.

5,439,192

## HAND-WORN DEVICE FOR ELEVATING THE HAND AND FINGERS WITH RESPECT TO A KEYBOARD

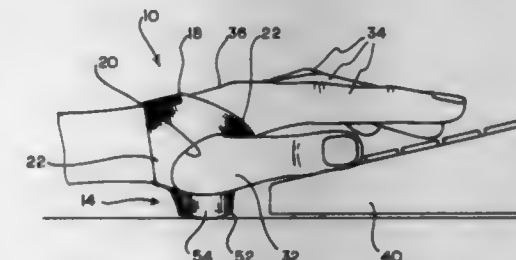
Mariam C. King, 7204 Pinebark Ct., Raleigh, N.C. 27615

Filed May 16, 1994, Ser. No. 243,126

Int. Cl.<sup>6</sup> B43L 15/00

U.S. Cl. 248—118

10 Claims



1. A two-piece hand work support assembly for elevating the hand of a typist or keyboard operator and elevating the fingers of the hand to where the fingers approximately align with a keyboard, comprising:

- a hand-worn cuff that completely encircles the hand including the heel of the hand, a back hand area opposite the heel, and the thumb;
- the cuff forming a single hand garment that wraps around the base of the hand and which includes a heel panel and an opposite back hand panel and wherein the wrap-around cuff includes a side thumb opening that is defined by splitting connecting strips that split and extend around the thumb and connect the heel and back hand panels;
- a rear hand opening formed on the back side of the cuff and which forms a base terminal end of the cuff;
- a forefinger opening formed on the front side of the cuff when worn and which forms a front terminal end of the cuff and which extends between the thumb and an adjacent forefinger and which is designed to allow the forefingers to extend therethrough as the cuff is inserted over the hand of the subject;
- a fastener formed on the outside of the heel panel of the cuff;
- a separate elevating pad detachably securable to the cuff, the elevating pad including a concave interface side that lies directly adjacent the heel panel of the cuff and extends transversely across the heel panel of the cuff when the elevating pad is secured to the cuff and wherein the shape of the concave interface side of the elevating pad assumes a shape that generally approximates the shape of the heel of the hand; and
- a mating fastener secured on the concave interface side of the elevating pad for mating with the fastener formed on the outside of the heel panel that enables the separate elevating pad to be quickly attached and detached with respect to the heel panel of the cuff and enables the cuff to be worn about the hand while the elevating pad has been removed from the cuff.

5,439,193

## CONTAINER INVERTING SUPPORT

J. Scott Coulter, Elko, Nev.; Samuel J. Gleason, Preston, Id., and Allen R. Thabit, Elko, Nev., assignors to Xcel Industrial Group, Elko, Nev.

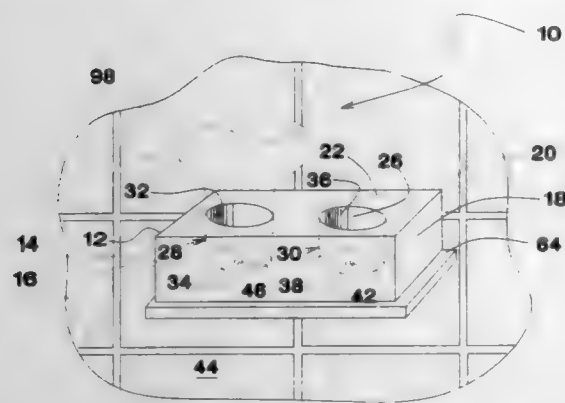
Continuation of Ser. No. 967,444, Oct. 28, 1992, abandoned.

This application Mar. 1, 1994, Ser. No. 204,894

Int. Cl.<sup>6</sup> A47G 29/00

U.S. Cl. 248—206.3

12 Claims



1. A container inverting device, for a container having an opening, for supporting said container on a substantially vertical wall at an inverted orientation, said container opening being located, in said inverted orientation, in a position lower than other portions of said container, whereby, in said inverted orientation, material contained in said container flows toward said opening, said container inverting device comprising:

- (a) a support member defining a passage for receiving a portion of said container adjacent said opening of said container, said passage being configured and dimensioned to support said container in said inverted orientation;
- (b) a suction cup having a suction surface for engaging said substantially vertical wall and compressible to a compressed suction gripping configuration, said suction cup being secured to and extending from a point of attachment on said support member for attaching said support member to said substantially vertical wall at a position which maintains said container in said inverted orientation; and
- (c) an abutting surface associated with said support member, said abutting surface being positioned on said support member and with respect to said suction cup to provide at a position where said suction cup is subjected to forces substantially parallel to said suction cup when said support member is maintained in a position where said container is in said inverted orientation, said abutting surface extending to provide support from a first position directly underneath said suction cup, wherein said suction cup is in its compressed suction gripping configuration, across to a second position displaced from said first position, wherein said abutting surface is provided by an elongated generally horizontally oriented raised portion of said support member.

5,439,194

## LOW PROFILE MOUNTING APPARATUS, FOR GAS MASKS OR OTHER DEVICES

Alan D. Lankford, 21314 Four Oaks Dr., Houston, Tex. 77073

Filed Jan. 21, 1994, Ser. No. 184,589

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 248—309.1

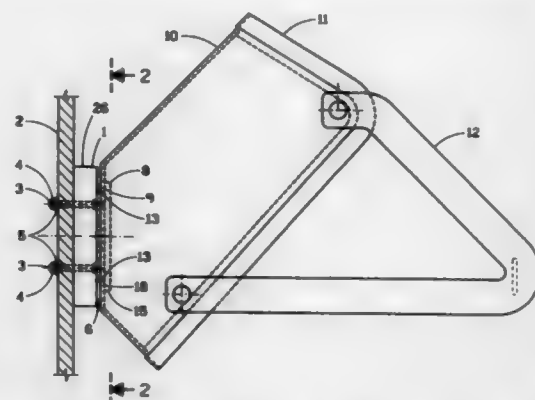
5 Claims

1. A low profile mounting apparatus mounted on a panel for securing a gas mask having at least one aperture formed in said gas mask to said panel comprising of:

- a body having a first end and a second end;
- a center axis wherein said center axis extends from said first end of said body through said second end of said body;
- a shaft with a first end and a second end wherein said shaft

is fixed to said body at said first end and further is a part of said body wherein said first end of said shaft is nearer to said first end of said body and said second end of said shaft is near said second end of said body;

at least one rounded flange wherein said rounded flange is formed at said second end of said shaft, and said rounded flange extends circumferentially from said center axis to form an arc past said shaft, said rounded flange further has at least one side that is not rounded and wherein said rounded flange is further formed to essentially the same



configuration as said aperture formed on said gas mask, but said aperture is greater than said rounded flange wherein said aperture may be placed around said rounded flange and said shaft and wherein said aperture is further rotated until part of said aperture is between said rounded flange and said inner surface of said rounded flange, thereby capturing said aperture between said rounded flange and said inner surface of said rounded flange, thereby mounting said aperture and said gas mask to said panel.

5,439,195

## TELEPHONE BOOK HOLDER

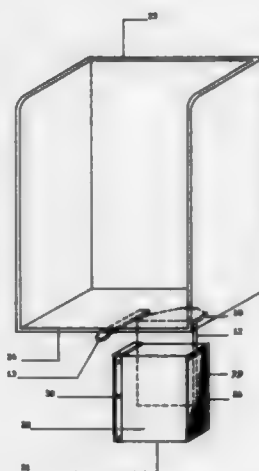
Fred W. Jessee, 164 Christie Park Manor SW., Calgary, Alberta, Canada T3H 2T6

Filed Sep. 28, 1993, Ser. No. 127,493

Int. Cl.<sup>6</sup> B42D 17/00, 17/01; A47B 97/04

U.S. Cl. 248—447

3 Claims



1. A mechanical device in combination with a shelf having a bottom, top, and front, and a binder having back and side covers pivotable between an access and stored position, the device comprising:

- a base attached to the bottom of the shelf, the base having a hinge means, the hinge axis being substantially parallel to

front of the shelf and a sector shaped dashpot attached thereto, the dashpot extending generally perpendicularly to the hinge means,

- a frame having an edge, the edge hinged to the base, the frame having a sector shaped piston means having a face, the piston means engageable with the dashpot, and the frame is attached to the cover of the binder allowing the binder to be attached to the frame at 90 degrees from the hinge axis,
- a rest attached to the front of the shelf supporting the back cover of the binder when the binder is in the accessed position, and
- a flexible seal secured to the face of the piston means enabling the entrapment of air in the dashpot upon pivoting of the binder to the stored position and allowing the passage of air into the dashpot during the pivoting of the frame to the access position.

5,439,196

## SAFETY CHRISTMAS TREE STAND

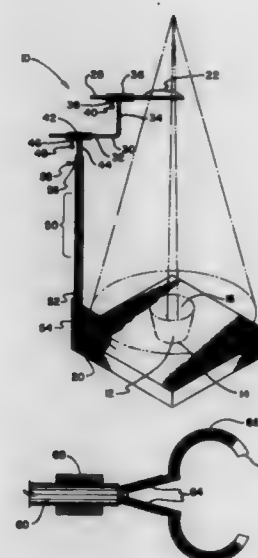
Vincent L. Widman, 10063 E. Township Rd. 138, Clyde, Ohio 43410

Filed Dec. 10, 1993, Ser. No. 164,530

Int. Cl.<sup>6</sup> F16M 13/00

U.S. Cl. 248—524

2 Claims



1. A new and improved tree stand for securing a cut tree in an upright position, the tree stand comprising:

- a container having a bottom end and an opening opposite the bottom end, the container adapted to receive a butt end of a tree trunk through the opening and hold a reservoir of water, the container further having a plurality of knife blades disposed therein and coupled thereto, the knife blades aligned to engage a tree trunk and hold it in an upright position;
- a rigid and planar base having the bottom end of the container centrally affixed thereto, the base adapted to stabilize the container when the butt end of a tree trunk is disposed therein;
- a clamp further comprising: an elongated support arm having a tip end and a base end and a U-shaped member coupled to the tip end, the U-shaped member adapted to hold a tree trunk therein;
- an elongated and rigid first staging rod having a first end a second end, the first end coupled to the base end of the clamp;
- an elongated and rigid second staging rod further comprising a lower end and an upper end, and an intermediate location defined therebetween and a lower segment and an upper segment with the lower segment extending laterally between the lower end and the intermediate location

and with the upper segment extending upwardly from the intermediate location to the upper end;

- a first collar coupled to the upper end of the second staging rod with the first staging rod slidably disposed therein, the first collar further having a threaded hole disposed thereon with a screw disposed therein for securing the first staging rod thereto once the lateral extent of the first staging rod relative to the first collar has been adjusted;
- a second collar having a downwardly extending alignment rod coupled thereto and the lower segment of the second staging rod slidably disposed therein, the collar further having a threaded hole disposed thereon with a screw disposed therein for securing the second staging rod thereto once the lateral extent of the second staging rod relative to the second collar has been adjusted; and
- an elongated and upright support leg further comprising a rigid tubular pole connected to the base and a plurality of gussets coupled to the pole and the base for reinforcing the connection therebetween, the pole having a first end and a second end, the first end connected to the base with the second end extending upwardly therefrom, the second end having the alignment rod of the second collar rotatably disposed therein, the second end of the pole further having a threaded hole disposed thereon with a screw disposed therein for securing the second collar thereto once upward extent of the alignment rod and the angular displacement of the second staging rod relative to the container has been adjusted, whereby the base, support leg, second collar, second staging rod, first collar, and first staging rod combine to locate the clamp at a position offset from and aligned with the container where it holds a tree trunk upright.

5,439,197

## FLOW RATE CONTROL VALVE

Shigeru Itoi, and Tetsuya Kojima, both of Osaka, Japan, assignors to Masako Kiyohara, Kumamoto, Japan

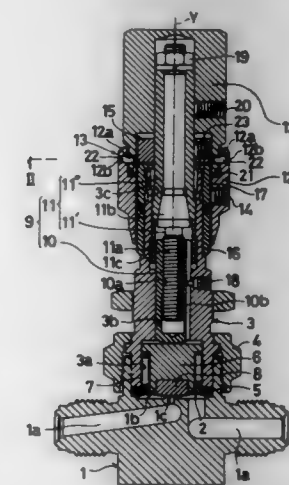
Filed Aug. 31, 1994, Ser. No. 297,551

Claims priority, application Japan, Sep. 17, 1993, 5-230612

Int. Cl.<sup>6</sup> F16K 35/00, 7/16

U.S. Cl. 251—95

6 Claims



1. A flow rate control valve comprising:

- a body defining a fluid passage, a valve chamber, and a valve seat;
- a tubularly-shaped bonnet supported on said body aligned with said valve seat;
- a stem supported by said tubularly-shaped bonnet and positioned in a passage of said bonnet so as to be aligned with said valve seat, said stem being movable along a length axis of said stem toward and away from said valve seat and being rotatable about said length axis;



a handle affixed to an outer end of the stem and enclosing an outer circumferential surface of the bonnet for rotating said stem;

a lock screw threadably mounted in said handle for selectively locking to said bonnet and thereby locking the handle against movement relative to the bonnet;

wherein said handle comprises a handle main body affixed to the upper end of the stem and a tubular lock handle enclosing the upper outer circumferential surface of the bonnet, said lock handle being coupled to said handle main body by a coupling means between the lock handle and main body for allowing said lock handle to be moveable in a direction orthogonal to the length axis of the stem relative to said main body but, for preventing said lock handle from substantially rotating about and moving along said length axis relative to said main body, and wherein said lock screw, when screwed to selectively lock said lock handle to said bonnet is moved in a direction substantially orthogonal to the length axis of the stem to thereby lock said stem against rotation and linear movement about and along said length axis said stem while is not substantially moved orthogonal to said length axis, even if said lock handle is thereby moved orthogonal to said length axis.

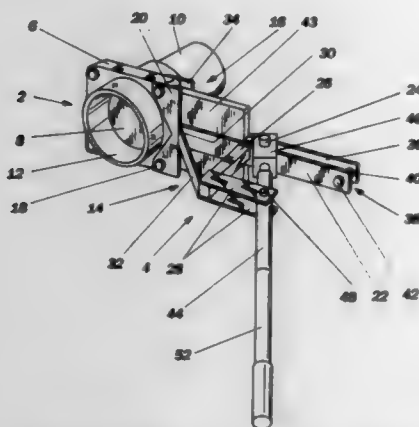
#### 5,439,198 VALVE APPARATUS

Leonard T. Reed, 2947 Kathy Jo La., Grand Junction, Colo. 81503

Filed Apr. 11, 1994, Ser. No. 225,805  
Int. Cl.<sup>6</sup> F16K 31/60, 3/314

U.S. Cl. 251-231

3 Claims



1. In a valve apparatus for use with a holding tank of a recreational vehicle which comprises a drain valve assembly and a manual valve actuator, said drain valve assembly including a drain pipe, a valve housing and a slidable valve therein, the improvement wherein the manual valve actuation comprises:

- a guide channel formed from spaced apart, parallel front and back mounting plates, said plates being releasably attached to said valve housing;
- a pivotable actuating lever assembly being affixed to said front mounting plate, said actuating lever assembly including a post member attached to said mounting plates, and a pair of extension arms extending from said post member;
- a clevis being slidable along an exterior portion of said mounting plates and being connected to a valve stem of said slidable valve within said channel, said clevis having a clevis pin connected between said pair of extension arms of said clevis, said clevis pin is vertically disposed between and cooperatively slides between said front and back mounting plates and along said guide channel in response to movement of the actuating lever for moving said slid-

able valve between open and closed positions as said valve stem moves within said channel;

said valve stem being releasably attached to and disposed between said slidable valve and said clevis pin; and

said actuating lever being pivotally attached between said extension arms for pivoting said actuator to move said slidable valve between said open and closed positions, said actuating lever being releasably attached to said clevis.

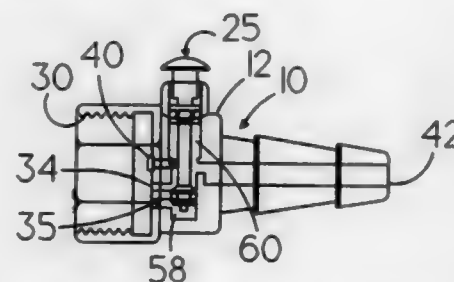
#### 5,439,199 WATER BALLOON FILLING VALVE

Michael Briggs; Gerald A. Lowe; Rick C. Geething, all of Ashland; Patrick Wagonfield, Hamilton, and John S. Zach, Cleveland, all of Ohio, assignors to The National Latex Products Company, Ashland, Ohio

Filed Dec. 20, 1993, Ser. No. 170,582  
Int. Cl.<sup>6</sup> F16K 3/24

U.S. Cl. 251-320

5 Claims



1. A valve for selectively dispensing an essentially noncompressible fluid from a pressurized source into a receptacle, said valve comprising:

- a body portion having a first end and a second end, the ends communicated by an internal channel, the first end adapted to engage the source and the second end adapted to engage the receptacle;

the internal channel having an intermediate portion comprising a hollow cylinder with a valve spool slidingly engaged therein, the valve spool having first and second enlarged portions effectively dividing the hollow cylinder into a first and a second chamber, the chambers not communicated to each other, the internal channel further having a first and a second passage communicating the hollow cylinder with the first end and a third passage communicating the hollow cylinder with the second end, the valve spool being held in the cylinder by a pin seated in an aperture in the first end such that an end of the pin extends into the cylinder sufficiently to block movement of the first enlarged portion therepast;

wherein the first and second passages communicate with the first chamber and the third passage communicates with the second chamber when the valve spool is in a first closed position, the pressure of the essentially noncompressible fluid in the first chamber providing an outward biasing force on the valve spool into the closed position; and

wherein the first passage communicates with the first chamber and the second and third passages communicate with the second chamber when the valve spool is moved to a second open position by application of an external force on the valve spool overcoming the outward biasing force, the communication of the second and third passages to the second chamber forming the internal channel and allowing fluid flow through the valve; and

wherein release of the external applied force allows the pressure of the fluid in the first chamber to restore the valve spool to the first closed position.

5,439,200

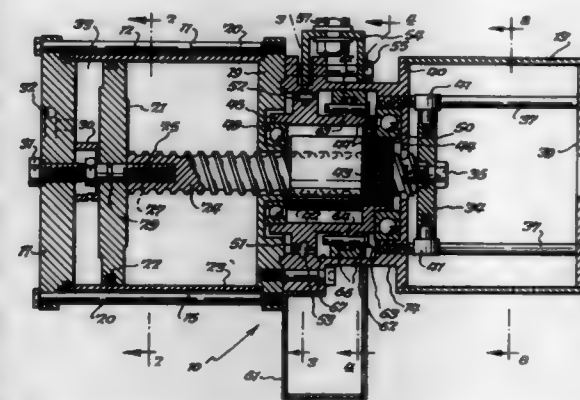
#### AIR LIFTING AND BALANCING UNIT

Robert O. Braesch; Peter L. Hong, both of Laurens, Iowa; Thomas A. Mefferd, Murrells Inlet, S.C., and Michael D. Olson, Laurens, Iowa, assignors to Columbus McKinnon Corporation, N.Y.

Filed Dec. 10, 1993, Ser. No. 165,701  
Int. Cl.<sup>6</sup> B66D 1/48, 1/10; F16D 31/02

U.S. Cl. 254-267

24 Claims



1. An air lifting and balancing unit comprising a cylinder, a piston in said cylinder, a ball screw affixed to said piston, a ball nut, means mounting said ball nut for rotation on said ball screw, drum means mounted on said ball nut for moving an elongated member which carries a load, brake means mounted relative to said drum, and means for causing said brake means to stop rotation of said drum when said drum exceeds a predetermined acceleration.

5,439,201

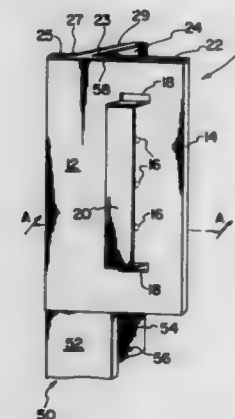
#### FENCE BRACKET

Charles Landreville, Dacre, Canada, assignor to 832276 Ontario Inc., Dacre, Canada

Filed Apr. 21, 1994, Ser. No. 230,745  
Int. Cl.<sup>6</sup> E04H 17/22

U.S. Cl. 256-65

8 Claims



8. A bracket for mounting fence members to a T-post having a substantially flat front face and an apertured web projecting rearwardly substantially perpendicularly from the centre of the front face, in which the bracket comprises a folded and perforated sheet metal strip of suitable length, breadth and thickness including a front plate, a first and a second rear plate, and a first and a second mounting plate:

- a first mounting plate apertured for securing to the web of the post;
- a first rear plate joined to the first mounting plate by a first fold line;
- a front plate attached to the first rear plate by a second fold

line, and having a width substantially wider than the face of the post, and perforated in the portion extending beyond the post front face to provide apertures adapted to receive securing means for a fence member;

a second rear plate attached to the front plate at a third fold line, and including perforations cooperating with the apertures in the front plate adapted to receive securing means for a fence member; and

a second mounting plate attached to the second rear plate at a fourth fold line, apertured in registration with the first mounting plate for securing the bracket to the web of the post;

wherein the bracket as shaped by the fold lines defines a T-shaped slot receiving the T-shaped post.

5,439,202

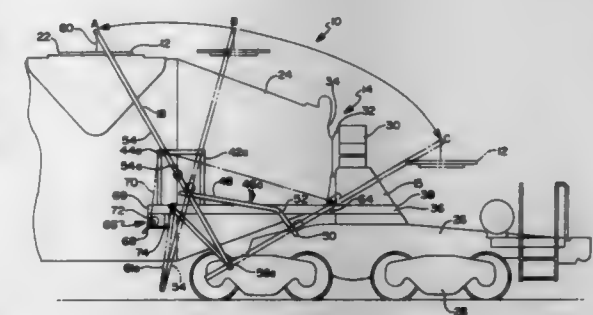
#### APPARATUS FOR REMOVING A COVER FROM A HOT METAL TRANSFER CAR

Ricky R. Scriven, 11331 Old Goddard Apt., Allen Park, Mich. 48101

Filed Sep. 1, 1993, Ser. No. 114,151  
Int. Cl.<sup>6</sup> C21B 3/10

U.S. Cl. 266-165

11 Claims



1. An apparatus for removing a cover from a hot metal transfer car, the apparatus being attached to the transfer car and comprising:

- (a) a base member;
- (b) a swing member having:
  - (1) a pair of arm members;
  - (2) a cross member integrally formed with the arm members, the cross member being substantially normal to the arm members, the cover being connected to the cross member; and
  - (3) a pair of connection members having a rearward end and a forward end, where the forward end of the connection members are pivotally connected to the base member;
- (c) means for moving the swing member; and
- (d) means for guiding the movement of the swing member while removing and replacing the cover.

5,439,203

#### VIBRATION-DAMPING BUSHING WITH SLIDING SURFACE ON INSERT LOCATED BETWEEN INNER AND OUTER CYLINDERS

Katsuya Hadano, Inazawa, Japan, assignor to Toyoda Gosei Co., Ltd., Aichi, Japan

Filed Oct. 26, 1992, Ser. No. 966,462  
Claims priority, application Japan, Oct. 24, 1991, 3-305367; Oct. 30, 1991, 3-311960

Int. Cl.<sup>6</sup> F16F 1/38

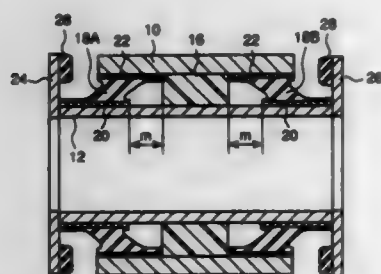
U.S. Cl. 267-140.12

11 Claims

1. A vibration-damping bushing comprising:

- an outer cylinder;
- an inner cylinder coaxially arranged with said outer cylinder, said inner and outer cylinders being adapted to be connected to a vibrating body;

ring-shaped insert structure made of resin material and disposed between said outer cylinder and said inner cylinder, both an inner peripheral surface and an outer peripheral surface of said ring-shaped insert structure being in direct contact with an outer peripheral surface of said inner cylinder and an inner peripheral surface of said outer cylinder respectively only when vibrations are input with a component perpendicular with respect to an axial direction of the cylinders, at least one of said inner peripheral surface and said outer peripheral surface of said ring-shaped insert structure being in close proximity to at least one of said outer peripheral surface of said inner cylinder and said inner peripheral surface of said outer cylinder so



as to define a clearance therebetween, thereby forming a sliding surface; and

- a pair of ring-shaped vibration-damping rubber members which are interposed between and joined to said inner peripheral surface of said outer cylinder and said outer peripheral surface of said inner cylinder so that an inside axial end of an inner peripheral surface of each of said rubber members is axially spaced apart from each of axial ends of said ring-shaped insert structure by a predetermined distance, whereby one of said outer and inner cylinders is constructed and arranged to be displaced in an axial direction and a torsional direction thereof so as to improve cushioning properties of the bushing.

5,439,204

## VIBRATION ISOLATOR

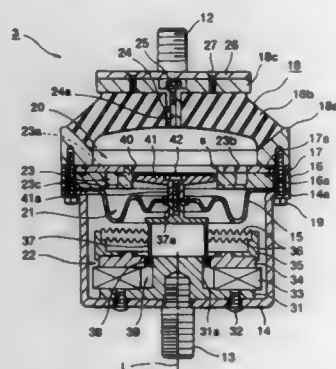
Hisamitsu Yamazoe, Kariya; Tokio Kohama, Nishio; Shuji Mizutani, Obu, and Toshiaki Agui, Koga, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan  
Filed May 16, 1994, Ser. No. 242,958

Claims priority, application Japan, May 17, 1993, 5-115061; Jul. 28, 1993, 5-185657; Aug. 2, 1993, 5-191180

Int. Cl.<sup>6</sup> F16F 13/00

U.S. Cl. 267-140,14

20 Claims



1. A vibration isolator provided between a vibration source and a base on which said vibration source is supported, said vibration isolator comprising:

an elastic member provided between said vibration source and said base to elasticity support said vibration source;

a main chamber in which a fluid is enclosed, wherein a

volume of said main chamber is changed by a deformation of said elastic member;

a sub chamber defined by an elastic membrane, said main chamber and said sub chamber together defining a fluid chamber;

a partition provided between said main chamber and said sub chamber, wherein a communication hole is defined in said partition to connect said main chamber and said sub chamber;

a moving member provided within said communication hole, said moving member having a surface that applies a force on a fluid contained within said main chamber, said force changing said volume of said main chamber, and a peripheral wall, said moving member being located within said communication hole such that a gap is defined between a wall of said communication hole and said peripheral wall of said moving member;

an actuator for driving said moving member; and attaching means for affixing said actuator to said elastic membrane in a fluid sealing manner, said actuator driving said moving member from a location outside said fluid chamber through said attaching means.

5,439,205

## VACUUM-TYPE WORK PIECE CLAMPING DEVICE

Rainer Häberle, Laichingen, Germany, assignor to Firma Gerhard Häberle, Laichingen, Germany

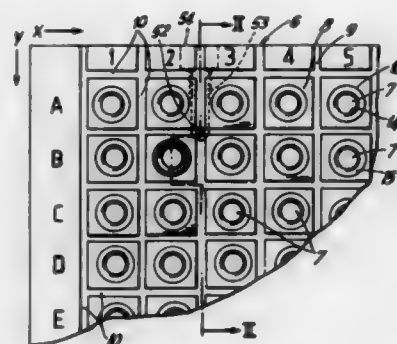
Filed Feb. 18, 1994, Ser. No. 199,376

Claims priority, application Germany, Feb. 20, 1993, 43 05 260.6

Int. Cl.<sup>6</sup> B25B 11/00

U.S. Cl. 269-21

5 Claims



1. A workpiece clamping device, comprising:

a base plate for vacuum-type clamping of work pieces, said base plate having an upper surface and a system of grooves formed in the upper surface, extending in a net-like manner and merging into each other at crossing points thereof;

a seal placed into selected grooves of the system of grooves; channels formed in the base plate, opening into grooves of the system of grooves, and each having a threaded segment;

sealing screws threadable into the channels;

at least one vacuum source junction disposed at an end face of the base plate, the channels communicating with the at least one vacuum source junction; and

means for enabling placing mechanical attachment arrangements on the upper surface of the base plate, the enabling means including at least one of threaded bores and close tolerances bores formed in the base plate between the grooves of the system of grooves.

5,439,206

## PRODUCT DELIVERY SYSTEM FOR A PRINTING-PRESS FOLDER

Gerd Raasch, Sandhausen, and Richard Mack, Brühl, both of Germany, assignors to Heidelberger Druckmaschinen, Heidelberg, Germany

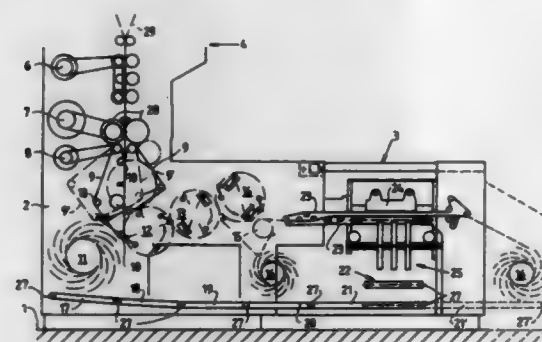
Filed Dec. 16, 1993, Ser. No. 168,680

Claims priority, application Germany, Dec. 16, 1992, 42 42 542.5

Int. Cl.<sup>6</sup> B41F 13/58

U.S. Cl. 270-8

6 Claims



1. A product delivery system for a printing-press folder including a cutting unit for dividing printed webs of material into a multiplicity of printed copies or signatures, and a gripper cylinder, comprising means for alternatively feeding cross-folded copies from the gripper cylinder to a device for producing a second longitudinal fold and to delivery units disposed down-line therefrom, on the one hand, and to a further chargeable delivery unit for cross-folded copies, on the other hand, said copy delivery units being chargeable facultatively in accordance with a respective production mode, said alternative feeding means comprising a first conveyor surface formed of delivery belts encompassing a 90-turn, a second conveyor surface disposed within the folder and formed of a conveyor belt, and means comprising a swivelable diverter for selectively delivering copies alternatively onto said first conveyor surface and onto said second conveyor surface, said swivelable diverter being connectable with a stacker.

5,439,207

## CONVEYOR SYSTEM FOR METALLIC PLATES AND STRIPS

Hermann Schleicher, Rathsbarg/Marlöffstein, Germany, assignor to Hermann Schleicher GmbH & Co., Hessdorf, Germany

Filed Feb. 23, 1994, Ser. No. 200,270

Claims priority, application European Pat. Off., Feb. 23, 1993, 93102775

Int. Cl.<sup>6</sup> B65H 9/30

U.S. Cl. 271-193

19 Claims

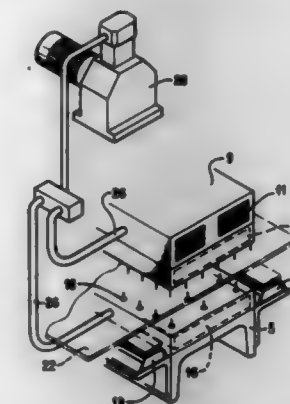
1. A conveyor system for metallic plates, comprising:

at least one linear motor, said linear motor including a coil that serves as a stator;

a first nozzle plate attached to the stator; and

a second nozzle plate constructed of non-metallic material that is spaced apart from and parallel to the first nozzle plate, said spacing between the first and second nozzle plates defining a gap through which a plate may pass, said first and second nozzle plates having nozzles distributed over their facing surfaces towards the gap defined therebetween, said first and second nozzle plates further including air conduits located therein by which the nozzles can be connected to a source of compressed air, wherein at least one of the nozzle plates can be used to form

an air cushion for controlling the distance between the stator and a plate, and wherein the plate forms the rotor of



the linear motor when the plate is constructed of ferromagnetic material.

5,439,208

## TURNOVER-SEQUENCER STAGING APPARATUS AND METHOD

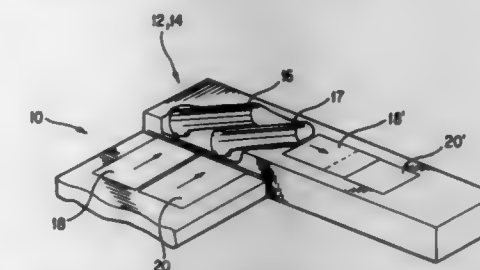
James R. Moser, Easton; Thomas E. Bieber, Coplay, and David M. Skvoretz, N. Catasauqua, all of Pa., assignors to Bell & Howell Phillipsburg Company, Allentown, Pa.

Filed Nov. 4, 1994, Ser. No. 336,116

Int. Cl.<sup>6</sup> B65H 5/00

U.S. Cl. 271-225

20 Claims



1. A turnover-sequencer staging apparatus for sheets, comprising:

means for receiving at least two sheets in a side-by-side relationship; and,

means for overturning and simultaneously substantially orthogonally rerouting received said at least two sheets, said means for overturning and rerouting including means for converting the side-by-side relationship to a sequential relationship wherein said at least two sheets are disposed seriatim and imbricated.

5,439,209

## PAPER STACKING APPARATUS

Kurt Rünzi, Küssnachterstrasse 59, CH-8126 Zumikon, Switzerland

Filed Mar. 30, 1994, Ser. No. 219,886

Claims priority, application Germany, Apr. 1, 1993, 9304964 U

Int. Cl.<sup>6</sup> B65H 9/16

U.S. Cl. 271-251

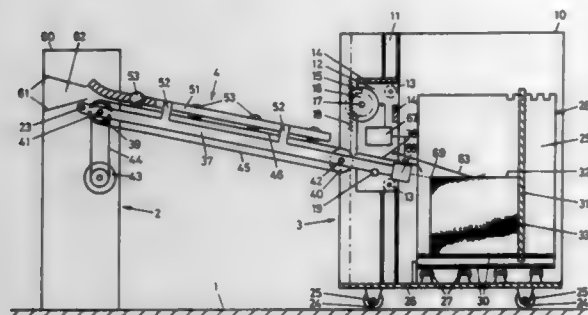
8 Claims

1. A device for arranging sheets of paper (32) in a stack (33), comprising:

a frame (2) to be mounted fixed in place, with an inlet opening (62) for introducing the sheets (32) to be stacked, an arm (4) pivotably seated at its rear end on the frame (2) and containing a conveying member (45) driven by a motor (43) for conveying the sheets (32), a container (3) for receiving the sheets (32), with a vertically



displaceable carriage (12) and a drive member (15) for displacing the carriage (12), wherein the front end of the arm (4) is pivotally connected with the carriage (12), a sensor (68) at the front end of the arm (4) for detecting the upper edge of the stack (33), and



a control device (67), connected with the sensor (68) and the drive member (15), for maintaining the front end of the arm (4) at the height of the stack (33) being formed, wherein an exchangeable cassette (28) for receiving the stack (33) is inserted into the container (3).

5,439,210

**BASKETBALL GOAL LOCKING DEVICE**

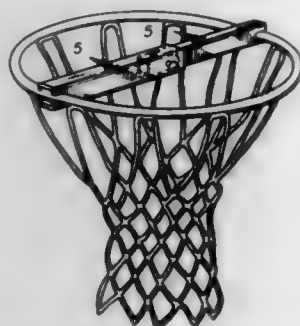
Daniel W. Davis, 14329 Riskin Rd., Cedar Lake, Ind. 46303

Filed Dec. 16, 1993, Ser. No. 168,533

Int. Cl.<sup>6</sup> A63B 63/08; E05B 65/00

U.S. Cl. 273-1.5 R

22 Claims



1. A locking device for removable attachment to the rim of a basketball goal, comprising at least one but no more than two sleeve members and a lock for securing at least one sleeve member to the rim, and wherein at least one sleeve member has a rim-receiving slot.

5,439,211

**TARGET TRAINING SYSTEM AND METHOD FOR BASEBALL PITCHERS**

Moe Drabowsky, 4741 Oak Run Dr., Sarasota, Fla. 34243, assignor to Moe Drabowsky, Sarasota, Fla.

Filed Nov. 1, 1994, Ser. No. 332,937

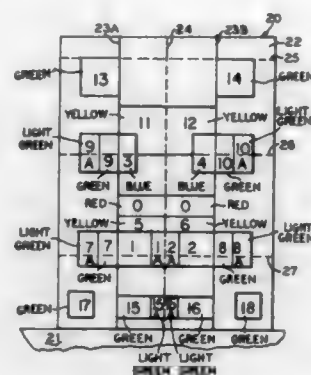
Int. Cl.<sup>6</sup> A63B 69/00

U.S. Cl. 273-26 A

28 Claims

1. A target training system for baseball pitchers, comprising: a target sheet mounted on a supporting structure so that a facing surface of the target sheet is aligned substantially in a vertical plane and a bottom of the target sheet is at ground level; hitter shoulder level, hitter waist level, and hitter knee level lines provided on said facing surface of said target sheet; first and second vertical boundary lines running from a top to the bottom of the sheet for indicating a width of a strike zone; and a plurality of boxes of differing colors and having differing sequencing indicia representing relatively high quality

pitches arranged in and around the strike zone, and wherein regions of a same color within and near the strike



zone and exclusive of the colored boxes are provided, said regions being exclusionary zones representing relatively poor quality pitches.

5,439,212

**BALL PITCHING DEVICE**

Dan Hart, 4900 Bell Rd., Auburn, Calif. 95602, assignor to Daniel L. Hart, Auburn, Calif.

Filed Jan. 27, 1994, Ser. No. 188,956

Int. Cl.<sup>6</sup> A63B 69/40

U.S. Cl. 273-26 D

7 Claims



1. A ball throwing device for projecting a game ball at a selectable speed and trajectory, comprising:

a frame with support means for positioning the frame stably on the ground or other surface, a ball throwing arm having ball seat means near one end for receiving and holding a ball during throwing, with pivotal arm support means for pivotally mounting the throwing arm on the frame for swinging motion relative to the frame,

latch means connected to the frame for latching the ball throwing arm in a pre-throwing position and for enabling manual release of the throwing arm,

foot lever means secured to the frame for receiving foot pressure and motion from a user effective to move the foot lever means from an unloaded to a loaded position,

spring means connected to the ball throwing arm for applying a spring loading force to the throwing arm, urging the arm toward a ball throwing direction, when the throwing arm is latched in the pre-throwing position by the latch

means, and linkage means connecting the foot lever means to the spring means so as to effect loading of the spring means to apply said spring loading force when the foot lever means is moved from the unloaded to the loaded position,

trajectory setting means for adjusting the trajectory at which the ball is thrown by the ball throwing arm, comprising means for adjusting the angular position of the ball-throwing arm in its pre-throwing position from more backwardly reclined to less backwardly reclined, whereby the ball when released is thrown at a higher trajectory or a lower trajectory, respectively, and

the frame including means for collapsing the frame from an erected configuration to a compact storage configuration, said means for adjusting the angular position of said ball throwing arm comprising a first horizontal shaft mounted for rotation on the frame, a second horizontal shaft in radially spaced, parallel relationship to the first horizontal shaft, bearing means fixed to the first horizontal shaft for supporting the second horizontal shaft, the ball-throwing arm being secured to the second horizontal shaft for rotation therewith, and adjustment lever means secured to the first horizontal shaft for rotatably adjusting the first horizontal shaft to thereby swing the second horizontal shaft through an adjustment arc whose center is the first horizontal shaft, thereby changing the angle of recline of the ball-throwing arm to affect the trajectory of the ball when thrown.

5,439,213

**GOLF BALL AND TEE POSITIONING TOOL**

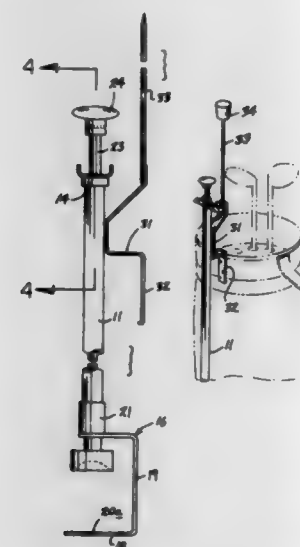
Joseph A. Pimentel, 20 Toledo Ave., Pawtucket, R.I. 02860

Filed Sep. 26, 1994, Ser. No. 312,127

Int. Cl.<sup>6</sup> A63B 57/00

U.S. Cl. 273-32.5

7 Claims



1. A golf ball and tee positioning tool, comprising, an elongate tubular housing, having a housing first end spaced from a housing second end, and a handle assembly fixedly secured to the housing first end, and

a frame member secured to the housing second end, and a plunger rod reciprocatably directed through the tubular housing extending beyond the housing first end and beyond the housing second end, with the plunger rod having a rod first end extending beyond the housing first end, with the frame member having a first plate spaced from a second plate, and the plunger rod second end extending into the frame member between the first plate and the second plate, with the plunger rod second end having a head member secured thereto, the head member having a

cavity in a facing relationship relative to the second plate, and

a mounting bracket fixedly secured to the tubular housing adjacent to the housing first end, with the mounting bracket having a spring plate fixedly secured to the mounting bracket, the spring plate extending along the tubular housing in a spaced relationship relative to the tubular housing to permit engagement of a golf ball bag between the spring plate and the tubular housing.

5,439,214

**STROKE TRAINING DEVICE**

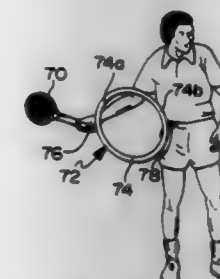
Leo Dalbo, Sebastopol, Calif., assignor to Dalme, Inc., Bloomfield Hills, Mich.

Continuation of Ser. No. 782,838, Oct. 24, 1991, Pat. No. 5,257,779. This application Oct. 4, 1993, Ser. No. 131,464

Int. Cl.<sup>6</sup> A63B 69/00

U.S. Cl. 273-29 A

4 Claims



1. A stroke training device for a sport in which a stroking device having a hand held end and an object striking end is rotated about the longitudinal axis of a body by rotation of the user's body between a backstroke position of the user's body, a stroke position of the user's body and a follow through position of the user's body for striking an object with the striking end of the stroking device comprising:

a guide member for guiding the stroking device during rotation of the body about its longitudinal axis to the hand end of the stroking device at a controlled radius from the longitudinal axis of the user's body at the backstroke position, the stroking position and the follow through position of the stroking device;

said guide member including a radially inwardly located portion thereon pivotally joined to said body; and

said guide member is reference means in the form of a rigid member located between the hand end of the stroking device and said radially inwardly located portion for defining a vertically extended reference plane located wholly between the hand end of the stroking device and the body and moveable into a plane perpendicular to the line of contact with the object being struck for positioning the striking end of the stroking device within the perpendicular plane when the user's body is rotated into the stroking position.

5,439,215

**COMPOSITE, PULTRUDED FIBERGLASS RESINOUS HOCKEY STICK, METHOD AND DEVICE FOR MANUFACTURE THEREOF**

David Ratchford, Marshall, Ark., assignor to Power Stick Manufacturing, Inc., Vancouver, Canada

Filed Jan. 25, 1994, Ser. No. 186,168

Int. Cl.<sup>6</sup> A63B 59/12

U.S. Cl. 273-67 A

6 Claims

1. A hockey stick shaft comprising:

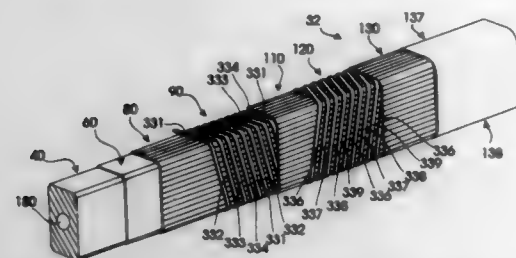
a longitudinal central cavity defining an interior of said shaft;

an open proximal end adapted to receive a plug;

an open distal end adapted to mate with a blade;

a first longitudinal layer of rovings; a first radially wound

layer of rovings spiraled about said first longitudinal layer and comprising individual, spaced apart, concentric roving helices;  
a second longitudinal layer of rovings formed on said first radially wound layer;



a second radially wound layer of rovings spiraled about said second longitudinal layer and comprising individual, spaced apart, concentric roving helices;  
a third longitudinal layer of rovings disposed on said second radially wound layer; and,  
an outer veil enveloping said third longitudinal layer.

5,439,216

# **METHOD AND TRAINING DEVICE TO ASSURE SPORTSMEN A PROPER GRIP WITH MEMBRANE SWITCH**

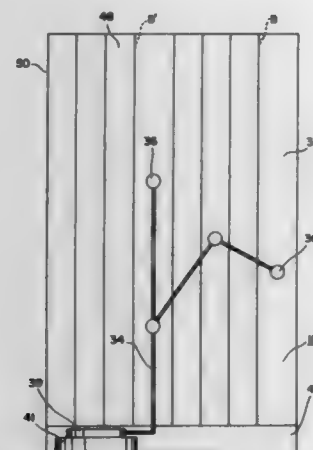
David E. Ganger, Sr., Cape Coral, Fla., assignor to Tone Trainer, Inc., Cape Coral, Fla.

Continuation-in-part of Ser. No. 53,485, Apr. 29, 1993, Pat. No. 5,322,281. This application May 17, 1994, Ser. No. 230,199. The portion of the term of this patent subsequent to Jul. 11, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> A63B 49/00

U.S. Cl. 273-75

30 Claims



1. A training device for audibly indicating a proper grip on a handle of a sports racket comprising:  
a thin sheet wrap sized to wrap around an outside grip surface of said racket handle;  
a non-domed membrane switch retained by said thin sheet wrap;  
releasable means for securing said thin sheet wrap on said racket handle;  
a portable power source electrically coupled to an audible alarm, both of which are retained on said racket; and  
electrical connectors coupling said switch with said power source and said audible alarm such that upon closure of said switch, said alarm sounds.

5,439,217

# **METHOD AND TRAINING DEVICE TO ASSURE SPORTSMEN A PROPER GRIP WITH MEMBRANE SWITCH**

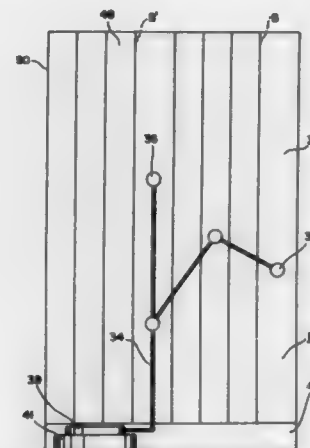
David E. Ganger, Sr., Cape Coral, Fla., assignor to Tone Trainer, Inc., Cape Coral, Fla.

Continuation-in-part of Ser. No. 53,485, Apr. 29, 1993, Pat. No. 5,322,281, Ser. No. 230,106, Apr. 20, 1994, and Ser. No. 230,199, May 17, 1994. This application Jul. 13, 1994, Ser. No. 274,213. The portion of the term of this patent subsequent to Jul. 11, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> A63B 59/00

U.S. Cl. 273-75

25 Claims



1. A training device for audibly indicating a proper grip on a handle of a golf club comprising:  
a thin sheet wrap sized to wrap around an outside grip surface of said golf club handle;  
a forward and an aft, serially connected, non-domed membrane switch retained by said thin sheet wrap;  
releasable means for securing said thin sheet wrap on said handle;  
a portable power source electrically coupled to an audible alarm, both of which are retained on an end of said golf club handle; and  
electrical connectors coupling said switches with said power source and said audible alarm such that upon closure of said switches, said alarm sounds.

5,439,218

# **GOLF CLUB HOSEL CONSTRUCTION**

Richard W. Gondeck, 31 Bryce Ct., Baltimore, Md. 21236

Filed Jan. 3, 1995, Ser. No. 367,895

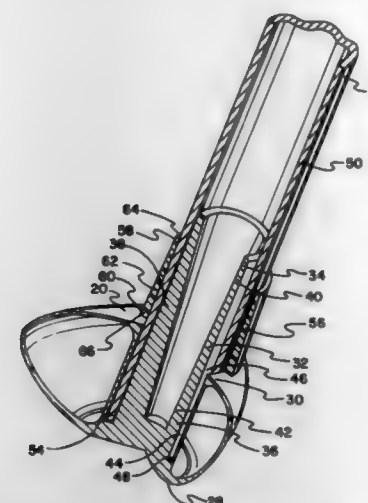
Int. Cl.<sup>6</sup> A63B 53/02

U.S. Cl. 273-80.5

5 Claims

2. A new and improved golf club hosel construction comprising:  
a golf club head having a toe end, a heel end, a golf ball hitting face, bottom sole and a top surface;  
a hollow cylindrical wall having an upper end, a lower end and an intermediate extent therebetween, the hollow cylindrical wall formed integrally with the heel end of the golf club head, the hollow cylindrical wall having a tapering thickness, with a minimum wall thickness being at the upper end of the cylindrical wall and a maximum wall thickness being at the lower end of the cylindrical wall, the lower end of the cylindrical wall being integral with the golf club head, the upper end of the cylindrical wall extending above the top surface of the golf club head;  
a cylindrical groove having an open upper end and a closed lower end, the groove being formed about the cylindrical wall within the golf club head, the closed lower end of the groove being formed about the lower end of the cylindrical wall, and the open upper end of the groove being

formed about the intermediate extent of the cylindrical wall where a shaft extends into the golf club head;



a hollow golf club shaft having an upper end, a lower end and an intermediate extent therebetween, the lower end of the golf club shaft adapted to be inserted over the cylindrical wall and bonded within the groove.

5,439,219

# **GOLF CLUB SHAFT WITH OPTIMIZED DISTRIBUTION OF FLEXIBILITY**

Benoit Vincent, Annecy Le Vieux, France, assignor to Taylor Made Golf Company, Inc., Carlsbad, Calif.

Filed Jun. 7, 1994, Ser. No. 255,733

Claims priority, application France, Jun. 21, 1993, 93 07714

Int. Cl.<sup>6</sup> A63B 53/10

U.S. Cl. 273-80 B

10 Claims



1. A golf club shaft having a tubular section with an evolving flexional rigidity along the length of the shaft, said shaft having a plurality of portions comprising:  
a rigid upper portion extending from an upper end of the shaft having the largest diameter, having a length (L1) at least equal to 100 mm, and a flexional rigidity at least equal to 50N-m<sup>2</sup>;  
a central portion joined to a lower end of the upper portion, the central portion having a length (L2);  
a lower portion joined to the central portion, the lower portion having a length (L3) and extending to a lower end of the shaft, the lower end being adapted to receive a club head;  
wherein the central portion comprises a flexible zone joined to the rigid upper portion, the flexible zone having a length (d) comprised between 100 and 300 mm in which

the flexional rigidity is comprised between 20 and 40N-m<sup>2</sup>, wherein  $L1 + d \leq 500$  mm; and  
a remaining zone, joined to said flexible zone, said remaining zone having a flexional rigidity decreasing from a value greater or equal to 50 N-m<sup>2</sup> in the vicinity of said flexible zone towards the lower portion to which the remaining zone is joined.

5,439,220

# **PUZZLE GAME**

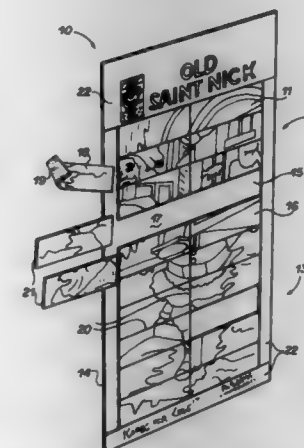
Ronald F. Hendricks, 233 Lamplighter Ln., Marietta, Ga. 30067

Filed Jun. 22, 1994, Ser. No. 263,997

Int. Cl.<sup>6</sup> A63F 9/08

U.S. Cl. 273-155

1 Claim



1. A puzzle comprising a backing card having a releasable surface overlaid with a plurality of segments bearing a portion of a scrambled image, said segments having a tacky obverse side in intimate contact with said releasable surface of said backing card and wherein said segments are of the same rectangular size positioned in two side by side columns, and wherein one half of said image is scrambled in one of said side by side columns and the other half of said image is scrambled in the other of said side by side columns, whereby upon removing at least some of the segments and rearranging the segments on the backing card the segments display the image unscrambled.

5,439,221

# **PUZZLE GAME**

Ian Harvie, 29 Roman Road, Stockbridge, Hampshire, SO20 6HA, United Kingdom

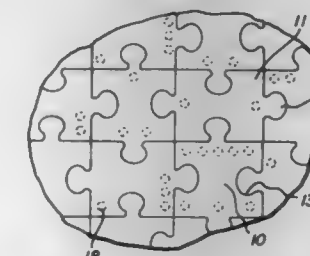
Filed Sep. 28, 1994, Ser. No. 314,513

Claims priority, application United Kingdom, Sep. 28, 1993, 9319964

Int. Cl.<sup>6</sup> A63F 9/10

U.S. Cl. 273-157 R

15 Claims



1. Puzzle game apparatus comprising a plurality of pieces, the pieces having display portions and means for interfitting with adjacent said pieces to form an assembled puzzle structure, said assembled puzzle structure having a finished visual



scheme and said finished visual scheme being a coherent combination of the display portions of the pieces;

at least a plurality of the pieces being changeable pieces, said changeable pieces being capable of taking more than one possible position in a said assembled puzzle structure whereby the apparatus has a plurality of assembled conditions corresponding to said different possible positions of the changeable pieces and each giving an assembled puzzle structure having a said finished visual scheme, and at least a plurality of the changeable pieces comprise respective distinctive markers in addition to their display portions, to indicate distinctively the position of the respective changeable pieces in the assembled puzzle structure and thereby distinguish the assembled conditions from one another in terms of the positions of the markers therein.

5,439,222

# TABLE BALANCED, ADJUSTABLE MOMENT OF INERTIA, VIBRATIONALLY TUNED PUTTER

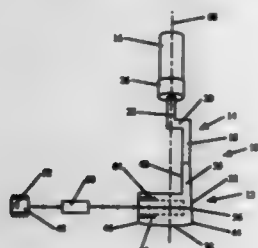
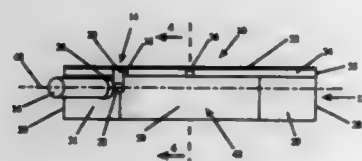
Christian F. Kranenberg, 1601 Tijeras NE, #20, Albuquerque, N. Mex. 87106

Filed Aug. 16, 1994, Ser. No. 291,189

Int. Cl.<sup>6</sup> A63B 53/04, 53/02

U.S. Cl. 273—167 G

9 Claims



1. A golf putter head in combination with a shaft having a grip to form a golf putter, the elements of the golf putter comprising:

- (a) an elongated front striking face and elongated rear face defining substantially flat surfaces extending from a heel to a toe, a sole surface being convexly curved from said heel to said toe extending rearwardly from a lower front edge and defining the bottom surface of said golf putter head, an elongated top edge surface extending between said front striking face and said rear face, said shaft having an axial line;
- (b) a fixed lengthed toe weight chamber near said toe and a fixed lengthed heel weight chamber near said heel located behind said front striking face, a fixed lengthed toe weight, a fixed lengthed heel weight, a toe weight plug receptacle, a heel weight plug receptacle, a toe weight plug, and a heel weight plug;
- (c) a lower hosel stem affixed to said top edge surface extending substantially upward, a hosel offset affixed to said lower hosel stem extending substantially horizontal and rearward, an upper hosel stem affixed to said hosel offset extending substantially upward, and a hosel barrel affixed to said upper hosel stem for affixing said shaft;
- (d) a center of mass plane defined as a vertical plane intersecting said toe and said heel elongatedly bisecting said golf putter head into equal amounts of mass on each side of said center of mass plane;
- (e) said hosel offset being so positioned such that said axial line of said shaft, longitudinal centerline of said hosel

socket, and longitudinal centerline of said upper hosel lie in said center of mass plane;

- (f) a table balanced golf putter defined by positioning said golf putter such that said axial line of said shaft is constrained horizontally and unconstrained rotationally resulting in said putter head coming to rest with said center of mass plane parallel to a vertical plane;
- (g) a means of securing said toe weight plug and said heel weight plug in said toe weight receptacle and said heel weight receptacle respectively, for immobilizing said toe weight received by said toe weight chamber, and immobilizing said heel weight received by said heel weight chamber thereby changing the moment of inertia of said putter head in an expected manner;
- (h) said toe weight chamber and said heel weight chamber so positioned such that upon receiving said toe weight and said heel weight respectively, said toe weight and said heel weight are bisected by said center of mass plane into equal amounts of mass of said toe weight and said heel weight on each side of said center of mass plane to maintain the table balanced feature of said golf putter.

5,439,223

# GOLF CLUB HEAD

Kenji Kobayashi, 1845, Ohaza-Higashiohta, Tsubame-shi, Niigata-ken, Japan

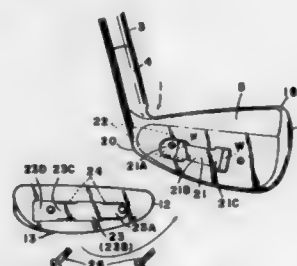
Filed Apr. 1, 1993, Ser. No. 41,449

Claims priority, application Japan, Apr. 2, 1992, 4-081052; Apr. 6, 1992, 4-084216; Apr. 7, 1992, 4-085727; Apr. 8, 1992, 4-087305; Apr. 9, 1992, 4-089075; May 1, 1992, 4-112872; Dec. 18, 1992, 4-339134; Dec. 18, 1992, 4-339135

Int. Cl.<sup>6</sup> A63B 53/04

U.S. Cl. 273—169

6 Claims



1. A golf club iron head, comprising:

- a head body having a front-facing face surface and a rear-facing back surface which has a convex portion which extends rearwardly for a first distance and which does not occupy the full lateral extent of the back surface, the convex portion laterally having first and second wide areas with a first narrow area therebetween;
- wherein, the first and second wide areas have upper and lower edges which are formed to provide areas with a tenon shape;
- a balance weight which has a mating surface with a concave portion extending rearwardly for a second distance and which does not occupy the full lateral extent of the mating surface, the second distance approximately corresponding to the first distance, said concave portion having in lateral sequence a second narrow area, a third wide area, a third narrow area and a fourth wide area;
- wherein the second and third narrow areas have upper and lower edges which are formed to provide areas with a mortise shape; and
- wherein the concave portion of the balance weight and the convex portion of the head body are sized and shaped so that the concave wide areas can fit into the convex wide areas and the concave narrow areas can fit into the convex narrow areas so that lateral relative movement between the convex portion and the concave portion aligns at least one narrow area and wide area, thereby affixing the balance weight to the head body in a mortise/tenon joint.

5,439,224

# DRIVING RANGE WITH AUTOMATED SCORING SYSTEM

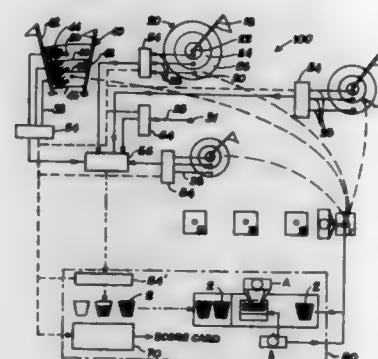
James Bertoncino, 6236 N. 16th St., No. 42, Phoenix, Ariz. 85016

Continuation of Ser. No. 894,559, Jun. 5, 1992, abandoned. This application Oct. 13, 1993, Ser. No. 136,479

Int. Cl.<sup>6</sup> A63B 69/36

U.S. Cl. 273—182 A

24 Claims



6. A golf driving range comprising:

- a driving range area;
- a plurality of coded golf balls, each of said golf balls having a different bar code thereon, said bar-coded golf balls being arrangeable into at least one set comprising a predetermined number of said golf balls;
- at least one target in said driving range area, said target having at least one ball receiving region contained therein for receiving any of said golf balls of said set which is hit into and maintained in said target;
- at least one teeing position in said driving range from which a player can hit said set of coded golf balls toward said target;
- a bar code scanner to identify said coded golf balls within said set prior to said golf balls of said set being hit toward said target, and to identify any of said golf balls of said set which are hit from said teeing position and which are hit into and are maintained in said target; and
- a computer system for receiving and processing input related to a player, said at least one target and said at least one teeing position, said computer system being operably connected to said scanner for receiving and processing inputs related to said coded golf balls and said target or targets into which said golf balls are hit, whereby statistical data regarding the player's performance is obtained.

5,439,225

# SWING TRAINING AND EXERCISE DEVICE

Ned Grolch, Beamsville, Canada, and Andreas Belalcazar, Bogota, Colombia, assignors to Kordua, Ltd., Studio City, Calif. Continuation-in-part of Ser. No. 30,628, May 13, 1993, Pat. No. 5,312,107. This application May 13, 1994, Ser. No. 242,550

Int. Cl.<sup>6</sup> A63B 21/24, 21/22, 69/36

U.S. Cl. 273—186.1

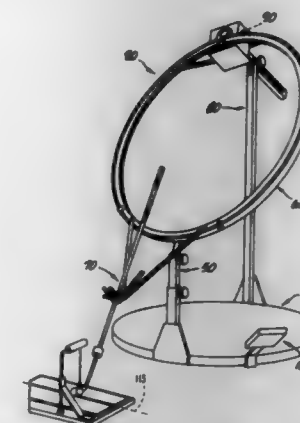
12 Claims

1. An exercise device adapted for use by a person, comprising:

- a first ring having a predetermined diameter, an inner surface, and an outer surface;
- a second ring concentric to the first ring and rotatably retained by the first ring;

means for providing isokinetic resistance to rotation of the second ring;

means for sensing predetermined characteristics of said second ring during rotation and providing sensor signals corresponding to said sensed characteristics;



whereby a person applying a torque in a first direction of rotation causes rotation of the second ring in the first direction of rotation against the isokinetic resistance and said sensing means in response to said rotation senses said predetermined characteristics which are subsequently converted into sensor signals.

5,439,226

# TRAINING APPARATUS FOR GOLFERS

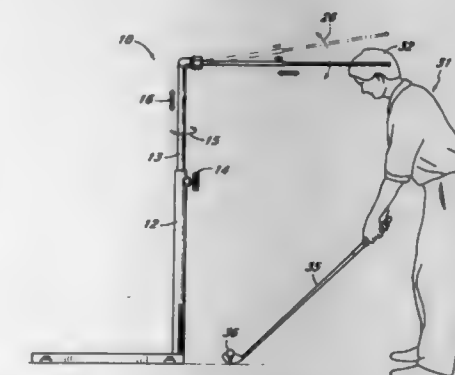
Fred Luedtke, 16144 Red Couch La., Whittier, Calif. 90604

Filed Jan. 23, 1995, Ser. No. 376,222

Int. Cl.<sup>6</sup> A63B 69/36

U.S. Cl. 273—190 R

4 Claims



1. A training apparatus for golfers which assists the golfer to hold the golfer's head steady during a swing, said apparatus comprising:

- a stand supported on the ground, said stand including a first and a second rod-supporting fixture held at about shoulder height to a golfer using the device;
- a first thin, flexible rod held by said first rod-supporting fixture and extending about horizontally outwardly therefrom, said first rod-supporting fixture permitting the first thin, flexible rod to be adjustably positioned; and
- a second thin, flexible rod held by said second rod-supporting fixture and extending about horizontally outwardly therefrom, said second rod-supporting fixture permitting the second thin, flexible rod to be adjustably positioned independently from said first thin, flexible rod thereby permitting the user to make a full swing with the rods adjacent the sides of the user's head to assist the golfer to maintain a stable head position during swing.

5,439,227

## MULTI-PIECE SOLID GOLF BALL

Yoshinori Egashira, Hidaka, and Seisuke Tomita, Tokorozawa, both of Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1993, Ser. No. 111,338

Claims priority, application Japan, Aug. 31, 1992, 4-255535

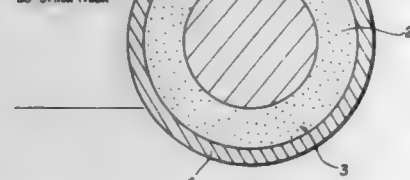
Int. Cl.<sup>6</sup> A63B 37/06

U.S. Cl. 273-228

6 Claims

SHORE D 55-68 15-27mm THICK  
FLEXURAL HARDNESS 200-450 MPa

SHORE D 30-55  
FLEXURAL HARDNESS 50-290 MPa  
JIS C 40-75  
30-37mm THICK



1. A multi-piece solid golf ball comprising, a solid core circumscribed by a cover, the solid core being of a multi-layer configuration including a core inner layer circumscribed by at least one core outer layer, wherein

said core outer layer is formed of a material predominantly comprising a mixture of 100 to 50% by weight of a poly-ether ester type thermoplastic elastomer having a Shore D hardness of 30 to 50 and a glass transition temperature of up to -25° C. as measured by differential thermal analysis and 0 to 50% by weight of an ionomer in the form of an ethylene-(meth)acrylate copolymer having a flexural modulus of 200 to 400 MPa, and

said cover is formed of an ionomer in the form of an ethylene-(meth)acrylate copolymer having a flexural modulus of 200 to 450 MPa and a Shore D hardness of 55 to 68.

5,439,228

## BOARD GAME APPARATUS AND METHOD OF PLAY

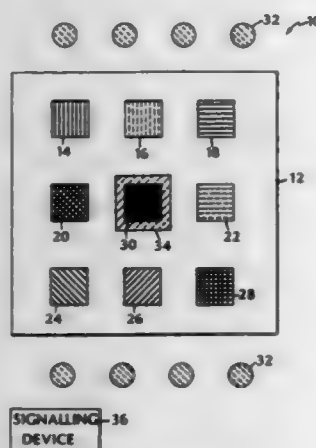
Geoffrey Pedersen, P.O. Box 109, Pocasset, Mass. 02559

Filed Apr. 7, 1994, Ser. No. 224,237

Int. Cl.<sup>6</sup> A63F 3/00

U.S. Cl. 273-236

19 Claims



14. Game playing apparatus comprising: sheet material defining a confined playing area and an array of locations delineated on said playing area, said playing area being of such size as to permit movement by persons around said playing area in response to a signal to start movement, said array of locations being of such size and spacing as to permit a person to occupy each said location

of said array of locations in response to a signal to stop movement, and

a set of substantially identically configured disks visually undistinguishable from each other each of which is configured to be disposed on one of said locations to designate that said location is unavailable to be occupied, said set including at least as many disks as are needed to cover all but one of said locations.

5,439,229

## PARLOR GAME APPARATUS STRIPS

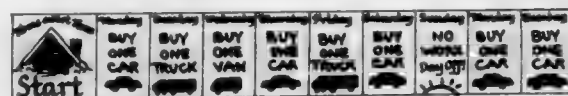
Ronald A. Kaiser, 12821 McCracken Rd., Garfield Heights, Ohio 44125

Filed Apr. 25, 1994, Ser. No. 232,991

Int. Cl.<sup>6</sup> A63F 3/00

U.S. Cl. 273-256

9 Claims



## Strip 1.

1. A parlor game that, during the play thereof, allows a plurality of players to simulate making purchases and sales transactions involving various tangible properties by dealing with a plurality of fictitious customers with the goal of each player to maximize his net worth, said game comprising:

a) a playing field comprising a plurality of playing strips arranged at the discretion of said players to form at least one pathway upon which a game piece for each player is to be moved, said playing strips each bearing a plurality of marked-off spaces, each space bearing indicia, said indicia including indicia that suggest an action to be taken when a game piece is moved to that space as a result of being moved a randomly-selected number of spaces from a prior location on said playing field;

b) an apparatus for randomly selecting one number from a limited set of numbers, said one number indicating said randomly-selected number of spaces for said game piece to be moved;

c) a plurality of tokens representing said various tangible properties that change hands in exchange for other assets including play money in effecting said transactions;

d) a plurality of cards having an obverse and a reverse face, each card bearing, on one face thereof, indicia in the form of a representation of one customer of said plurality of fictitious customers and also bearing on said one face information regarding the ability and desire of said one customer to enter into a transaction, each card thereby presenting one of several possible opportunities relating to an attempted transaction; whereby, each player in rotation is given randomly-determined opportunities upon moving his game piece by randomly-selected moves around said playing field, following directions thereon, to attempt purchases and sales transactions with said fictitious customers, the selection of each customer and the possible outcome of each said transaction attempt being indicated by randomly-selected cards, and the outcome of the transaction attempt sometimes being determined by said cards and sometimes being determined by a player's decision as to the consummation of the transaction attempt, thereby to affect his net worth.

5,439,230

## WATER COLUMNAR RACE GAME

John F. Mendes, Jr., 427 15th St., Daytona Beach, Fla. 32117

Filed Nov. 16, 1993, Ser. No. 153,138

Int. Cl.<sup>6</sup> A63F 9/14

U.S. Cl. 273-349

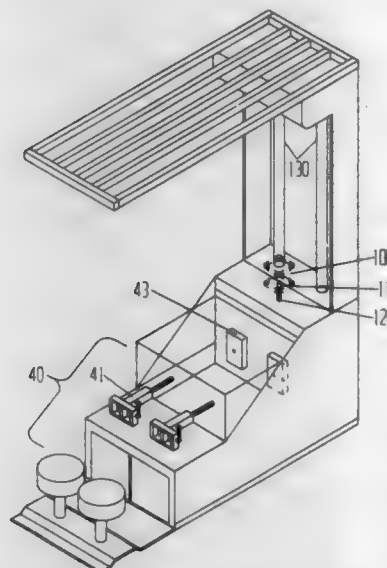
17 Claims

1. A competition game in which two or more players seek to

cause respective columns of water to rise within a designated generally vertical column, the game apparatus comprising:

two or more player control means and targets, each said player control means further comprising a player firing mechanism which is capable of permitting a player to direct either a fluid or solid projectile stream or a light beam onto or about a target, said target being further adapted with a detection means which is adapted to detect the presence of said fluid or solid projectile stream or light beam, and signalling means which is adapted to transmit a signal to a respective fluid control means during times in which a player's respective fluid or projectile stream or light beam is detected by said target detection means;

respective fluid control means, each said respective fluid control means further comprising a respective game fluid reservoir which further comprises a fluid storage container, a game fluid conduit between said game fluid storage container and a generally vertical column, and a piston member, said piston member adapted to alternatively compress the game fluid storage container so that game fluid is forced into said conduit and up into said generally vertical column or to decompress said game fluid storage container and permit the flow of fluid back from said generally vertical column, through said game fluid con-



duit, and into said respective game fluid reservoir, said piston member being mounted upon a shaft adapted to facilitate the motion of said piston member into and out of said game fluid storage container, reservoir control means, said reservoir control means further comprising threads on the exterior surface of said piston member shaft to receive the interior threads of a concentrically mounted cylinder upon which said piston member is positioned and piston shaft control means which are adapted to turn said threaded shaft in accordance with electrical signals received from said respective target detection means or from fluid detection means within a respective columnar fluid housing means in order to cause said fluid to either fill said generally vertical column or drain from said generally vertical column as directed and being adapted to control the movement of said piston member along said shaft; and

each said respective fluid columnar housing means further comprising said generally vertical column, said generally vertical column being further adapted to permit the observation of fluid as it rises or falls within said generally vertical column by each said player and one or more said housing means fluid detection means adapted to detect the presence of fluid at a fluid level or levels.

5,439,231

## ARCHERY ARROW VANE AND NOCK ASSEMBLY

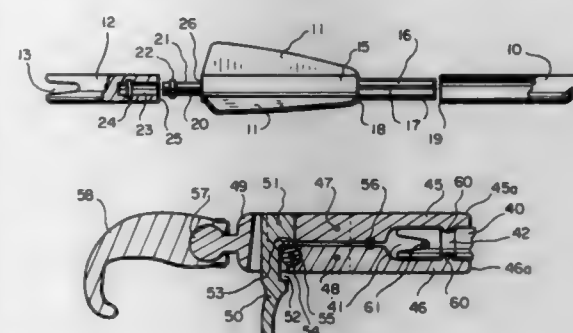
Kent S. Roberts, and Brent J. Roberts, both of American Fork, Utah, assignors to Inventive Technology, American Fork, Utah

Filed Jan. 7, 1993, Ser. No. 1,273

Int. Cl.<sup>6</sup> F41B 5/18; F42B 6/06

U.S. Cl. 273-423

19 Claims



1. A vane and nock assembly for use with an archery arrow shaft to make an archery arrow, said arrow shaft having a rearward end beyond which no part of the arrow shaft extends, comprising a single elongate body having a length, a forward end, and a rearward end; a plurality of vanes projecting from the body and extending along at least a portion of the length of said body, each vane being a single elongate piece molded integrally with the body; arrow shaft attachment means at the forward end of said body for attaching the vane assembly to the rearward end of an arrow shaft and preventing the arrow shaft from extending into the body beyond the attachment means so that the portion of the body with the vanes projecting therefrom is located entirely rearwardly of the rearward end of the arrow shaft; and nock means at the rearward end of said body.

5,439,232

## EDUCATIONAL CARD GAME

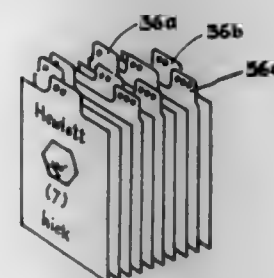
John S. Pollock, 1018 High Vista Trail, Webster, N.Y. 14580

Filed Jan. 15, 1993, Ser. No. 5,074

Int. Cl.<sup>6</sup> A63F 9/18, 1/02

U.S. Cl. 273-431

5 Claims



1. An educational card game comprising:

- a number of decks of cards wherein each card has:
  - a front side bearing a first word, a second word, a replica of an illustration of an object as depicted on the page of a dictionary said object being identifiable by a word or words the spelling of which is alphabetically sequenced between the spelling of the first word and the spelling of the second word;
  - a tab positioned on the edge thereof having a first set of indicia thereon which represents the level of difficulty of identifying the object, wherein tabs representing the same level of difficulty have the same relative positions on the edges of the various cards and are offset from tabs that are positioned on the edges of cards having



different levels of difficulty, the amount of offset of each tab from a common reference point increasing with the level of difficulty represented by the indicia thereon; and

- iii. a back side bearing a word or words which identify the object depicted on the front side; and
- b. a container for the decks of cards, said container having a number of compartments which corresponds to the number of levels of difficulty comprising the first set of indicia, each compartment being configured so that only the portion of the foremost card of each deck bearing the first set of indicia is visible to a player and wherein each compartment contains a deck of cards having the same level of difficulty.

5,439,233

# SEGMENTED SEAL WITH LOCK PORTIONS FOR MISSILE LAUNCH TUBE

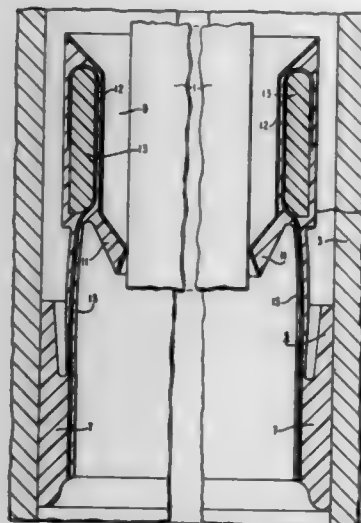
Jerry K. Endo; Jeffrey P. Connell, both of Santa Clara, and Philip G. Ruhle, Los Gatos, all of Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sep. 9, 1983, Ser. No. 530,912

Int. Cl.<sup>6</sup> F16J 15/32

U.S. Cl. 277—212 F

6 Claims



1. A self-centering seal for forming a high pressure seal in a large annular opening disposed between inner and outer cylindrical members, said seal being made of an elastomer and comprising a base ring portion attached to one of said cylindrical members; a hoop portion having a lip portion disposed thereon to form a seal on the other of said cylindrical members; and a tensile membrane extending between said hoop portion and said base portion, whereby the pressure being sealed acts on said tensile membrane exerting a lateral pressure tending to center the inner cylindrical member within the outer cylindrical member.

5,439,234

# METAL GASKET WITH EDGE SUPPORT BEADS

Trunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1993, Ser. No. 127,580

Claims priority, application Japan, Oct. 1, 1992, 4-068727 U

Int. Cl.<sup>6</sup> F16J 15/08

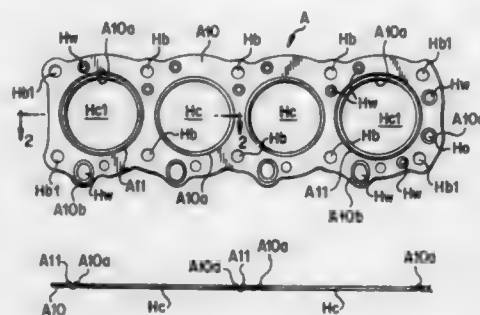
U.S. Cl. 277—235 B

8 Claims

1. A metal gasket for an internal combustion engine formed of a cylinder head and a cylinder block, said engine including two longitudinal edges, two lateral edges substantially perpendicular to the longitudinal edges and parallel to a longitudinal direction of the engine to form a generally rectangular shape, a plurality of cylinder bores arranged along the longitudinal

direction of the engine, and a plurality of bolt holes arranged to surround the cylinder bores, some of said bolt holes located at longitudinal ends of the engine being located close to the longitudinal edges, said gasket comprising,

at least one metal plate extending substantially throughout an entire area of the engine for constituting the metal gasket, said metal plate including two longitudinal ends, two lateral ends perpendicular to the longitudinal ends and parallel to a longitudinal direction of the gasket, a plurality of first holes corresponding to the cylinder bores,



a plurality of second holes corresponding to the bolt holes, and a plurality of sealing beads formed around the first holes for sealing therearound, and two edge support beads integrally formed on the plate and located only around the first holes situated at longitudinal ends of the gasket to substantially completely support tightening pressure of bolts applied to the longitudinal ends of the gasket to thereby prevent deformation of the cylinder head and provide substantially equal tightening pressure around the entire cylinder bores.

5,439,235

# APPARATUS FOR COUPLING CONCENTRIC CYLINDRICAL MEMBERS THROUGH THE SELECTIVE RADIAL ENLARGEMENT OF ONE OF THE COUPLING COMPONENTS

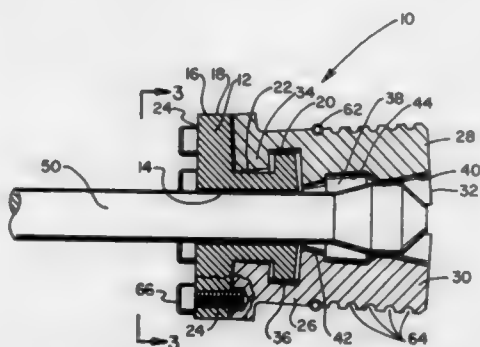
William R. Blackwell, 2168 Sunset Dr. NE., New Philadelphia, Ohio 44663-7012

Filed May 31, 1994, Ser. No. 251,199

Int. Cl.<sup>6</sup> B23B 31/40

U.S. Cl. 279—2.15

4 Claims



2. An apparatus for coupling concentric cylindrical members through the selective radial enlargement of one of the coupling components comprising:

a fixed collar having a cylindrical interior bore of a common diameter and with an exterior cross section of varying diameters, an exterior inboard section being of a large diameter, an exterior outboard section being of an intermediate diameter and an exterior intermediate section being of a small diameter, the fixed collar having a plurality of apertures in a circular configuration extending through the inboard section;

an adjustable component having an upper half and a lower

half and a central bore extending therethrough with an inboard end forming a flange of an intermediate diameter positionable over the intermediate section of the collar and having an enlarged diameter thereadjacent for being positioned over the outboard section of the collar and having an outboardly tapering intermediate section with its greatest diameter at an outboard end and its smallest diameter at its inboard end joining at its inboard end with the enlarged diameter, the tapered section including an intermediate part of a greater diameter than the sections of the tapering section on opposite sides thereof, the adjustable member being provided with at least one annular groove on its exterior surface; and

an actuator rod located through the bores of the fixed collar and the adjustable component, the actuator rod having an outboard end with a circular cross section of an increased diameter and having downwardly tapering surfaces forwardly and rearwardly thereof, the rearward tapering surface reducing to a diameter equal to the exterior diameter of the remainder of the rod.

5,439,236

# APPARATUS FOR SUPPORTING A PAINT STIRRING STICK AND FOR COUPLING TO AN ELECTRIC DRILL

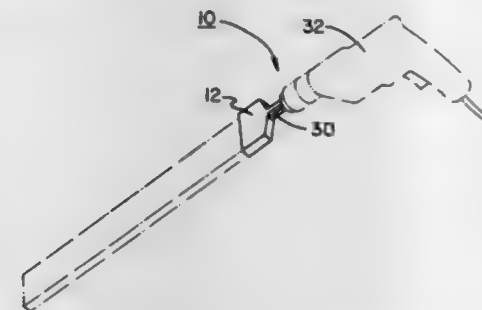
Doug Musil, 4148 E. Madura Five, Gulf Breeze, Fla. 32561-3536

Filed Jul. 11, 1994, Ser. No. 273,184

Int. Cl.<sup>6</sup> B01F 13/00

U.S. Cl. 279—102

4 Claims



2. An apparatus for supporting a paint stirring stick and for coupling to an electric drill comprising:

a generally box-like container, the container having large parallel upper and lower walls, and small parallel side walls coupled therebetween, the container having an open front end adapted to receive a stirring stick, the device also having a closed rear end formed of symmetric walls adapted to close the rear end of the container; and

a drive shaft extending rearwardly from the rear end for being received by an electric drill, the drive shaft having a cylindrical shape with a hexagonal cross-section, the length of the drive being essentially the length of the side walls.

5,439,237

# SNOWMOBILE SKI WHEELS

Steven A. Kutchie, Sunnyside Estates, #69, Ishpeming, Mich. 49849

Filed Apr. 13, 1994, Ser. No. 226,933

Int. Cl.<sup>6</sup> B62B 13/18

U.S. Cl. 280—11

2 Claims

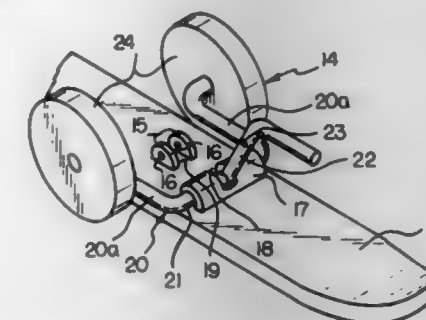
1. A wheel assembly for use with a snowmobile having at least one ski support, the ski support having at least one ski member mounted thereon, the wheel assembly comprising:

a pair of spaced lock flanges mounted onto the ski member defining a flange gap therebetween, with the lock flanges each having an individual lock bore therewithin, and each lock bore coaxially aligned with an adjacent lock bore; a support tube spaced from said lock flanges, with the sup-

port tube mounted upon the ski member, the support tube having a slot aligned with the flange gap;

a U-shaped wheel support bracket rotatably mounted partially within the support tube, the wheel support bracket having a plurality of legs;

a plurality of wheel members, with each of said wheel members being rotatably mounted to an individual one of the legs;



a latch leg integrally mounted to the U-shaped wheel support bracket, with the latch leg projecting through the slot and arranged for reception within the flange gap, with the latch leg having a latch leg opening, the latch leg opening being arranged for alignment with the lock bores when the latch leg is positioned within the flange gap; and,

a lock pin removably positioned through the latch leg opening and the latch bores.

5,439,238

# BRAKING SYSTEM FOR IN-LINE ROLLER SKATES

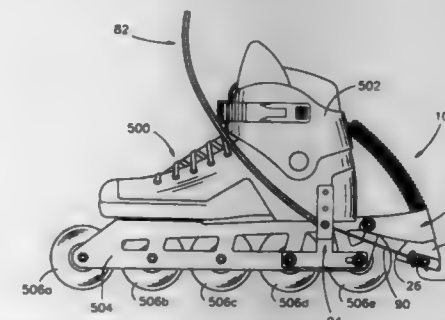
Stuart Neal, No. 9, Bonneville Dr., Council Bluffs, Iowa 51503

Filed Oct. 25, 1993, Ser. No. 140,422

Int. Cl.<sup>6</sup> A63C 17/14

U.S. Cl. 280—11.2

15 Claims



1. A braking system for an in-line roller skate having a shoe portion and a longitudinally extended wheel bracket, the wheel bracket mounted on the underside of the shoe portion, the in-line skate further including at least two ground-engaging wheels mounted on the wheel bracket in-line for rotation about generally parallel transverse axes such that one wheel is a rearmost wheel, said braking system comprising:

a wheel engaging structure comprising;

brake pad means;

a brake bracket connected to said brake pad means, said brake bracket including a forwardly extending arm for mounting on the in-line skate wheel bracket adjacent the rearmost wheel;

means for pivotably mounting said arm to the in-line skate wheel bracket above the rotational axis of the rearmost wheel of the in-line skate such that upon said brake bracket being pivoted downwardly and forwardly, said brake pad means is brought into frictional contact with the rearmost wheel;

a brake actuator;

cable means extending between and connected to said brake actuator and said wheel engaging structure, said cable means operative to pivot said brake bracket and said brake pad means to frictionally engage the wheel of the skate upon engagement of said brake actuator;

biasing means connected to said wheel engaging structure, said biasing means operative to bias said brake bracket away from the wheel of the skate thereby stopping frictional engagement between said brake pad means and the wheel.

5,439,239

**COLLAPSIBLE LUGGAGE CART**

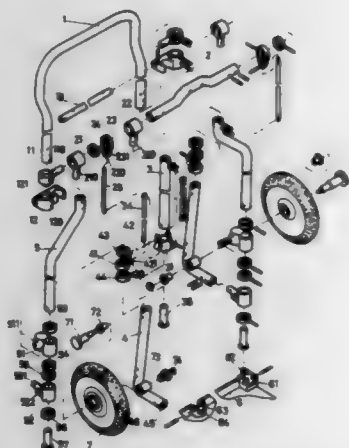
Chung-shiu Su, No. 3 Lane 565, Ta She Road, Lu Chu Hsiang, Kaohsiung Hsuan,

Filed Oct. 18, 1994, Ser. No. 324,934

Int. Cl.<sup>6</sup> B62B 1/12

U.S. Cl. 280—40

3 Claims



1. A collapsible luggage cart comprising:

a handle shaped as an inverted U, made of a tube, and having two ends respectively combined with a pivotal disc provided with a sidewise short tube, which fits and fixed firmly with rivets in an end opening of a horizontal eccentric tube described later, said pivotal disc being connected with a connector at the bottom side;

a horizontal eccentric tube having an intermediate curved portion and two side in-line portions, two ends respectively being fitted around with a side pivotal ring provided with a vertical short downward tube which fits in an upper end opening of each of two vertical side support tubes, two eccentric rings fitting around the intermediate portion at both sides of a middle pivotal ring fitting around the same intermediate portion, said middle pivotal ring having a vertical short downward tube fitting in an upper end opening of a vertical middle support tube, each said eccentric ring having an eccentric hole for pivotally connecting an upper end of a rotatable rod, each said rotatable rod having its lower end pivotally connected with a slidable ring of a vertical middle tube;

a vertical middle support tube having its upper end firmly connected with said vertical tube of said middle pivotal ring fitting around the intermediate curved portion of said horizontal eccentric tube, its lower end connected with a short bottom tube fitted and pivotally connected in a middle opening of a horizontal luggage frame, a slidable ring fitted around and able to slide along the vertical middle support tube and having two pairs of tipper ears and two lower ears said two pairs of upper ears pivotally connected with two lower ends of said two rotatable rods, said two lower ears pivotally connected with two upper ends of two connecting rods, the lower ends of which are

pivotally connected with a rotatable ring of a wheel frame;

two wheel frames respectively having an L shape consisting of a vertical portion and a horizontal portion, their upper ends respectively fitting in a cylindrical portion of a support sleeve of a vertical side support tube, their lower ends respectively fitting in a stop sleeve of the vertical side support tube, a rotatable ring provided to fit around the lower portion of each said wheel frame and having a pair of projecting sidewise ears pivotally connected the lower end of said two connecting rods, a downward slot provided in each said lower end which has an end opening for a sidewise short tube of said stop sleeve to fit therein, said downward slot being fitted through by a locking block extending down from the sidewise short tube of said stop sleeve;

two vertical side support tubes are nearly shaped as an N, respectively having their upper end connected with each said side pivotal ring fitting around each end of said eccentric tube, their lower ends fitting and riveted in two side openings of a luggage frame, their intermediate portion fitted around with a rotatable support sleeve kept at its position by two fixing rings riveted around said intermediate portion on and under said rotatable support sleeve, which has a sidewise cylindrical portion for the upper end of each said wheel frame to fit therein, a rotatable stop sleeve provided to fit around the lower end and having a sidewise short tube to fit in the lower end opening of each said wheel frame, two pivotal short posts provided to fit in the lower end openings and pivotally deposited in two side openings of a horizontal luggage frame;

a horizontal luggage frame having two side openings at both ends of a rear side for the bottom end of each said vertical side support tube to fit and be riveted pivotally therein, a middle opening between said two side openings for said short bottom tube of said middle support tube to fit and riveted pivotally therein; and

said handle able to be folded down to a collapsed condition from a spread condition or vice versa with said two pivotal discs as pivots, with said eccentric tube swung down or up by means of said two eccentric rings with said slidable ring moving up and down along said middle support tube, said two connecting rods pulled or pushed by said slidable ring pulling or pushing said two rotatable rings on said two wheel frames and consequently forcing said two wheel frames being spread outward or collapsed inward with said rotatable support sleeves and said rotatable stop sleeves as pivots.

5,439,240

**BALANCE SHIFTED PERSONAL CARRIAGE**

Clyde L. Tichenor, 15524 Cohasset St., Van Nuys, Calif. 91406, and Irwin Ginsburgh, 24125 Clearbank La., Newhall, Calif. 91321

Filed Oct. 21, 1991, Ser. No. 779,621

Int. Cl.<sup>6</sup> B62M 1/02, 1/04

U.S. Cl. 280—250.1

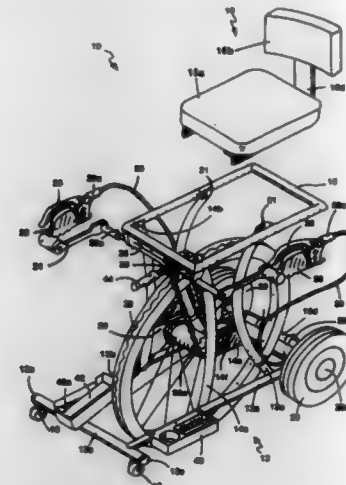
18 Claims

1. A balance shifted personal carriage comprising:

- a base frame assembly,
- a seating assembly attached to said base frame assembly,
- a free-pivoting wheel attached to each front or back corner of said base frame assembly,
- a steerable wheel attached to said base frame assembly at each corner opposite the corners where said pivoting wheels are attached,
- a power wheel attached to said base frame assembly and substantially centered between said pivoting wheels and said steerable wheels, where said power wheel is mounted with its lowest tangential point below the tangential line between said pivoting wheels and said steerable wheels, wherein said power wheel is driven by a manual drive assembly having dual opposed hand cranks that are connected to a common hand crank shaft, wherein each of

said hand cranks further comprise a thumb or finger lever which functions in combination with a squeeze lever that is connected to a means for controlling the steering angle of the two steerable wheels, and

f) wherein said carriage is operable in either of two modes of operation: in Mode 1, the seated rider shifts his or her weight backwards to allow the steerable wheels to pivot downwardly with respect to said pivoting wheels, and



make contact with the floor surface allowing said carriage to be steered by the seated rider; in Mode 2, the seated rider shifts his or her weight forward to allow said steerable wheels to rise above the floor and said pivoting wheels to make contact with the floor surface allowing the seated rider to pivot and move said carriage away from an obstacle in a direction opposite the pushing or pulling direction.

5,439,241

**COLLAPSIBLE GOLF BAG CART WITH SEAT**

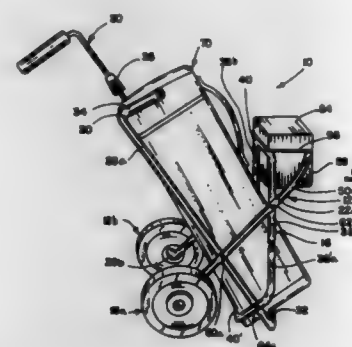
Walter T. Nelson, Grand Rapids, Mich., assignor to Pingree Products Ltd., Grand Rapids, Mich.

Filed Dec. 6, 1993, Ser. No. 161,593

Int. Cl.<sup>6</sup> B62B 1/12

U.S. Cl. 280—645

19 Claims



1. A collapsible golf club bag cart movable between collapsed and uncollapsed configurations, said cart comprising:

- a wheel support frame;
- a bag support frame having dual spaced apart side members for seating a golf club bag therebetween, said bag support frame being pivotally secured to said wheel support frame;
- a seat support frame pivotally secured to both said wheel support frame and said bag support frame, said seat support frame including at least one telescoping side member which extends or retracts as said cart is being collapsed or uncollapsed, respectively;
- a seat hinged affixed to said wheel support frame and

movable between a collapsed position and an uncollapsed position resting on said seat support frame; and a pair of wheels secured to said wheel support frame.

5,439,242

**SUPPORT ARRANGEMENT FOR RADIUS ARMS**

Milorad Zivkovic, Filderstadt, Germany, assignor to Mercedes-Benz AG, Germany

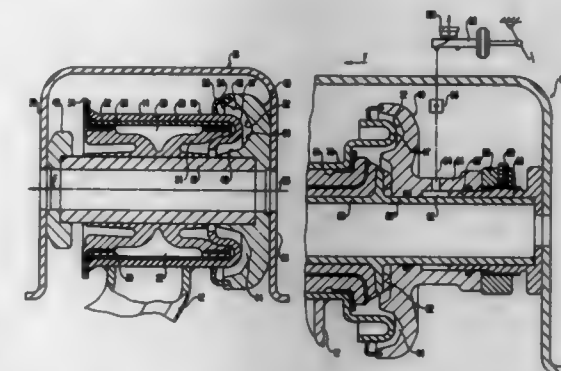
Continuation of Ser. No. 9,049, Jan. 26, 1993, abandoned. This application Jul. 7, 1994, Ser. No. 271,574

Claims priority, application Germany, Feb. 6, 1992, 42 03 366.7

Int. Cl.<sup>6</sup> B62D 17/00

U.S. Cl. 280—661

9 Claims



1. A support arrangement for radius arms, comprising an outer support arrangement part, an inner support arrangement part, an elastomer body operatively located between the outer and inner support arrangement parts to provide axial and radial flexibility therebetween, and a stop located at one end of the inner support arrangement part to limit relative motions of the outer and inner support arrangement parts in one direction of a support arrangement center line, which stop has a centering surface concentric with the center line of the inner support arrangement part and facing towards the outer support arrangement part arranged to be brought into contact therewith, which centering surface, in a predetermined position of the support arrangement parts, is at a distance from the end of the outer support arrangement part, wherein the centering surface of the stop has an annular groove narrowing conically inwardly and accommodating an end of the outer support arrangement part to be centered, which end is convexly curved in the form of an annular bead as viewed in an axial direction along the support arrangement center line and a groove bottom of the annular groove forms a centering bead.

5,439,243

**VEHICLE SUSPENSION**

Yoichiro Kato, Masaki Tanaka, and Chikara Ito, all of Zama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 15, 1994, Ser. No. 212,780

Claims priority, application Japan, Mar. 15, 1993, 5-053880; Mar. 15, 1993, 5-053881; Mar. 15, 1993, 5-053882; Mar. 15, 1993, 5-053883

Int. Cl.<sup>6</sup> B60G 21/00

U.S. Cl. 280—689

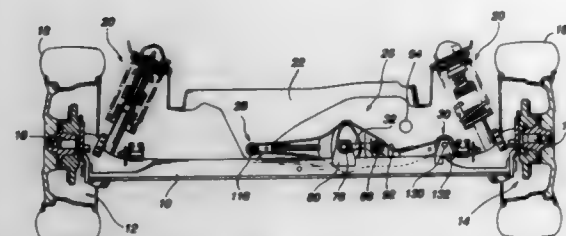
17 Claims

1. In an automotive vehicle:

- a vehicle body;
- a torsion beam supporting left and right axles at opposite ends thereof and supporting said vehicle body thereon;
- a lateral link extending in a transverse direction of said vehicle body and pivotally connected at one end portion thereof to said vehicle body about a first axis and at the other end portion thereof to said torsion beam about a second axis parallel to said first axis;
- a control link pivotally connected at one end portion thereof to said lateral link about a third axis and at the other end



portion thereof to said torsion beam about a fourth axis parallel to said third axis;  
 wherein centers of the respective pivotal connections of said lateral link to said vehicle body and said torsion beam and centers of the respective pivotal connections of said control link to said lateral link and said torsion beam, are disposed in a common vertical plane with respect to said vehicle body;  
 wherein said lateral link includes means for sharing a lateral force applied to said lateral link;



wherein said sharing means include a set of plates opposed in a longitudinal direction of the vehicle to define a space in which said control link is disposed;  
 wherein said set of plates are respectively formed with shoulders on which said one end portion of said control link is supported; and  
 a pin fixedly supported by said shoulders of said set of plates of said lateral link.

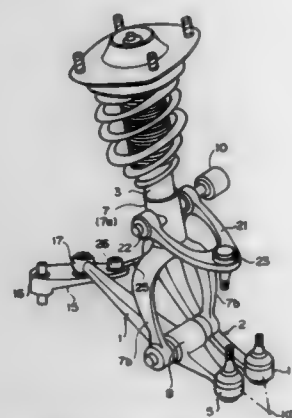
#### 5,439,244 SUSPENSION APPARATUS FOR AN AUTOMOTIVE VEHICLE

Kenji Tomosada; Fumitaka Ando; Toshiro Kondo, and Takao Imada, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 27, 1993, Ser. No. 9,753  
 Claims priority, application Japan, Jan. 28, 1992, 4-037195; Jan. 28, 1992, 4-037196; Jan. 28, 1992, 4-037197  
 Int. Cl.<sup>6</sup> B60G 3/00

U.S. Cl. 280—691

32 Claims



1. A suspension apparatus for an automotive vehicle having a member for supporting a steerable wheel mounted to a body of the vehicle through a front lower arm and a rear lower arm so as to be pivotable in a vertical direction and having a lower set point of a virtual kingpin axis constituted by an intersection of an extension of said front lower arm in an outer direction of the body with an extension of said rear lower arm in the outer direction thereof, wherein:

a transversely inner end portion of one lower arm of said front lower arm and said rear lower arm is connected to

the body of the vehicle so as to be in a longitudinal direction of the body; and  
 a control link is linked with an intermediate portion of at least one of said front lower arm and said rear lower arm and at least one of said body and one of said lower arms and is pivotable in the horizontal direction so as to convert a rearward displacement of at least one of a transversely outer end portion of said front lower arm and a transversely outer end portion of said rear lower arm into an external force for displacing the transversely inner end portion of the one lower arm, said rearward displacement occurring at an externally cornering wheel when the wheel is steered.

#### 5,439,245

##### SYSTEM FOR CHASSIS CONTROL

Juergen Breitenbacher, Winterbach; Stefan Otterbein, Stuttgart; Rainer Kallenbach, Waiblingen-Neustadt, and Heinz Decker, Vaihingen Enz Riet, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

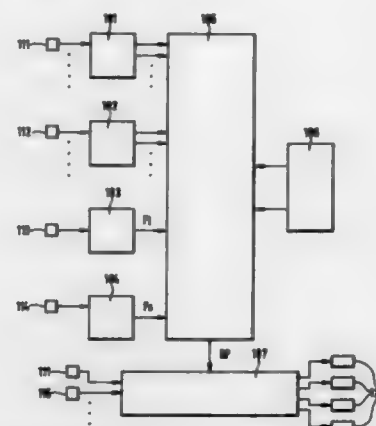
Continuation of Ser. No. 941,673, Sep. 8, 1992, abandoned. This application Mar. 24, 1994, Ser. No. 217,073

Claims priority, application Germany, Oct. 5, 1991, 41 33 237.7

Int. Cl.<sup>6</sup> B60G 17/015

U.S. Cl. 280—707

8 Claims



1. A method of controlling an active or semi-active chassis on a vehicle, said chassis having at least one actuator, said method comprising the steps of:

sensing a state of travel of the vehicle, said state of travel representing an individual driving style of a driver;  
 generating at least one control parameter dependent on said state of travel, said generating step including the step of determining a statistical value based on at least one of effective values and peak values corresponding to one of a throttle valve position and a throttle valve change velocity, said generating step further including the step of determining said control parameter dependent on said statistical value;  
 varying an output of a controller dependent on said control parameter; and  
 controlling said at least one actuator utilizing said controller.

#### 5,439,246

##### MULTI-DIRECTIONAL AIR BAG MODULE DOOR ATTACHMENT

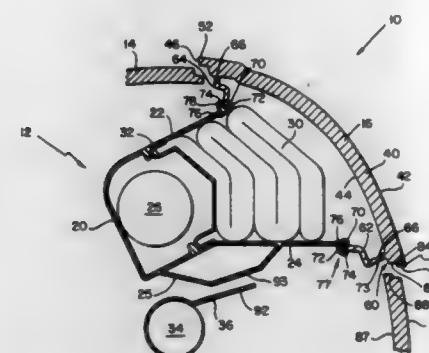
Michael J. Ravenberg, Corinne; Mark A. Thompson; David J. Green, both of Brigham City; Terry R. Davis, Layton, all of Utah; Jeffery L. Scharret, Rochester Hills, and Russell S. Gans, Westland, both of Mich., assignors to Morton International, Inc., Chicago, Ill.

Filed Feb. 7, 1994, Ser. No. 192,919

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—728.3

20 Claims



1. An air bag module door for an air bag module unit, said module door comprising:

a face portion to provide closure to an opening in an interior trim structure of a vehicle where through an air bag is deployable, said face portion having an upper surface, a lower surface and a peripheral surface between the upper and lower surfaces, said module door having at least a portion of the peripheral surface supported by an underlying portion of the interior trim structure, and  
 at least one first flexible leg joined at a first end to said face portion and joinable at a second end to a corresponding mounting section of the module unit, said flexible leg permitting said face portion to be positioned about the air bag deployment opening as the module unit is secured to the vehicle and wherein said flexible leg becomes tensioned as said module door is fixed in position relative to the air bag deployment opening.

#### 5,439,247

##### INFLATABLE GAS BAG FOR A VEHICULAR RESTRAINING SYSTEM

Andreas Kolb, Schwäbisch-Gmünd, Germany, assignor to TRW Repa GmbH, Alfdorf, Germany

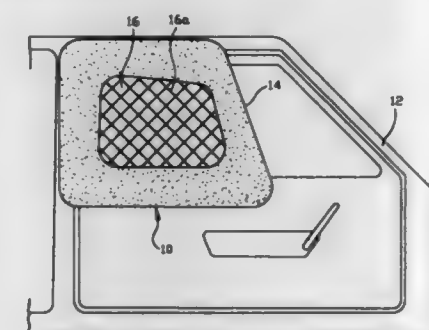
Filed Sep. 22, 1993, Ser. No. 125,425

Claims priority, application Germany, Sep. 29, 1992, 42 32 658.3

Int. Cl.<sup>6</sup> B60R 21/22

U.S. Cl. 280—730.2

3 Claims



1. An inflatable gas bag for a passenger restraining system in vehicles, comprising, when inflated, a generally flat inner portion having a generally polygonal periphery with rounded corners, and an outer tubular portion connected to the periphery of and surrounding said inner portion forming a closed

loop, said outer portion projecting on opposed sides of said inner portion and having an outer periphery of a generally polygonal shape with rounded corners, and said outer portion being designed to extend in the inflated condition along a portion of a vehicle side window to protect the passenger against lateral impact, wherein said inner and outer portions are defined by a pair of superimposed layers of fabric interconnected by stitches along lines and wherein said inner portion is formed by a plurality of straight tubular webs in communication with said outer portion.

#### 5,439,248

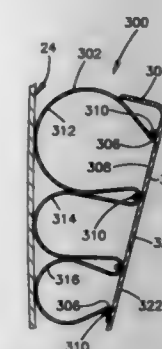
VEHICLE OCCUPANT RESTRAINT APPARATUS  
 Charles E. Steffens, Jr., Washington, and Louis R. Brown, Oxford, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Dec. 21, 1993, Ser. No. 170,700

Int. Cl.<sup>6</sup> B60R 21/22

U.S. Cl. 280—730.2

7 Claims



1. Apparatus for restraining an occupant of a vehicle occupant compartment, said apparatus comprising:

a vehicle part having a detachable panel section, said detachable panel section of said vehicle part having an outer side surface means for partly defining the occupant compartment;  
 an inflatable vehicle occupant restraint supported on said vehicle part, said restraint having a folded air bag portion which moves into an unfolded condition extending from said vehicle part into the occupant compartment upon inflation of said restraint;  
 said restraint further having a panel portion which comprises said detachable panel section of said vehicle part, said panel portion of said restraint being fixed to said air bag portion to move from said vehicle part with said air bag portion;  
 a source of inflation fluid; and  
 means for directing inflation fluid from said source into said restraint to inflate said restraint;  
 said restraint including means for separating said air bag portion into distinct sections that adjoin respective distinct sections of said panel portion, said sections of said air bag portion separately applying respective fluid pressure forces to said respective sections of said panel portion upon inflation of said restraint;  
 said sections of said air bag portion having elongated tubular shapes, said means for separating said air bag portion into distinct sections comprising a plurality of mounting rods which extend longitudinally between said sections of said air bag portion.

5,439,249

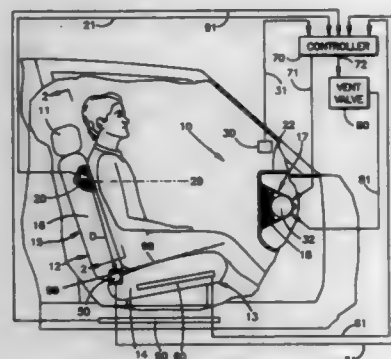
# VEHICLE OCCUPANT RESTRAINT SYSTEM INCLUDING OCCUPANT POSITION SENSOR MOUNTED IN SEAT BACK

Charles E. Steffens, Jr., Washington; Thomas H. Vos, Rochester; Scott B. Gentry, Romeo; Joseph F. Mazur, Washington, and Brian K. Blackburn, Rochester, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio  
Continuation of Ser. No. 161,141, Dec. 2, 1993, abandoned. This application Dec. 5, 1994, Ser. No. 349,385

Int. Cl.<sup>6</sup> B60R 21/26, 21/28

U.S. Cl. 280—735

19 Claims



7. A vehicle occupant restraint system comprising: deceleration sensor means for providing a deceleration signal indicative of sudden vehicle deceleration such as occurs in a vehicle collision requiring deployment of an occupant restraint;
- a vehicle seat including a seat bottom, a seat back, and a head rest above said seat back;
- occupant position sensor means mounted in said seat back and below said head rest of said vehicle seat for (i) sensing the position of an occupant in said vehicle seat and (ii) providing a continuous analog occupant position signal indicative of the position of the occupant relative to said seat back of said vehicle seat;
- seat position sensor means for providing a continuous analog seat position signal indicative of the position of said vehicle seat in the forward and rearward directions of travel of the vehicle;
- occupant restraint means including an inflatable air bag for, when inflated in response to said deceleration sensor means providing said deceleration signal, restraining the occupant in said vehicle seat; and
- controller means for controlling inflation of said air bag as a function of the difference between said continuous analog occupant position signal from said occupant position sensor means and said continuous analog seat position signal from said seat position sensor means.

5,439,250

# INFLATOR FOR AIR BAG DEVICE

Akira Kokeguchi, and Yoshikazu Nakayama, both of Shiga, Japan, assignors to Takata Corporation, Tokyo, Japan  
Filed May 26, 1994, Ser. No. 249,570

Claims priority, application Japan, Jun. 8, 1993, 5-137435

Int. Cl.<sup>6</sup> B60R 21/26

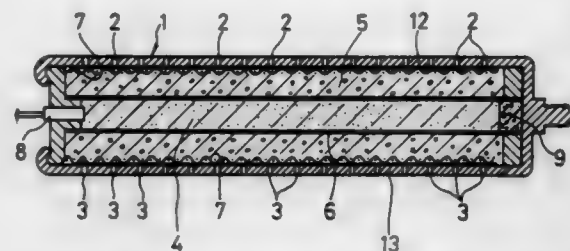
U.S. Cl. 280—736

8 Claims

1. An inflator for an air bag device comprising, a cylindrical casing having a cylindrical periphery, two side portions located at longitudinal ends of the casing, a plurality of first gas outlet holes disposed on one side of the cylindrical periphery, and a plurality of second gas outlet holes disposed on the other side of the cylindrical periphery,
- a propellant filled in the casing,
- a tube situated in a center of the propellant and extending in

a longitudinal direction of the casing between the side portions,

a booster filled in the tube for actuating the propellant, an electrical ignitor attached to one of the side portions of the casing, said ignitor being operated by a collision of an automobile and igniting the booster to actuate the propellant to thereby expand an air bag for the air bag device, an auto ignition material situated inside the tube opposite to the electrical ignitor and disposed adjacent the other side portion of the casing, said auto ignition material igniting at a temperature between 150° and 200 ° C.,



- a first sealing film for sealing the first gas outlet holes, said first sealing film being opened in the case that the propellant is ignited by one of the electric ignitor and the auto ignition material, and
- a second sealing film for sealing the second gas outlet holes, said second sealing film being opened in the case that the propellant is ignited only by the auto ignition material so that when the inflator is involved in fire, the first and second sealing films are opened to thereby smoothly release a gas from the inflator.

5,439,251

# METHOD OF TETRAZOLE AMINE SALTS HAVING IMPROVED PHYSICAL PROPERTIES FOR GENERATING GAS IN AIRBAGS

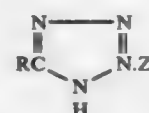
Atsuhiko Onishi, and Hiroshi Tanaka, both of Takasago, Japan, assignors to Toyo Kasei Kogyo Company Limited, Japan  
Filed Nov. 29, 1993, Ser. No. 158,307

Claims priority, application Japan, Nov. 30, 1992, 4-345568  
Int. Cl.<sup>6</sup> C06B 31/28, 31/02

U.S. Cl. 280—741

2 Claims

1. An airbag assembly which comprises an airbag and, as a gas generating agent therefor, tetrazole amine salts of formula (I)



wherein R represents methyl or tetrazolyl, and wherein Z is a member selected from the group consisting of methylamine, ethylamine, n-propylamine, isopropylamine, n-butylamine, tert-butylamine, n-pentylamine, n-hexylamine, aniline, benzylamine, phenethylamine, 1-amino-4-phenylbutane, benzhydrylamine, cyclohexylamine, dimethylamine, diethylamine, di-n-propyl amine, di-n-pentylamine, di-n-hexylamine, propylencimine, pyrrolidine, piperidine, N-methylmorpholine, trimethylamine, triethylamine, tri-n-pentylamine, tri-n-hexylamine, triphenylamine, pyridine, 1,8-diazabicyclo-[5.4.0]-7-undecene, hydrazine, trimethylenediamine, pentamethylenediamine, hexamethylenediamine, piperazine, m-phenylenediamine, 1,3-diazocyclohexane, triethylenediamine, N, N, N', N'-tetramethylethylenediamine, ammonia, urea, carbonylhydrazide, thiocarbonylhydrazide, azodicarbonamide, guanidine, dicyandiamide, aminoguanidine, N, N'-bis (3-aminopropyl) piperazine, melamine, acetoguanamine, 3-amino-1,2,4-tetrazole and hexamethylenetetramine.

5,439,252

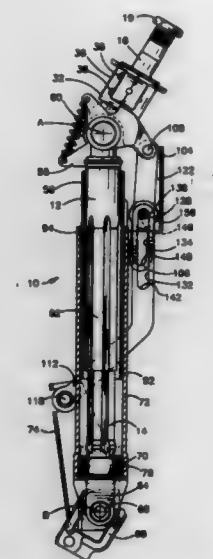
# DUAL PIVOT STEERING COLUMN

Gerald K. Oxley; Chester D. Renick, and Frederick D. Venable, all of Lafayette, Ind., assignors to TRW Inc., Lyndhurst, Ohio  
Filed Apr. 22, 1993, Ser. No. 52,195

Int. Cl.<sup>6</sup> B62D 1/18

U.S. Cl. 280—775

12 Claims



1. A rotatable, torque transmitting drive assembly for an automotive vehicle steering column comprising: an input shaft; means connected to and rotatable with said input shaft for transferring rotational movement of said input shaft to an output shaft to effect movement of steerable vehicle wheels of a vehicle, said transfer means being pivotable relative to a vehicle frame into a plurality of pivot positions to position a steering wheel connectable with said input shaft relative to an occupant of the vehicle, said input shaft being pivotable relative to said transfer means into a plurality of pivot positions, said input shaft having a plurality of pivot positions for each one of said plurality of pivot positions of said transfer means to further position the steering wheel relative to an occupant of the vehicle; and
- a locking mechanism for locking said transfer means in any one of the plurality of pivot positions relative to the vehicle frame and for locking said input shaft in any one of the plurality of pivot positions relative to said transfer means.

5,439,253

# AUTOMATIC RETRACTABLE SAFETY BELT DEVICE FOR A SEAT COMPARTMENT OF A SHOPPING CART

Antoine Trubiano, Montreal, Canada, assignor to Cari-All Inc., Montreal East, Canada

Filed Apr. 12, 1994, Ser. No. 226,478

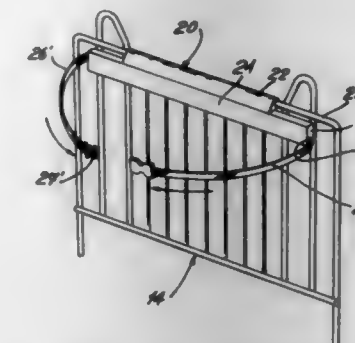
Int. Cl.<sup>6</sup> B60R 22/00

U.S. Cl. 280—801.1

14 Claims

1. An automatic retractable safety belt device for arresting a child seated in a seat compartment of a shopping cart, said device comprising a housing having clamp for securing same to a frame member adjacent said seat compartment, an elongated flexible belt of predetermined length disposed in said housing and having a free end thereof accessible from outside said housing, retractable means in said housing having an inner end of said belt connected thereto, said retractable means maintaining a major portion of said belt retracted in said housing, connector means at said free end of said belt for attaching

said belt extended from said housing and positioned in a restraining manner about a child seated in said seat compartment,



said belt major portion being automatically retracted in said housing when said connector means is detached.

5,439,254

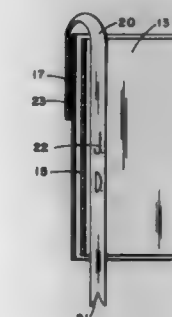
# BOOKMARKER METHOD AND APPARATUS

Jeffrey P. Dorion, 1104 Donnell Dr., Port Orange, Fla. 32119  
Filed Sep. 2, 1992, Ser. No. 939,921

Int. Cl.<sup>6</sup> B42D 9/00

U.S. Cl. 281—42

7 Claims



1. A method of making a bookmark comprising the steps of: selecting a sheet of fiber reinforced paper TYVEX; coating a portion of said sheet of said fiber reinforced paper TYVEX with an adhesive; and cutting a plurality of bookmarks from said sheet of fiber reinforced paper TYVEX, each said bookmark having an enlarged area having said adhesive on one side thereof and an elongated bookmarking ribbon portion extending from said enlarged portion, whereby a bookmark has an enlarged portion attachable to said book spine with said elongated portion extending therefrom for marking a page in said book.

5,439,255

# APPARATUS AND METHOD FOR THE XEROGRAPHIC PRINTING OF INFORMATION CARDS

Harley J. McIntire; Stevenson M. Givens, both of Columbus, and James P. Harman, Jr., Greenville, all of Ga., assignors to American Family Life Assurance Company of Columbus, Columbus, Ga.

Continuation of Ser. No. 901,863, Jun. 22, 1992, abandoned.

This application Aug. 17, 1994, Ser. No. 293,412

Int. Cl.<sup>6</sup> B42D 15/00

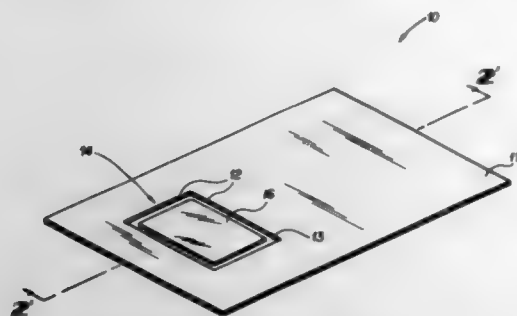
U.S. Cl. 283—62

96 Claims

1. A card assembly for use with a printer, said card assembly comprising: a carrier sheet having an aperture; a suspension sheet attached to said carrier sheet over said aperture, said suspension sheet comprising a material of the type capable of permitting viewing therethrough, said



suspension sheet and said aperture collectively defining a cavity; and  
an information card having a first surface detachably bonded within said cavity to said suspension sheet so that informa-



tion on said first surface of said information card can be viewed through said suspension sheet, and having a second surface exposed to receive print from said printer while said information card resides in said card assembly.

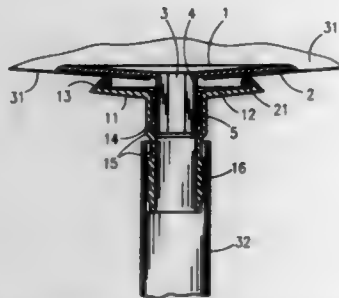
5,439,256

**BULKHEAD FITTING FOR THIN FLEXIBLE BARRIERS**  
Paul M. Brainard, 5561 Santa Anita Ave., #5, Temple City, Calif. 91780

Continuation-in-part of Ser. No. 142,868, Oct. 25, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 320,117  
Int. Cl.<sup>6</sup> F16L 41/08

U.S. Cl. 285—200

5 Claims



1. A fitting for attaching a conduit to an opening in a thin flexible barrier, comprising:

- (a) a male threaded member, a female threaded member, and a flexible seal,
- (b) said male threaded member having a male threaded spout and a wide flange, said male threaded spout having an upper end, said wide flange projects outwardly from said upper end at an angle slightly larger than 90° as measured from the side of said male threaded spout, said male threaded spout having a bore through the center of its length,
- (c) said thin flexible barrier being a sheet of flexible, water resistant material that is at least 1 mil thick, said thin flexible barrier having an upperside, said opening in the barrier being slightly larger than the outer perimeter of said male threaded spout, said wide flange having an undersurface, said undersurface to rest on said upperside of the barrier with said male threaded spout extending through said opening in the barrier, said undersurface having a surface area that is at least 12 times larger than the area of the largest cross section of said male threaded spout as measured perpendicular to the axis of said male threaded spout,
- (d) said female threaded member having a seal supporting flange with a female threaded aperture located approximately in the center of said seal supporting flange, said female threaded aperture receives said male threaded spout, said seal supporting flange having an uppersurface,

said uppersurface faces towards said wide flange when said male threaded member and said female threaded member are threaded together,

- (e) said flexible seal having an inner perimeter that is smaller than both the outer perimeter of said wide flange and the outer perimeter of said seal supporting flange, said flexible seal rests on said uppersurface of said seal supporting flange, said flexible seal encircles said male threaded spout when said male threaded member and said female threaded member are threaded together,
- (f) a concentric cusp on said uppersurface of said seal supporting flange to hold said flexible seal in a fixed position.

5,439,257

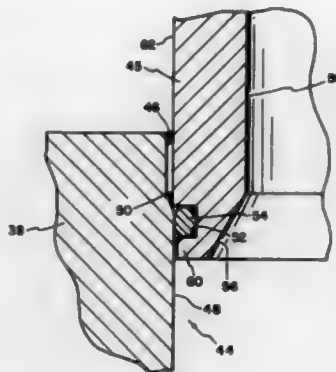
**BRAZED HYDRAULIC FITTINGS WITH INTERFERENCE FIT AND METHOD OF MAKING SAME**  
Nigel D. L. Williamson, Fort Wayne, Ind., assignor to NWD International Inc., Morencie, Mich.

Continuation-in-part of Ser. No. 915,007, Jul. 16, 1992, abandoned. This application Feb. 7, 1994, Ser. No. 192,716

Int. Cl.<sup>6</sup> F16L 13/08; B23K 101/04

U.S. Cl. 285—286

24 Claims



1. A process for brazing together a male and a female component of a fitting for forming a hydraulic coupling, the male component being generally cylindrical, said process comprising the steps of:

- forming a bore in the female component, the bore having three distinct portions, a first generally cylindrical aligning portion having a diameter greater than the diameter of the male component, a second generally cylindrical mating portion having a diameter approximately equal to the diameter of the male component, and a third guiding portion with a tapered surface connecting the aligning and mating portions;
- locating a brazing material in one of the female and male components so that the brazing material is located within the interface between the mating portion of the female component when the male component is pressed into an interference fit with the female component;
- locating the male component within the aligning portion of the bore and thereby aligning the male component with the bore;
- pressing the male component into the mating portion of the bore to create an interference fit between the male and female components; and
- heating the male and female components to melt the brazing material whereby liquid brazing material penetrates the interstices between the male and female components to form a brazed connection.

5,439,258

**TUBE COUPLING UNIT**

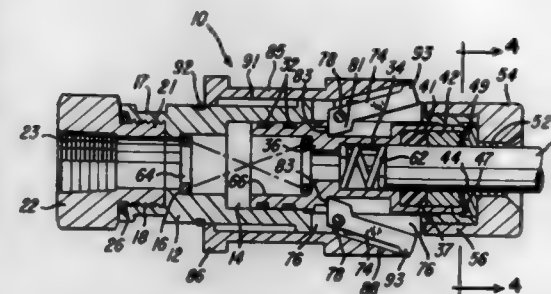
Clinton R. Yates, Dayton, Ohio, assignor to Production Control Units, Inc., Dayton, Ohio

Filed Aug. 17, 1993, Ser. No. 107,071

Int. Cl.<sup>6</sup> F16L 37/00

U.S. Cl. 285—313

10 Claims



1. A tube coupling unit adapted for releasably connecting a flexible conduit to a rigid cylindrical tube having a smooth outer surface, comprising a tubular body defining an internal chamber, a tubular actuating member supported for axial sliding movement within said chamber and defining a bore for receiving the tube, a resilient sealing ring supported within said body for engaging the tube when inserted into said bore, a gripping collet supported within said body for receiving the tube and movable between a tube gripping position and a tube released position, a collet retaining member cooperating with said tubular actuating member to move said collet to said gripping position and to compress said sealing ring against the tube in response to movement of said tubular actuating member axially within said chamber and including a tubular sleeve surrounding said body and supported by said body for axial movement, at least one actuating lever supported by said body for pivotal movement in a generally radial direction, said lever including means for moving said tubular actuating member in an axial direction in response to generally inward movement of said lever, and said sleeve having means for pivoting said lever in response to axial movement of said sleeve.

5,439,259

**COUPLING AND METHOD FOR FOLDING BACK A PIPE AND USING FOR IT AND ITS APPARATUS**

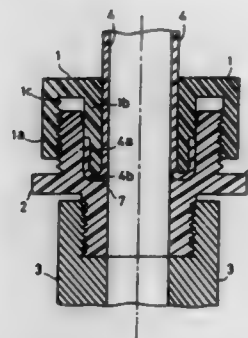
Jun Taga, No. 1-10, Minamikutu 7-Chome, Tama-Ku, Kawasaki-Ki-Shi, Kanagawa-Ken, 214, and Kimio Okamoto, Saitama, both of Japan, assignors to Jun Taga, Kanagawa, Japan

Filed Aug. 10, 1993, Ser. No. 104,820

Int. Cl.<sup>6</sup> F16L 25/00, 35/00

U.S. Cl. 285—334.5

2 Claims



1. A coupling comprising a nut-shaped tightening means having an outer annular portion and an inner annular portion, the inner surface of said outer annular portion being threaded and the outer surface of said inner annular portion being threaded.

of said inner annular portion having a recess therein; said tightening means adapted to receive a first conduit through the inner annular portion thereof, said conduit having a terminal portion thereof folded back upon itself and seated in said recess;

an annular main body coupling having a first threaded portion and a second threaded portion in the exterior walls thereof, an inner surface of the first threaded portion of said main body coupling being tapered from a first diameter to a second and smaller diameter, said second diameter being maintained through the remainder of the first threaded portion and terminating in a curved ledge adapted to receive the curved bottom of the folded back portion of the conduit and sealing said conduit to said tightening means and main body coupling upon threaded engagement therebetween; and a second conduit adapted to be threadedly engaged to the second threaded portion threads of said main body coupling, thereby couplings said first conduit to said second conduit.

5,439,260

**HANDLE OPERABLE ROTARY LATCH AND LOCK**

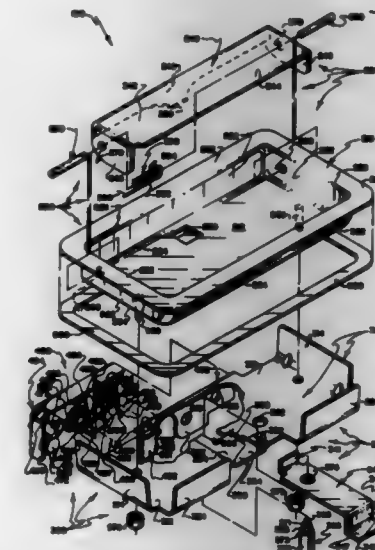
Lee S. Weinerman, Medina; Arthur J. Kuminiski, Parma; James L. Hollingsworth, Middleburg Heights, and Scott A. Arthurs, Brunswick, all of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Filed Oct. 29, 1993, Ser. No. 145,691

Int. Cl.<sup>6</sup> E05C 3/26

U.S. Cl. 292—48

16 Claims



1. A flush-mountable, handle-operable rotary latch for mounting on a closure for releasably retaining the closure in a closed position by latchingly engaging a suitably configured strike formation that is located within relatively close proximity to the rotary latch when the closure is in its closed position, comprising:

- a) flush-mountable front assembly means for mounting as a first modular assembly on a closure adjacent a mounting opening that is formed through a front wall of the closure, including:
- i) first housing means including a pan-shaped housing for mounting on the closure adjacent the mounting opening, including a one-piece housing that defines:
- A) mounting flange means for defining a front wall of the pan-shaped housing, including a mounting flange that is configured 1) to extend perimetricaly about the closure's mounting opening, 2) to closely overlie portions of a front surface of the closure's front wall

that extend perimetrically about the mounting opening, and 3) to be clamped toward engagement with said portions of the closure's front surface to substantially flush-mount the pan-shaped housing on the closure;

B) side walls and a back wall that cooperate to define a forwardly-facing recess, 1) with the side walls being configured to extend forwardly and rearwardly through the closure's mounting opening when the mounting flange closely overlies said portions of the closure's front surface, 2) with front portions of the side walls joining smoothly with and being perimetrically surrounded by the mounting flange, 3) with rear portions of the side walls joining smoothly with and perimetrically surrounding the back wall, 4) with the back wall being configured to extend substantially parallel to the front wall of the pan-shaped housing, 5) with the back wall having a front surface that faces forwardly into the recess and a rearwardly-facing back surface on the opposite side thereof, and 6) with an opening being formed through the back wall;

ii) handle means including an operating handle that is at least partially nested within the recess, and that is connected to the first housing means for movement relative to the pan-shaped housing between a non-operated position and an operated position;

iii) biasing means connected to and interposed between the first housing means and the handle means for biasing the handle away from its operated position toward its non-operated position;

b) rear assembly means for mounting as a second modular assembly on the closure, for being connected to the front assembly means to clampingly draw the mounting flange toward engagement with said portions of the closure's front surface to securely mount the rotary latch on the closure, including:

i) mounting bracket means including a mounting bracket for overlying at least a portion of the back surface of the back wall of the pan-shaped housing, for bridging at least a portion of the closure's mounting opening at a location behind the back surface of the closure's front wall, for being fastener-connected to the front assembly means, and for defining back-surface engaging means for being clamped toward engagement with the back surface of the closure's front wall when the mounting flange of the first housing means is being clamped toward engagement with said portions of the closure's front surface;

ii) rotary means including second housing means rigidly connected to the mounting bracket means, with the second housing means including:

A) an elongate, generally rectangular first housing side plate having opposed end regions near opposite ends of the length thereof, and defining a first U-shaped notch located near one of the opposed end regions of the first housing side plate;

B) an elongate, generally rectangular second housing side plate having opposed end regions near opposite ends of the length thereof, and defining a second U-shaped notch located near one of the opposed end regions of the second housing side plate, with the second U-shaped notch being substantially aligned with the first U-shaped notch;

C) spacer means for extending transversely between, for rigidly connecting with, and for maintaining a substantially parallel relationship between the first and second housing side plates, with the spacer means including a first spacer that extends along a first transverse axis that intersects each of the first and second housing side plates at a location that is relatively near to the other end regions thereof, and with the spacer means also including a second spacer that extends along a second transverse axis that intersects each of the first and second housing side plates at a

location that is substantially mid-way between the opposite ends thereof;

iii) with the rotary means additionally including a rotary jaw and a rotary pawl that extend substantially within a common plane located between the first and second housing side plates, with the rotary jaw being connected to the second spacer and being rotatable through a limited range of angular movement about the second transverse axis between latched and unlatched positions but being spring-biased toward its unlatched position, with the rotary pawl being connected to the first spacer and being movable relative to the housing about the first transverse axis between jaw-retaining and jaw-releasing positions to selectively release and retain the rotary jaw in its latched position but being spring-biased to move the rotary pawl toward its jaw-retaining position as the rotary jaw moves to its latched position, with an operating arm being provided for moving the rotary pawl to release the rotary jaw from its latched position, with the rotary jaw defining a third U-shaped notch that is configured to cooperate with the first and second U-shaped notches to concurrently receive and to latchingly retain within the confines of the first, second and third U-shaped notches a suitably configured strike formation when the rotary latch latchingly engages the strike formation, and with a selected one of the first and second housing side plates being strengthened and enhanced in rigidity by the close proximity presence of a transversely extending flange that is formed integrally with said selected housing side plate; and,

iv) with the rotary means additionally including linkage means movably connected to the mounting bracket means for extending through the back wall opening of the pan-shaped housing for interconnecting the operating handle with the operating arm for moving the operating arm to effect movement of the rotary pawl to release the rotary jaw from being retained in its latched position in response to movement of the operating handle away from its non-operated position toward its operated position to thereby release the striker from being concurrently received within and latchingly retained within the confines of the first, second and third U-shaped notches; and,

c) fastener means for connecting and clamping toward each other the housing means and the mounting bracket means to thereby clamp the back-surface engaging means of the mounting bracket toward a position of engagement with the back surface of the closure's front wall, and to clamp the mounting flange of the pan-shaped housing toward a position of engagement with said portions of the closure's front surface.

5,439,261

#### VEHICULAR DOOR LOCK HAVING SUPER-LOCK MECHANISM

Paul W. O'Hare, Yamanashi, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1993, Ser. No. 111,157

Claims priority, application Japan, Aug. 24, 1992, 4-247363

Int. Cl. E05B 3/00

U.S. Cl. 292—336.3

3 Claims

3. A super-lock mechanism of a vehicular door lock device, comprising:

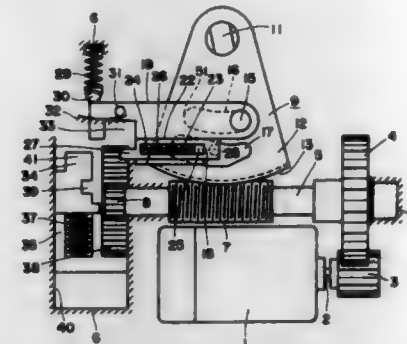
a rotary shaft rotatable by a motor and having a first gear located at a center portion of said shaft and a second gear at a distal end of said shaft,

a fan shaped arm engaged with the first gear and returnable to a neutral position, said fan shaped arm having a first long hole and a second long hole,

a lock lever engageable with the first long hole of the fan shaped arm and displaceable to a locked position and an unlocked position,

a movement member connected to said lock lever and hav-

ing a first dent, said movement member transversely moving when the lock lever is displaced, a pressing body engaged with said second gear and moving along a generally longitudinal direction, a block member connected to the pressing body through a first spring so as to make the block body intimately contact with the pressing body, said block member having a head portion engageable with the first dent of the movement member, said block having a second dent, a slider supported on the movement member transversally-slidable and having an end engageable with the second long hole and another end engageable with the second dent of the block member, said slider being urged toward the block member due to a second spring,



wherein, when the lock lever is displaced to said locked position by means of the motor through said fan shaped arm, the movement member and said slider move transversely while the block member simultaneously moves longitudinally, the head portion of the block member engaging with the first dent of the movement member and another end of the slider engaging in the second dent of the block member to attain a super-lock condition of the lock device wherein an exchange of the lock lever cannot be achieved,

wherein when the fan shaped arm rotates in an unlocking direction at the super-lock condition, the second long hole engages with said end of the slider in order to disengage another end of the slider from the second dent of the block member before said first long hole engages with the lock lever.

5,439,262

#### LOCKING/RELEASE MECHANISM FOR A PIVOT BOLT OF A CLOSED-CIRCUIT DOOR OPENER

Fritz H. Fuss, Albstadt, and Augustin Toma, Balingen, both of Germany, assignors to Fritz Fuss GmbH & Co., Albstadt, Germany

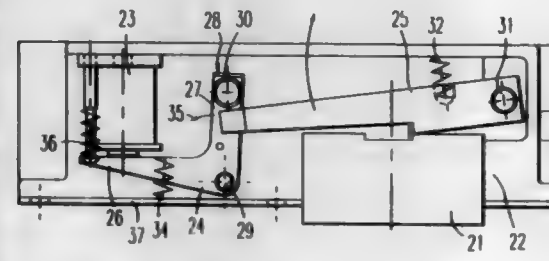
Filed Sep. 2, 1993, Ser. No. 114,963

Claims priority, application Germany, Sep. 2, 1992, 42 29 239.5

Int. Cl. E05B 15/02

U.S. Cl. 292—341.16

5 Claims



1. A locking/release mechanism for a pivot bolt of a closed-circuit door, which comprises:

a safety catch for the pivot bolt, the safety catch being pivotable about a first pivot axis; an electromagnet for controlling the safety catch; a locking lever located between the electromagnet and the safety catch wherein the locking lever comprises a two-armed rocking lever which is pivotable about a second axis which is axially parallel to the first pivot axis of said safety catch, a first arm of the locking lever comprising an armature of the electromagnet and a second arm of the locking lever including a stop member for engaging with the safety catch wherein a contact surface between the safety catch and the stop member is provided such that when uninterrupted pressure from the safety catch occurs on the stop member upon occurrence of a power supply interruption to the electromagnet, a wedge-like displacement action on the stop member also occurs via the safety catch and wherein the stop member comprises a bush rotatably mounted on the second arm.

5,439,263

#### HAND TOOLS FOR PULLING POSTS THROUGH COMPUTER PAPER PRINTOUTS

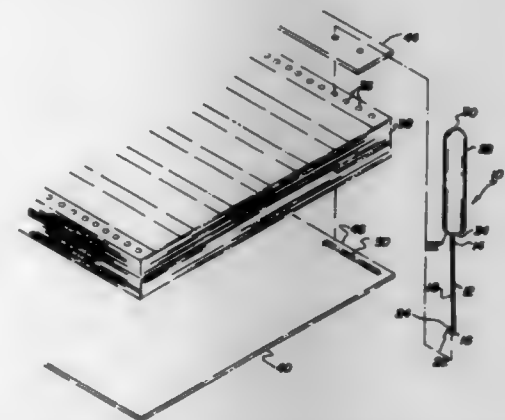
Harry A. Chambers, 243 Carlan Rd., Commerce, Ga. 30529-9246

Filed Mar. 14, 1994, Ser. No. 209,235

Int. Cl. B25J 11/00

U.S. Cl. 294—26

2 Claims



1. A hand tool for pulling posts through computer paper printouts comprising, in combination:

an essentially rigid wire of a constant diameter with limited flexibility having an upper end and a lower end and an elongated linear central extent therebetween, the wire having a diameter of about 1/16 inch, the lower end being formed as an extension of the central extent with a 180 degree curve forming a radius of curvature, the radius of curvature of the wire being about 1/16 inch, the linear extent being about 4 1/2 inches, the wire also having a one-piece handle of an enlarged diameter secured to the upper end of the wire; and

screw threads on the upper exterior periphery of the central extent and internal screw threads formed in an axial bore extending upwardly from the lower end of the handle in cooperative relationship with the threads of the central extent whereby rotation of the central extent with respect to the handle will cause the central extent to expand and contract in length when measured from the handle to thereby vary the distance of the curve from the handle.



5,439,264

**APPARATUS FOR LIFTING OBJECTS HAVING A HOLLOW CYLINDRICAL CORE**

John Margiottello, 3075 - 12th Avenue, Port Alberni, British Columbia, Canada V9Y 1X2

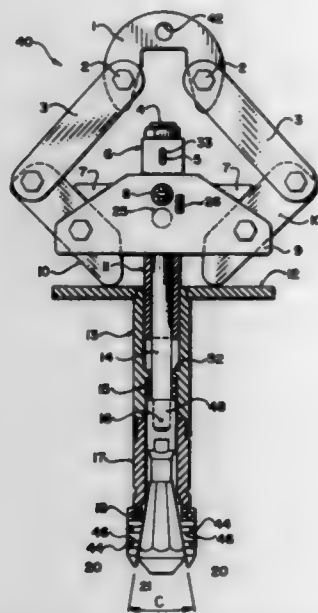
Filed Nov. 5, 1993, Ser. No. 147,319

Claims priority, application Canada, Feb. 1, 1993, 2088539

Int. Cl.<sup>6</sup> B66C 1/54

U.S. Cl. 294-94

4 Claims



1. Apparatus for lifting objects having a vertically oriented, hollow cylindrical core comprising:

- a means for connecting a hook or other lifting device;
- a vertically-extending plate having front and rear surfaces provided with a horizontal aperture in said front surface;
- a threaded housing secured to the rear surface of said vertically-extending plate having a threaded passageway extending vertically therethrough for receiving a threaded rod;
- linkage means connecting said means for connecting a hook to said vertically-extending plate;
- a hollow sleeve having an upper end and a lower end and dimensioned to be inserted into said core and comprising at the lower end thereof a plurality of pivotable jaw segments forming a diametrically expandable lower end;
- a transverse plate having upper and lower surfaces, said upper surface of said plate being attached to the upper end of said sleeve, said transverse plate having a diameter greater than said core;
- a latch assembly attached to the upper surface of said transverse plate and provided with a horizontally extending bolt biased to extend into said aperture in said vertically-extending plate when said vertically-extending plate is in a lowered position and handle means for releasably retracting said bolt from a first extended position into a second retracted position;
- a rod extending through said hollow sleeve threadably received by said threaded housing at the upper end thereof and having secured to the lower end thereof a mandrel having outwardly tapered sides adapted to engage said pivotable jaw segments; and
- spring means positioned co-axially in said hollow sleeve and having upper and lower ends, engaging at the upper end thereof an inward extension of said hollow sleeve and at the lower end thereof an outer extension of said rod, thereby biasing said rod downwardly in said hollow sleeve.

5,439,265

**SLING FOR POSITIONING A LARGE-DIAMETER, LIQUID-CONTAINING HOSE**

Richard R. Plante, 18 W. Union St., Goffstown, N.H. 03045-1606

Filed Dec. 14, 1993, Ser. No. 166,559

Int. Cl.<sup>6</sup> B65D 63/18

U.S. Cl. 294-152

11 Claims



1. A sling for moving a large-diameter hose, and comprising, two handles, each of said handles (a) including a gripping surface for receiving a human hand, said surface including a plurality of ridges adapted for receiving digits of said hand, and (b) having a respective U-shaped sleeve for holding an elongate, flexible flat strap for carrying said hose, said strap having two ends, said ends being looped through respective sleeves and secured to said strap to form two respective loops of said strap about said sleeves, said loops being dimensioned to permit rotation of said sleeves in said respective loops, said strap having a predetermined length that is between 95 and 160 percent of the height of an individual using said sling, and being reinforced with additional material of said strap attached at a mid-portion of said strap whereby to strengthen said strap at said mid-portion.

5,439,266

**RIVETED PLATE TRAILER CONSTRUCTION**

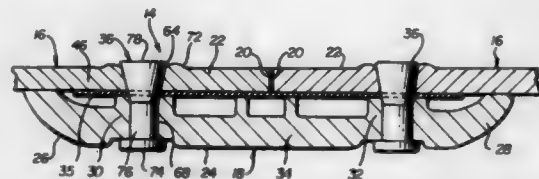
Rodney P. Ehrlich, Monticello, Ind., assignor to Wabash National Corporation, Lafayette, Ind.

Filed Oct. 13, 1993, Ser. No. 136,569

Int. Cl.<sup>6</sup> B62D 33/04

U.S. Cl. 296-181

13 Claims



1. A trailer body comprising a floor and upstanding sides, said sides including a plurality of adjacent pairs of upstanding side plate members of predetermined thickness, said plate members having opposed edges, a plurality of side post members respectively covering said edges of adjacent pairs of plate members, each of said plate members and post members having a first surface and a second surface, said second surface of said plate members and said first surface of said post members being generally adjacent to each other, each of said plate members and post members having a series of aligned holes punched therethrough, said holes in said plate members initially having a first pre-determined diameter at said first surface thereof and a second larger diameter at said second surface thereof, said holes in said post members initially having a diameter at said first surface thereof less than said second diameter of said plate members second surface and a larger diameter at said second surface thereof, and rivets respectively extending through said aligned holes in said members for securing said members together, each of said rivets having a shank with a diameter initially substantially the same as said initial first diameter of

said plate members, each of said rivets including a head with a substantially frustoconical member-engaging surface having an included angle for ensuring substantially completely filling at least a portion of said aligned holes substantially at a shear plane between the members, and after assembly, an end of each rivet opposite from said head being upset and enlarged thereby enlarging the diameter of the shank of the rivet for finally completely filling a portion of the holes, surfaces of said holes in said plate members and said post members substantially finally conforming to said rivets after assembly of said rivets through said holes and upsetting of said rivet ends.

5,439,267

**CHAIR WITH ADJUSTABLE ARM ASSEMBLIES**

Gordy Peterson, Grand Rapids; David D. Sayers, Kentwood; Charles P. Roossien, Wyoming; David L. Rundhaug, Grand Rapids; Kevin J. DeWeerd, Grand Rapids, and Michael L. Deimen, Grand Rapids, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed May 28, 1993, Ser. No. 69,172

Int. Cl.<sup>6</sup> A47C 7/54

U.S. Cl. 297-411.36

37 Claims



1. An adjustable armrest mechanism for a chair, said mechanism comprising:  
an elongated liner adapted to be inserted into an arm support tube of a chair, said liner defining a bore open at a top and having a sidewall defining a plurality of vertically spaced notches;  
a latch tube telescopically positioned with said bore of said liner;  
a latch mounted within said latch tube, said latch including an upper trigger end extending from said latch tube and a lower latch end positionable within one of said notches;  
an armrest;  
an armrest attachment member connected to said armrest and to said latch tube; and  
an actuator engaging said latch trigger end for moving said latch end out of engagement with said notches.

5,439,268

**ADJUSTABLE ARMREST ASSEMBLY FOR A CHAIR**  
Andras Dozza-Farkas, München, Germany, assignor to Shin Yen Enterprise Co., Ltd., Taiwan

Filed Jun. 14, 1994, Ser. No. 259,394

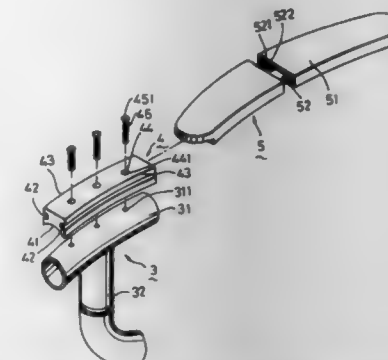
Int. Cl.<sup>6</sup> A47C 7/54

U.S. Cl. 297-411.35

2 Claims

1. An adjustable armrest assembly for a chair, the chair including a seat on which the armrest assembly is disposed, said armrest assembly comprising:  
an elongated connector adapted to be mounted on the seat and having two opposite side surfaces formed with a respective open-ended horizontal slide slot, said slots being aligned with each other; and  
an elongated armrest member having a horizontal top wall,

and two generally L-shaped guide bodies disposed on two opposite side portions of said top wall, each of said guide bodies including a vertical plate portion secured to a bottom surface of said top wall at a top end portion



thereof, and a horizontal plate portion connected securely to said vertical plate portion, said horizontal plate portions being respectively and slidably engaged with said slide slots of said connector so that said armrest member can be moved on said connector.

5,439,269

**CHAIR ASSEMBLY**

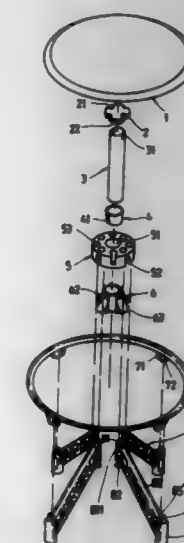
W. H. Cheng, No. 323, Sec. 2, An Kang Rd., Hsin Tien City, Taipei Hsien, Taiwan

Filed Apr. 22, 1994, Ser. No. 231,507

Int. Cl.<sup>6</sup> A47C 4/02

U.S. Cl. 297-440.1

3 Claims

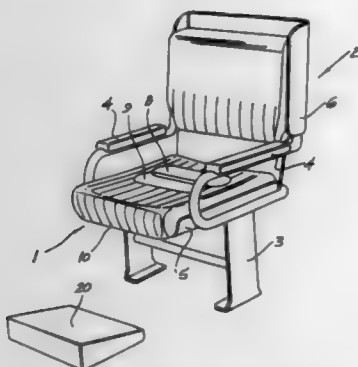


1. A chair assembly, comprising:  
a cushion having a circular center hole at the bottom, a plurality of vertical ribs symmetrically spaced around said circular center hole, and an annular groove around said circular center hole at the top;  
a stem having a mounting device fastened to a top end thereof, said mounting device being inserted through said circular center hole into said annular groove and turned through an angle to become supported on said vertical ribs;  
a stem socket mounted around said stem, said stem socket having a plurality of supporting leg mounting holes, each supporting leg mounting hole being made gradually smaller toward the top and having two vertical grooves on the periphery at two opposite locations;

- a tapered packing ring fitted in between said stem and said stem socket to hold down said stem socket in position;
- a plurality of supporting legs for supporting said stem socket on the ground, said supporting legs having each a first vertical bar at one end respectively connected to either supporting leg mounting hole on said stem socket and a second vertical bar at an opposite end disposed at a lower elevation than said first vertical bar, said first vertical bar having two raised blocks bilaterally disposed at the top and respectively fitted into the two vertical grooves inside either supporting leg mounting hole and a beveled retaining notch at the bottom, said second vertical bar having two recessed holes bilaterally disposed at the top, two projecting strips raised from a top wall thereof and spaced by a gap;
- a locating member mounted around said stem to connect said supporting legs together, said locating member comprising a center through hole, which receives said stem, and a plurality of projecting tongues respectively fitted into the beveled retaining notch on the first vertical bar of either supporting leg; and
- a ring mounted on the second vertical bar of each supporting leg, said ring having two endless mounting grooves, which receive the projecting strips of the second vertical bar of each supporting leg, pairs of mounting rods respectively fitted into the recessed holes on the second vertical bar of each supporting leg.

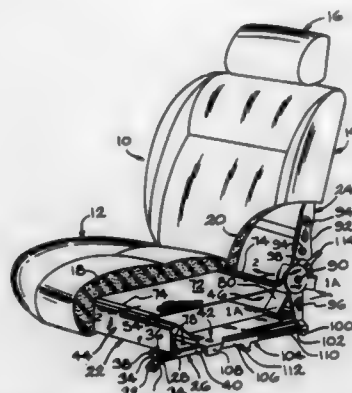
#### 5,439,270 STATIC CHAIR

Earl R. Owen, Microsurgery Centre, 1 Esther Street, Surry Hills NSW 2010, Australia  
PCT No. PCT/AU92/00311, § 371 Date Dec. 22, 1993, § 102(e) Date Dec. 22, 1993, PCT Pub. No. WO93/00029, PCT Pub. Date Jan. 7, 1993  
PCT Filed Jun. 24, 1992, Ser. No. 170,188  
Claims priority, application Australia, Jun. 24, 1991, PK6866  
Int. Cl.<sup>6</sup> A47C 7/18  
U.S. Cl. 297—452.27 9 Claims



1. A seat comprising a seating cushion formed from resilient foam material and having a front edge, a rear edge, and a base layer, the base layer being formed of foam of a predetermined density and having an upper face, the upper face having first and second zones of foam of a density relatively lower than the predetermined density foam of the base layer, the two zones being inset into the upper face of the base layer, the first zone being positioned toward the rear edge of the cushion so as to be located beneath the buttocks of a typical user seated in an upright position, and the second zone being positioned toward the front edge of the cushion with respect to the first zone so as to be located beneath the buttocks of a typical user seated in a slumped position, the first and second zones being substantially oval in plan view, and having a longer axis and a shorter axis, the longer axis being oriented transversely across the cushion.

#### 5,439,271 VEHICLE SEAT WITH EXTRUDED FRAME MEMBERS Thomas M. Ryan, White Lake, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich. Filed Nov. 8, 1993, Ser. No. 148,316 Int. Cl.<sup>6</sup> A47C 7/18 U.S. Cl. 297—452.56 20 Claims

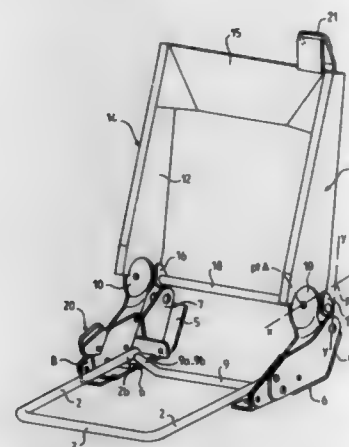


1. In a vehicle seat having a generally horizontal cushion section and opposite lateral sides;
- a frame for said cushion section comprising a pair of elongated laterally extending frame members arranged in a spaced and generally parallel relation with each other, each of said frame members having a pair of ends and being substantially straight between said ends, means connected to and extended between said frame members so as to maintain said frame members in said spaced and generally parallel relation with each other, each of said frame members being hollow and having projection means which extend in a direction away from the other one of said frame members, a load supporting web having ends and extending between said frame members, said web having mounting means secured to the ends thereof for coupling with said projection means to mount said web to said frame members and to maintain said web in a generally taut condition between said frame members, said frame members constituting the sole support for said web on said frame, each of said frame members being of a structural load carrying shape and having a uniform cross section enabling forming of said frame members by extrusion of long members which can be cut into the desired lengths for the frame members of said section.

#### 5,439,272 SEAT FOR A VEHICLE PROVIDED WITH A SAFETY BELT WITH FIXATION POINTS EMBARKED ON THE ARMATURE OF THE SEAT Michel Hallet, Clinchamps, and Frédéric Degrenne, Ste Honorine la Chardonne, both of France, assignors to Bertrand Faure Automobile, Bois D'Arcy, France Continuation-in-part of Ser. No. 634,097, Dec. 26, 1990, abandoned. This application May 14, 1993, Ser. No. 61,840 Claims priority, application France, Dec. 26, 1989, 89 17177 Int. Cl.<sup>6</sup> B60R 21/00 U.S. Cl. 297—479 4 Claims

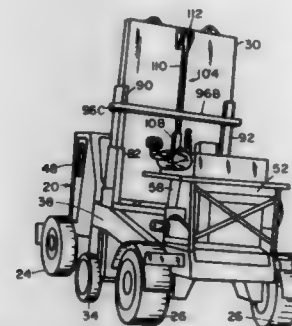
1. In a vehicle seat provided with a safety belt having fixation points embarked on a seat armature, the improvement wherein:
- one end of a strap that forms said safety belt is fixedly connected, to form a first fixation point, to a rear lower portion of an armature of a seating portion of said seat via a blockage mechanism;
- a shoulder keeper disposed on a seat back forward of an upper portion of a front face of said seat back provides for a sliding and guiding of a run of said safety belt strap above a passenger's shoulder;

- another end of a further run of said safety belt strap is secured, to form a second fixation point, to a fitting that is fixed to side flange means on one side of said seating portion armature; and
- a further keeper that is disposed on said safety belt strap between said shoulder keeper and said fitting and that cooperates, to form a third fixation point, with a lock that is connected to side flange means on an opposite side of said seating portion armature, whereby both of said side flange means receive and mobile portions of articulation means for adjusting the position of said seat back relative to said seating portion of said seat, wherein said blockage mechanism of said safety belt strap is disposed rearwardly



- of said seat back and comprises spaced-apart throughgoing tubes that are disposed in two essentially parallel vertical planes and in three parallel horizontal planes between which runs of said strap are defined, with the component of the forces of said runs being such as to create an antagonistic force that produces a torque which considerably reduces the torque exerted on said articulation means, and wherein said two side flange means that receive said portions of said articulation means provide a pivot axis for said articulation means for adjusting the position of said seat back relative to said seating portion of said seat, with said pivot axis being disposed forward of a conventional pivot axis for such articulation means at a rear end of a seating portion armature.

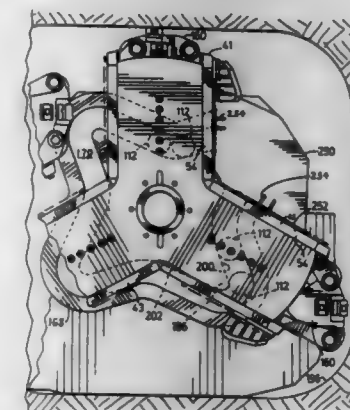
#### 5,439,273 CONCRETE BREAKER AND METHOD Robert E. Price, Grand Rapids, and James R. Trutsch, Middleville, both of Mich., assignors to Price Industries, Inc., Detroit, Mich. Filed Apr. 28, 1994, Ser. No. 234,272 Int. Cl.<sup>6</sup> E01C 23/12; E21C 27/12 U.S. Cl. 299—37 35 Claims



35. A method of breaking concrete comprising: supporting a main frame on front and rear wheels; slideably supporting a blade frame on said main frame be-

- tween said front and rear wheels in an upright operating position;
- slideably supporting a blade on said blade frame for busting concrete; and
- independently supporting said blade frame on the concrete sections being broken when operating said blade and where moving the main frame over the concrete sections.

#### 5,439,274 ROTARY MINE BORING HEAD HAVING MOVABLE LINKS WITH CUTTER BITS Edward Krueckl, Saskatoon, Canada, assignor to Prairie Machine & Parts Mfg. Ltd., Saskatoon, Canada Filed Oct. 6, 1993, Ser. No. 132,993 Claims priority, application Canada, Oct. 8, 1992, 2080217 Int. Cl.<sup>6</sup> E21B 10/62; F21C 27/24 U.S. Cl. 299—59 28 Claims



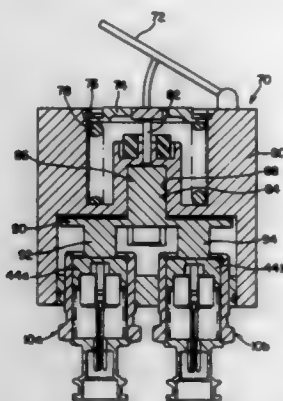
1. In a continuous mining machine,
- a cutter frame,
- two rotary boring heads mounted on said frame for rotation about axes extending longitudinally of said machine, each boring head having a plurality of radially extending rotor arms which carry and support cutter bits on the front thereof;
- a pair of reciprocating pole devices mounted in each of said rotor arms for movement in the radial direction of the arm;
- a number of link members each pivotally connected at opposite ends thereof to a respective pair of said pole devices; additional cutter bits mounted on said link members; and
- cam means for reciprocating each pair of pole devices as said boring heads are rotated, said cam means causing each pair of pole devices to be pushed radially outwardly at each of four corners distributed about a circular hole cut by the respective boring head in such a manner that the resulting hole bored by said machine is generally rectangular.

#### 5,439,275 SIGNAL GENERATOR Santo A. Padula, Lake Orion, Mich., and Duane R. Johnson, Wellington, Ohio, assignors to Allied-Signal Inc., Morristown, N.J. Division of Ser. No. 974,648, Nov. 10, 1992, Pat. No. 5,365,791. This application May 12, 1994, Ser. No. 241,821 Int. Cl.<sup>6</sup> B60L 7/00 9 Claims

1. Braking signal generating means for operating brakes of a vehicle comprising a hall effect generator for generating an output signal as a function of the strength of a magnetic field applied to the hall effect generator, an operating member including a dual actuating portion for simultaneously moving each of a pair of magnetic means relative to a corresponding one of a pair of hall effect generators, and magnetic field



generating means controlled by said operating member for varying the magnetic field applied to the hall effect generator as a adjusting screw includes a break-away portion which is detached after said adjusting screw is appropriately adjusted.



function of the position of the operating member whereby said output signal is also varied as a function of the position of the operating member.

5,439,276

# TAMPER-RESISTANT INDEPENDENT BRAKE VALVE DEVICE FOR LOCOMOTIVE AIR BRAKE EQUIPMENT

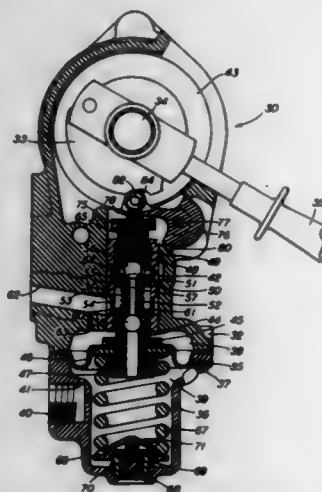
Frank J. Jerina, Irwin; Michael E. Romansky, North Huntingdon, and Dale A. Chovan, Trafford, all of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sep. 30, 1993, Ser. No. 128,966

Int. Cl.<sup>6</sup> B60T 15/04

U.S. Cl. 303—56

8 Claims



1. A tamper-resistant independent brake valve for railway locomotives comprising a valve body portion, an operating handle carried by said valve body portion for rotating a cam member, a follower member moved by said rotatable cam member, a valve assembly having a supply and exhaust valve opened and closed by said follower member, a spring housing fixedly attached to said valve body portion by a plurality of one-way security fasteners, an adjustable spring disposed within said spring housing, and an adjusting screw for permitting a compression spring to be adjusted during testing to establish a maximum brake cylinder pressure, wherein said follower member is pivoted about an end remote from said cam member and is designed to preclude the insertion of a prying instrument, wherein said spring housing includes an opening which is vented to atmosphere, but which prevents the altering of compressive force of said compression spring, and wherein said

5,439,277  
ANTI-SKID BRAKE CONTROL METHOD  
Katsumi Higashi, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 984,683, Dec. 2, 1992, abandoned. This application Aug. 19, 1994, Ser. No. 293,167  
Claims priority, application Japan, Dec. 6, 1991, 3-322649  
Int. Cl.<sup>6</sup> B60T 13/68  
U.S. Cl. 303—113.1 8 Claims



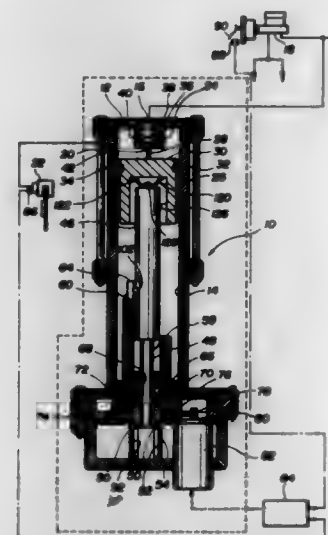
1. A method of controlling brake pressure in a brake pressure control system during anti-skid brake control, wherein said brake pressure control system includes pressure fluid supplied to and discharged from a brake cylinder by a relay valve, said relay valve is operated and controlled by a signal pressure received from a brake valve during braking, and said signal pressure is controlled by a holding valve and exhaust valve, said method of controlling said brake pressure comprising the following steps:  
increasing said brake pressure for braking while said holding valve is opened and said exhaust valve is closed;  
detecting a tendency of wheels to skid during said increasing of said brake pressure;  
transferring from said increasing brake pressure to holding of said brake pressure at a desired brake pressure by closing said holding valve; and  
adjusting said brake pressure before said holding thereof by opening said exhaust valve only for a period of time sufficient to compensate for overshooting of said desired holding pressure due to an occurrence of a delay in operation of said relay valve and thereby decreasing said brake pressure only for said period of time so that said holding of said brake pressure is carried out at said desired brake pressure.

5,439,278  
CAM ACTUATED ANTI-LOCK BRAKING SYSTEM MODULATOR  
Masahiro Tsukamoto, Yokosuka, and Masamichi Matuda, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan  
Filed Aug. 11, 1994, Ser. No. 288,267  
Claims priority, application Japan, Aug. 23, 1993, 5-229525; Nov. 13, 1993, 5-307470  
Int. Cl.<sup>6</sup> B60T 8/42  
U.S. Cl. 303—115.2 24 Claims

1. An anti-lock braking system (ABS) pressure modulator for a braking system having a wheel cylinder and a master cylinder, the pressure modulator having connections for the

wheel cylinder and the master cylinder, the pressure modulator comprising:

a frame having a bore fluidly exposed to the master cylinder and wheel cylinder connections and a check valve means for preventing fluid communication from the master cylinder connection to the wheel cylinder connection via said bore, said bore having a longitudinal axis;  
a piston slidably sealably mounted within said bore for reciprocal movement along said longitudinal axis for providing a variable control volume in communication with the wheel cylinder and thereby modulating the pressure therein, said piston having means for opening said check valve means when said piston is at a predetermined extreme position, said piston having a cam follower surface; power means; and



a cam moved by said power means having a cam surface in contact with said cam follower surface of said piston whereby movement of said cam in a first rotational direction moves said piston toward said predetermined extreme position and the subsequent movement of said cam in a second rotational direction, opposite to said first rotational direction, allows said piston to move away from said predetermined extreme position, characterized in that said cam follower surface is in the form of a roller operatively associated with said piston, and a one-way brake means is operatively connected to said roller for preventing rotation of said roller when said cam moves in said second rotational direction, but allowing said roller to roll over said cam surface when said cam moves in said first rotational direction.

5,439,279  
VEHICULAR ANTI-LOCK BRAKE SYSTEM HYDRAULIC CONTROL UNIT

Herbert L. Linkner, Jr., Dexter, and Wendell D. Tackett, Ann Arbor, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Feb. 18, 1994, Ser. No. 198,365

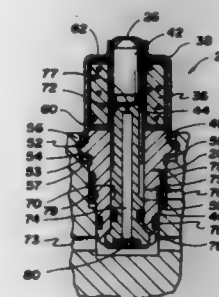
Int. Cl.<sup>6</sup> B60T 8/36

U.S. Cl. 303—119.2

15 Claims

1. A control valve for a vehicle anti-lock brake system control unit having a housing with a control valve bore therein, the control valve comprising:  
a sleeve having a moveable armature therein;  
a coil surrounding the sleeve for moving the armature, the coil having an inner diameter and an outer diameter;  
a valve body having an inner and an outer end, the outer end attached to the sleeve and the inner end seated within the control valve bore of the housing, the valve body having

an outer diameter no greater than the outer diameter of the coil;  
a flux ring surrounding the outer end of the valve body;  
a casing for securing the coil about the sleeve, the casing attached to the flux ring;  
the outer diameter of the valve body being reduced at the outer end of the valve body, the outer end of the valve body adapted to receive the flux ring, the flux ring having



an outer diameter no greater than the outer diameter of the coil;  
an electrical control module attached to the coil, the control module, casing, coil and flux ring together forming a sub-assembly, the sub-assembly being placed over the sleeve and the outer end of the valve body after the inner end of the valve body is seated within the control valve bore of the housing.

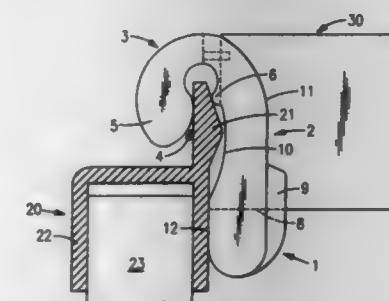
5,439,280  
FILE HANGER SYSTEM AND CLIPS THEREFOR  
Richard Steinberg, Bedford, and James J. Decknick, Manchester, both of N.H., assignors to Keller Products Incorporated, Manchester, N.H.

Filed Jul. 9, 1993, Ser. No. 89,689

Int. Cl.<sup>6</sup> B42F 15/00

U.S. Cl. 312—184

16 Claims



1. A clip for mounting a file hanging rail between two parallel walls having top edges comprising:  
a generally hook shaped clip having:  
a substantially vertical portion having a top, a bottom, and front and back faces;  
a generally C-shaped hook portion integral with the top of said vertical portion defining a downward facing reentrant opening facing along the back face of said vertical portion for hooking onto a top edge of said walls and providing a wedging means;  
an aperture defined by the front face of said vertical portion, said aperture providing support for a said file hanging rail; wherein  
said wedging means comprising a horizontal ridge which extends from said back face adjacent said hook portion to partially define said reentrant opening for abutting opposing sides of a said top edge, whereby, when a hanging weight is applied to a said file hanging rail supported in

said aperture, said reentrant opening wedges onto a said top edge when hooked thereon.

# 5,439,281 STORAGE SYSTEM

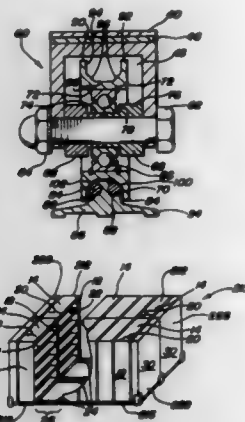
John C. Croker, Farmington Hills, Mich., assignor to Denstar Mobile Storage Systems Inc., Farmington Hills, Mich.

Filed Aug. 16, 1993, Ser. No. 107,272

Int. Cl.<sup>6</sup> A47B 53/00

U.S. Cl. 312—201

20 Claims



1. A movable storage system comprising:  
at least one storage unit;

a plurality of track members extending between spaced apart locations;

a frame structure being formed by a plurality of longitudinal and lateral support members, said frame structure supporting each of said at least one storage unit and having a plurality of roller members supported by and operable to be guided by said track members to facilitate movement of said storage unit between said spaced apart locations, at least one of said plurality of roller members defining a generally U-shaped exterior surface having a pair of opposed annular surfaces, each of said pair of opposed annular surfaces engaging a respective longitudinally extending cylindrical guide; and

said track members having a base and a plurality of longitudinally extending cylindrical guide members supported by said base, said plurality of roller members adapted to engage said cylindrical guide members.

# 5,439,282

## DOOR FOR A SWITCH CABINET, WITH A FRAME TO BE INSTALLED ON THE INNER SIDE

Willi Probst, Frankfurt am Main; Richard Blum, Dietzenbach; Hans-Michael Groh, Hainburg; Willi Kuester, Gelnhausen, and Klaus-Jürgen Herr, Linsengericht, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 18, 1993, Ser. No. 108,360

Claims priority, application Germany, Aug. 18, 1992, 42 27 634.9

Int. Cl.<sup>6</sup> A47B 95/00

U.S. Cl. 312—321.5

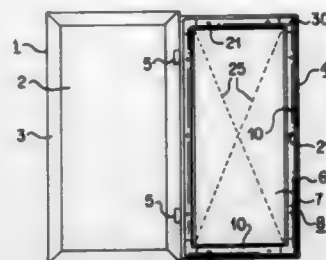
16 Claims

1. In a switch cabinet including a door having an inner side and a frame fastened onto the inner side of the door, an improvement comprising:

the frame including a plurality of profile sections, each having a first profile part located close to the inner side of the door and a second profile part, parallel to said first profile part and more remote from the inner side of the door;

wherein each first profile part includes a stud opening to allow passage of a retainer stud and each second profile part includes a fastening opening to allow passage of an associated fastening element to interact with the retainer

stud, each profile section including at least one retainer stud disposed in a stud opening and a fastening element to interact with said retainer stud;



wherein a space is provided between the inner side of the door and the entire first profile part and that by means of the fastening element only the second profile part of the frame is directly clamped with the retainer stud.

# 5,439,283

## ADJUSTMENT DEVICE TO ALIGN A DRAWER

Gerhard Schröder, Bad Oeynhausen, and Frank Noske, Minden, both of Germany, assignors to Paul Hettich GmbH & Co., Kirchlingern, Germany

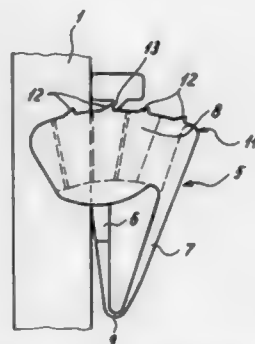
Filed Jan. 12, 1994, Ser. No. 180,866

Claims priority, application Germany, Jan. 12, 1993, 9300260 U; Mar. 25, 1993, 9304521 U

Int. Cl.<sup>6</sup> A47B 88/04

U.S. Cl. 312—334.4

13 Claims



1. An adjustment device to align a drawer that is mounted on rails comprising:

a body member having means for being fastened to a rail, an activation part that is movably hinged to the body member at a hinge area, the activation part being connected to a wedge piece, the activation part being moveable with respect to the body member to achieve alignment between the rail and the drawer, wherein the body member, the activation part, and the wedge piece are integrally made of a plastic material, and wherein the hinge is formed by a material constriction in the form of a film hinge, and wherein the film hinge has an axis that is approximately parallel to a fastening plane disposed between the body member and the rail, and wherein the wedge piece extends approximately at right angles to the hinge axis and to the activation part.

# 5,439,284 DRAWER WITH DETACHABLE CONNECTION OF DRAWER CASING AND DRAWER RAIL

Guenter Grabher, Fussach, Austria, assignor to Grass AG, Hochst/Vlb., Austria

Filed Oct. 27, 1993, Ser. No. 144,271

Claims priority, application Germany, Nov. 10, 1992, 9215250 U

Int. Cl.<sup>6</sup> A47B 88/00

U.S. Cl. 312—334.6

6 Claims



1. A drawer slide for connecting a drawer to a cabinet, the drawer having a drawer casing and a front panel, and an inner profile disposed within the drawer casing, the drawer slide comprising:

a drawer rail having a horizontal shank, the drawer rail being detachably connectable to the drawer casing inner profile;

a hook affixed to the horizontal shank of the drawer rail, the hook facing the direction in which the drawer is pulled out and functioning as a pivot bearing around which the inner profile is pivotable; and

a locking mechanism affixed to the inner profile for releasably locking the drawer rail to the inner profile; wherein the locking mechanism locks and releases independently of manipulation.

# 5,439,285

## SYSTEM FOR FASTENING DRAWER BOTTOMS

Horst Lautenschläger, Reinheim, Germany, assignor to ME-PLA-Werke Lautenschläger GmbH & Co. KG, Reinheim, Germany

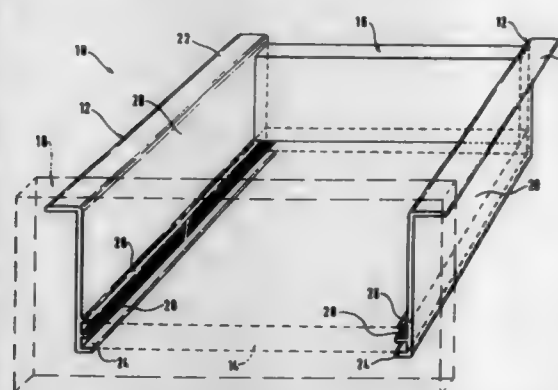
Filed May 17, 1994, Ser. No. 243,956

Claims priority, application Germany, Jun. 2, 1993, 9308254 U; Jun. 15, 1993, 43 19 716.7

Int. Cl.<sup>6</sup> A47B 88/00

U.S. Cl. 312—348.1

12 Claims



1. A system for fastening the bottom of a drawer to sides of a drawer, comprising: drawer sides having an area which faces an adjacent lateral edge of the drawer bottom; projecting strips; integral with the drawer sides and running in a direction in which the drawer opens, which overlap a top side and a bottom side of the drawer bottom; and a further projecting strip, configured as a harpoon strip, which enters into a groove made in the edge of the drawer bottom, wherein said harpoon strip has at least one interruption over its length which divides

the harpoon strip into sections and, in an area of the interruption, a rib-like projection running transversely to the harpoon strip sections projects as an anchoring projection which penetrates into the drawer bottom when the drawer is assembled, and which reaches beyond the projecting strips at right angles to the direction in which the drawer opens.

# 5,439,286

## METHODS OF CONSTRUCTING DRIVE ELEMENTS INCLUDING PADDLE AND SHAFT ASSEMBLIES FOR TWIN SCREW MIXER AND/OR PROCESSORS AND THE RESULTING APPARATUS

James E. Kowalczyk, and Bernard A. Loomans, both of Saginaw, Mich., assignors to APV Chemical Machinery Inc., Saginaw, Mich.

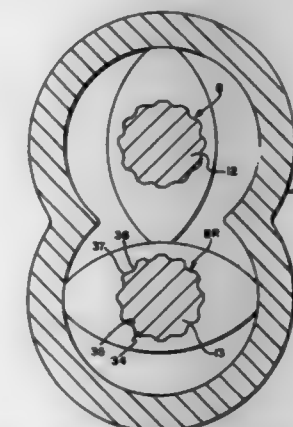
Continuation of Ser. No. 98,134, Jul. 28, 1993, Pat. No. 5,304,000. This application Jan. 31, 1994, Ser. No. 189,180

The portion of the term of this patent subsequent to Apr. 19, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B29B 1/06

U.S. Cl. 366—97

16 Claims



1. A method of constructing or reconstituting drive assemblies comprising a shaft and an element in driving interrelationship therewith, comprising the steps of:

(a) forming the element with a bore of a configuration comprising alternating lobular projections and root recesses, and arcuate corner portions on the lobular projections and root recesses, the arcuate corner portions of said projections being tangential to the arcuate corner portions of said root recesses;

(b) forming the shaft with intermeshing matching projections and root recesses and mounting said element on said shaft with the lobes and root recesses of the element and shaft in intermeshing relation.

# 5,439,287

## SHAKER FOR AEROSOL CAN

David W. Roepke, Sr., 4346 CR.RD. 59, Helena, Ohio 43435

Filed Oct. 29, 1993, Ser. No. 145,760

Int. Cl.<sup>6</sup> B01F 11/00

U.S. Cl. 366—130

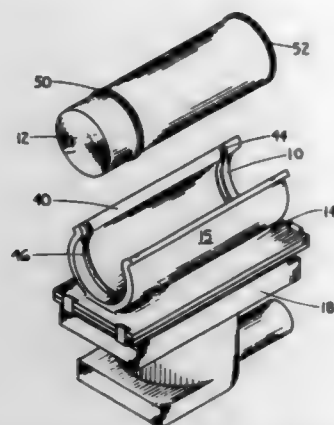
14 Claims

1. A device for attaching aerosol cans and small paint cans to a hand held electric sander with a vibrating surface for shaking comprising:

a. a C-shape clip with outer edges and an opening of approximately the size and length of an aerosol can made out of a resilient substance adapted such that the aerosol can or small paint can be pressed through the opening forcing the edges of the C-shape clip outward and once the can is in placed within said C-shape clip the edges of the C-shape



clip will snap back into position to hold the can securely; and,  
b. a base to attach the C-shape clip; and,



c. a means for attaching the C-shape clip and the base to a vibrating surface of the sander.

5,439,288

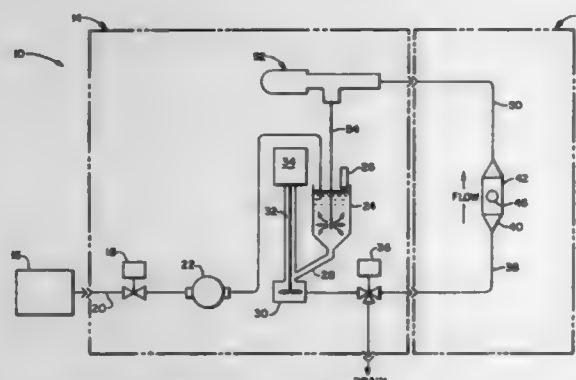
# AUTOMATED SMALL VOLUME RECIRCULATOR FOR PARTICLE ANALYSIS

Jeffrey G. Hoffman, Hatfield; Mary E. Gerrard, New Britain, and Alex H. Clark, Sigel, all of Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed Feb. 1, 1994, Ser. No. 189,864  
Int. Cl.<sup>6</sup> B01F 15/02; 11/02

U.S. Cl. 366-137

20 Claims



1. A mixing and delivery system for supplying small particles suspended in a liquid to form a slurry for delivery and recirculation which comprises:

- a mixing tank having an inlet and an outlet;
- a pump having an inlet and an outlet;
- a sample cell having an inlet and an outlet;
- an ultrasonic flow cell having an inlet and an outlet;
- a transition bushing having an inlet and an outlet;
- said sample cell having first and second generally rectangular planar opposed faces, said inlet of said sample cell being rectangular and defined by two opposed sides which are respectively part of said first and second generally rectangular planar opposed faces, said opposed sides being much longer in length than the intermediate opposed sides of said rectangular inlet;
- said outlet of said mixing tank being connected to said inlet of said pump and said outlet of said pump being connected to said inlet of said transition bushing by a circular cross section tube, said transition bushing being coupled directly to said inlet of said sample cell;
- said transition bushing having a tapered construction, said transition bushing tapering at the inlet thereof from the cross-section of said circular cross-section tubing to said rectangular inlet of said sample cell, said transition bush-

ing being formed from (1) a generally trapezoidal shaped portion which tapers from the maximum dimension of said sample cell inlet to the diameter of said tube and (2) two sections of a truncated cone tapering from a maximum circumferential extent proximate said circular cross-section tubing to a point that is disposed in space relation to said circular cross-section tubing.

5,439,289

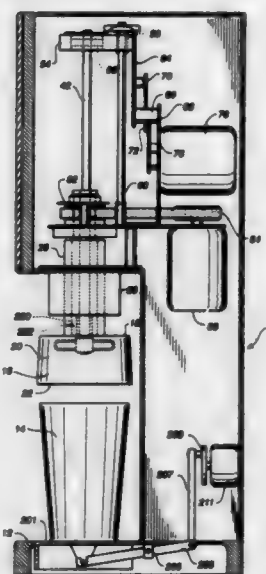
# APPARATUS FOR MIXING INGREDIENTS IN A RECEPTACLE

Jim L. Neilson, 9205 Lime Crest Ct., Elk Grove, Calif. 95624  
Continuation-in-part of Ser. No. 42,519, Apr. 5, 1993, Pat. No. 5,328,263. This application Jun. 28, 1994, Ser. No. 267,452

Int. Cl.<sup>6</sup> B01F 7/32, 13/00

U.S. Cl. 366-207

3 Claims



1. Apparatus for mixing consumable ingredients, said apparatus comprising, in combination:

- a support including a support portion for selectively releasably supporting a receptacle at a support location on said support portion, said receptacle including a receptacle bottom and a receptacle side wall having a rim, said receptacle bottom and said receptacle side wall defining an interior for containing consumable ingredients to be mixed by said apparatus and said rim defining an opening communicating with said interior;
- a lid supported by said support over said support location of said support portion having a lid top wall defining an aperture and defining a lid recess extending downwardly from and communicating with said aperture, said lid recess terminating at a lower lid opening spaced from and larger than said aperture, and defined by said lid at the bottom of said lid, said lid top wall positioned over a receptacle when a receptacle is supported by said support portion at said support location;
- support portion placement means for moving said support portion relative to said lid from a lower position wherein said lid is not in engagement with a receptacle supported by said support portion to an elevated position wherein the receptacle supported by said support portion is fixedly disposed between and in engagement with both said support portion and said lid and wherein said lid is positively engaged with and seals said receptacle to substantially close said receptacle opening and said lid opening and wherein said lid top wall is located above the rim of the receptacle and said recess is disposed above the receptacle interior and in communication therein;
- an elongated mixer shaft supported by said support and

extending through the lid aperture, said mixer shaft axially and rotatably movable relative to said lid and relative to the receptacle and having a lower end;

a mixer head connected to said shaft lower end under said lid top wall;

transport means connected to said support for transporting said mixer shaft and mixer head downwardly and then upwardly within said receptacle after said lid has been positively engaged by and forms a seal with the receptacle supported by said support portion caused by movement of said support portion from said lower position to said elevated position, said mixer head being closely adjacent to said lid top wall and spaced upwardly from the rim of the receptacle both prior to downward transport of said mixer shaft and said mixer head by said transport means and after upward transport of said mixer shaft and said mixer head by said transport means; and

rotating means for rotating said mixer shaft and mixer head within the receptacle, said support portion placement means operable to move said support portion from said elevated position to said lower position to disengage the receptacle from said lid, break the seal between the receptacle and said lid, and lower the receptacle away from said lid after termination of rotation of said mixer shaft and mixer head by said rotating means.

5,439,290

# FLUID FLOW CONDUIT VIBRATOR AND METHOD

Moye Wicks, III, Houston, Tex.; Gregory S. Lester, Mandeville, La., and Joe O. Esparza, Katy, Tex., assignors to Shell Oil Company, Houston, Tex.

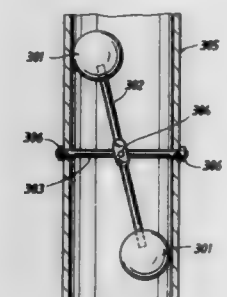
Division of Ser. No. 894,667, Jun. 5, 1992, Pat. No. 5,361,830.

This application Sep. 21, 1994, Ser. No. 310,018

Int. Cl.<sup>6</sup> B01F 11/04

U.S. Cl. 366-241

1 Claim



1. A process to prepare a fine dispersion of a discontinuous phase of a first fluid within an immiscible second fluid comprising:

- combining the first fluid and the second fluid;
- passing the combined first and second fluid through a fluid flow conduit; and
- constraining within the fluid flow conduit a bluff hammer movable to a plurality of positions wherein fluid flow through the fluid flow conduit causes the bluff hammer to move between positions and change direction of movement of the bluff hammer after the bluff hammer impacts a wall of the fluid flow conduit.

5,439,291

# METHOD AND APPARATUS FOR AC DIFFERENTIAL THERMAL ANALYSIS

Michael Reading, London, England, assignor to TA Instruments, Inc., New Castle, Del.

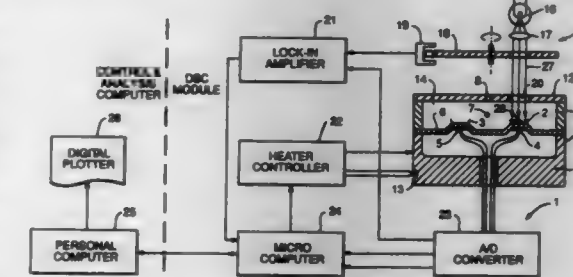
Continuation-in-part of Ser. No. 60,214, May 7, 1993, Pat. No. 5,346,306, which is a continuation of Ser. No. 844,448, Mar. 2, 1992, Pat. No. 5,224,775. This application Dec. 22, 1993, Ser. No. 171,656

The portion of the term of this patent subsequent to Apr. 6, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> G01N 25/00

U.S. Cl. 374-11

92 Claims



1. A method for analyzing a material comprising the steps of:
  - (a) providing a heat flux differential scanning calorimeter having a sample position and a reference position, said differential scanning calorimeter having means for measuring the differential heat flow to the sample position with respect to the reference position;
  - (b) selecting an underlying heating rate;
  - (c) selecting a modulation function characterized by a modulation frequency and a modulation amplitude;
  - (d) placing a sample of the material on the sample position of the differential scanning calorimeter and placing a reference material on the reference position of the differential scanning calorimeter;
  - (e) varying the temperature of the sample position such that the average temperature of the sample position increases at the underlying heating rate, and applying an oscillating heat flow to the sample position, said heat flow oscillating according to the selected modulation function;
  - (f) varying the temperature of the reference position at the selected underlying heating rate;
  - (g) measuring the temperature of the sample position and measuring a differential signal representative of the total heat flow to the sample position with respect to the reference position; and
  - (h) deconvoluting the differential signal representative of the total heat flow to the sample position with respect to the reference position to compute at least one deconvoluted signal.

5,439,292

Patent Not Issued For This Number

5,439,293

# RAIL CONSTRUCTION FOR MACHINE TOOL

Sadao Mizuno, Nagoya, and Akinori Hoshino, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 16, 1994, Ser. No. 306,944

Claims priority, application Japan, Sep. 17, 1993, 5-231996

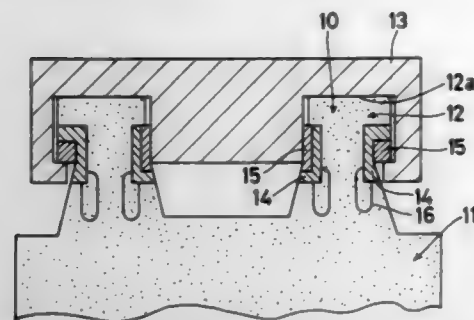
Int. Cl.<sup>6</sup> F16C 29/06

U.S. Cl. 384-9

11 Claims

1. A rail construction for a machine tool comprising:
  - a bed made of resin concrete;
  - a pair of laterally spaced rails made of resin concrete, each rail extending along a lengthwise direction of the bed and having an upper surface;
  - a slidable table mounted for slidable movement on the upper surface of the rails; and

a reinforcing member mounted on each of the rails and disposed so that the reinforcing members are spaced from



a surface of the slide table which bears on the upper surface of the rails during movement of the slide table along the upper surface of the rails.

5,439,294

## LINEAR GUIDE

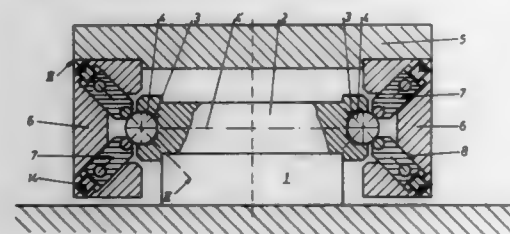
Wolfgang Rixen, and Gerrit Pies, both of Friedenstrasse 107-109, 5650 Solingen 11, Germany

Filed Jul. 2, 1993, Ser. No. 86,590

Int. Cl.<sup>6</sup> F16C 29/06

U.S. Cl. 384-45

17 Claims



1. A linear guide with two parallel guide rails, disposed so as to extend on either side of a rail supporting body parallel to one another, and a carriage, which is longitudinally displaceable on the guide rails and is supported in a double-track arrangement at two different places on the periphery of each guide rail by, in each case, two linear circulating ball bearing assemblies mounted in lateral supporting side walls of the carriage embracing the guide rails, characterized in that each linear circulating ball bearing assembly is adjustably supported individually in a supporting side wall of the carriage substantially radial to the associated guide rail and in that the two linear circulating ball bearing assemblies which are mounted in each case in the supporting side wall of the carriage, are disposed at right angles to one another and at an angle of essentially 45° to a center plane passing through the two guide rails.

5,439,295

## IDLER WHEEL WITH TAPERED SHAFT

Daniel J. Mikolaizik, 4063 Knollwood Dr., Grand Blanc, Mich. 48439

Filed Apr. 29, 1994, Ser. No. 235,740

Int. Cl.<sup>6</sup> F16C 27/02

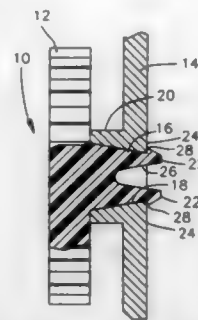
U.S. Cl. 384-125

13 Claims

1. A member adapted to be rotatably mounted to a tapered aperture formed in a support member, said member comprising:

a tapered shaft extending from a surface of said member along an axis of rotation of said member, said tapered shaft having a first portion adjacent said surface and a second portion spaced apart from said surface of said member,

said first portion having a diameter which is larger than a diameter of said second portion;



means formed adjacent said second portion of said tapered shaft for resiliently securing said tapered shaft in said tapered aperture.

5,439,296

## BEARING HOUSING WITH TEMPERATURE SWITCH

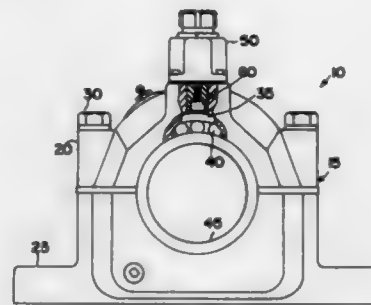
Yehia El-Ibiary, Greenville, S.C., assignor to Reliance Electric Industrial Company, Greenville, S.C.

Filed Jun. 4, 1993, Ser. No. 71,478

Int. Cl.<sup>6</sup> F16C 32/00

U.S. Cl. 384-448

15 Claims



1. An improved bearing assembly, said bearing assembly comprising:

- a bearing housing, said bearing housing containing at least one bearing therein adapted to rotatably support a shaft in said housing, wherein said housing includes a shaft bore therein for receipt of said bearing, said housing further including a switch receiving bore extending from an exterior surface of said housing toward said shaft bore, wherein said switch receiving bore terminates prior to intersecting with said shaft bore;
- a temperature switch, said temperature switch being arranged in said housing so as to be responsive to the temperature within said housing so that said switch will be activated when a predetermined temperature in said housing is reached.

5,439,297

## NONMAGNETIC RACEWAY ASSEMBLY

Azuyasu Kitayama, Ibaragi, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1994, Ser. No. 252,608

Claims priority, application Japan, Jun. 3, 1993, 5-156316

Int. Cl.<sup>6</sup> F16C 33/62

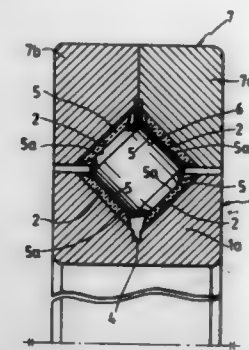
U.S. Cl. 384-492

11 Claims

1. A structure of a nonmagnetic raceway assembly comprising:

a pair of raceway bodies made of a nonmagnetic metal material and having raceway forming surfaces, the pair of raceway bodies moving relative to each other; and raceway layers adhering to the raceway forming surfaces to form raceway surfaces, the raceway layers being made of

a nonmagnetic composite material of a porous structure that can retain any one of lubricating oil and lubricant;



wherein the raceway surfaces of the relatively moving raceway bodies face each other to form a raceway through which rolling elements can travel rolling.

5,439,298

## SUSPENSION STRUT BEARING

Alexander Zernickel; Horst Dopplig, both of Herzogenaurach, and Horst Scholian, Aurachtal, all of Germany, assignors to Ina Walzlager Schaeffler KG, Germany

PCT No. PCT/EP92/01979, § 371 Date Dec. 2, 1993, § 102(e) Date Dec. 2, 1993, PCT Pub. No. WO93/04882, PCT Pub. Date Mar. 18, 1993

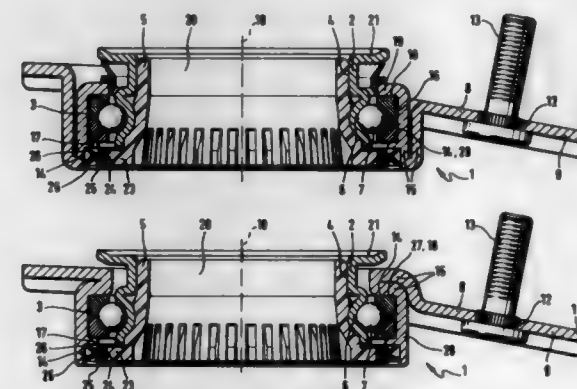
PCT Filed Aug. 27, 1992, Ser. No. 162,037

Claims priority, application Germany, Sep. 5, 1991, 41 29 513.7

Int. Cl.<sup>6</sup> F16C 43/00

U.S. Cl. 384-537

4 Claims



1. A suspension strut bearing (1) for the suspension of wheels in automotive vehicles comprising an inner bearing ring (2) and an outer bearing ring (3) which can be secured by means (12, 13) to a neighboring part of a vehicle body, the inner bearing ring (2) radially surrounding a tolerance ring (5) arranged concentrically in a bore (4) thereof, the said bearing further comprising a bearing housing (8) of deep drawn sheet metal which encloses the outer bearing ring (3), and a flange (9) which extends essentially crosswise to a bearing axis (10) and is made in one piece with the bearing housing (8), characterized in that the bearing housing (8) comprises a crimping (15) of 180° C. in at least one region of its inner surface (14) which bears against the outer bearing ring (3), the crimping (15) extends at least over the entire outer surface (16) of the outer bearing ring (3) or over the front end (18) thereof, an axial positional fixing of the outer bearing ring (3) is assured by an annular swaging (17) of the inner surface (14) of the bearing housing (8), and the crimping (15) merges directly into the flange (9).

5,439,299

## SELF-ADJUSTING BEARING SUPPORT

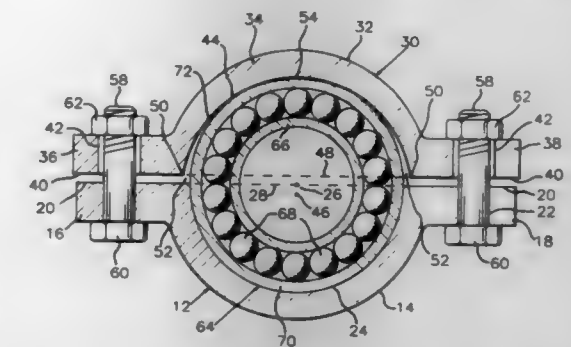
Dale I. Havens, 11101 Devils Lake Hwy., Addison, Mich. 49220

Filed Jan. 13, 1995, Ser. No. 372,491

Int. Cl.<sup>6</sup> F16C 19/06

U.S. Cl. 384-542

6 Claims



1. A self adjusting bearing support for supporting an anti-friction bearing having an axis and an outer race outer cylindrical surface concentric to said axis and having a diameter, comprising, in combination, a bearing support half having a semi-cylindrical recess having a longitudinal axis and a diameter substantially equal to the diameter of the bearing outer race outer surface, a planar parting surface defined on said bearing support half diametrically intersecting said recess, said recess axis lying within the plane of said parting surface, the bearing outer race outer surface being closely concentrically receivable within said recess whereby said axes of the bearing and said recess are coincident and said recess determines the radial relationship between the bearing and said bearing support half, a bearing retainer having a deformable wall and having a substantially semi-cylindrical recess having a longitudinal axis and a diameter slightly greater than said bearing support half recess diameter, a planar parting surface defined on said bearing retainer intersecting said recess thereof at opposed intersection corners located on opposite sides of said retainer recess axis, an apex defined on said retainer recess circumferentially midway between said intersection corners, the plane of said retainer parting surface perpendicularly intersecting the retainer recess radius intersecting said retainer recess axis and said apex whereby the shortest distance between said retainer parting surface plane and said apex is slightly less than one-half said retainer recess diameter and the shortest distance between said intersection corners is greater than the diameter of said bearing support half recess, a tension fastener located upon each side of said bearing support half recess interposed between said bearing support half and said bearing retainer upon said parting surfaces thereof being in opposed relationship, tensioning of said tension fasteners drawing said retainer toward said bearing support half whereby a bearing outer race outer surface located within said retainer recess will initially be engaged by said retainer recess apex and the retainer wall will deform to permit said retainer recess to wrap around the bearing outer race outer surface engaged thereby and conform thereto retaining the anti-friction bearing within said bearing support half recess.

5,439,300

## ROLLING BEARING

Kiyoshi Hirakawa; Toichi Kondo, and Shigeru Okita, all of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Feb. 28, 1994, Ser. No. 202,481

Claims priority, application Japan, Feb. 26, 1993, 5-038857; Aug. 31, 1993, 5-216748

Int. Cl.<sup>6</sup> F16C 19/00

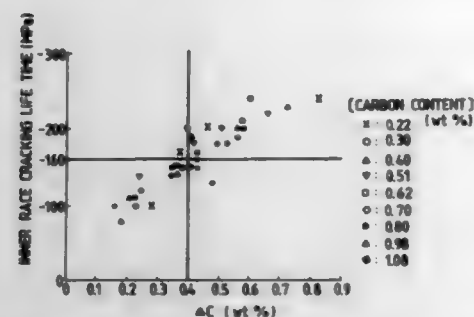
U.S. Cl. 384-625

8 Claims

1. A rolling bearing including an inner race which is used with a fitting stress applied between bore of said inner race and shaft, wherein



said inner race is formed by an alloy steel whose carbon content is ranged from 0.3 to 0.7% by weight; said inner race is subjected to a carburizing or carbonitriding treatment; and



said inner race having the difference ( $\Delta C = C_1 - C_2$ ) between the carbon content ( $C_1$ ) of the surface layer of the raceway track of said inner race and the carbon content ( $C_2$ ) of the core of said inner race being at least 0.4% by weight.

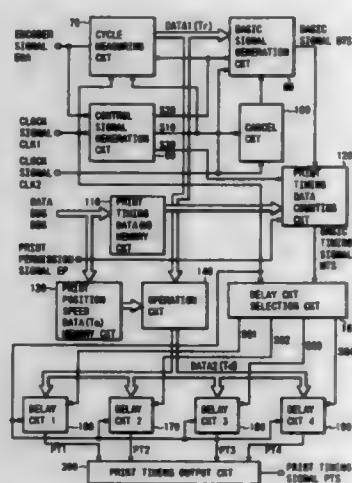
5,439,301

**PRINTER CONTROLLER AND METHOD THEREOF FOR A PRINTHEAD ASSEMBLY**  
Katsuhiko Nishizawa, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan  
Continuation of Ser. No. 916,705, Jul. 22, 1992, Pat. No. 5,310,272. This application Nov. 15, 1993, Ser. No. 151,856  
Claims priority, application Japan, Jul. 22, 1991, 3-180989; Aug. 8, 1991, 3-199255; Oct. 28, 1991, 3-281193; Jun. 16, 1992, 4-156806

Int. Cl. B41J 9/24, 2/30

U.S. Cl. 400—124.05

4 Claims



1. A printhead pin control method for a printer having a detector which outputs a detect signal each time a printhead carriage moves a predetermined distance, said printhead pin control method comprising the steps of:  
measuring first and second signal cycles based on detect signals output by the detector for first (N-2) and second (N-1) predetermined distances, respectively;  
determining a difference signal corresponding to a difference between said first and second signal cycles;  
detecting a current moving speed of the printhead moving with respect to the printing paper based upon said first and second signal cycles and said difference signal and generating a speed signal having a signal cycle in inverse proportion to said detected moving speed;  
generating a drive signal having a signal cycle in proportion

to the signal cycle of said speed signal in accordance with said speed signal; and  
contacting a head pin provided on said printhead with said paper only for a time corresponding to the signal cycle of said drive signal to form a dot having a predetermined length with respect to the moving direction of said printhead on said paper;  
wherein said measuring step and said determining step together comprise the steps of counting up, with a first counter, during a period corresponding to the first (N-2) predetermined distance to generate said first signal cycle, and counting down, with said first counter, during a period corresponding to the second (N-1) predetermined distance to generate said difference signal, and counting up, with a second counter, during a period corresponding to the second (N-1) predetermined distance, and counting down, with said second counter, during a period corresponding to the first (N-2) predetermined distance to generate said second signal cycle.

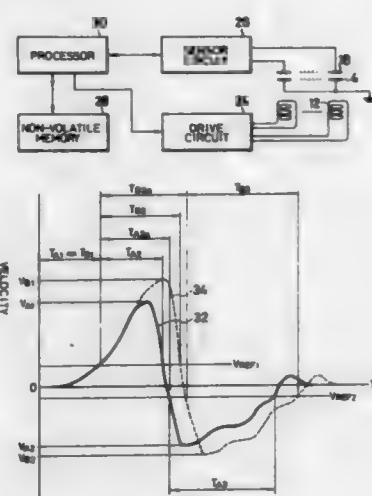
5,439,302

**SELF-ADJUSTING CONTROLLER FOR DOT IMPACT PRINTER**

Hirokazu Andou, Mitsuru Kishimoto, Hideaki Ishimizu, Yoichi Umezawa, and Toshiyuki Asaka, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan  
Filed Dec. 13, 1993, Ser. No. 165,462  
Claims priority, application Japan, Dec. 11, 1992, 4-330815  
Int. Cl. B41J 2/25

U.S. Cl. 400—124.07

13 Claims



1. A controller for controlling electromagnets that actuate dot wires in a dot impact printer, comprising:  
a drive circuit for feeding pulses of exciting current to said electromagnets, thereby actuating said dot wires;  
a plurality of capacitance sensor electrodes for sensing motion of respective dot wires;  
a sensor circuit coupled to convert outputs from said capacitance sensor electrodes to waveform data;  
a non-volatile memory for storing self-adjustment data; and  
a processor coupled to control said drive circuit responsive to said self-adjustment data during normal printing, to execute, at certain times, a test sequence in which each dot wire is actuated in turn, and to update said self-adjustment data according to said waveform data resulting from said test sequence;  
wherein said processor increases durations of said pulses of exciting current when a predetermined characteristic of said waveform data exceeds a first threshold value;  
wherein said processor also controls rates of said pulses of exciting current, thereby controlling printing speed, responsive to said self-adjustment data;

and wherein said processor reduces said rates of said pulses, thereby reducing said printing speed, if said predetermined characteristic of said waveform data exceeds a second threshold value, which is higher than said first threshold value.

5,439,303

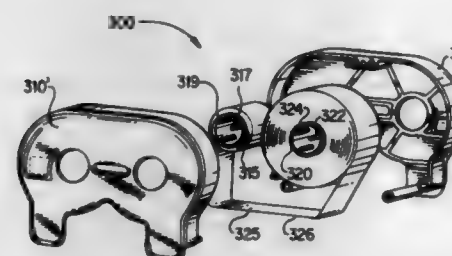
**SPLIT-SPLINE HUB AND LATCH MECHANISM**  
James M. Alday, Honeoye Falls, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 22, 1993, Ser. No. 139,773

Int. Cl. B41J 32/00; B65H 75/00

U.S. Cl. 400—242

36 Claims



1. A tubular, hollow hub for supporting a length of material wound around the hub, said hub comprising:  
an outer surface for receiving the material;  
an inner surface disposed radially inwardly from the outer surface;  
first and second opposite ends;  
at least one first spline on the inner surface and extending in a longitudinal direction of said hub from near said first end of said hub toward a central portion of said hub and terminating between a midpoint of said hub and said first end so that said at least one spline is spaced from said midpoint of said hub, said midpoint being located midway between said first and second opposite ends; and  
a detent located near said midpoint and having a detent surface between said first end and said midpoint closely adjacent to said midpoint and facing said second end.

5,439,304

KEYBOARD

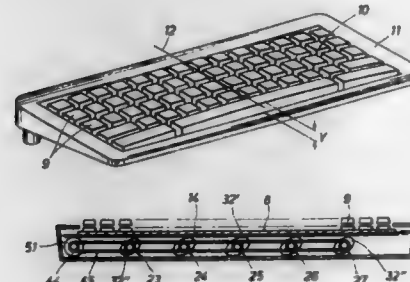
Michael Phillips, 16 Windermere La., Houston, Tex. 77063, and Rodney H. Neumann, Houston, Tex., assignors to Michael Phillips, Houston, Tex.

Filed Nov. 22, 1993, Ser. No. 156,103

Int. Cl. B41J 5/26

U.S. Cl. 400—492

10 Claims



1. A keyboard assembly having keys defining a keyboard for use in providing input signals to a processing unit, comprising:  
flexible circuit means forming a substrate of said keyboard;  
a flexible mat supporting said substrate;  
resilient means for connecting said mat to said keyboard; and  
automatically controlled means for warping said mat and said substrate upward in a central portion thereof during

lengthy use of said keyboard in order to induce forearm rotation of the user.

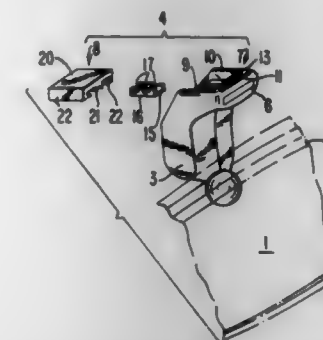
5,439,305

**FIXING DEVICE FOR INSIDE REARVIEW MIRROR**  
Antonio F. d. E. Santo, Sao Bernardo do Campo, Brazil, assignor to Metagal Industria e Comercio Ltda., Sao Paulo, Brazil  
Filed May 3, 1994, Ser. No. 237,179

Claims priority, application Brazil, May 7, 1993, 7300601  
Int. Cl. B60R 1/00

U.S. Cl. 403—76

3 Claims



1. A fixing device for an inside rearview mirror of a vehicle comprising an arm having a lower end articulately connectable with a mirror supporting frame of a rearview mirror and an upper end mountable on a vehicle ceiling, and means for mounting said upper end of said arm on the vehicle ceiling and formed as a coupling, said coupling including a first coupling part having a substantially horizontal plate, two side wings extending substantially vertically from said plate, a front wing and a rear end which is open, said first coupling part being also provided with two fitting guides extending on and along said horizontal plate and each including a T-shaped wing section and a rib located between said T-shaped wing section and a respective one of said side wings, said first coupling part being also provided with a U-shaped spring having a transverse branch and two parallel side branches, said coupling further including a second coupling part having a base plate fixable to the ceiling of the vehicle, an inverted U-shaped central rib and L-shaped side wings, so that said T-shaped wing sections of said first coupling part are fitted and retained between said U-shaped central rib and L-shaped side wings, while said L-shaped side wings of said second coupling part are inserted between said T-shaped wing sections, said rib and said side wings of said first coupling part.

5,439,306

**DEVICE FOR ASSEMBLING TWO ELEMENTS OF MATERIALS HAVING DIFFERENT COEFFICIENTS OF THERMAL EXPANSION**

Jacques C. N. Lhernould, Merignac, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris Cedex, France  
Continuation of Ser. No. 991,311, Dec. 16, 1992, abandoned.

This application Nov. 30, 1994, Ser. No. 351,106

Claims priority, application France, Dec. 16, 1991, 91 15841  
Int. Cl. B01J 8/34; F16B 5/06

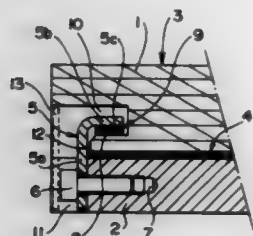
U.S. Cl. 403—179

23 Claims

1. Device for assembling two elements made of materials having different coefficients of thermal expansion, which materials are subject to substantial temperature variations, comprising:

a layer of a first compressible, heat insulating material capable of being positioned between a first element having an upper surface and an outer edge, and a second element comprising at least one surface portion;  
means for maintaining the second element against said layer and said layer against the first element, and for enabling relative movement between the two elements in any direc-

tion in a plane substantially parallel to a plane passing through said layer, said means for maintaining including a first section adapted to be connected to the outer edge of the first element, and a second section adapted to be spaced a distance from at least one surface portion of the second element, the at least one surface portion being substantially parallel to said plane passing through said layer;



a second compressible, heat insulating material positionable between said second section and the at least one surface portion; and  
said first section of said means for maintaining adapted to be spaced a distance from an opposing face of said second element, said opposing face being located between said first and second compressible heat insulating materials.

5,439,307

# APPARATUS FOR REMOVABLY ATTACHING AND OBJECT TO A SUPPORT SURFACE

Helmut Steinhilber, Sonnenbergstrasse 40, CH-6052 Hergiswil, Switzerland

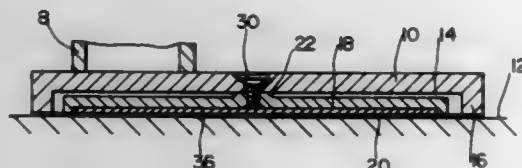
Filed Sep. 30, 1993, Ser. No. 128,699

Claims priority, application Germany, Oct. 14, 1992, 42 34 552.9; Oct. 14, 1992, 92 13 834.9

Int. Cl.<sup>6</sup> F16B 47/00

U.S. Cl. 403-267

15 Claims



1. Apparatus for removably attaching a rigid plate, with an object attached thereto, to a support surface comprising:

- (a) said rigid plate having a transverse extension engageable with said support surface and providing a cavity, said extension having an edge at said support surface;
- (b) a pad in the cavity of said rigid plate having a central region;
- (c) a connector joining the central region of said pad to said plate;
- (d) a body in said cavity having a surface thereof facing said pad and a surface thereof remote from said pad;
- (e) said body having adhesive on said remote surface thereof;
- (f) means for connecting said pad to said body; whereby, said connector joining said central region of said pad to said plate and said means for connecting said pad to said body causes substantially only a lifting force on said pad and body perpendicular to said remote surface when said plate is subjected to a force tending to tilt said plate about said edge thereof.

5,439,308

# CONNECTOR

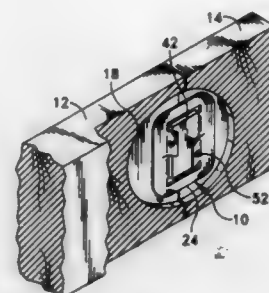
Roland Beaulieu, P.O. Box 129, Tiverton, R.I. 02878

Filed Mar. 28, 1994, Ser. No. 219,035

Int. Cl.<sup>6</sup> F16B 12/24

U.S. Cl. 403-292

14 Claims



1. A device for connecting separate material pieces between adjacent face to face edge surfaces of said pieces wherein each of said face to face edge surfaces is provided with an open end slot of substantially constant width inwardly extending into the respective piece, said device comprising a main member having a generally planar body which includes laterally opposed sides in turn provided with at least one outwardly extending tooth wherein said opposed sides are positioned in said slots with said teeth engaging the slot walls, said planar body further including an opening disposed laterally between said opposed body sides, said opening of a generally geometric configuration and defined by a plurality of adjacent side edges in turn forming a means for receipt of a generally planar stiffening member, said stiffening member separate from said main member.

5,439,309

# JOINT COUPLING

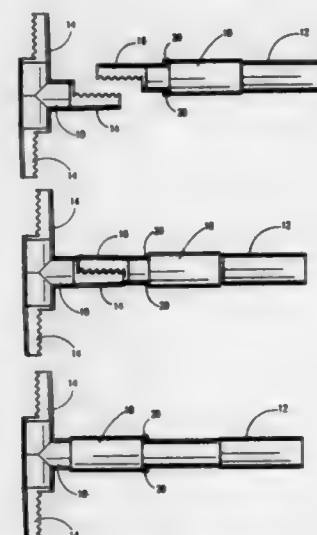
Danny Raz, 71 Beit Lehem, 35568 Haifa, Israel

Filed Apr. 20, 1993, Ser. No. 48,897

Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 403-316

6 Claims



1. A joint coupling for axially connecting together a first joint and a second joint, comprising:

- (a) a first complementary member connected to, or integrally formed with, the first joint;
- (b) a second complementary member connected to, or integrally formed with, the second joint, said first and second complementary members being sized and shaped so that,

when properly aligned, said complementary members form an overlap structure which is effectively a continuation of the first joint or the second joint;

- (c) a sleeve slidable over said overlap structure so as to secure the joint coupling; and
- (d) a first depressible member and a second depressible member connected to, or integrally formed with, each other, said first and second depressible members being biased outwardly so as to prevent said sleeve from sliding off said second joint until the joint coupling is to be secured and to prevent said sleeve from sliding away from said overlap structure when the joint coupling is secured.

5,439,310

# CONNECTOR SYSTEMS FOR STRUCTURES

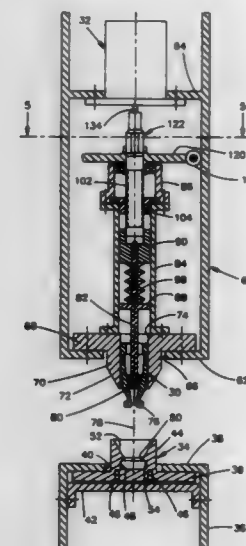
Erik E. Evenson; Christian P. Lupo, both of Houston, and Clarence J. Weaselski, Alvin, all of Tex., assignors to The United States of America as represented by United States National Aeronautics and Space Administration, Washington, D.C.

Filed May 25, 1993, Ser. No. 66,271

Int. Cl.<sup>6</sup> F16B 21/06

U.S. Cl. 403-321

11 Claims



1. A fastener for coupling two facing structural members to one another, said fastener comprising:

- a socket member in one structural member having an opening extending to a locking recess;
  - an elongated tubular member in the other structural member, said tubular member having resiliently arranged collet fingers radially movable relative to a central axis between a contracted position and an expanded position;
  - an elongated expander member disposed within said tubular member and movable longitudinally between first and second positions for moving said collet fingers between said contracted and said expanded positions;
  - said collet fingers and expander member being insertable into said opening for locating locking portions on said collet fingers in said locking recess so that movement of said collet fingers to an expanded position attaches the structural members to one another; and
  - first means for moving said expander member longitudinally only in a first direction between said first and second positions in response to linear force, and second means for moving said expander member longitudinally in either direction along its longitudinal axis in response to rotational force;
- wherein said first means includes a source of energy which develops a force on said expander member in response to volumetric expansion of a fluid.

5,439,311

# BENDABLE MARKER WITH RIBBED SLEEVE

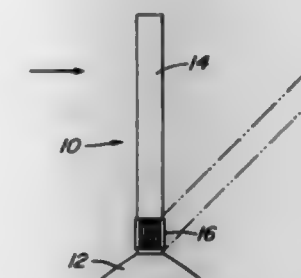
Robert K. Hughes, Jr., Fort Myers, Fla., assignor to Flexstake, Inc., Fort Myers, Fla.

Filed Dec. 17, 1993, Ser. No. 169,476

Int. Cl.<sup>6</sup> E01F 9/017

U.S. Cl. 404-10

19 Claims



1. A bendable marker comprising in combination:

- a base;
- a marker post; and
- an elastomeric flexible element having a longitudinal axis extending from an upper end to a lower end of the flexible element, the lower end of the flexible element being secured to the base and the upper end being secured to the marker post, the flexible element having a midsection located between the upper end and the lower end of the flexible element, the midsection having a plurality of longitudinally extending ribs formed therein which are separated by longitudinally extending grooves located about the midsection of the flexible element, the grooves defining void spaces which are free of material when the flexible element is secured to the base and marker post, the ribs enhancing the resiliency of the flexible element when the marker post is bent relative to the base.

5,439,312

# METHOD FOR APPLYING A NIGHT-VISIBLE TRAFFIC STRIPE TO A ROAD

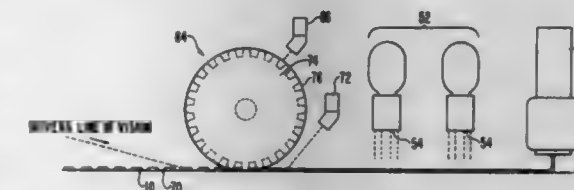
Forrest C. Marcato, Montgomery, Ala., assignor to The Rainline Corporation, Montgomery, Ala.

Filed Jan. 15, 1993, Ser. No. 5,057

Int. Cl.<sup>6</sup> E01F 9/087

U.S. Cl. 404-12

15 Claims



1. A method for applying a night-visible traffic stripe to a road surface, said method comprising the steps of:

- applying a material capable of adhesion and forming a traffic stripe to a road surface;
  - applying a first particulate reflective material to the traffic stripe with a first reflective material applicator and incorporating the first reflective material into the traffic stripe;
  - applying means for preventing adhesion between the traffic stripe material and a deformation means such that the deformation means remains substantially free of traffic stripe material during a deformation step; and
  - deforming the traffic stripe material with the deformation means to form spaced grooves in the traffic stripe material;
- wherein said step of applying means for preventing adhesion includes applying a second particulate reflective material to the traffic stripe with a second reflective material applicator.



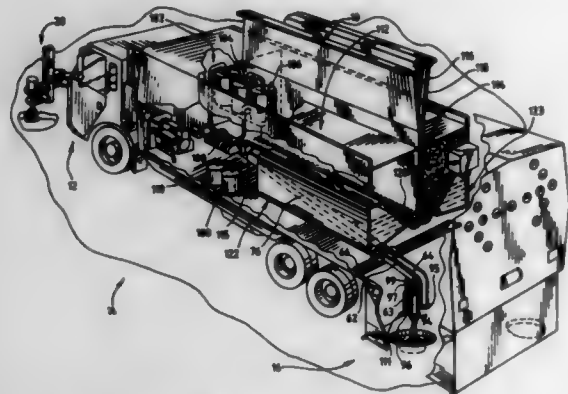
cator prior to said deforming step to form a barrier of the second reflective material on an upper surface of the traffic stripe that prevents adhesion between the traffic stripe material and the deformation means.

5,439,313

**SPRAY PATCHING PAVEMENT REPAIR SYSTEM**  
James R. Blaha, Evanston; Herbert N. Underwood, Chicago; Ralph Salle, Lake Zurich, and Ronald R. Ralston, Elmhurst, all of Ill., assignors to Northwestern University, Evanston, Ill. Division of Ser. No. 34,506, Mar. 19, 1993, Pat. No. 5,333,963. This application May 3, 1994, Ser. No. 238,151  
Int. Cl.<sup>6</sup> E01C 19/00

U.S. Cl. 404—75

13 Claims



1. A spray patch application system for repairing pavement defects, comprising:

- a source of aggregate addition;
- a source of asphalt emulsion addition;
- an application conduit, said application conduit providing mixing and transport of said aggregate addition and said emulsion addition to a pavement defect;
- said application conduit being an extended tube of substantially cylindrical shape ending in a nozzle portion, said emulsion being added to said aggregate addition in said application conduit, said aggregate being drawn into and transported through said application conduit by air passing through said application conduit;
- a moveable control arm system, said control arm system having an application control arm positioned for horizontal and vertical movement, said application conduit forming a portion of said application control arm;
- a regulation mechanism, said regulation mechanism providing a control of the rate of flow through said application conduit, said flow rate through said application conduit being controlled to have particles of said aggregate exceed a speed of 90 miles per hour, said regulation mechanism providing a control of the mixture of said aggregate addition and said asphalt emulsion addition.

5,439,314

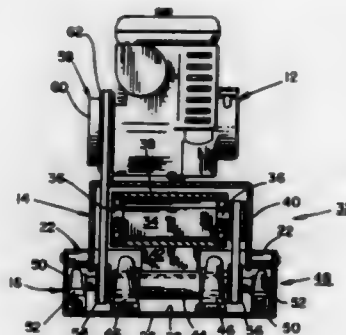
**REVERSIBLE SELF-PROPELLED PLATE COMPACTOR**  
Theodore S. Wadensten, P.O. Box 8, Wyoming, R.I. 02898  
Filed Jan. 3, 1994, Ser. No. 176,212  
Int. Cl.<sup>6</sup> E01C 19/00

U.S. Cl. 404—133.05

9 Claims

1. A reversible self-propelled plate compactor comprising:
- a) a tamper plate having a tamper side for contacting material to be compacted;
  - b) a motor carried on a mounting plate, said mounting plate being selectively shaped; said mounting plate being resiliently attached to said tamper plate for isolating said mounting plate and said motor from said tamper plate, said motor having a drive means attached to an output shaft;
  - c) at least one vibratory assembly including a weight being eccentrically carried on a vibrator shaft for imparting vibratory motion when rotating by way of a driven means

mounted thereon, said driven means being selectively driven by said drive means, said vibratory shaft having selected portions being journaled in a vibratory housing, said vibratory housing being attached to one end of an arm, the opposite end of the arm having a flex mounting means for attaching to an interior side of said tamper plate, said interior side being opposite to said tamper side, a flexing axis of said flex mounting means being transverse to a direction of self-propelled travel; and



wherein said vibrator housing and said arm being selectively tilted about said flexing axis at a predetermined angular position with respect to a plane parallel to said tamper side for directing substantially all forces necessary for said self-propelled travel into said tamper plate by way of said arm and said flex mounting means, said direction of said self-propelled travel being irrespective of the direction of rotation of said vibratory shaft.

5,439,315

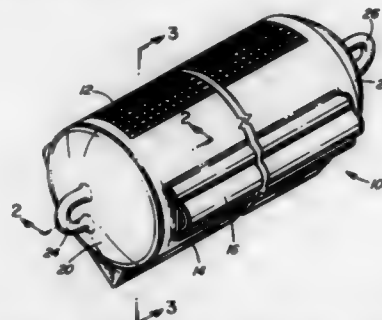
**SYNTHETIC BOOMSTICK**  
Kirk J. MacKenzie, Surrey, and William W. G. Liang, Richmond, both of Canada, assignors to MacMillan Bloedel Limited, Vancouver and Canadian Boomstick Company Ltd., Surrey

Filed Feb. 24, 1994, Ser. No. 201,507

Int. Cl.<sup>6</sup> E02B 15/04

U.S. Cl. 405—60.5

21 Claims



1. A boomstick comprising an elongated, hollow ridged cylindrical body portion that floats in water, said body portion having a longitudinal axis, partition means dividing said body portion into a plurality of compartments, an end cap sealing each axial end of said body portion, ballast means fixed to and extending longitudinally of said body portion in a position to orient said body portion with said ballast means submerged and a longitudinally extending tread area uppermost, a coating of wear and abrasion resistant water proofing material substantially completely encasing said boomstick, said coating having a coefficient of friction with logs to permit slippage there between, said tread area being formed in said coating, said coating being sufficiently thick to protect said body portion and to receive in said tread area caulk on boots of workmen walking thereon without damaging said body portion, a pair of

stabilizers positioned one on each side of said body portion and symmetrically relative to said ballast means, each of said stabilizers extending longitudinally of said body portion substantially parallel to said longitudinal axis of said body portion along at least a significant portion of the length of said body portion and each of said stabilizers being on or adjacent to a water line formed along its adjacent side of said body portion when said boomstick is afloat in water to thereby inhibit rotation of said body portion about said longitudinal axis.

5,439,316

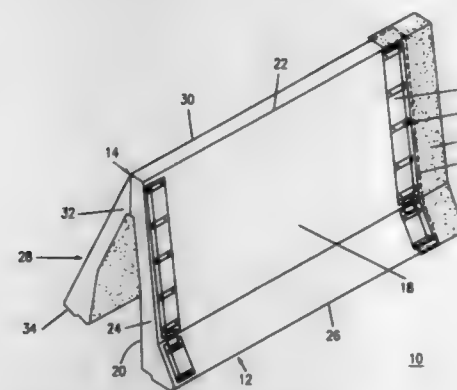
**PORTABLE REUSABLE FLOOD BARRIER PANEL SYSTEM**

Cecil A. Richardson, 105 Gardenia Ct., Upland, Calif. 91786  
Filed Jul. 28, 1994, Ser. No. 282,201

Int. Cl.<sup>6</sup> E02B 7/02; E02D 31/00

U.S. Cl. 405—114

15 Claims



1. A portable flood barrier comprising:

- (a) a front panel having a front face, a rear face, a top edge, a pair of side edges, and a base;
- (b) a rear support attached to the rear face of the front panel to prop the front panel on the base;
- (c) at least one stacking support affixed to the rear face of the front panel to allow stacking a portion of a second flood barrier on top of said flood barrier to form a higher flood barrier bank, the front panel of the second flood barrier being disposed in parallel with the front panel of said flood barrier so as to substantially seal their interface; and
- (d) an elongated clamp removably and adjustably affixed to the front face of the front panel, the clamp having an edge disposed proximate and substantially parallel to each side edge of the front panel respectively, wherein the clamp is capable of anchoring a long edge of an elongated interconnection gasket, the gasket being capable of placement over the gap between a side edge of the front panel of a first flood barrier and an abutting side edge of the front panel of an adjacent second flood barrier to provide a water seal between the front panels.

5,439,317

**METHOD OF HANDLING SOLID PARTICLES**

William M. Bishop, Katy; James D. Grenia, Spring, and Donald R. Richner, Houston, all of Tex., assignors to PB-KBB Inc., Houston, Tex.

Filed Oct. 8, 1992, Ser. No. 958,574

Int. Cl.<sup>6</sup> B09B 1/00

U.S. Cl. 405—128

23 Claims

1. A method of suspending solid mineral particles, consisting essentially of the steps of:

- adding a suitable clay to water to form a water/clay mixture;
- mixing a first amount of the solid mineral particles with the water/clay mixture to form a base mixture, the first amount of solid mineral particles being greater than an amount of solid particles that could be suspended in the water/clay mixture; and
- mixing an additional amount of the solid mineral particles

with the base mixture, to form a final suspension that includes a total amount of solid particles, said total amount of solid particles being fully suspended in the final suspension such that said total amount remains substantially suspended in the absence of agitation.

5,439,318

**CEMENTITIOUS ENCAPSULATION OF WASTE MATERIALS AND/OR CONTAMINATED SOILS CONTAINING HEAVY METALS TO RENDER THEM IMMOBILE**

J. Norman Stark, 22420 S. Woodland Rd., Shaker Heights, Ohio 44122

Continuation-in-part of Ser. No. 999,286, Dec. 30, 1992, Pat. No. 5,276,255. This application Nov. 17, 1993, Ser. No. 154,753  
The portion of the term of this patent subsequent to Jan. 4, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B09B 3/00; E02D 3/12

U.S. Cl. 405—128

12 Claims

1. A structural product comprising:

- a waste and/or contaminated soil comprising one or more heavy metals;
- a cementitious material encapsulating said waste and/or contaminated soil;
- said cementitious material being the reaction product of magnesium oxide and magnesium chloride in proportions which, when mixed with water, produce magnesium oxychloride cement;
- said magnesium oxychloride cement being present in an effective amount to immobilize said heavy metals.

5,439,319

**TUNNEL BARRIER SYSTEM AND METHOD OF INSTALLING THE SAME**

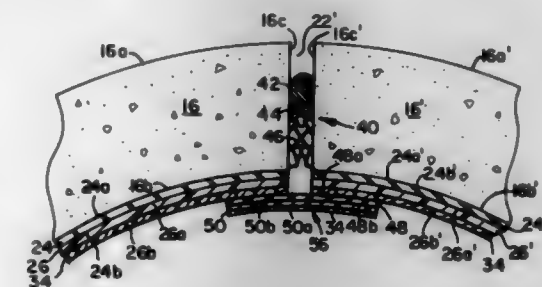
Roy C. Flanagan, Dallas, Tex., and G. Richard Stauffer, Yardley, Pa., assignors to Carlisle Coatings & Water Proofing, Incorporated, Sapulpa, Okla.

Filed Aug. 12, 1993, Ser. No. 105,993

Int. Cl.<sup>6</sup> E21D 11/00

U.S. Cl. 405—152

15 Claims



1. A tunnel barrier system for lining a tunnel cavity having an interior surface, said tunnel barrier system comprising:

- (a) a first panel having a first surface, a second surface, and a side surface defining a periphery of said first panel, said first surface of said first panel being in facing relationship with the interior surface;
- (b) a first impermeable membrane having a first surface and a second surface, said first surface of said first membrane being affixed to said second surface of said first panel such that said first surface of said first membrane is in facing engagement with said second surface of said first panel;
- (c) a second panel having a first surface, a second surface, and a side surface defining a periphery of said second panel, said first surface of said second panel being in facing relationship with the interior surface, a portion of said side surface of said first panel being positioned adjacent to but spaced apart from a portion of said side surface of said second panel such that a cavity is formed between said

- portion of said side surface of said first panel and said portion of said side surface of said second panel;
- (d) a second impermeable membrane having a first surface and a second surface, said first surface of said second membrane being affixed to said second surface of said second panel such that said first surface of said second membrane is in facing engagement with said second surface of said second panel;
- (e) a filling material positioned within said cavity; and
- (f) a third impermeable membrane having a first surface and a second surface, said first surface of said third membrane being in facing engagement with said second surface of said first membrane and said second surface of said second membrane, said third membrane extending across said cavity such that said first panel, said second panel and said cavity are impermeable to fluids.

5,439,320

## PIPE SPLITTING AND SPREADING SYSTEM

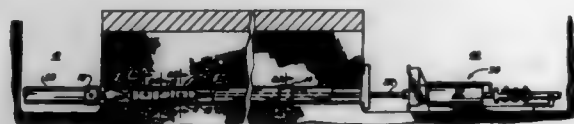
Sam Abrams, P.O. Box 3626, Fort Myers, Fla. 33918

Filed Feb. 1, 1994, Ser. No. 189,687

Int. Cl.<sup>6</sup> F16L 1/028

U.S. Cl. 405—154

25 Claims



1. A pipe splitting and spreading system for replacing existing underground utility pipe and pipe fittings with new pipe comprising in combination:

- a cutter assembly having an elongated frame and a leading end and a trailing end and a plurality of co-aligned cutter wheels mounted longitudinally in the cutter assembly, the first cutter wheel for cutting through the existing utility pipe and scrubbing a scoring line on the existing utility pipe fittings, the second cutter wheel for cuttably engaging the existing utility pipe fittings in the scoring line, and cutting the existing utility pipe fittings along the scoring line, the cutter assembly further including a plurality of pipe expanders adapted for frictionally expanding the interior wall of the existing underground pipe and pipe fittings wherein the distance between extremities of one of the paired pipe expanders is greater than an inside diameter of the existing pipe;
- a mandrel having a first section adapted for coupling to the trailing end of the cutter assembly and a second section adapted for coupling to a pipe adapter, the mandrel being of a sufficient size to expand the existing cut underground pipe and pipe fittings as it traverses through a bore of the existing underground utility pipe and pipe fittings; and means for engaging the cutter assembly and pulling the cutter assembly and the mandrel and the pipe adapter and the new pipe connected to the pipe adapter through the bore of the existing underground utility pipe and pipe fittings.

5,439,321

## INTERRUPTIVE MOBILE PRODUCTION SYSTEM

Andrew F. Hunter, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Mar. 11, 1993, Ser. No. 29,743

Int. Cl.<sup>6</sup> E02B 17/00

U.S. Cl. 405—195.1

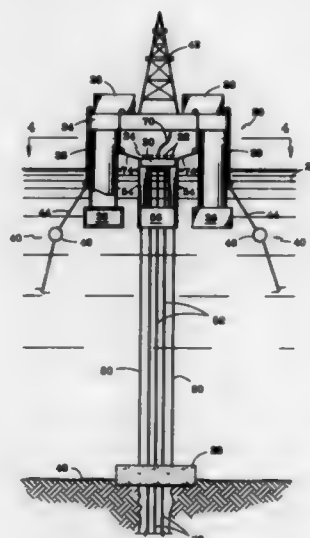
25 Claims

1. An offshore interruptive mobile production system for hydrocarbon production from an offshore reservoir and including provisions for conveniently mobilizing portions of the system for movement to another location, the system comprising in combination:

- a floating semisubmersible structure floating on a surface of

a body of water and containing facilities and equipment for the production of hydrocarbons;

- a small tension leg wellhead platform connected to the semisubmersible structure and having an upper deck positioned above the surface of the water and having wellhead equipment thereon in fluid connection and communication with the facilities and equipment for the production of hydrocarbons, a multiplicity of hollow corner columns, a lower pontoon section positioned below the surface of the water and at or near the bottom of the columns, the water displacement volumes of the columns and pontoon section positioned and sized such as to impart wave transparency attributes to the platform, at least one riser connecting a subsea well in fluid communication to the upper deck of the platform, the riser having lateral bending restraints at



or near the same horizontal level as the lower pontoon section, and tendons connecting the upper deck of the platform to the floor of the body of water, the tendons having lateral restraints at or near the same horizontal level as the lower pontoon section;

mooring means for the floating semisubmersible structure; and

means for conveniently disconnecting the semisubmersible structure from the mooring lines and the wellhead platform wherein fluid communication of the subsea well is shut off upon disconnect, wherein the semisubmersible can be moved to another location, and wherein the wellhead platform remains connected to the floor of the body of water by means of the riser and tendons, the riser and tendons being under sufficient tension so that no riser or tendon will go slack in a design storm.

5,439,322

## ASBESTOS ABATEMENT

Irvin Barnett, P.O. Box 27209, San Diego, Calif. 92198-1209

Filed Nov. 15, 1993, Ser. No. 151,942

Int. Cl.<sup>6</sup> A62D 3/00; B09B 3/00

U.S. Cl. 588—254

9 Claims

1. An aqueous solution for treating an asbestos fiber containing material comprising:

- a. an acid that reacts with carbonates and oxides in said material;
- b. a binder;
- c. a surfactant for increasing wettability, decreasing viscosity, and immunizing said binder from coagulating in said acid; and
- d. a coalescent for merging said binder into a film on drying of said solution; whereby said solution penetrates said asbestos fiber containing material upon application

thereto, causing coalescence or encapsulation of said asbestos fiber to a state immune to flotation in air.

5,439,323

## ROD AND SHELL COMPOSITE RISER

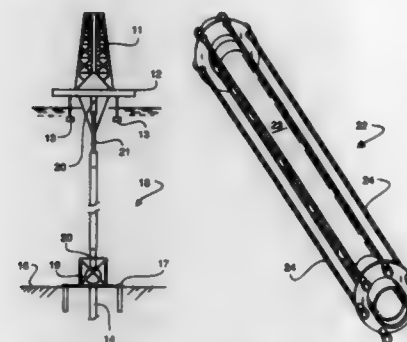
Donald A. Nance, Los Altos, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jul. 9, 1993, Ser. No. 89,724

Int. Cl.<sup>6</sup> E02B 17/00; F21B 17/01

U.S. Cl. 405—195.1

22 Claims



1. A rigid riser section having opposed ends, for use with a fossil fuel borehole comprising the combination of:

- (a) means for carrying radial pressures expected to be applied to said riser section; and
- (b) means separate from said radial pressure carrying means, for transferring tensile loads between said opposed ends, said means extending generally for the full length of said riser section.

5,439,324

## BUMPER DOCKING BETWEEN OFFSHORE DRILLING VESSELS AND COMPLIANT PLATFORMS

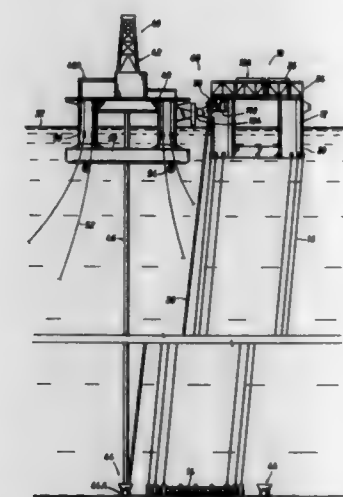
Anders G. C. Ekvall, Houston; David A. Huete, Spring, and Lee K. Brasted, Kingwood, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 1, 1993, Ser. No. 24,584

Int. Cl.<sup>6</sup> E02B 17/00

U.S. Cl. 405—202

19 Claims



1. A bumper system for docking an auxiliary vessel with a compliant platform comprising:

- a first pad presenting a vertically extending outboard face from the auxiliary vessel;
- a second pad presenting a vertically extending complementary outboard face from the compliant platform config-

ured to engage the outboard face of the first pad in vertically slidable abutment; and

a biasing system to push the auxiliary vessel and the compliant platform into abutment across the first and second pads;

whereby the auxiliary vessel docks to the compliant platform in a manner such that vertical loading is not substantially transmitted between the vessel and the compliant platform across the sliding engagement of the abutted first and second pads.

5,439,325

## VARIABLE YIELDING MINING CRIB SUPPORT COLUMN

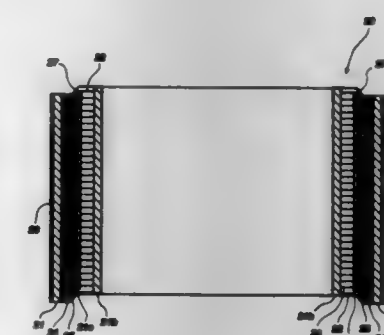
Chris D. Kitchen, Springville, Utah, assignor to Mountainland Support, Inc., Provo, Utah

Continuation-in-part of Ser. No. 23,618, Feb. 26, 1993, Pat. No. 5,342,150. This application Apr. 18, 1994, Ser. No. 229,128

Int. Cl.<sup>6</sup> E21D 11/00

U.S. Cl. 405—288

6 Claims



1. A collapsible crib for a mine roof support column, comprising in combination:

- a triple-walled vertical support structure having a hollow center, said triple walls having an outer wall, a center wall and an inner wall in spaced-apart relationship with each other;
- a composite material filling the aperture between the outer and center walls comprising a composite of urethane formable material and rock aggregate;
- a honeycomb material filling the aperture between the inner and center walls;
- an indent along the upper and lower ends of the triple-walled support structure for interlocking respectively the upper end of one support structure with the lower end of another support structure; and
- a fiberglass jacket surrounding the outer wall for waterproofing the support structure.

5,439,326

## APPARATUS FOR INSERTING PREFABRICATED VERTICAL DRAINS INTO THE EARTH

R. Robert Goughnour, Leesburg, Va., and T. Richard Morris, Matthews, N.C., assignors to Geotechnics America, Inc., Peachtree City, Ga.

Filed Apr. 14, 1993, Ser. No. 46,848

Int. Cl.<sup>6</sup> E02D 3/10, 7/00

U.S. Cl. 405—303

7 Claims

1. Apparatus for inserting flexible drain members downwardly into earth, said apparatus comprising:

- a) a mast adapted to be arranged with a generally vertical extent above the earth, said mast being formed of a lower mast base and an upper light weight mast extension, and having therein a longitudinally extending chamber;
- b) a vehicle supporting said mast base and adapted to raise and lower said mast to and from vertical and to otherwise manipulate and transport said mast;
- c) an earth penetrating tube member carried for vertical



movement in said longitudinal chamber of said mast, said tube member having a passage therethrough for receiving an elongated flexible drain member for movement therewith;

d) drive means positioned on said mast base for driving said tube member into and out of underlying earth;



e) said mast extension including a series of axially aligned extension tubes constructed of light weight material and connected together end to end, and combination spar and guy means connected for supporting said mast extension from said mast base.

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**METAL CUTTING TOOL**

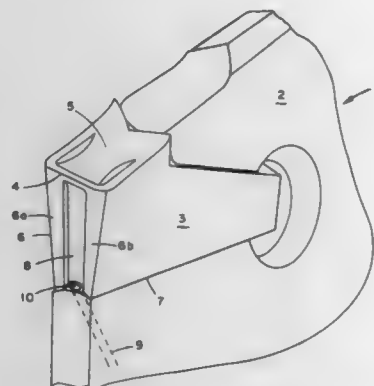
Raphael Wertheim, Kiryat Bialik, Israel, assignor to Iscar Ltd., Migdal Tefen, Israel

Continuation of Ser. No. 948,197, Sep. 18, 1992, abandoned. This application Apr. 7, 1994, Ser. No. 224,174

Claims priority, application Israel, Sep. 27, 1991, 99584

Int. Cl.<sup>6</sup> B23B 27/10

U.S. Cl. 407—11



1. A metal cutting tool having a metal cutting tip with a rake face and a relief flank at least one cutting edge defined therebetween; and at least one groove formed in the surface of said relief flank and bounded on either side by unrecessed portions of said relief flank and constituting a coolant channel and extending towards said cutting edge and being spaced therefrom by a spacing *s*; whereby in use the spacing *s* is at least about equal to a prescribed permissible extent of flank wear as measured in a direction from said cutting edge along said relief flank.

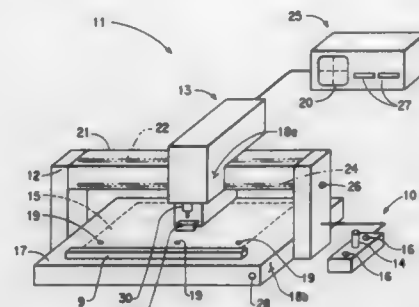
5,439,328  
**SINGLE-HEAD DRILL WITH VIDEO ATTACHMENT**  
Kevin C. Haggerty, Carlisle, Mass.; David L. Fox, North Rose, N.Y.; John L. Fox, Rose, N.Y., and Richard O. Toles, Wolcott, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 24, 1993, Ser. No. 109,371

Int. Cl.<sup>6</sup> B23B 35/00, 41/00

U.S. Cl. 408—1 R

9 Claims



7. A process for locating a hole target on a material and drilling a hole at said hole target using an apparatus having a table mounted on a stationary base, a drill attached to supporting means located adjacent the table and mounted perpendicular to and aligned toward the table, means for providing movement of the table and the supporting means relative to one another, a mirror interposed between the drill and the table, such that a line intersecting said mirror and the drill is perpendicular to the table, said mirror being retractably mounted on the supporting means, and a video imaging system aligned with said mirror, the process comprising mounting said material on the table, the material having a hole target defining the location to be drilled; moving the table and the supporting means relative to one another until said mirror is aligned directly over the hole target and the hole target is displayed by the video imaging system; retracting said mirror from said intersecting line beneath the drill; and drilling a hole in the material at the hole target.

5,439,329

**VALVE MACHINING UNIT**

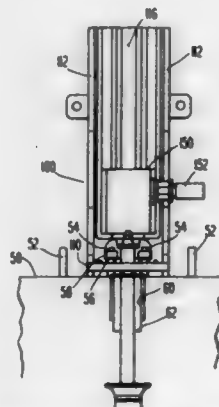
Gerald I. Marron, Broomall, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 30, 1994, Ser. No. 220,349

Int. Cl.<sup>6</sup> B23B 41/12, 35/00

U.S. Cl. 408—1 R

7 Claims



1. A method of machining turbine valves comprising the steps of:  
aligning a base plate of a milling fixture with one or more valve mounting studs;  
attaching the base plate to the turbine using the valve mounting studs;

attaching a fixture to the base plate;  
attaching a milling head to the fixture;  
mounting a first tool in the milling head;  
machining a bonnet bore and sealing face of a valve;  
removing the first tool from the milling head;  
mounting a second tool comprising a tool bar and retractable cutter in the milling head;  
lowering the tool bar into the valve;  
moving the retractable cutter from a retracted position to a cutting position; and  
machining the valve seat of the valve.

5,439,330

**ANCHOR AND METHOD AND SYSTEM FOR SECURING SAME**

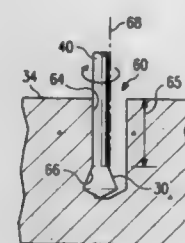
Jeffrey A. Bayer, Dallas, and James A. Lee, Garland, both of Tex., assignors to Stone Anchors, Inc., Dallas, Tex.

Division of Ser. No. 54,820, Apr. 26, 1993, This application Apr. 18, 1994, Ser. No. 228,967

Int. Cl.<sup>6</sup> B23B 35/00

U.S. Cl. 408—1 R

4 Claims



1. A method for forming a drilled hole having a sidewall and a bevelled bottom portion in a hard substance for securing an anchor in the hard substance, the method comprising the steps of:

- (1) forming a cylindrical hole having a cylindrical sidewall and a cylindrical bottom portion in the hard substance using a cutter bit, said cutter bit having an essentially non-abrasive cylindrical shaft portion and an abrasive bevelled head portion, said cylindrical hole being formed to a predetermined depth;
- (2) moving said cutter bit laterally off the center axis of said cylindrical hole by a pre-determined amount such that said shaft non-abrasively contacts the sidewall of the cylindrical hole while the abrasive bevelled head portion continues to drill the cylindrical hole; and
- (3) laterally moving the cutter bit at the pre-determined depth to enlarge the cylindrical bottom portion of the cylindrical hole and form a bevelled bottom portion having a bevelled sidewall that essentially follows the form of the abrasive bevelled head portion to form the drilled hole for receiving the anchor.

5,439,331

**HIGH PRESSURE TAPPING APPARATUS**

Bill D. Andrew, Tulsa; William D. Duwe, Broken Arrow, and Michael L. Wilson, Tulsa, all of Okla., assignors to TDW Delaware, Inc., Wilmington, Del.

Filed Mar. 31, 1994, Ser. No. 220,730

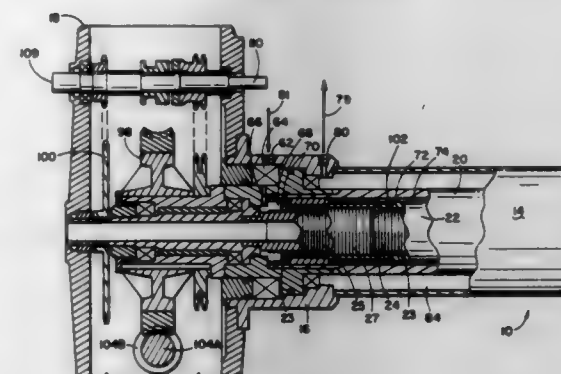
Int. Cl.<sup>6</sup> B23B 41/08

U.S. Cl. 408—8

4 Claims

1. An apparatus for tapping an opening into an existing pipeline or the like under high internal pressure, comprising:  
an elongated tapping machine body having a means on the lower end for attachment to a pipeline that is to be tapped;  
a feed screw positioned longitudinally inside the tapping machine body that rotates about its longitudinal axis;  
a boring bar connected to the feed screw for axial movement relative to the boring bar upon relative rotation of the feed screw and boring bar, the boring bar having means for attachment to a cutter for rotation by the boring bar and

for movement by the boring bar into and out of engagement with a pipeline;  
means for rotating said feed screw;  
a means for rotating said boring bar to tap a pipeline when moved into engagement therewith by the relative rotation of said feed screw and said boring bar;



means for sensing pipeline pressure;  
means to control hydraulic fluid pressure inside said tapping machine body based upon said pipeline pressure to at least in part balance the forces applied to said boring bar; and  
means for controlling the speed of rotation of said feed screw and said boring bar.

5,439,332

**PNEUMATIC SPOT WELD DRILL**

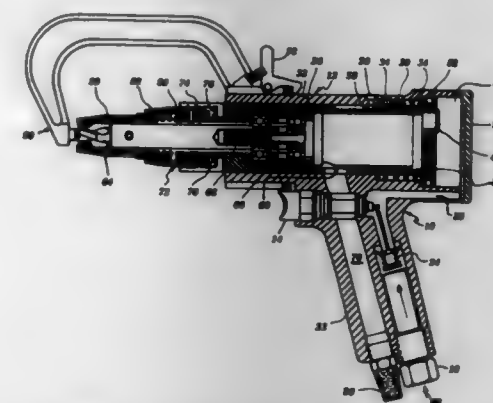
Max W. A. Spitznagel, 13207 Warren Ave., Los Angeles, Calif. 90066

Filed Jun. 11, 1993, Ser. No. 75,997

Int. Cl.<sup>6</sup> B23B 45/14, 47/08, 47/22

U.S. Cl. 408—84

12 Claims



1. A pneumatic spot weld drill, comprising:  
a) a drill housing assembly including a trigger assembly for providing a supply of pressurized gas, said drill housing assembly comprising a spring bias means for providing piston assembly return pressure;  
b) a piston assembly positioned within said drill housing assembly and axially translatable thereto, said piston assembly being actuated by said pressurized gas so as to provide cutting pressure for a drill bit;  
c) a motor assembly contained within said drill housing assembly, said motor assembly having a rotatable output shaft, said output shaft for securing a drill bit and for providing rotary movement of said drill bit; and,  
d) a control valve for receiving a supply of said pressurized gas and for controllably discharging said pressurized gas to said motor assembly, said control valve providing said cutting pressure at a desired level and providing rotary motion of said drill bit.

5,439,333

**COOLANT FEEDER IN A TOOL HOLDER ASSEMBLY**  
Haruaki Kubo, Nara, Japan, assignor to Daishowa Seiki Co., Ltd., Osaka, Japan

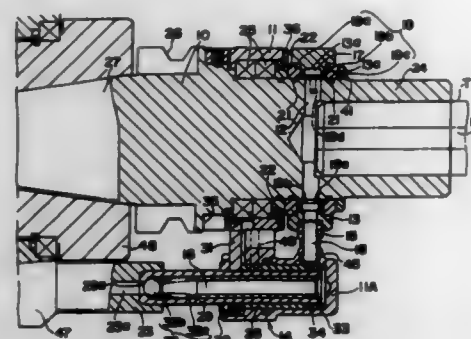
Filed Feb. 17, 1994, Ser. No. 196,159

Claims priority, application Japan, Jun. 18, 1993, 5-147851;  
Jul. 27, 1993, 5-184627

Int. Cl.<sup>6</sup> B23Q 11/10

U.S. Cl. 409—136

18 Claims



1. A coolant feeder in a tool holder assembly which has a rotary shaft for mounting from the spindle of an associated machine tool, the feeder comprising a stationary support member for journaling the rotary shaft, a stationary coolant feeder ring assembly having a hollow interior is disposed adjacent to said stationary support member, said stationary coolant feeder ring assembly being in fluid communication with a tool holding passage within the rotary shaft, a coolant coupling device having a hollow interior, a coolant pipe for maintaining fluid communication between the hollow interior of the coolant coupling device, the stationary support member, said passage, and said coolant feeder ring assembly.

5,439,334

# **QUICK CHANGE GEAR BOX FOR HARDWARE DRILLING MACHINE**

G  nther Grabher, Fussbach, Austria, assignor to Grass AG, Hochst/Vibg., Austria

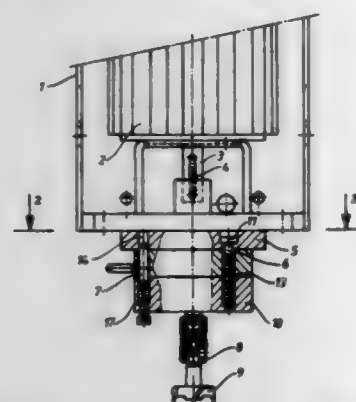
Filed Jun. 27, 1994, Ser. No. 266,946

Claims priority, application Germany, Jun. 28, 1993, 9309483  
U

Int. Cl.<sup>6</sup> B23Q 5/00; B23B 47/02

U.S. Cl. 409—230

3 Claims



1. Quick change gear box for a hardware drilling machine of the type having a machine frame stand supporting a motor with a rotatable shaft which is connectable to a vertical boring tool, the quick change gear box comprising:

a mounting plate attachable to said machine frame stand and having portions defining at least two elongate coupling bolt recesses and at least one catch pin bore hole, each recess having a coupling bolt bore hole at a first end of the recess and a coupling bolt slot leading from the coupling

bolt bore hole to a second end of the recess, and each coupling bolt slot having an upper surface; and a fastening block for supporting said boring tool having at least two spring biased headed coupling bolts receivable through respective ones of said coupling bolt bore holes into said first recess end in an uncoupled position of the coupling bolt and moveable in the recess to said second recess end in a coupled position of the coupling bolt with the coupling bolt head urging a clamping force toward the fastening block on said coupling bolt slot upper surface, the coupling bolt slot including means increasing said clamping force on movement of the coupling bolt from the first recess end toward the second recess end, and the fastening block having a spring biased catch pin inserting said catch pin bore hole.

5,439,335

# **APPARATUS FOR CUTTING A KEYWAY IN A MILL ROLL**

Gary L. Curtis, River Falls, Wis.; Gregory A. Johnson, Dearborn Heights, Mich., and Paula M. Tuebo, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

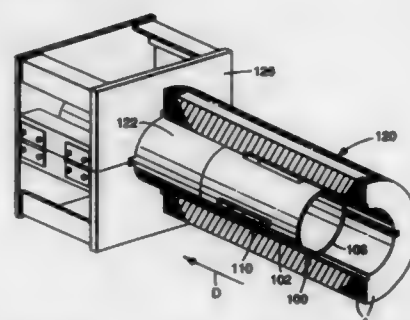
Division of Ser. No. 85,285, Jun. 30, 1993, abandoned, which is a division of Ser. No. 971,940, Nov. 5, 1992, Pat. No. 5,247,740.

This application Jun. 16, 1994, Ser. No. 260,518

Int. Cl.<sup>6</sup> B23D 37/04

U.S. Cl. 409—259

31 Claims



1. An apparatus for cutting a longitudinally extending keyway portion in a stack of mill roll discs comprising:

- (a) a cutting head comprising:
    - (i) a cylindrical body portion having a central longitudinal axis, and
    - (ii) a cutting tool provided on said body portion for cutting the keyway portion;
  - (b) a stack of mill roll discs including a first end, a second end, a concentric central bore extending between said first and second ends, and a central longitudinal axis;
  - (c) means for supporting said stack of discs; and
  - (d) means for inducing relative motion between said cutting head and said stack of discs along the respective longitudinal axes to drive said cutting head through said bore from said first end to said second end of said stack of discs to progressively cut the longitudinally extending keyway portion in said stack of discs;
- wherein said body portion is sized to slide along said central bore thereby maintaining said body portion concentric with said central bore.

5,439,336

# **STUD END PIERCE NUT**

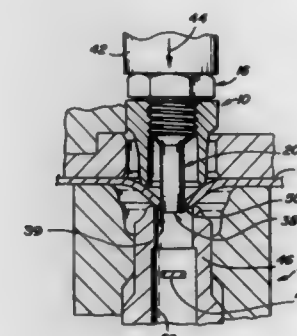
Rudolf R. M. Muller, Frankfurt, Germany, assignor to Profil Verbindungstechnik GmbH & Co KG, Germany  
Division of Ser. No. 774,437, Oct. 10, 1991, Pat. No. 5,309,618, which is a continuation-in-part of Ser. No. 457,060, Dec. 26, 1989, Pat. No. 5,072,518, and Ser. No. 491,925, Mar. 12, 1990, Pat. No. 5,092,724, which is a division of Ser. No. 196,209, May 19, 1988, Pat. No. 4,915,558, which is a division of Ser. No. 892,017, Aug. 1, 1986, Pat. No. 4,765,057, which is a division of Ser. No. 773,387, Sep. 6, 1985, Pat. No. 4,633,560, which is a division of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, and Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701, which is a continuation of Ser. No. 229,274, Jan. 28, 1981, abandoned, said Ser. No. 485,099, is a division of Ser. No. 229,274, Jan. 28, 1981, said Ser. No. 457,060, is a division of Ser. No. 271,123, Nov. 14, 1988, Pat. No. 4,893,394, which is a division of Ser. No. 111,966, Oct. 21, 1987, Pat. No. 4,831,698, which is a continuation-in-part of Ser. No. 69,804, Aug. 17, 1987, Pat. No. 4,810,143, which is a division of Ser. No. 869,507, Jun. 2, 1986, Pat. No. 4,700,470, which is a division of Ser. No. 657,570, Oct. 4, 1984, Pat. No. 4,610,072, which is a continuation-in-part of Ser. No. 563,833, Oct. 4, 1984. This application Oct. 20, 1993, Ser. No. 138,094

Claims priority, application Germany, Feb. 2, 1980, 3993908

Int. Cl.<sup>6</sup> F16B 37/04; B23P 11/00

U.S. Cl. 411—179

27 Claims



1. A fastener assembly adapted to be attached to a panel, comprising:

- a female fastener element having a body portion having an axial bore therethrough and a panel riveting portion integral with said body portion and extending generally axially beyond said body portion,
  - a male fastener element having a portion retained within said axial bore of said female fastener and a quill portion integral with said shank portion, said quill portion extending beyond said panel riveting portion of said female fastener element, and
- wherein said fastener assembly is adapted to be received into said panel and wherein said quill portion of said male fastener is adapted to engage a hole in said panel thereby generally locating said fastener assembly relative to said panel hole, and wherein said panel riveting portion of said female fastener is adapted to engage said panel thereby riveting said fastener assembly to said panel.

5,439,337

# **LOCK NUT**

Hiroshi Kakimoto, 31-8, Akitsu-cho 4-chome, Higashimurayama-shi, Tokyo 189, Japan

Filed Apr. 12, 1994, Ser. No. 226,464

Claims priority, application Japan, Apr. 12, 1993, 5-110070  
Int. Cl.<sup>6</sup> F16B 39/04, 39/12

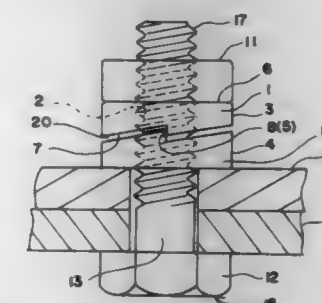
U.S. Cl. 411—240

11 Claims

1. A lock nut comprising a first nut and a second nut each having at its outer periphery in the radial direction polygonal planes, each having the same helical groove on the inner surface of a hole provided therein, and each having first and

second end surfaces, said pair of nuts being superposed in the axial direction,

said first end surface of said first and second nuts being planar, said first and second nuts including locking means provided on said second end surface for preventing the rotation of said first and second nuts relative to each other, thereby preventing the loosening of said lock nut, said first and second nuts intended to be integrally and rotationally screwed on the outer periphery of the shank of a bolt by engaging with each other,



the pair of first and second nuts when engaged satisfying the following conditions:

- (1) said polygonal planes of said first nut and said second nut are aligned in the axial direction;
- (2) the leading end of said helical groove of said second nut is located on an elongated line of said helical groove at the trailing end of said helical groove of said first nut; and
- (3) said locking means are to be so formed that a pressing force in the axial direction is not transmitted between said second end surfaces of said first and second nuts in the axial direction.

5,439,338

# **ANCHORAGE AND INSTALLATION TOOL**

Mikael Rosenberg, Agatan 35 B, S-295 34 Brom  lla, Sweden  
PCT No. PCT/SE92/00775,   371 Date May 10, 1994,   102(e)  
Date May 10, 1994, PCT Pub. No. WO93/10363, PCT Pub. Date May 27, 1993

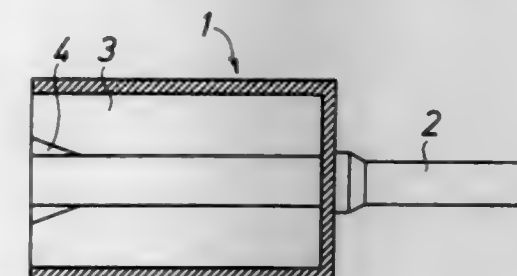
PCT Filed Nov. 11, 1992, Ser. No. 240,744

Claims priority, application Sweden, Nov. 13, 1991, 9103335

Int. Cl.<sup>6</sup> F16B 23/00, 25/00; B25B 13/00

U.S. Cl. 411—400

13 Claims



1. An anchorage arrangement for anchoring a member to a wall, said anchorage arrangement comprising a socket and an anchor bolt engageable in said socket, said socket having an inner recess formed by intersecting channels defining a cruciform section for said recess, said socket including an extension pin drivingly connectable to a rotary drive means so that the socket can be driven in rotation, said socket having four chamfers formed at intersecting corners of the channels of the recesses, said chamfers extending from an open end of the socket inwardly thereof and being tapered to diminish in height as the chamfers extend inwardly of the socket, said anchor bolt including a stem, an end portion on said stem and a conical



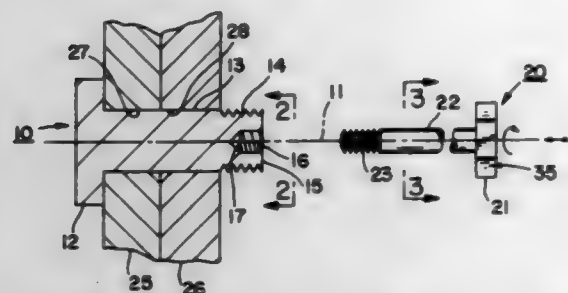
extension secured to said stem, said end portion being engageable in said recess in said socket with said conical extension engaging said chamfers.

5,439,339

# **EXTERNALLY THREADED INTERFERENCE FIT FASTENER WITH OPPOSITELY THREADED PULLER**

John S. Batchelor, Rugby, England, assignor to Hi-Shear Corporation, Torrance, Calif.  
Filed Dec. 1, 1993, Ser. No. 160,049  
Int. Cl.<sup>6</sup> F16B 23/00, 35/06  
U.S. Cl. 411—407

2 Claims



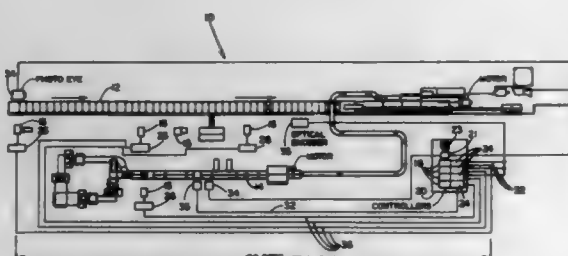
1. In combination: a fastener pin having a head, a shank, an unheaded end, an external thread adjacent to said unheaded end, a recess opening onto said unheaded end, and an internal thread in said recess, said internal thread being of a first hand, and said external thread being of a second, opposite, hand; and a puller comprising wrench-engaging means adapted for pulling and rotation, a shank, and an external thread on said shank of said first hand, dimensioned to mate with said internal thread in said recess, whereby with the puller threaded into the recess, an axial force can be exerted by it to pull the pin into a hole in a workpiece, and a torque can be exerted on said puller in opposition to torque exerted on a collar or nut threaded to the external thread, whereby to prevent the pin from freely rotating in the hole while the collar or nut is being torqued, said puller having no other connection of any kind with said fastener pin, said collar or nut, or with any object threadably connected with said fastener pin or said collar or nut.

5,439,340

# **PRINTED DOCUMENT ASSEMBLY APPARATUS INCLUDING REMOTELY CONTROLLED PRINTING DEVICE**

Jeffrey R. Volkman, Madison Lake, Minn., assignor to Brown Printing Company, Minneapolis, Minn.  
Filed Mar. 11, 1994, Ser. No. 209,222  
Int. Cl.<sup>6</sup> B42C 13/00  
U.S. Cl. 412—11

10 Claims



1. An apparatus for integrating plural printed documents in stacked relationship, comprising:

- (a) a conveyor belt for conveying plural material documents therealong;
- (b) binding means downstream of said stacking station for binding said plural material documents;

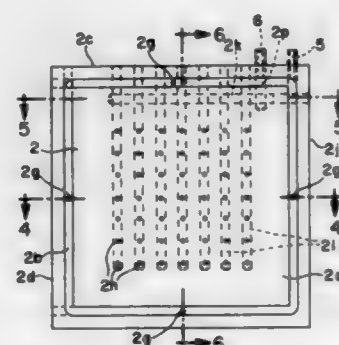
- (c) means responsive to control signals for printing indicia on said plural material documents;
- (d) controller means located remote from said printing means for generating said control signals; and
- (e) interface means coupled to both said controller means and said printing means for relaying and amplifying said control signals transmitted therebetween.

5,439,341

# **NON-CONTACT TYPE MOVING TABLE**

Nobuto Yamazaki, Minoru Torihata, and Shinji Maki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan  
Filed Aug. 4, 1993, Ser. No. 101,847  
Claims priority, application Japan, Aug. 4, 1992, 4-227975  
Int. Cl.<sup>6</sup> F16C 32/06  
U.S. Cl. 414—676

2 Claims



2. A non-contact type XY moving table assembly for a semiconductor processing machine comprising:

- a guide table having a guide surface which is a flat top surface thereof; and
- a moving table installed on said guide table, said moving table having a moving surface which faces said guide surface of said guide table, and said moving table being provided with a plurality of air supply holes around a circumference of said moving table and a plurality of vacuum suction holes which are opened on said moving surface and surrounded by said plurality of air supply holes;
- a source of compressed air and vacuum coupled respectively to said air supply and vacuum suction holes so that compressed air is blown out of said air supply openings towards said guide surface of said guide table and vacuum suction is effected onto said guide surface of said guide table so that said moving table floats on and is movable on said guide surface of said guide table.

5,439,342

# **SAFETY BARRIER/RAMP ACTUATING MECHANISM FOR WHEELCHAIR LIFTS**

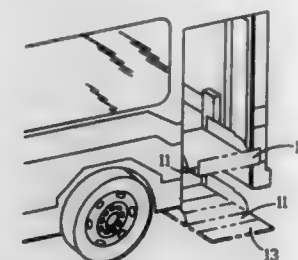
John C. Hall, Hayward, and Lee B. Petersen, Jr., Castro Valley, both of Calif., assignors to All American Transit Parts, Inc., Oakland, Calif.  
Filed Feb. 18, 1994, Ser. No. 198,227  
Int. Cl.<sup>6</sup> B60P 1/46  
U.S. Cl. 414—545

8 Claims

1. An improved safety barrier/ramp actuating mechanism for combination folding stair and platform wheelchair lifts which translate from one configuration to the other depending upon the purpose to be served, said combination stair and lift having a horizontally disposed panel forming both the bottom step of the folding stair configuration of said combination as well as the outer horizontally projecting lift panel of the platform configuration of said combination depending upon in which configuration of the stairs or platform the combination has been positioned, said combination including a safety barrier/ramp panel which is pivotally hinged about a pivot/hinge

axis proximate to the outer edge of said horizontally disposed bottom step/outer panel, said barrier/ramp being disposed in a retracted substantially horizontal position folded flat against said bottom step on top thereof and acting as a tread for the lower stair step of said folding stair configuration, said barrier/ramp being pivotable to a substantially vertical projecting raised barrier position and subsequently to a substantially horizontal extended position in a ramp configuration at the end of said outer panel when said lift is disposed in said platform configuration, the improved safety barrier/ramp actuating mechanism comprising:

- a slide plate disposed internally of said bottom step/outer panel and arranged to reciprocate horizontally and perpendicular to the pivot/hinge axis of said barrier/ramp,



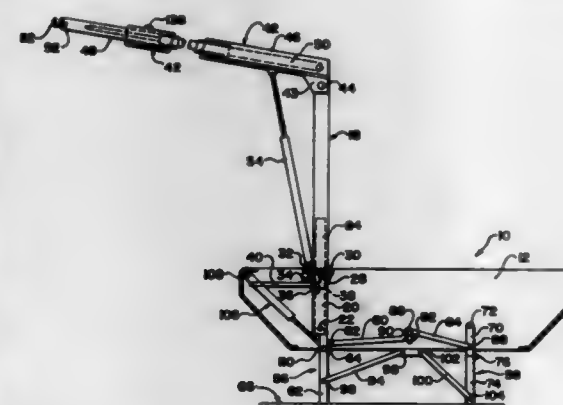
- a connecting linkage secured between said slide plate and said barrier/ramp, said linkage being retracted between said bottom step/outer panel and said barrier/ramp when said barrier/ramp is retracted to form the tread of said lower stair step, said linkage allowing said barrier/ramp to depend downward from said outer panel without lockup when said barrier/ramp is disposed in said ramp configuration, whereby as said slide plate reciprocates between its limits of motion, said barrier/ramp moves between its retracted, raised, and extended positions, and
- a means disposed internally of said bottom step/outer panel and operatively connected to said slide plate for reciprocating said slide plate between its limits of motion to raise and lower said barrier/ramp.

5,439,343

# **MINI BOOM BUMPER**

Jeff Watson, Box 53, Mountain View, Alberta, Canada  
Filed Mar. 31, 1994, Ser. No. 221,238  
Claims priority, application United Kingdom, Apr. 13, 1993, 9307497  
Int. Cl.<sup>6</sup> B66C 5/00  
U.S. Cl. 414—744.3

15 Claims



- 1. A hoist comprising: an elongate housing; means for mounting the housing across a vehicle frame as a bumper;
- a mast pivotally mounted on the housing for movement between a stored, lateral position within the housing and

an upright, extended position projecting upwardly out of the housing;

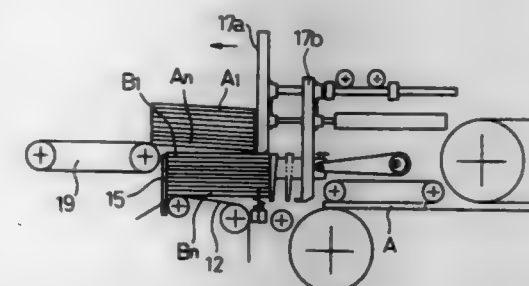
- a boom pivotally mounted on the mast for pivotal movement between a stored position extending along the mast and an in-use position projecting from the mast;
- support legs mounted on the housing at positions spaced therealong for movement of each leg between a stored position substantially within the housing and an extended position projecting downwardly from the housing for supporting the housing on a ground surface; and
- linkage means coupling the support legs and the mast for moving the support legs between the stored and extended positions of the support legs simultaneously with movement of the mast between the stored and extended positions of the mast.

5,439,344

# **CORRUGATED CARDBOARD BOX COUNTING AND DISCHARGING DEVICE**

Haruo Yoshizuka, Kanazawa, and Junichi Takeda, Hakui, both of Japan, assignors to Kabushiki Kaisha Ishikawa Seisakusho, Ltd., Kanazawa, Japan  
Filed Nov. 4, 1994, Ser. No. 334,076  
Int. Cl.<sup>6</sup> B65G 60/00  
U.S. Cl. 414—789.1

3 Claims



1. A corrugated cardboard box counting and discharging device which is arranged to vertically stack and store folded corrugated cardboard boxes successively forwarded in a horizontal direction until the number of said boxes reach a predetermined number, and a group of the predetermined number of the boxes are moved all together in a horizontal direction again and discharged for a next process, comprising:

- a rotary screw provided with a spiral vane which is spirally wound two or three turns for receiving corrugated cardboard boxes one by one forwarded thereto and successively stacking said boxes vertically upward from the bottom;
- a first pusher bar and a second pusher bar each provided with a dividing member for sorting a group of corrugated cardboard boxes successively forwarded wherein when said stacked and stored corrugated cardboard boxes have reached a predetermined number, the dividing member is inserted into the bottom of a lowermost corrugated cardboard box for transporting the predetermined number of the boxes stacked on the dividing member in a horizontal direction for a next process; and
- a driving source for reciprocally operating the first pusher bar and second pusher bar.

5,439,345

**AUTOMATIC DISTRIBUTOR OF STACKED PACKAGES**  
Argazzi Ivo, Pianoro, Italy, assignor to Progetto Automazione S.R.L., Parma, Italy

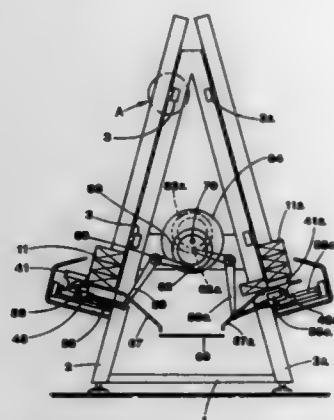
Filed Feb. 4, 1994, Ser. No. 191,612

Claims priority, application Italy, Feb. 8, 1993, BO93A0039 U

Int. Cl.<sup>6</sup> B65G 59/06

U.S. Cl. 414-797.9

8 Claims



1. An automatic distributor of packages comprising: two parallel rows of package stacking means inclined and convergent upwards, said stacking means having vertical channels for stacking the packages, and having counter-facing outlets; delivering means for each channel for delivering one package from each channel, with each delivering means including a delivery element sliding transversely to a longitudinal axis of the distributor; means for transporting delivered packages to a collecting zone, said transporting means being situated between said two rows of stacking means; said delivering means having guide elements having slide guides perpendicular to a longitudinal axis of said transporting means; delivering elements slidingly guided by said slide guides and moved to cross transversely at least one of said channel to push a lowermost package of the respective stack of packages out of said channel; holding elements to hold said delivering elements when inoperative; and operating means, for operating said delivering means.

5,439,346

**PNEUMATIC PRESSURE AUTOMATIC BRAKING MECHANISM**

Gregory A. Bowser, Boynton Beach, and Edward C. McCollough, Lantana, both of Fla., assignors to Air Turbine Technology, Inc., Boca Raton, Fla.

Filed Sep. 16, 1993, Ser. No. 122,375

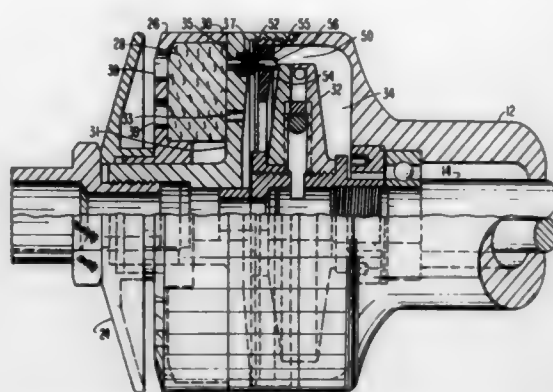
Int. Cl.<sup>6</sup> F01D 1/34

U.S. Cl. 415-18

13 Claims

1. A rotary apparatus comprising: a housing adapted to receive a pressurized fluid and to discharge the received pressurized fluid so as to create an exhaust pressure;

a rotor mounted in said housing and being rotatable therein in response to the receipt of said pressurized fluid; and



braking means, responsive to the absence of said exhaust pressure, for preventing said rotor from rotating.

5,439,347

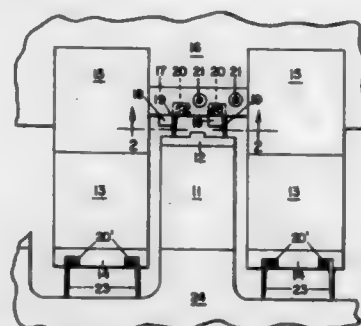
**TURBINE TIP SEAL DAMAGE PROTECTION MEANS**  
Ronald E. Brandon, 652 Jubilee St., Melbourne, Fla. 32940

Filed Aug. 31, 1994, Ser. No. 298,595

Int. Cl.<sup>6</sup> F01D 11/08

U.S. Cl. 415-121.2

5 Claims



1. In a steam or gas turbine employing tip seals which are disposed between a stationary shell or spill strip holder and a rotating bucket cover or shroud to minimize steam leakage, the improvement for limiting particulate damage to the tip seals and adjacent components comprising:

a scoop plate mounted on the shell or spill strip holder from which the tip seals depend, circumferential openings in the tip seals, and expulsion scoops on the scoop plate adjacent the tip seals for deflecting particulate material through the circumferential openings in the tip seals for minimizing damage thereto.

5,439,348

**TURBINE SHROUD SEGMENT INCLUDING A COATING LAYER HAVING VARYING THICKNESS**

John H. Hughes, Manchester; David M. Nissley, Marlborough, both of Conn.; Kevin N. McCusker, Framingham, Mass., and Charles A. Ellis, Stuart, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1994, Ser. No. 220,084

Int. Cl.<sup>6</sup> F01D 11/12

U.S. Cl. 415-173.4

5 Claims

1. A turbine shroud segment including a substrate formed from a first material and a coating layer formed from a second material, the substrate having a quadrilateral-shaped mating surface extending in two directions and having (an) four edges, the coating layer having a thickness  $t$  and being bonded to the mating surface, the coating layer extending over the mating

5,439,350

**HOUSING FOR CEILING FAN**

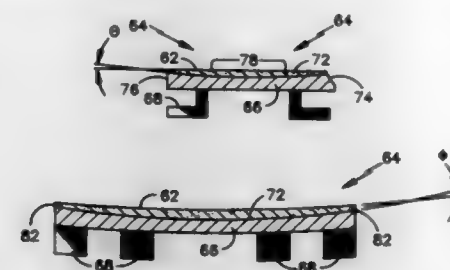
Jack Yu, No. 109-1, Avenue 6, Lane 164, Tzong Sa Road, Da Du Hsiang, Taichung Hsien, Taiwan

Filed Oct. 26, 1994, Ser. No. 329,640

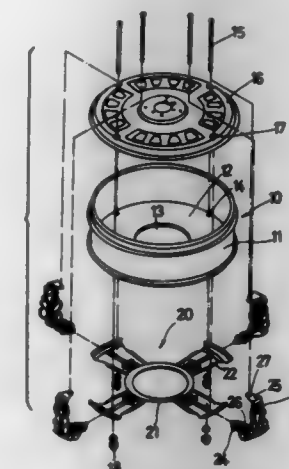
Int. Cl.<sup>6</sup> F04D 29/00

U.S. Cl. 416-5

2 Claims



of all four edges and (toward the edge) such that a cross-section of the coating layer forms an angle, and wherein the angle is less than or equal to ten degrees.



1. A housing for a ceiling fan comprising: a body including a cylindrical member and a bottom plate having an opening formed therein, a cap engaged on said body, a frame including a ring element aligned with said opening of said bottom plate and a plurality of extensions radially extended outward from said ring element for engaging with said bottom plate, and means for coupling said body, said cap and said frame together.

5,439,351

**HEAT PIPES**

David W. Artt, Belfast, Northern Ireland, assignor to Rolls-Royce, plc, Derby, England

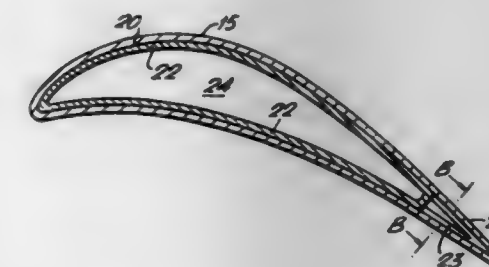
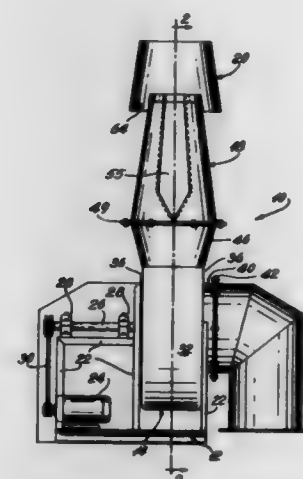
Filed Jun. 15, 1978, Ser. No. 917,270

Claims priority, application United Kingdom, Jul. 22, 1977, 30809

Int. Cl.<sup>6</sup> F01D 5/18

U.S. Cl. 416-95

4 Claims



1. An exhaust fan apparatus comprising a housing having an upper portion and a lower portion, wherein the lower portion includes a centrifugal fan scroll casing, the scroll casing having parallel side walls, a shaft extending within the casing normal to the side wall and mounting an impeller for rotation therein, motor means for driving the shaft, an inlet port provided axially of the fan shaft axis on a side wall of the casing, a discharge port extending from the scroll, a first tubular diffuser portion communicating with the fan discharge port and a second tubular portion extending upwardly from the first tubular portion, the second tubular portion being bifurcated to provide at least two passageways having generally parallel axes generally normal to the axis of the fan shaft, and wherein the axes of the passageways lie in a plane which is parallel to the axis of the fan.

1. An aerofoil blade for a gas turbine engine, said aerofoil blade having a leading edge region and a trailing edge region and including a heat pipe comprising a sealed container, a material capable of vapourisation and condensation within the temperature limits at which said heat pipe is adapted to operate, and capillary means, said material and said capillary means being enclosed within said sealed container, said capillary means being capable of causing transport of the condensed vapour from a cooler to a hotter region of the container, the condensed vapour being transported from the hotter area to the cooler area by the vapour pressure gradient between the two areas, said vapour being condensed in the cooler area, at



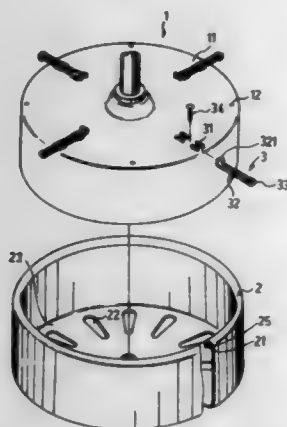
least one portion of said capillary means being in the form of a porous material positioned adjacent to and in substantial contact with the internal wall of said container and the remainder portion of said capillary means being in the form of grooves formed directly in the internal wall of said container at least in the trailing edge region of said aerofoil blade, said at least one portion of said porous material of said capillary means and said remainder portion of grooves of said capillary means being connected in flow series and in an abutting nonsuperposed relationship.

5,439,352

## DECORATIVE CASING FOR A CEILING FAN

Chin Line, P.O. Box 82-144, Taipei, Taiwan  
Filed Mar. 1, 1993, Ser. No. 24,241  
Int. Cl.<sup>6</sup> F04D 29/62

U.S. Cl. 416-170 R



1. A decorative casing for a ceiling fan having a body portion, characterized in that said decorative casing is provided with an upper edge curving inwards to form a rack and a bottom having a plurality of slots for dissipating heat evolved from a motor of said ceiling fan, said body portion having a top with a plurality of radial engaging mechanisms each of which includes two pairs of guides and a resilient supporting member having a raised portion at one end and a roller at another end, the roller of said resilient supporting member being engageable with the rack of said decorative casing.

5,439,353

## COMPOSITE BLADE WITH REINFORCED LEADING EDGE

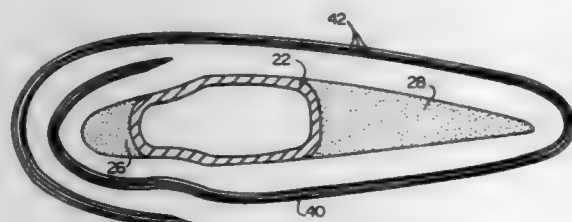
James A. Cook, Agawam, and David P. Nagle, Westfield, both of Mass., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 123,769, Sep. 20, 1993, which is a continuation of Ser. No. 832,119, Feb. 6, 1992, abandoned. This application Jun. 9, 1994, Ser. No. 257,401

Int. Cl.<sup>6</sup> F01D 5/14

U.S. Cl. 416-230

7 Claims



1. A composite propulsor blade comprising:  
a spanwisely extending load bearing spar assembly having a

leading edge, a trailing edge, and a pressure side and a suction side extending therebetween; and  
an outer shell disposed about said spar assembly, said shell having a first relatively uniform thickness overlapping the leading edge of said spar assembly and a second relatively uniform thickness overlapping the remainder of said spar assembly, said first thickness being about twice as thick as said second thickness.

5,439,354

## HOLLOW AIRFOIL IMPACT RESISTANCE IMPROVEMENT

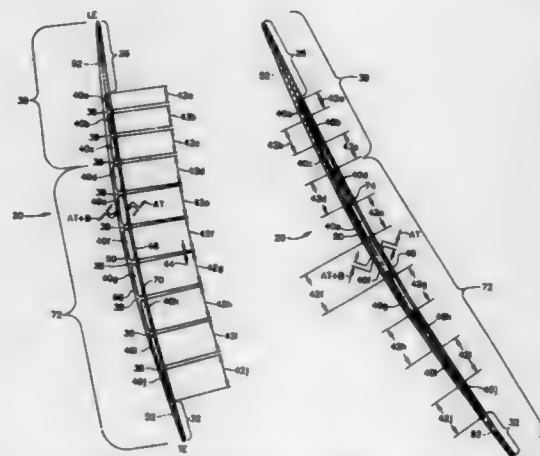
Kurt L. Hansen, Cincinnati; Jay L. Cornell, Hamilton, and Jan C. Schilling, Middletown, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 15, 1993, Ser. No. 76,668

Int. Cl.<sup>6</sup> F01D 5/18

U.S. Cl. 416-233

22 Claims



1. A hollow airfoil including a flow axis that extends from a forward location to an aft location, said hollow airfoil comprising:

- a root section located at the base of said airfoil;
- a tip section located distally from said root section;
- a leading edge connecting said root section and said tip section and facing forward along the flow axis;
- a trailing edge connecting said root section and said tip section and facing aft along the flow axis and a chord length extending between said trailing edge and said leading edge that generally bisects a cross section of the airfoil at a radial position between said root and tip sections;
- a skin that extends between and connects said root section, said tip section, said leading edge and said trailing edges and forms an outer surface of said airfoil;
- said skin having a first and second oppositely disposed sides extending substantially along said chord length and bounded by said root section, said tip section, said leading edge and said trailing edge;
- a plurality of spacers located between said leading edge and said trailing edge, each of said spacers extending between and enclosed by and supporting said skin sides and forming a plurality of non-uniformly sized cavities having widths that increase in length from said leading edge towards said trailing edge as measured along said chord length; and
- said spacers angled at an angles other than 90 degrees with respect to said sides and said chord forming a corrugated truss structure with said sides.

5,439,355

## METHOD AND APPARATUS TO TEST FOR VALVE LEAKAGE IN A PUMP ASSEMBLY

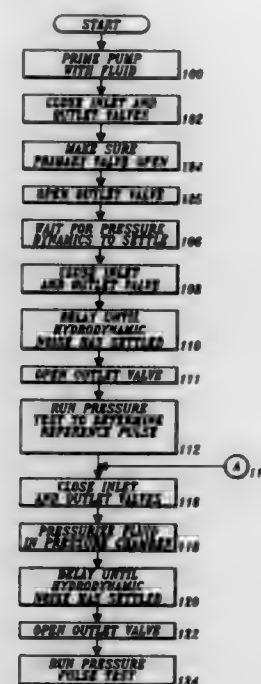
Walter L. Jimison, Palo Alto; Craig S. Barker, San Carlos, and Marc R. Bunyard, Milpitas, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Nov. 3, 1993, Ser. No. 147,154

Int. Cl.<sup>6</sup> F04B 21/02

U.S. Cl. 417-63

39 Claims



1. A pump assembly having the capacity to self test for leakage, comprising:

- a pumping chamber in which a fluid is pressurized during a pumping cycle;
- an inlet valve that periodically interrupts fluid flow into and out of the pumping chamber, with respect to a source of the fluid disposed upstream of the inlet valve;
- an outlet valve that periodically interrupts fluid flow into and out of the pumping chamber, with respect to a delivery passage through which a pressurized fluid flows when the pump assembly is operating to pump the fluid;
- a pressure sensor, disposed downstream of the outlet valve and operative to sense the pressure of the fluid and to produce a signal indicative of that pressure; and
- control means for controlling the pumping cycle, including self test means connected to receive the signal produced by the pressure sensor, for:
  - filling the pumping chamber with fluid;
  - closing the inlet and outlet valves;
  - equalizing pressure in the pump assembly distal to the inlet valve;
  - opening the outlet valve and then determining a reference pulse as a function of the signal produced by the pressure sensor when the outlet valve is opened;
  - closing the outlet valve and effecting at least a partial pumping cycle to pressurize fluid in the pumping chamber for a predetermined time interval, and thereafter terminating the pumping cycle;
  - opening the outlet valve after the pumping chamber has been pressurized; and
  - determining whether the pump assembly has leaked, as a function of the reference pulse and the signal produced by the pressure sensor after the outlet valve is opened in section (e)(vi).

5,439,356

## HYDRAULIC MOTOR AND PUMP HAVING HYDRAULIC COUNTER BALANCING MEANS

Thomas Grahl, Neumunster, Germany, assignor to Sauer Inc., Ames, Iowa

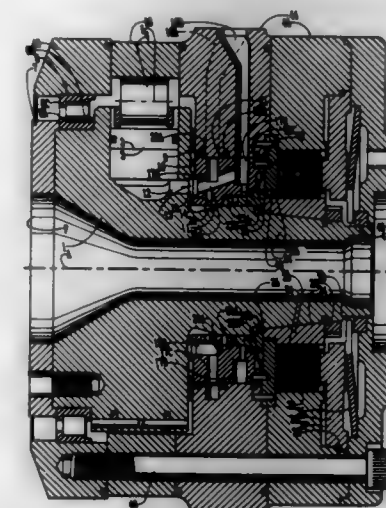
Filed Apr. 11, 1994, Ser. No. 225,603

Claims priority, application Germany, Apr. 13, 1993, 43 11 997.2

Int. Cl.<sup>6</sup> F04B 1/04

U.S. Cl. 417-273

5 Claims



1. A fluid pressure unit including a hydraulic motor or hydraulic pump having a stationary housing, the fluid pressure unit comprising:

- a rotor and a stator and a bearing arrangement supporting the rotor with respect to the stator and allowing relative rotation of these elements about a geometrical axis and ensuring axial hold in both directions;
- a cam ring fixed to the stator and a cylinder block as a part of the rotor containing cylinder bores which are disposed substantially in a radial direction and pistons which are capable of sliding in the cylinders, each piston being equipped with a roller abutting on the cam ring;
- outlets in a side face of each cylinder for interacting with a distribution face of a control device being part of the stator, whereby upon generation of hydraulic separating forces between the cylinder block and the control device, the hydraulic separating forces are compensated for hydraulically, characterized in that by means of pressurized substantially annular shaped areas on the control device, delimiting annular chambers in an axial direction, which are formed between the control device and an adjacent counterpart, the counterpart being maintained in position against the hydraulic separating forces and that said counterpart is fastened to the rotor and is rotating with the rotor.

5,439,357

## MAGNETICALLY GUIDED POSITIVE-DISPLACEMENT MACHINE

Benoit Barthod, Cran Gevrier; Jean-Pierre Chicherie, Annecy-Le-Vieux, and Denis Perrillat-Amede, Annecy, all of France, assignors to Alcatel Cit, Paris, France

Filed Feb. 3, 1994, Ser. No. 190,983

Claims priority, application France, Feb. 19, 1993, 93 01926

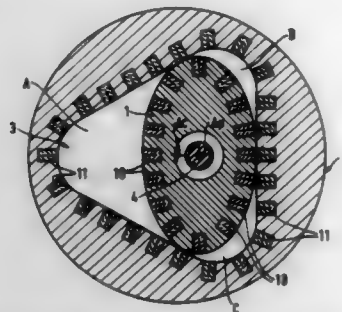
Int. Cl.<sup>6</sup> F04B 17/00

U.S. Cl. 417-410.3

20 Claims

1. A positive-displacement machine comprising a cylindrical piston which has an axis  $\Delta_p$ , which is rotary, and which is situated in a cylindrical casing which has an axis  $\Delta_c$ , wherein, in a plane perpendicular to its axis  $\Delta_p$ , said piston has a cross-

section that is hypertrochoidal in geometrical shape and that has  $S_p$  axes of symmetry, said casing delimiting a hollow volume whose cross-section in a plane perpendicular to its axis  $\Delta c$  is hypertrochoidal in geometrical shape and has  $S_c$  axes of symmetry,  $S_p$  and  $S_c$  differing from each other by unity, the axes  $\Delta p$  and  $\Delta c$  being parallel and separated by a distance  $E$ , said piston being mounted to rotate freely about its axis  $\Delta p$ , on a crank pin that has an axis  $\Delta p$ , and that is secured to a shaft



having an axis  $\Delta c$  and supported by said casing, said shaft being designed to be rotated about its axis  $\Delta c$  by drive means, the piston and the casing delimiting at least three chambers between them, and the casing including at least one suction inlet and one delivery outlet, and wherein the rotation of the piston in its orbital motion about the axis  $\Delta c$  of the casing is created by magnetic repulsion forces by means of permanent magnets situated firstly on the surface of the piston, and secondly on the inside surface of said casing.

5,439,358

## RECIRCULATING ROTARY GAS COMPRESSOR

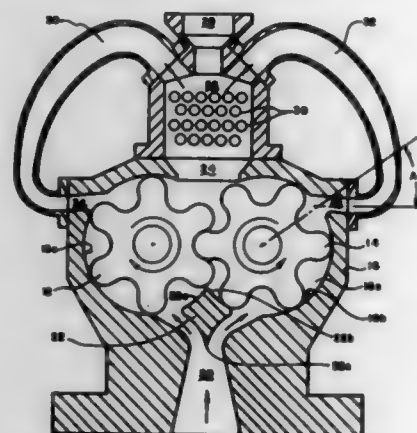
John F. Weinbrecht, 601 Oakwood Pl., NE., Albuquerque, N. Mex. 87123-2203

Filed Jan. 27, 1994, Ser. No. 187,145

Int. Cl.<sup>6</sup> F04C 18/18, 29/04

U.S. Cl. 418-15

9 Claims



1. A positive displacement recirculating rotary compressor comprising:

a housing having two mutually opposing cylindrically curved interior side walls; said housing including a gas inlet port at one end located between said mutually opposing cylindrically curved side walls and a gas outlet port located at the opposite end of said housing from said inlet port and also located between said mutually opposing cylindrically curved interior side walls; said gas outlet port opening into a discharge manifold having a gas discharge port;

said housing further including first and second gas recirculation ports formed respectively in said cylindrically curved

opposing side walls between said inlet port and said outlet port;

first and second involutely lobed impellers journaled for rotation in opposite directions within said housing; each of said impellers having at least four lobes; said impellers being intermeshed so as to form a high-impedance seal when said impellers are rotated in opposite directions; first and second recirculation conduits connecting said manifold with said first and second recirculation ports, said recirculation ports opening onto said interior walls of said housing at an acute angle with respect to said interior surface walls of said housing, whereby gas entering said housing through said recirculation ports enters in a direction approximating the direction of travel of said impellers;

said inlet port and said outlet port being approximately equal in size to one another; said outlet port being approximately twice the size of each of said recirculation ports; said inlet, said outlet and said recirculation ports being isolated from direct fluid communication with one another and further being as large as possible within the constraints of the foregoing size relationships;

whereby a portion of gas discharged from said housing through said outlet port is returned to said housing through said recirculation ports so as to reduce heating of said impellers; and with the sizing of said inlet, outlet and recirculation ports thereby resulting in minimal flow losses.

5,439,359

## ROTARY POSITIVE DISPLACEMENT MACHINE WITH HELICOID SURFACES OF PARTICULAR SHAPES

Andre Leroy, 64 Chaumee de Binche, B 7030 Mons, Belgium, and Jean M. Flamme, 23 Boulevard Richard Lenoir, F 75011 Paris, France

PCT No. PCT/FR92/01010, § 371 Date Apr. 22, 1994, § 102(e) Date Apr. 22, 1994, PCT Pub. No. WO93/08402, PCT Pub. Date Apr. 29, 1993

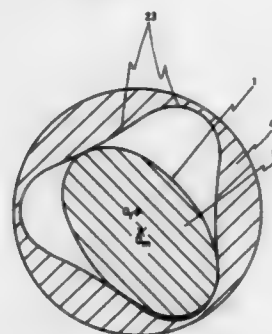
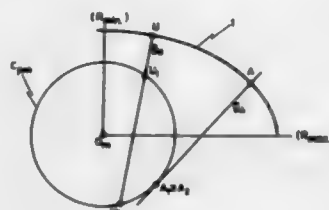
PCT Filed Oct. 15, 1992, Ser. No. 211,713

Claims priority, application France, Oct. 23, 1991, 91 13530

Int. Cl.<sup>6</sup> F01C 1/10

U.S. Cl. 418-48

7 Claims



1. A rotary positive displacement machine comprising:

a male organ;

a female organ surrounding said male organ, an outer surface of the male organ defining a male surface and an inner surface of the female organ defining a female surface, said male and female surfaces defining, by evolution of linear contacts of said male and female surfaces and displace-

ment, a work chamber, said male and female surfaces being helicoidal surfaces having parallel axes spaced apart by a length  $E$ , said surfaces being further defined about said axes by a nominal profile in a cross section of the mechanism and by a pitch  $P_f$  of the female surface and a pitch  $P_m$  of the male surface;

a profile of the male surface defining a male profile, said male profile having an order of symmetry  $n_m$  with respect to a center  $O_m$  of said male profile and a symmetry with respect to an axis originating at  $O_m$  and passing through extreme polar radius points of said male profile;

a profile of the female surface defining a female profile, said female profile having an order of symmetry  $n_m+1$  about a center  $O_f$  of said female profile;

a ratio of the pitch  $P_f$  of the female surface to the pitch  $P_m$  of the male surface is equal to

$$\frac{n_m + 1}{n_m};$$

said male profile being inscribed in a circular ring having a center  $O_m$  a half-width  $E$  and a mean radius  $R_m$  defining a ring containing the male profile said mean radius determining a scale of cross sections of the mechanism;

said female profile being inscribed in a circular ring having a center  $O_f$  a half-width  $E$  and a mean radius  $R_m+E$ , defining a ring containing the female profile;

said male organ being in relative planetary motion with respect to the female organ, a first rotation comprising said planetary motion driving an axis of said male surface to define, at a predetermined speed  $\omega$  about an axis of the female surface, a cylinder of revolution said cylinder having a radius  $E$ , and a second rotation comprising said planetary motion driving the male organ in rotation about the axis of said male organ at a speed

$$\frac{(-\omega)}{n_m};$$

wherein the male profile is such that, between two successive extreme polar radii of said male profile, a running point  $U$  traversing said male profile from a point of maximum polar radius  $R_{max}$  to a point of minimum polar radius  $R_{min}$  passes via a fixed point  $A$  on the male profile, a polar radius  $R_{A0}$  of said male profile, a first derivative  $R_{A1}$  thereof with respect to the polar angle and a second derivative  $R_{A2}$  thereof with respect to the polar angle satisfy equations:

$$n_mE = R_{A0} \sin(\arctan(-R_{A1}/R_{A0})) \text{ and}$$

$$R_{A2}/R_{A0} = -(R_{A1}/R_{A0})^4, \text{ where } R_{max} - R_{min} = 2E$$

simultaneously;

a nominal female profile being defined by a complete physically embodiible outer envelope of the male profile in relative planetary motion;

wherein in addition to having  $n_m+1$  permanently existing points of contact between said male and female profiles on  $n_m+1$  disconnected arcs of the female profile traveling in reciprocating motion, for certain predetermined configurations, there is an additional point of contact defining a closure point said closure point being defined in a single direction and successively traversing on the male profile at all segments, and on the female profile in said single direction and successively on  $n_m+1$  separate arcs, said  $n_m+1$  separate arcs joining each other tangentially with said  $n_m+1$  disconnected arcs of the female profile; and said work chambers of said machine are closed such that said male and female surfaces defining the chambers contain a single point defining a tapered closure in a section where a closure point comes into contact with said  $n_m+1$  permanently existing points of contact.

5,439,360

## SELF-ADJUSTING CRANKSHAFT DRIVE

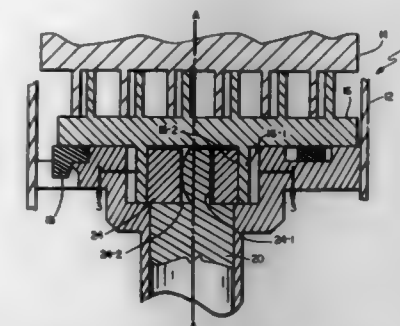
Thomas R. Barito, East Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 22, 1991, Ser. No. 734,009

Int. Cl.<sup>6</sup> F04C 18/04; F16D 3/48

U.S. Cl. 418-55.5

5 Claims



1. A self-adjusting crankshaft drive comprising: driven means having an axially extending opening therein; a crankshaft having an axis; axially extending drive means integral with said crankshaft and eccentrically located with respect to said axis; said drive means being drivingly located in said opening of said driven means and one of said drive means and driven means having an axially curved surface and the other one of said drive means and driven means having a corresponding flat surface parallel to said axis whereby when said crankshaft rotates about said axis, said drive means rotates eccentrically with respect to said axis and coacts with and drives said driven means such that said axially curved surface engages said corresponding flat surface at an essentially constant axial location relative to said axis even when said drive means is deformed under load.

5,439,361

## OIL SHIELD

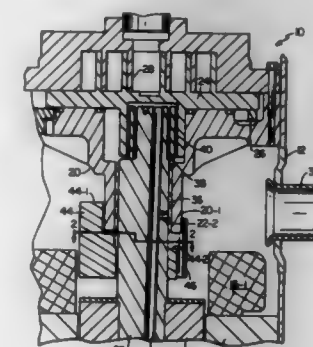
Ernest F. Reynolds, Mexico, and James C. Wilson, Cazenovia, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 31, 1994, Ser. No. 220,859

Int. Cl.<sup>6</sup> F04C 18/04, 29/02; F01M 11/00

U.S. Cl. 418-55.6

4 Claims



1. A low side hermetic scroll compressor having a casing containing a crankcase, an orbiting scroll, a shaft operatively connected to said orbiting scroll, motor means including a rotor and stator for driving said shaft and thereby said orbiting



scroll, bearing means supporting said shaft in said crankcase, oil distribution means for lubricating said bearing means, counterweight means on said shaft having a first portion partially surrounding and axially coextensive with a portion of said crankcase and a second portion having a radially extending surface axially spaced from said crankcase, suction means secured to said casing and generally located opposite said counterweight means for supplying suction gas whereby when said motor means drives said shaft and thereby said orbiting scroll, oil is supplied to said bearing means and drains onto said radially extending surface which rotates with said shaft and is slung off, the improvement comprising:

oil shield means integral with said counterweight means and located radially outward of and extending axially above and below said radially extending surface whereby said oil slung off of said radially extending surface is collected on said shield means and flows downwardly.

5,439,362

**SEX-ASSOCIATED MEMBRANE PROTEINS AND METHODS FOR INCREASING THE PROBABILITY THAT OFFSPRING WILL BE OF A DESIRED SEX**  
Glenn F. Spaulding, Chandler, Ariz., assignor to Cytogam, Inc., Chandler, Ariz.

Division of Ser. No. 667,974, Mar. 12, 1991, Pat. No. 5,346,990, which is a division of Ser. No. 351,642, May 12, 1989, Pat. No. 5,021,244, which is a continuation-in-part of Ser. No. 282,922, Dec. 6, 1988, abandoned, which is a continuation of Ser. No. 35,986, Apr. 8, 1987, abandoned. This application Jul. 25, 1994, Ser. No. 280,637

Int. Cl.<sup>6</sup> A61K 35/52; G01N 21/64

U.S. Cl. 424—185.1

7 Claims

1. A method for increasing the probability that a mammalian offspring will be female or male comprising the step of immunizing a female mammal with a Y-SAM protein or an X-SAM protein, respectively.

5,439,363

# **MAGNETIC SUPPORT SYSTEM FOR CABLE INSERTION TUBE**

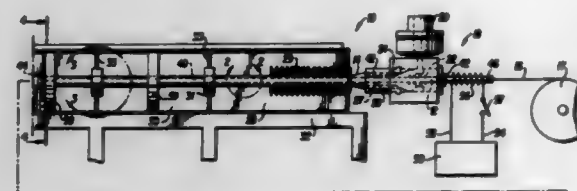
Steve C. Owens, Coweta County; Richard V. Lovvorn, Carroll, and Albert B. Elder, Haralson, all of Ga., assignors to Southwire Company, Carrollton, Calif.

Filed Apr. 25, 1994, Ser. No. 232,883

Int. Cl.<sup>6</sup> B29C 47/90

U.S. Cl. 425—3

12 Claims



9. Apparatus for positioning a cable in a bore of an extruded polymeric conduit, comprising:

means for extruding the conduit;  
a ferromagnetic cable insertion tube cantilevered from said extruding means and adapted to extend upstream of said extrusion means and downstream of said extrusion means through said bore of the extruded conduit, said cable insertion tube having a first free end at the downstream

end thereof and a second free end at the upstream end thereof;  
an electrical winding surrounding the tube adjacent the second free end thereof;  
a d.c. power source connected to said winding for generating a magnetic flux in said tube with a first magnetic pole at the first free end with a given polarity and a second magnetic pole at the second free end with an opposite polarity to said given polarity; and  
magnet means having a magnetic pole with a polarity the same as said given polarity and supported in confronting relationship with said first free end in such position for magnetically levitating the tube and preventing the free end thereof from sagging into contact with the polymeric conduit.

5,439,364

# **APPARATUS FOR DELIVERING AND DEPOSITING CONTINUOUS FILAMENTS BY MEANS OF AERODYNAMIC FORCES**

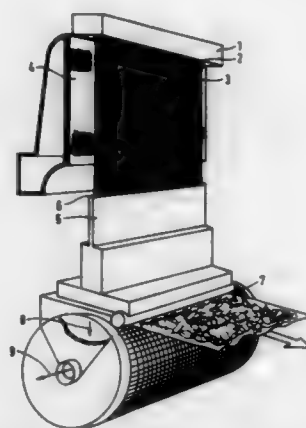
Lüder Gerking, and Friedrich Weger, both of Berlin, Germany, assignors to Karl Fischer Industrieanlagen GmbH, Germany  
Filed Oct. 25, 1993, Ser. No. 142,234

Claims priority, application Germany, Oct. 26, 1992, 42 36 514.7

Int. Cl.<sup>6</sup> D01D 5/00, 5/12; B29C 55/00

U.S. Cl. 425—66

14 Claims



1. An apparatus for delivering and depositing groups of continuous and substantially parallel threads comprising an elongated passage for guiding the threads, a means for producing a gas flow for delivering the threads into the passage, and a laying device having a depositing surface, the passage passing via the depositing surface into a laying area of increased cross-section, wherein the passage has an upper area and a lower area, the lower area located adjacent the laying area and being provided with a passage wall having openings through which part of the gas flow is sucked from the passage to decelerate the gas flow in the passage.

5,439,365

# **APPARATUS FOR FLUID COMPRESSION OF INJECTION MOLDED PLASTIC MATERIAL**

James W. Hendry, Brooksville, Fla., assignor to ICP Systems, Inc., Madison Heights, Mich.

Continuation of Ser. No. 83,382, Jun. 28, 1993, abandoned, which is a continuation of Ser. No. 855,236, Mar. 23, 1992, abandoned. This application Jun. 20, 1994, Ser. No. 262,342

Int. Cl.<sup>6</sup> B29C 45/16

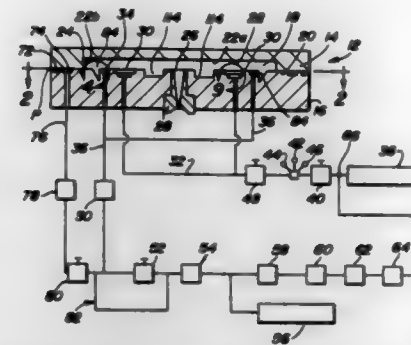
U.S. Cl. 425—130

21 Claims

1. In a plastic molding apparatus including closable first and second mold members defining a mold cavity, means for injecting a predetermined quantity of hot plastic material into said mold cavity, and means for applying an external pressure on one surface of the plastic material which moves the plastic

material at that position away from the surface of the mold cavity adjacent thereto and for maintaining the external pressure until the plastic material is self supporting, the improvement comprising

a gas inlet connected to an external source of pressurized gas to introduce said pressurized gas between one side of the plastic material and the mold member adjacent thereto,



control means for causing the gas to be introduced at a predetermined time after the plastic material has been injected and prior to any significant cooling of the plastic material in the mold cavity, and  
seal means for inhibiting said gas once introduced into the mold cavity from migrating around the plastic material and reaching the other side of the plastic material.

5,439,366

# **SAFETY DEVICE FOR A ROLL SPACE OF A CALENDER OR SIMILAR ROLL MACHINE**

Hans-Rolf Conrad, Dormagen; Jochen Autrata, Duisburg, and Albert Hille, Aachen, all of Germany, assignors to Kleinewefers GmbH, Krefeld, Germany

Filed Oct. 21, 1993, Ser. No. 141,182

Claims priority, application Germany, Oct. 21, 1992, 42 35 421.8

Int. Cl.<sup>6</sup> B29C 43/24; B41F 33/00; D21G 5/00

U.S. Cl. 425—151

18 Claims



1. A safety device for a roll space of a roll machine comprising:

a first roller having a longitudinal axis;  
a second roller having a longitudinal axis, said second roller being disposed adjacent to said first roller such that a roller gap is disposed between said first roller and said second roller;  
a beam being disposed in front of said roller gap, said beam having a longitudinal axis that is parallel to said longitudinal axis of said first roller and said longitudinal axis of said second roller, said beam having a predetermined mass, said mass element being connected to said beam by a spring such that said beam and said mass element form a two mass oscillator system.

5,439,367

# **PLASTIC MATERIAL CHANGING UNIT IN AN INJECTION MOLDING MACHINE**

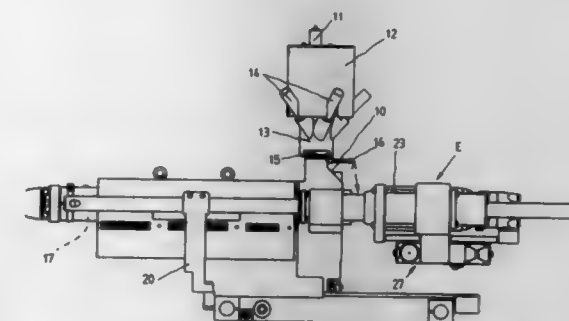
Karl Hehl, Arthur-Hehl-Str. 32, D-7298 Lössburg 1, Germany  
Continuation of Ser. No. 59,599, May 12, 1993, abandoned. This application Aug. 5, 1994, Ser. No. 286,788

Claims priority, application Germany, May 16, 1992, 42 16 312.9

Int. Cl.<sup>6</sup> B29C 45/23

U.S. Cl. 425—183

14 Claims



1. In an injection molding unit for processing synthetic materials having a changing unit to supply said injection molding unit with synthetic material, the injection molding unit further comprising:

a carrier block provided with a central feed opening, a basic body of said changing unit detachably mounted on said carrier block and also provided with a feed opening, a plurality of connecting bores, which are transversely lockable and are arranged at said central feed opening in said basic body,  
a plurality of supply lines, which are optionally connectable to said connecting bores and by which material stored in tanks of said injection molding unit is supplied via said central feed opening and said basic body feed opening,  
a plurality of stoppers, which can be separately triggered and each of which is cooperating with one of said connecting bores to stop supply of said synthetic material in a first operating position or to allow supply of said synthetic material in a second operating position to said injection molding unit,  
the improvement residing in that  
said connecting bores are arranged radially around said central feed opening and at least partially bordered by said stoppers, whereby the connecting bores are selectable in any combination and sequence according to said first or second operating position of said stoppers.

5,439,368

# **KNOCKOUT ROD ASSEMBLY FOR MOLD**

Roger G. Martin, Greenville, Mich., assignor to Master Unit Die Products, Inc., Greenville, Mich.

Division of Ser. No. 920,612, Jul. 27, 1992, Pat. No. 5,350,289.

This application Jun. 17, 1994, Ser. No. 261,389

Int. Cl.<sup>6</sup> B29C 33/00

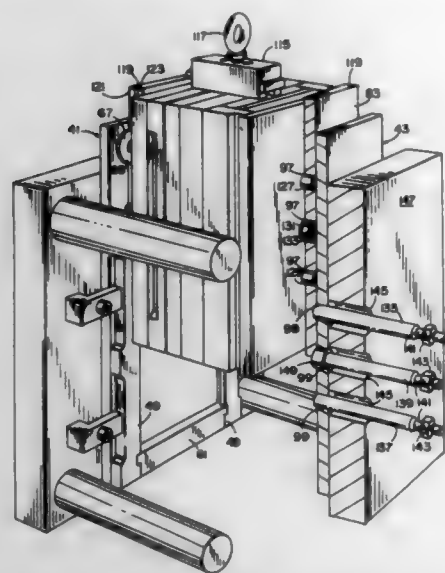
U.S. Cl. 425—190

7 Claims

1. A knockout rod assembly for activating an ejector plate in a mold base comprising:

an ear plate for attachment to a back surface of an ejector half of a mold base, said ear plate having a pattern of apertures therein;  
at least one push rod for extending through an aperture in said ear plate and a back of said mold base for attachment to said ejector plate;  
at least one push/pull rod for extending through an aperture in said ear plate and the back of said mold base for attachment to said ejector plate;  
a locking surface at the end of said push/pull rod;  
at least one knockout rod for attachment to the knockout

assembly in a press for moving said push rod and said ejector plate;  
a push/pull knockout rod for attachment to the knockout



assembly in a press for pushing and pulling said push/pull rod attached to said ejector plate in said mold base; and  
a locking member on said push/pull knockout rod for locking to said locking surface at the end of said push/pull rod.

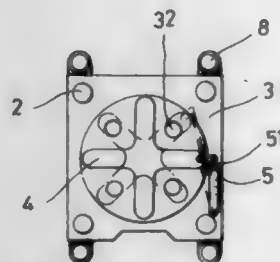
5,439,369

# MOLD LOCKING DEVICE FOR AN INJECTING MACHINE

Jui-Hsiang Wang, Tainan Hsien, Taiwan, assignor to Hwa Chin Machinery Factory, Co., Ltd., Tainan Hsien, Taiwan  
Filed May 26, 1994, Ser. No. 249,629  
Int. Cl.<sup>6</sup> B29C 45/66

U.S. Cl. 425—589

1 Claim



1. A mold locking device for an injection molding machine, comprising:

- a stationary disc secured to a base surface for interface with one side of a mold;
- four guide rods affixed to said stationary disc, each of said four guide rods having opposing first and second ends, said first end of each said guide rods being secured to said stationary disc adjacent a perimeter portion thereof;
- a support disc secured to said second end of each of said four guide rods on a front surface thereof, said support disc having a piston chamber formed in said front surface thereof, said support disc having a first through bore formed centrally in a bottom wall of said piston chamber and four second through bores formed in said bottom wall of said piston chamber, said four second through bores being disposed in radially spaced relationship around said first through bore, said piston chamber bottom wall having an oil passage formed therethrough for providing fluid communication with said piston chamber;
- a movable disc slidingly disposed on said four guide rods between said stationary disc and said support disc, said

movable disc having opposing front and rear surfaces, said front surface of said movable disc providing an interface with one side of a mold;

- a plurality of first hydraulic cylinders coupled between said movable disc and said support disc for displacing said movable disc relative to said support disc to capture a mold between said movable disc and said stationary disc;
- four cylindrical tube members respectively secured to said support disc within said second through bores, each of cylindrical tube members having an end portion extending from an front surface of said piston chamber bottom wall;
- a piston displaceably disposed within said piston chamber, said piston having a centrally disposed third through bore formed therein in axially aligned relationship with said first through bore, said piston having four fourth through bores formed therein in radially spaced relationship around said third through bore, each of said four fourth through bores being disposed in axially aligned relationship with a respective one of said four second through bores and adapted to be slidingly received on a respective one of said four cylindrical tube members;

four push rod members secured to said movable disc, each of said four push rod members having opposing first and second ends with said first end thereof being secured to said rear surface of said movable disc, each of said four push rod members being disposed in axial alignment with a respective one of said four second through bores for passage therethrough;

- a cross-shaped shield plate having four extending arm portions and a shaft extending from a rear surface thereof, said cross-shaped shield plate being pivotally coupled to said piston by extension of said shaft through said third through bore and said first through bore respectively; and,
- a second hydraulic cylinder having one end coupled to said front surface of said support disc and an opposing end to said cross-shaped shield plate for rotation thereof between a first position and a second position, said first position being defined by each of said four arm portions being disposed in unaligned relationship with said fourth through bores and said second position being defined by each of said four arm portions being disposed in aligned relationship with said fourth through bores, said cross-shaped shield plate being displaced to said second position for interface between each of said four arm portions and said second ends of said four push rod members for displacement thereof responsive to displacement of said piston by oil introduced into said piston chamber through said oil passage.

5,439,370

# DEVICE FOR MOLDING PLASTIC MATERIAL FERRULE FOR OPTICAL FIBER CONNECTORS

Said Lalaouna; Jean-Francois Ollivier, both of La Ferte Bernard, and Manuel Penha, Le Mans, all of France, assignors to Framatome Connectors International, Courbevoie, France  
Division of Ser. No. 103,031, Mar. 24, 1993, Pat. No. 5,313,541.

This application Feb. 22, 1994, Ser. No. 199,631

Claims priority, application France, Mar. 24, 1992, 92 03523  
Int. Cl.<sup>6</sup> B29C 45/34, 45/36

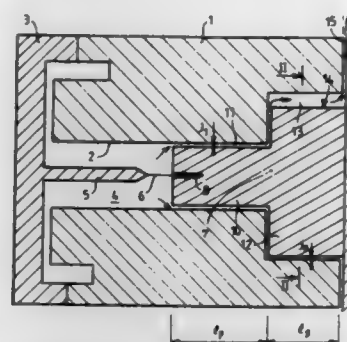
U.S. Cl. 425—546

4 Claims

1. Device for molding a plastic ferrule for optical fiber connectors, said device comprising

- (a) a molding cavity defined by a cylindrical bush of a size defining an outside diameter of a said ferrule and a cover closing said molding cavity;
- (b) a peg joined to said cover, extending axially into said molding cavity and having a free end extended by a needle of a size defining an inside diameter of said ferrule;
- (c) a backing member extending axially into said molding cavity from an end of said molding cavity remote from said peg and comprising a bore for guiding said needle, said bore being adapted to receive a free end of said needle when said backing member moves towards said peg so as

to render said needle and said bush concentric, said backing member being a substantially cylindrical body of revolution adapted to fit directly into said cavity of said bush with substantially zero clearance and substantially zero force; and



(d) vent means for allowing gases to escape from said molding cavity to the exterior when plastic material is injected into said molding cavity.

5,439,371

# LOCALLY PRESSURIZING INJECTION MOLDING MACHINE

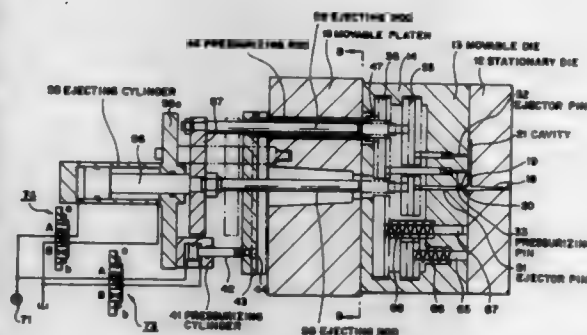
Atsushi Sawaya, Chiba, Japan, assignor to Sumitomo Heavy Industries, Ltd., Japan

Filed Sep. 29, 1993, Ser. No. 128,295

Claims priority, application Japan, Oct. 7, 1992, 4-268553  
Int. Cl.<sup>6</sup> B29C 45/40

U.S. Cl. 425—553

7 Claims



1. A locally pressurizing injection molding machine comprising:

- a stationary die;
- a movable die disposed for movement into and out of contact with said stationary die to define a cavity therebetween and a resin passage for injecting resin into said cavity;
- a pressurizing pin extending through said movable die to a distal end facing at least one of said resin passage and said cavity;
- a pressurizing cylinder for reciprocally driving said pressurizing pin and a pressurizing rod, said pressurizing rod transmitting a driving force of said pressurizing cylinder to said pressurizing pin;
- an ejector pin extending through said movable die to a distal end facing said cavity; and
- an ejecting cylinder for reciprocally driving said ejector pin and an ejector rod, said ejector rod being coaxial with said pressurizing rod transmitting a driving force of said ejecting cylinder to said ejector pin, said pressurizing rod being in the form of a hollow sleeve and said ejector rod extending through said hollow sleeve for sliding motion relative to said hollow sleeve.

5,439,372

# MULTIPLE FIRING RATE ZONE BURNER AND METHOD

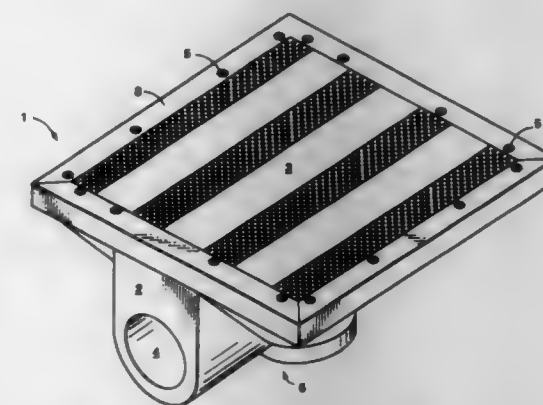
Michael J. Duret, Pleasanton; Robert M. Kendall, Sunnyvale, and Frederick E. Moreno, Los Altos, all of Calif., assignors to Alzeta Corporation, Santa Clara, Calif.

Filed Jun. 28, 1993, Ser. No. 83,353

Int. Cl.<sup>6</sup> F23D 14/14

U.S. Cl. 431—7

17 Claims



1. A gaseous fuel burning method comprising the steps of:
  - (a) introducing a premixed fuel-oxidizer mixture to a burner surface;
  - (b) creating a first radiant combustion zone on said burner surface at a first firing rate;
  - (c) creating a second radiant combustion zone on said burner surface at a second firing rate; and
  - (d) creating, at a third firing rate higher than said first and second firing rates, a non-surface radiant combustion zone between said first and second radiant combustion zones on said burner surface.

13. A gaseous fuel burner comprising:

- (a) means for introducing a premixed fuel-oxidizer mixture to the surface of a burner;
- (b) means for creating a first radiant combustion zone on said burner surface at a first firing rate;
- (c) means for creating a second radiant combustion zone on said burner surface at a second firing rate; and
- (d) means for creating, at a third firing rate higher than said first and second firing rates on said burner surface, a non-surface radiant combustion zone positioned between said first and second radiant combustion zones.

5,439,373

# LUMINOUS COMBUSTION SYSTEM

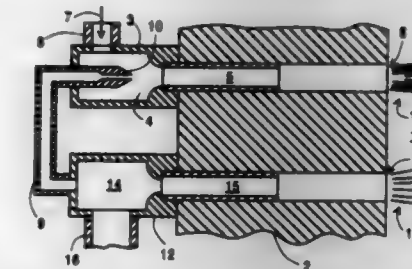
John E. Anderson, Somers, N.Y.; Dennis R. Farrenkopf, Bethel, Conn.; Arthur W. Francis, Jr., Monroe, N.Y.; Steven L. Slader, New York, N.Y., and William J. Snyder, Ossining, N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Sep. 13, 1993, Ser. No. 119,556

Int. Cl.<sup>6</sup> F23C 5/00

U.S. Cl. 431—10

6 Claims



1. A luminous combustion method comprising:



- (A) providing fuel into a first compartment communicating with a furnace zone;
- (B) providing at a high velocity from about 10 to 30 percent of oxygen required to completely combust said fuel into the first compartment in the form of a fluid having an oxygen concentration of 30 percent or more, and entraining the fuel into said oxygen within the first compartment to establish a uniform mixture of fuel and oxygen within the first compartment;
- (C) passing the fuel and oxygen mixture from the first compartment into the furnace zone in a uniform velocity profile and at a velocity less than that of said oxygen as it is passed into the first compartment and thereafter combusting the fuel and oxidant mixture in a luminous flame within the furnace zone;
- (D) providing additional oxygen into a second compartment communicating with the furnace zone;
- (E) passing said additional oxygen from the second compartment into the furnace zone at a velocity about the same as the velocity of the mixture of fuel and oxygen passed into the furnace zone and at a point spaced from the point where the mixture of fuel and oxygen is passed into the furnace zone; and
- (F) combusting said additional oxygen with uncombusted fuel within the furnace zone.

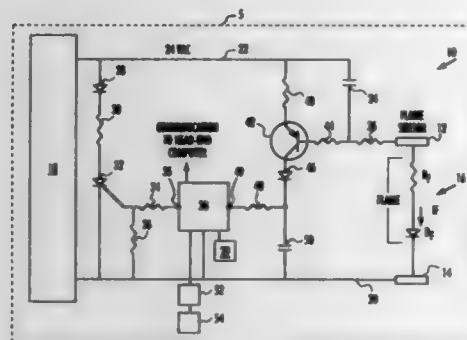
5,439,374

**MULTI-LEVEL FLAME CURRENT SENSING CIRCUIT**  
J. Scott Jamieson, Waukesha, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Jul. 16, 1993, Ser. No. 92,754  
Int. Cl.<sup>6</sup> F23Q 23/00

U.S. Cl. 431—25

20 Claims



1. A flame detection circuit for detecting the presence of a flame between a first electrode and a second electrode, where the impedance of the current path between the electrodes depends upon the presence of a flame between the electrodes, the flame detection circuit comprising:

- a current sensing circuit coupled to the first and second electrodes and configured to generate a first signal representative of a flame current above a first current level and a second signal representative of the flame current above a second current level greater than the first current level.

5,439,375

**CHILD-RESISTANT LOCKABLE LIGHTER**  
Zhengge Wang, Vancouver, Canada, assignor to American Tec-trade Enterprises, Inc., Vancouver, Canada

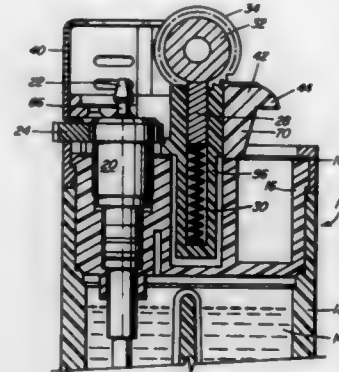
Filed Jun. 16, 1994, Ser. No. 260,806  
Int. Cl.<sup>6</sup> F23D 11/36

U.S. Cl. 431—153

6 Claims

1. A child resistant lockable lighter, comprising:  
a fuel tank;  
a cover on said tank;  
a valve mounted on said cover;  
said valve including a gas outlet nozzle for the outflow of gas from said tank under the control of said valve;  
a spark wheel, a flint and a spring urging said flint against

said spark wheel to produce a spark on rotation of said spark wheel;  
a lever for operating said valve; and  
a fulcrum for said lever;  
said lever being displaceable between a locked position, in which said lever maintains said valve in a closed condition, and a released position, in which said lever is free to pivot about said fulcrum to thereby open said valve;



a retainer engageable with said lever to prevent pivotation of said lever about said fulcrum on displacement of said lever into said locked position;  
said nozzle having a neck;  
said lever being formed with a slot slidably receiving said neck; and  
said slot having first and second widened portions for resiliently engaging said neck and thereby releasably retaining said lever in its locked position and its released position, respectively.

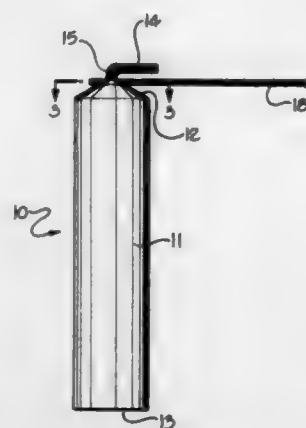
5,439,376

**CANDLE WITH ATTACHED IGNITOR**  
Herbert J. Kramer, 14 Mallow Hill Rd., and Betty L. Egan, 12 Mallow Hill Rd., both of Baltimore, Md. 21229

Filed Aug. 10, 1994, Ser. No. 288,938  
Int. Cl.<sup>6</sup> F23D 3/16

U.S. Cl. 431—287

15 Claims



1. A candle comprising a body, a top end, a bottom end and a wick within the body between the top end and the bottom end, the wick having a portion extending outwardly above the top end of the body and being bent at an angle with respect to the body, an ignitor having a first end connected to, and in intimate contact with, the top end of the body of the candle and a second end distal from the body of the candle, the ignitor extending from the body of the candle, the ignitor being aligned with the bent portion of the wick, wherein, with the candle in an upright position, ignition of the second end of the ignitor produces combustion of the ignitor and the burning

ignitor produces direct ignition of the portion of the wick of the candle.

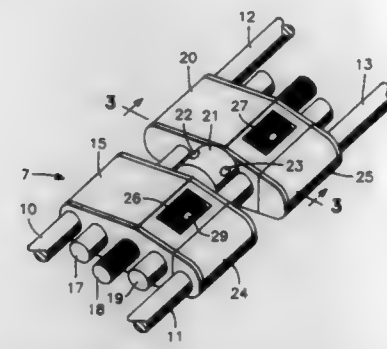
5,439,377

**BI-DIRECTIONAL ORTHODONTIC APPLIANCE**  
Philip J. Milanovich, 10 N. Lake Dr., Butte, Mont. 59701

Filed Apr. 21, 1994, Ser. No. 230,762  
Int. Cl.<sup>6</sup> A61C 3/00

U.S. Cl. 433—7

13 Claims



1. A bi-directional orthodontic appliance comprising:  
a split jack body having a first half and a second half;  
parallel rods attached to and extending from the respective halves, the rods having outer ends for tooth attachment means;  
a jack screw means connecting said first half to said second half allowing movement of the respective halves towards and away from one another, said jack screw means extending in a first direction parallel to said rods;  
wherein at least one of said halves includes an extension connected to said at least one of said halves on one side of said jack screw means by an adjustment mechanism; and  
wherein said extension is movable by said adjustment mechanism in a second direction, different from said first direction and wherein one of said rods is fitted to said extension, whereby said appliance can apply asymmetric corrective movements to maxillary teeth.

5,439,378

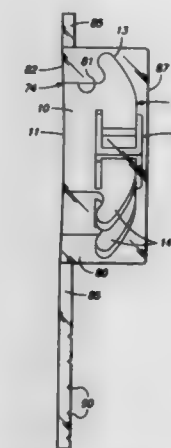
**ORTHODONTIC BRACKET ASSEMBLY AND METHOD OF INSTALLATION**

Dwight H. Damon, Spokane, Wash., assignor to Damon Family Limited Partnership, Spokane, Wash.

Continuation-in-part of Ser. No. 45,529, Apr. 8, 1993, Pat. No. 5,275,557. This application Oct. 20, 1993, Ser. No. 140,689  
Int. Cl.<sup>6</sup> A61C 3/00

U.S. Cl. 433—8

22 Claims



1. An orthodontic bracket assembly, comprising:

a bracket base having an outer periphery intersecting a posterior base surface adapted to be bonded to a tooth;  
a shield removably mounted to the base, the shield having one or more inner surfaces complementary to corresponding surfaces about the base periphery, the inner surfaces of the shield being juxtaposed against their corresponding surfaces about the base periphery to prevent adhesive from flowing between the base and shield;  
a protruding extension on the shield adapted to be aligned along the long axis of the tooth; and  
a protective cap formed integrally with the shield.

5,439,379

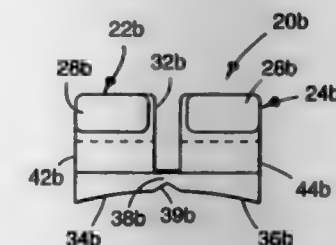
**CERAMIC ORTHODONTIC BRACKET WITH DEBONDING CHANNEL**

James D. Hansen, Duarte, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 29, 1993, Ser. No. 159,060  
Int. Cl.<sup>6</sup> A61C 3/00

U.S. Cl. 433—8

19 Claims



1. A ceramic orthodontic bracket comprising a mesial section, a distal section and an archwire slot extending in a generally mesial-distal direction in said mesial section and said distal section, said bracket including an elongated channel extending in a generally occlusal-lingual direction between said mesial section and said distal section, said channel having a depth in a lingual direction that is greater than the lingual depth of said archwire slot, said bracket including a frangible web interconnecting said mesial section and said distal section lingually of said channel and extending along the length of said channel, said web having a thickness in a labiolingual direction sufficiently small to enable said bracket to be debonded from a tooth by rocking said mesial section and said distal section about a reference axis extending generally parallel to the longitudinal axis of said channel.

5,439,380

**METHOD OF FORMING AN ABUTMENT POST**  
Gerald M. Marlin, 4400 Jenifer St., NW., Washington, D.C. 20015

Continuation of Ser. No. 921,729, Jul. 30, 1992, Pat. No. 5,350,302, which is a continuation-in-part of Ser. No. 729,170, Jul. 12, 1991, Pat. No. 5,238,405, which is a continuation-in-part of Ser. No. 548,250, Jul. 5, 1990, Pat. No. 5,135,395. This application Mar. 7, 1994, Ser. No. 206,679  
Int. Cl.<sup>6</sup> A61C 13/12, 13/225, 8/00

U.S. Cl. 433—172

19 Claims

1. A method of making an abutment post which is used to receive a prosthesis in dental restorations, the method compris-

ing the steps of applying a post part on a collar part and moving the parts relative to each other into a desired position,



fixing the parts together, inserting the parts into a mold, and molding a one piece abutment post from the parts in the mold.

5,439,381

**DENTAL IMPLANT APPARATUS AND METHOD**

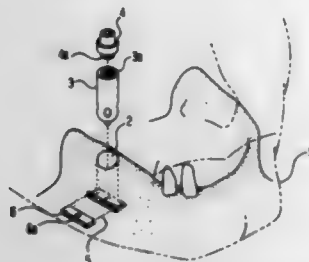
Howard Cohen, 1228 Wantagh Ave., Wantagh, N.Y. 11793

Filed Sep. 28, 1992, Ser. No. 953,535

Int. Cl.<sup>6</sup> A61C 8/00, 13/12, 13/225

U.S. Cl. 433-173

49 Claims



1. A dental apparatus for attachment to a vertical post which passes through the gums and is attached to the jawbone, said apparatus comprising:

- a base attachable to a first end of said vertical post;
- an expandable means attachable to said base for defining an interior cavity with respect to said base; and,
- an orifice means in said expandable means for passing filler into said interior cavity through said orifice to expand said expandable means.

5,439,382

**METHOD OF TEACHING/LEARNING A PART OF A MULTI-PART MUSICAL COMPOSITION**

Ruth A. Pettinichi, 50 Spring St., Kingston, N.Y. 12401

Division of Ser. No. 860,990, Mar. 31, 1992, abandoned. This

application Jan. 21, 1994, Ser. No. 184,847

Int. Cl.<sup>6</sup> G09B 5/04

U.S. Cl. 434-319

5 Claims

5. A method of teaching a part of a multi-part musical composition, the method comprising:

- requiring a student to listen at least once to a recording of a multi-part musical composition, said recording having one part of said composition recorded at a preselected volume, said recording having the remaining parts of said composition recorded at a volume fainter than the preselected volume of said one part.

5,439,383

Patent Not Issued For This Number

5,439,384

**SOCKET HAVING AN AUXILIARY ELECTRICAL COMPONENT MOUNTED THEREON**

Roger L. Thrush, Clemmons, and Kevin Snead, Greensboro, both of N.C., assignors to The Whitaker Corporation, Wilmington, Del.

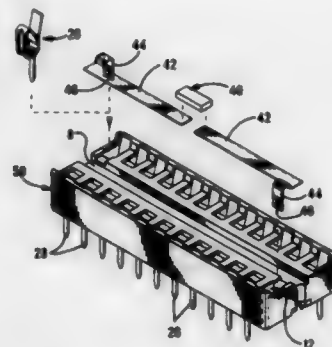
Division of Ser. No. 248,136, May 24, 1994, Pat. No. 5,403,195.

This application Nov. 23, 1994, Ser. No. 344,244

Int. Cl.<sup>6</sup> H01R 13/66

U.S. Cl. 439-69

1 Claim



1. A socket for an electrical component, comprising: a dielectric housing having contact retention cavities; contacts disposed in respective ones of said cavities, at least two of said contacts each comprising:

- a generally U-shaped configuration having first and second legs with a transverse element joining together said legs;
- an extension of said first leg being bent back toward said second leg and arranged to cooperate with said second leg to engage a lead of said electrical component; and,
- a tab sheared from a center portion of said transverse element and said first leg and extending downwardly from said second leg through an aperture in a bottom of its respective said cavity, thereby defining a slot in said center portion of said transverse element and said first leg; and,

an auxiliary electrical component mounted on said housing and having at least two leads extending therefrom, each of said at least two leads being electrically terminated to a respective one of said at least two contacts by engagement between said respective one contact and a wall of its respective said cavity.

5,439,385

**CONNECTOR FOR CIRCUIT BOARD**

Hitoshi Sakai, and Katsumi Koyama, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

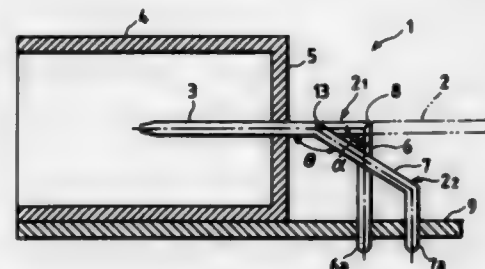
Filed Jan. 13, 1994, Ser. No. 181,258

Claims priority, application Japan, Jan. 14, 1993, 5-00716 U

Int. Cl.<sup>6</sup> H01R 13/00

U.S. Cl. 439-79

2 Claims



1. A connector for a circuit board comprising: a connector housing; and a plurality of terminals, distal end portions of the plurality of

terminals being passed through and fixed to the connector housing, proximal end portions of the plurality of terminals being bent and being connected to the circuit board, the plurality of terminals having the same overall length before being bent,

wherein an internal bend angle of one of said plurality of terminals is larger than an internal bend angle of an adjacent terminal wherein the distal end portions of the plurality of terminals are disposed in a row, and wherein the proximal end portions are disposed out of phase with each other.

5,439,386

**QUICK DISCONNECT ENVIRONMENTALLY SEALED RF CONNECTOR FOR HARDLINE COAXIAL CABLE**

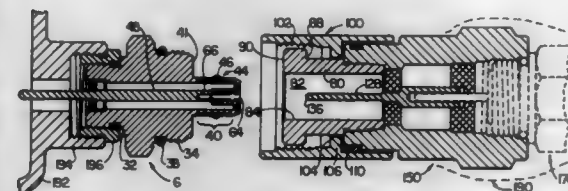
William H. Ellis, Mercer Island, and Scott R. Hopper, Kent, both of Wash., assignors to Augat Inc., Mansfield, Mass.

Filed Jun. 8, 1994, Ser. No. 255,393

Int. Cl.<sup>6</sup> H01R 13/622

U.S. Cl. 439-322

18 Claims



1. An environmentally sealed quick disconnect RF connector for use with hardline coaxial cable, said connector comprising:

- a chassis mounting portion comprising:
  - a first central conductor;
  - a threaded surface; and
  - an o-ring positioned adjacent to said threaded surface; and
- an adaptor comprising:
  - a coaxial cable portion having a first end and a second end portion, said first end of said coaxial cable portion for attachment to a hardline coaxial cable;
  - a second central conductor; and
  - a locking member including an inner wall, and having a threaded surface sized and threaded to engage said threaded surface of said chassis mounting portion, said locking member attached to and movably positioned upon said second end portion of said coaxial cable portion and movable relative thereto between:
    - a first unlocked position wherein said threaded surface of said locking member does not engage said threaded surface of said chassis mounting portion when said second central conductor of said adaptor and said first central conductor of said chassis mounting portion are electrically continuous, and
    - a second locked position wherein said threaded surface of said locking member engages said threaded surface of said chassis mounting portion when said second central conductor of said adaptor and said first central conductor of said chassis mounting portion are electrically continuous, and wherein said inner wall of said locking member compresses said o-ring positioned adjacent to said threaded surface of said chassis mounting portion to thereby form an environmental seal between said chassis mounting portion and said adaptor,

whereby said adaptor may be pulled from said chassis mounting portion when said second central conductor of said adaptor and said first central conductor of said chassis mounting portion are electrically continuous and said locking member is in said unlocked position.

5,439,387

**CONNECTOR DEVICE**

Hiroyuki Hayashi, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan

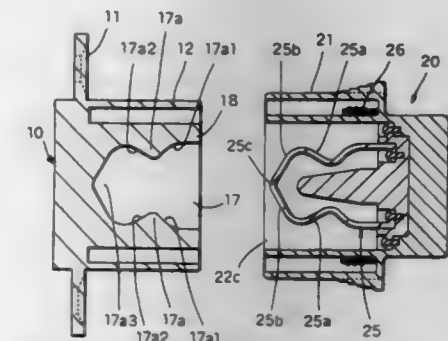
Filed Apr. 21, 1994, Ser. No. 230,824

Claims priority, application Japan, Apr. 27, 1993, 5-125120

Int. Cl.<sup>6</sup> H01R 4/50

U.S. Cl. 439-345

8 Claims



1. An electrical connector device comprising: a first connector including a first mating means having at least one drawing slanting surface receding progressively in an inserting direction; and a second connector to be electrically coupled with said first connector, including a second mating means having a spring member bent to provide at least one leading portion which is projected toward said drawing slanting surface; wherein said leading portion passes past a peak of said drawing slanting surface and slides down therealong, so that the second mating means is drawn into said first mating means during insertion operation, and said leading portion is brought into intimate contact with said drawing slanting surface at a proper fitted position.

5,439,388

**CORD GRIP ARRANGEMENT**

Christopher J. Weiss, Cheltenham, and David L. van Emmerik, Dingley, both of Australia, assignors to Alcatel Components Limited, Melbourne, Australia

Filed Jun. 30, 1993, Ser. No. 85,395

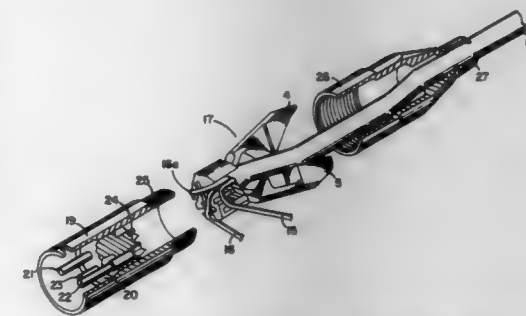
Claims priority, application Australia, Jul. 3, 1992, PL3338; Feb. 24, 1993, PL7441

The portion of the term of this patent subsequent to Apr. 26, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> H01R 4/24

U.S. Cl. 439-417

23 Claims



1. A cord grip arrangement for an electrical connector element assembly of a first shell member supporting therein at least one forwardly extending contact element whose opposite end terminates in a rearwardly extending termination means, and a second shell member having a cord entrance passage, and detachably attached to said first shell member, said cord grip arrangement comprising a base member having two longitudinal limbs extending therefrom to form a pair of jaws, at least



one limb being hinged by hinge means, and wherein one of the two said limbs is provided intermediate its length with an inwardly extending protuberance opposite a space defined by two raised shoulders that extend inwardly from the other said limb, whereby when an end section of a cord having at least one exposed conductor for termination on said termination means of a detached first shell member is brought through said cord entrance and laid longitudinally between said limbs of said cord grip arrangement with said conductor/s extending towards said base member, a part of said end section of the cord spans said space such that upon holding the jaws closed with a co-operating part within said second shell member of an assembled said connector element assembly, said part of said end section of the cord is wedged between said shoulders and said protuberance.

5,439,389

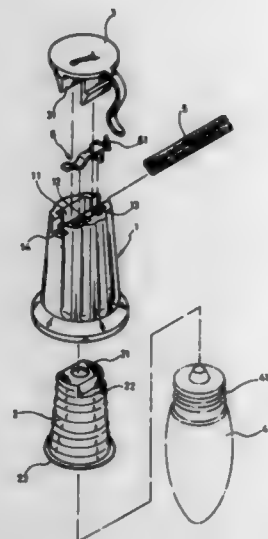
## STRUCTURE OF LAMP SOCKET

You-Jen Cheng, and Tzu-Ling Cheng, both of 2nd Fl., 18-9, Tienmu W. Road, Taipei City, Taiwan

Filed May 23, 1994, Ser. No. 247,713

Int. Cl.<sup>6</sup> H01R 4/24

U.S. Cl. 439—419



1. A lamp socket of the type having an internally threaded socket body having a wire groove, a socket cap fastened to said socket body to hold down an electric wire in said wire groove, a first contact metal plate and a second contact metal plate respectively fastened in a respective hole on said socket body and having each a top end connected to either conductor of said electric wire and a bottom end disposed inside said socket body, the improvement comprising a contact metal socket fastened to said socket body on the inside through a screw joint and electrically connected to said second contact metal plate, said contact metal socket comprising a through hole on a top end thereof spaced below said first contact metal plate, two recessed portions bilaterally made on the top end thereof respectively engaged with a respective rib on said socket body, a spiral groove around an inside wall thereof for fastening the base of a lamp bulb permitting the tip contact of said lamp bulb to extend out of the through hole of said contact metal socket and to electrically contact said first contact metal plate and permitting the ring contact of said lamp bulb to electrically contact said second contact metal plate through said contact metal socket, and a serrated outward flange disposed around the border of a bottom end thereof and engaging the inside wall of said socket body.

5,439,390

## POWER CORD

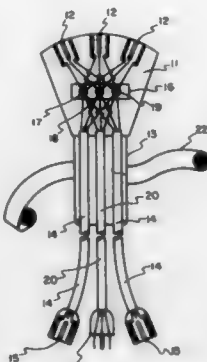
Emmett S. Raynor, 365 E. Connecticut Ave., and Alan C. Walters, 142 Bridgewater Dr., both of Southern Pines, N.C. 28387

Filed Mar. 24, 1993, Ser. No. 36,507

Int. Cl.<sup>6</sup> H01R 11/08, 35/00

U.S. Cl. 439—502

9 Claims



1. An improved power cord comprising: a power source leg having a male plug at one end and communicatively attached to a head means at its other end; and at least one extension leg having a female plug at one end and being communicatively attached to said head means at its other end whereby said improved power cord can be coiled from the head means to the respective plugs and can also be deployed without tangling from the coiled position by holding said head means and heaving the coiled leg means away therefrom.

5,439,391

## LEAD ADAPTER

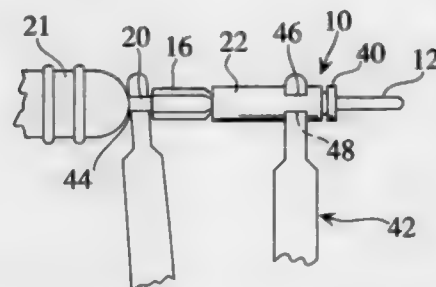
Stanley D. McEchlin, Pleasanton; D. Scott Romkee, San Jose, and M. Elizabeth Bush, Fremont, all of Calif., assignors to Ventritex, Inc., Sunnyvale, Calif.

Filed Feb. 9, 1993, Ser. No. 15,684

Int. Cl.<sup>6</sup> H01R 29/00

U.S. Cl. 439—518

25 Claims



1. An electronic connector pin adapter, which comprises: a forward connector pin portion; a rear end portion comprising a plurality of longitudinally extending retaining fingers in electrically connected relation with said forward connector pin portion and spaced about an open bore for connecting with and retaining an electronic connector pin different from that of the forward connector pin portion; a flange integral with and disposed between said forward connector pin portion and the fingers of said rear end portion; and a compression collar surrounding said retaining fingers, longitudinally movable with respect to said fingers, to urge said fingers inwardly in retentive relation with said electronic connector pin in said bore.

5,439,392

## PENETRATOR ASSEMBLY CONNECTOR SLEEVE AND SYSTEM COMPRISING SAME

Maurice Rouhier, Viroflay, and Jean-Louis Striebig, Chen-nevieres, both of France, assignors to Framatome Connectors International, Paris La Defense, France

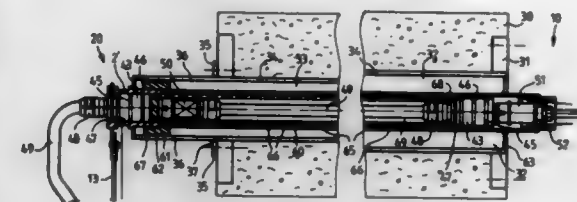
Filed Nov. 24, 1993, Ser. No. 156,775

Claims priority, application France, Nov. 25, 1992, 92 14196

Int. Cl.<sup>6</sup> H01R 13/74

U.S. Cl. 439—559

6 Claims



1. Penetrator assembly connection system comprising first and second connectors each having extensions, the first of said connectors having a peripheral seal and a front edge including a said extension disposed in a housing of a penetrator assembly connector sleeve, said penetrator assembly connector sleeve having a hollow cylindrical part with an outside surface carrying sealing means and a closed first end and defining a housing for said extension of said first connector, said first connector having a diameter substantially equal to a diameter of said outside surface, wherein said sleeve contacts a front edge of said first connector at a second end of said cylindrical part opposite said closed first end so that, when said closed first end of said sleeve contacts a rear edge of said second connector with a peripheral seal disposed in a penetrator assembly, one of said first and second connectors can be replaced by the other of said first and second connectors by translational movement without compromising the sealing.

5,439,393

## HELICAL ZERO INSERTION FORCE CONNECTOR FOR COAXIAL CABLES

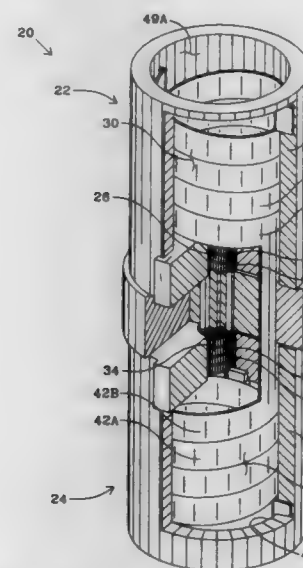
Troy M. Watson, 5672 E. Kelso, Tucson, Ariz. 85712

Filed Apr. 18, 1994, Ser. No. 228,820

Int. Cl.<sup>6</sup> H01R 17/04

U.S. Cl. 439—578

31 Claims



1. A coupler of the zero insertion force type for electrically and mechanically connecting a bared end of a first coaxial cable including a center-conductor and outer conductive shield, with a bared end of a second coaxial cable including a

center-conductor and outer conductive shield, the coupler comprising:

- a first generally cylindrical receptacle formed from at least one predetermined length of helically coiled, electrically conductive material, and having in the absence of an externally applied torque a predetermined inner cross-sectional area approximate to the cross-sectional area of the center-conductor of the first coaxial cable;
- a second generally cylindrical receptacle formed from at least one predetermined length of helically coiled, electrically conductive material, the receptacle generally concentric about the first receptacle, and having in the absence of an externally applied torque a predetermined inner cross-sectional area approximate to the cross-sectional area of the outer conductive shield of the first coaxial cable;
- a third generally cylindrical receptacle formed from at least one predetermined length of helically coiled, electrically conductive material, and having in the absence of an externally applied torque a predetermined inner cross-sectional area approximate to the cross-sectional area of the center-conductor of the second coaxial cable, said receptacle disposed generally opposite to the first receptacle;
- a fourth generally cylindrical receptacle formed from at least one predetermined length of helically coiled, electrically conductive material, and having in the absence of an externally applied torque a predetermined inner cross-sectional area approximate to the cross-sectional area of the outer conductive shield of the second coaxial cable, said receptacle disposed generally opposite to the second receptacle;
- means for electrically and mechanically connecting the first and third receptacles, said means comprising at least one rigid, electrically conductive bridge;
- means for electrically and mechanically connecting the second and fourth receptacles, said means comprising at least one rigid, electrically conductive bridge;
- means for enlarging the inner cross-sectional areas of the first and second receptacles;
- means for contracting the inner cross-sectional areas of the first and second receptacles;
- means for enlarging the inner cross-sectional areas of the third and fourth receptacles; and
- means for contracting the inner cross-sectional areas of the third and fourth receptacles.

5,439,394

## ELECTRIC CONNECTOR WITH A COAXIAL CONNECTOR

Kazuhiko Ikeda, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

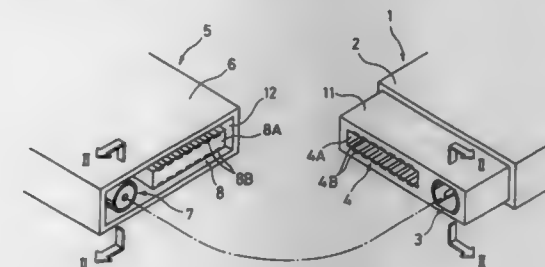
Filed Mar. 18, 1994, Ser. No. 214,552

Claims priority, application Japan, Apr. 23, 1993, 5-026543 U

Int. Cl.<sup>6</sup> H01R 17/04

U.S. Cl. 439—675

2 Claims



1. An electrical connector comprising: a housing; at least one coaxial connector disposed in said housing; a conductive shell with a fitting portion provided in said coaxial connector for receiving a mating connector; and

at least one cut-out formed on at least one of upper and lower sides of said fitting portion thereby minimizing a height of said housing.

#### 5,439,395 DSX JACK

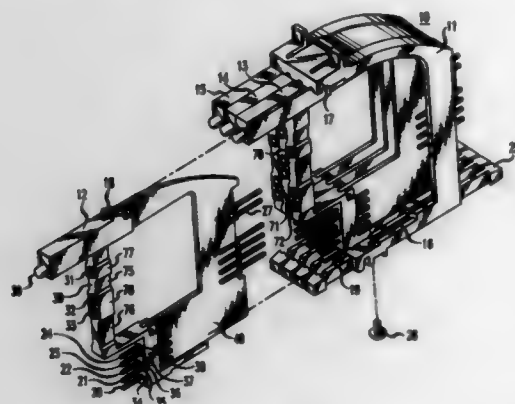
Daniel A. Laukzemis, Township of Roxbury, Morris County, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Aug. 30, 1993, Ser. No. 113,119

Int. Cl.<sup>6</sup> H01R 17/18

U.S. Cl. 439—668

10 Claims



1. A jack assembly comprising:  
a front panel including a single column of at least two sleeves for receiving plugs therein;  
switch assemblies mounted rearward therewith so that the switch assemblies are adapted to receive and make electrical contact to plugs inserted into associated sleeves, the switch assemblies being permanently fixed to an edge of a printed circuit board having major surfaces essentially perpendicular to the front panel; and  
terminal pins permanently fixed to a rear edge of the printed circuit board to form a permanent continuous electrical path between the switch assemblies and the pins.

#### 5,439,396

#### ADAPTER FOR CIRCUIT BREAKER AND ASSEMBLAGE THEREOF

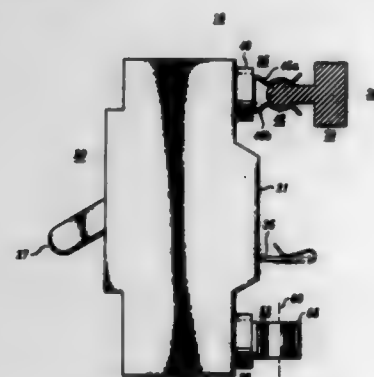
Jose L. Magdaleno, Dallas, Tex., assignor to AT&T Corp., Murray Hill, N.J.

Filed Sep. 28, 1993, Ser. No. 127,852

Int. Cl.<sup>6</sup> H01R 9/26

U.S. Cl. 439—716

9 Claims



1. An adapter for effecting electrical connection between a ferrule load terminal of a single pole circuit breaker and a lug on a cable for distributing current from said breaker to a load, said circuit breaker also having a line terminal for receiving current from a source thereof, and said adapter comprising: a rigid plastic case comprising, a vertically extending bar-shaped main body, a plastic receptacle for said lug which is formed by

said case at a first end of said body to be integral with said body, a pair of horizontally extending plastic brackets integral with and at the second end of said body and transversely projecting forwardly therefrom, said brackets being spaced to be separated by a gap, a metallic cylindrical contact disposed in said gap horizontally away from said body and crossing said gap to extend between opposite ends of said contact and be received in the plastic of, respectively, one and the other of said brackets, said contact being coupleable to said load terminal by being clipped thereto, a rigid metallic output current bus strap having a strap end projecting into said receptacle and being encapsulated over its length excluding that end by the plastic of said case, said strap extending from that end through said main body and then through one of said brackets to be electrically connected in that bracket with said contact, and adjustable terminal means in said receptacle for electrically coupling therein said lug and strap end.

#### 5,439,397 CONNECTOR

Makoto Yamanashi; Keishi Jinno; Tamio Watanabe; Takayoshi Endo, and Sakai Yagi, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

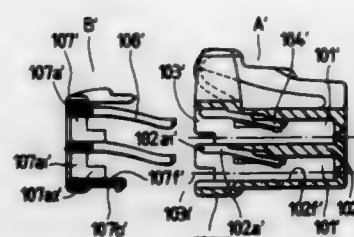
Continuation-in-part of Ser. No. 974,153, Nov. 10, 1992, abandoned, which is a division of Ser. No. 767,947, Sep. 30, 1991, Pat. No. 5,183,418. This application Dec. 7, 1993, Ser. No. 162,754

Claims priority, application Japan, Oct. 1, 1990, 2-260629; May 27, 1991, 3-37485

Int. Cl.<sup>6</sup> H01R 13/436

U.S. Cl. 439—752

4 Claims



1. A double-lock connector for receiving terminals, comprising:  
a connector housing having terminal receiving chambers respectively defined by horizontal partition walls of said housing for receiving the terminals;  
a terminal retainer connectable to a rear portion of said connector housing in a provisionally-connected condition and a completely-connected condition, said retainer including flexible arms extending from a forward side of said retainer for respectively retaining the terminals in said chambers; and  
terminal guide means for guiding each metal terminal into the respective terminal receiving chambers in the provisionally-connected condition when said each terminal is in a tilted position, the terminal guide means being provided with the connector housing and the terminal retainer, wherein the terminal guide means includes:  
projections formed on a rear side of respective said horizontal partition walls of said housing; and  
recess portions formed in forward sides of respective said retaining arms so as to receive said projections when said terminal retainer is in the provisionally-connected condition.

#### 5,439,398

#### TRANSISTOR MOUNTING CLAMP ASSEMBLY

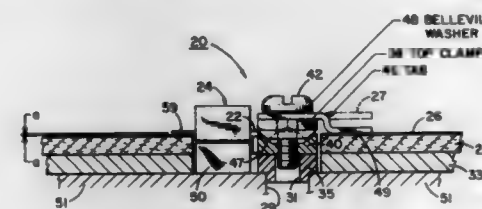
Martina B. Testa, Corvallis, Oreg., and Robert P. Smith, So. Plainfield, N.J., assignors to Radio Frequency Systems, Inc., Marlboro, N.J.

Filed Dec. 10, 1992, Ser. No. 989,038

Int. Cl.<sup>6</sup> H01R 4/38

U.S. Cl. 439—801

38 Claims



1. A transistor mounting clamp assembly for electrically connecting an electrical connector tab of a power transistor to a metallized portion of an associated printed circuit board, comprising:

- A) a top clamp having a first surface dimensioned for engagement with the connector tab of the transistor;
- B) a bottom clamp having a first surface dimensioned for engagement with the top clamp first surface and with the connector tab positioned therebetween;
- C) means for mechanically urging the top clamp and bottom clamp together so as to sandwich the transistor connector tab between said first surfaces; and
- D) means for electrically connecting the clamp assembly to the metallized portion of the associated printed circuit board.

#### 5,439,399

#### POWER SUPPLY BLADE LOCK MECHANISM

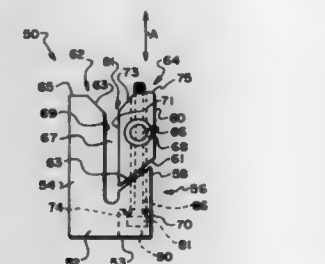
Lee Spechts, Billerica; Tuva Leneman, Newton, both of Mass., and Larry Pignolet, Woonsocket, R.I., assignors to EMC Corporation, Hopkinton, Mass.

Filed Feb. 2, 1994, Ser. No. 190,265

Int. Cl.<sup>6</sup> H01R 4/42

U.S. Cl. 439—807

11 Claims



1. An interconnect device for a power supply blade having two flat sides, comprising:  
a first portion having a flat surface for contact with a first flat side of the blade;  
a second portion having a flat surface facing the flat surface of the first portion for contact with a second flat side of the blade;  
at least one of said first and second portions including first and second mating parts having mating inclined surfaces; and  
means for translating a flat surface of at least one of said first and second portions toward and away from the flat surface of the other of said first and second portions to engage and disengage the blade, respectively, said means for translating including a threaded member passing through said first mating part and engaged with a threaded hole in a transverse member disposed in a transverse member receiving passage in said second mating part for relatively translating said first and second mating parts towards and

away from each other to cause the mating parts to slide along their mating inclined surfaces.

#### 5,439,400

#### DISPOSABLE ELECTRICAL CONNECTOR HEADER

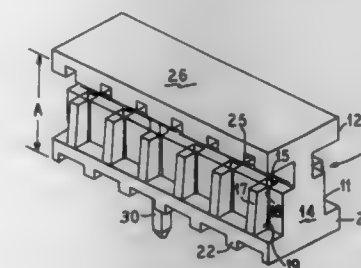
Charles A. Kozel, McHenry, and Daniel P. Vladic, Antioch, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Jul. 1, 1993, Ser. No. 85,979

Int. Cl.<sup>6</sup> H01R 9/24, 13/424

U.S. Cl. 439—885

8 Claims



1. A disposable electrical connector header for temporarily retaining terminal pins in a predetermined array comprising:  
a base having longitudinal pin-receiving passages;  
spring members external to and adjacent said passages;  
a top having a pin stop surface and a longitudinal tab; and  
a neck of lesser width than said base and protruding from said base supporting said top.

#### 5,439,401

#### ELECTRIC TROLLING MOTOR STEERING DEVICE

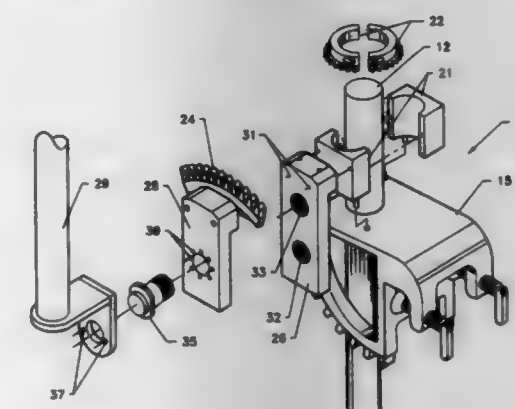
James F. Clark, 11146 Circle Loop, King George, Va. 22485

Filed Sep. 2, 1994, Ser. No. 300,789

Int. Cl.<sup>6</sup> B63H 5/12

U.S. Cl. 440—6

11 Claims



1. A steering device for an electric trolling motor comprising:  
means for rotating an electric trolling motor shaft;  
means for engaging said means for rotating; and  
a two-position tiller bracket having a handle and attached to said means for engaging for said two-position tiller handle having a two-position mounting for rotation in the vertical plane in a first mounting position and in a horizontal plane in a second mounting position.



5,439,402

**DESIGN OF AN INTEGRATED INLET DUCT FOR EFFICIENT FLUID TRANSMISSION**

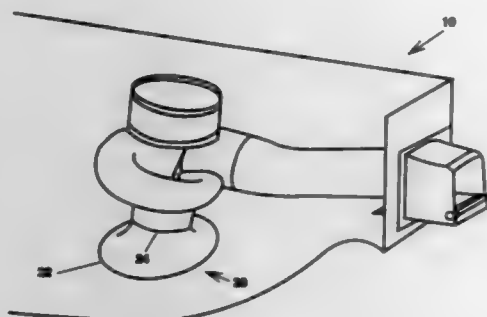
Charles M. Dai, Potomac; Christopher J. Kerr, Germantown, both of Md.; Phuc N. Nguyen, Lorton, and Han-Ch'ing Wang, Vienna, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1994, Ser. No. 314,278

Int. Cl.<sup>6</sup> B63H 11/103

U.S. Cl. 440-47

16 Claims



1. A method for designing an integrated inlet duct for efficient transmission of a substantially cavitation free fluid flow, said inlet duct for mounting in a marine vehicle, said method comprising the steps of:

- determining a surface geometry for said integrated inlet duct within specified hydrodynamic design constraints, said inlet duct having an inlet opening defining an inlet plane, an inlet exit defining an exit plane, a centrally located reference axis extending from said inlet plane to said exit plane, and a smooth continuous surface extending from a periphery of said inlet opening to a periphery of said inlet exit, wherein said surface geometry is represented by a series of fifth-order Bezier cross-link curves, each of said Bezier cross-link curves being explicitly and uniquely defined by a set of five associated control points said five associated control points being independent variables of a Bezier basis function, wherein a series of said sets defines said surface geometry;
- generating a panel representation of said surface geometry, said panel representation representing said smooth continuous surface of said inlet duct, said surface establishing pressure and velocity distributions of said flow within said inlet duct;
- calculating said pressure and velocity distributions of said flow within said inlet duct, said calculating including a predetermined suction effect;
- evaluating said surface geometry based on said specified hydrodynamic design constraints;
- repeating steps (a) through (d) for subsequent iterations of said surface geometry until said specified hydrodynamic design constraints are satisfactorily met at a predetermined design condition;
- evaluating a resulting surface geometry at off-design conditions; and
- repeating step (a) through (d) for subsequent iterations of said surface geometry until said specified hydrodynamic design constraints are satisfactorily met at off-design conditions.

5,439,403

**MARINE TRACTOR SURFACE DRIVE SYSTEM**

Philip M. Rolla, via Silva 5, 6828 Balerna, Switzerland

Filed Feb. 28, 1994, Ser. No. 203,990

Int. Cl.<sup>6</sup> B63H 25/42

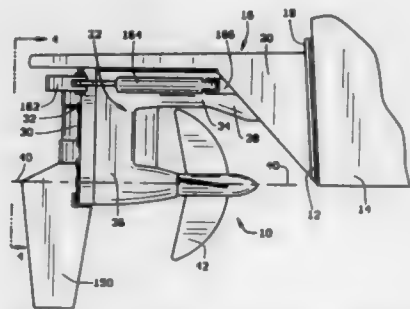
U.S. Cl. 440-51

16 Claims

1. A drive system for a boat having a hull with a transom at a rearward end of the hull and having a motor mounted in the boat within the hull, the hull having a configuration that will

float the boat on a body of water with a surface of the body of water delineating a waterline around the boat hull as the hull is propelled through the body of water by the drive system, the drive system comprising:

a housing having a horizontal portion and a vertical portion, the horizontal portion having a forward end and a rearward end with the forward end having means for attaching the housing to a transom of a boat in a position relative to the transom where the housing horizontal portion extends rearwardly from the transom above the waterline of the boat, the vertical portion having a top end and a bottom end with the top end connected to the rearward end of the housing horizontal portion, and the vertical portion extending downwardly from the horizontal portion to the bottom end of the vertical portion where the vertical portion has a configuration to position the bottom



end below the waterline of the boat to which the housing is attached;

a propeller mounted on the housing vertical portion for rotation of the propeller relative to the housing and at a position on the vertical portion where the propeller is forward of the vertical portion and only a portion of the propeller is positioned below the waterline of the boat to which the housing is attached;

a transmission contained inside the housing and connected to the propeller for driving the propeller in rotation, the transmission including means for connecting the transmission to a motor of the boat to which the housing is attached to drive rotation of the propeller from the motor, and;

the horizontal portion of the housing has a configuration that extends the horizontal portion rearwardly from its forward end to its rearward end directly over the propeller.

5,439,404

**COOLING SYSTEM FOR OUTBOARD MOTOR**

Yukio Sumigawa, Hamamatsu, Japan, assignor to Sanshin

Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 13, 1994, Ser. No. 305,200

Claims priority, application Japan, Sep. 14, 1993, 5-251032

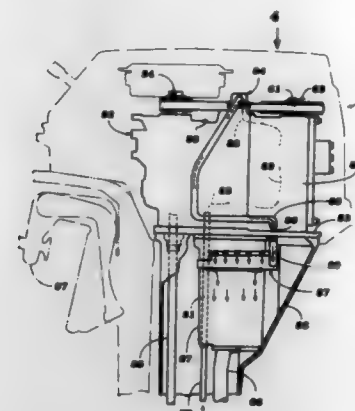
Int. Cl.<sup>6</sup> B63H 21/10

U.S. Cl. 440-88

20 Claims

1. An outboard motor comprised of a power head having a powering internal combustion engine, a drive shaft housing and lower unit depending from said power head and containing a propulsion device driven by said engine for propelling an associated watercraft, a lubricant reservoir depending into said drive shaft housing and having an outer wall, a water manifold

surrounding said outer wall and having a plurality of spaced discharge openings in the lower portion thereof for directing



water toward said outer wall, and means for delivering cooling water to said water manifold.

5,439,405

**COMBINED TOTE BAG, SEMI-SUBMERGIBLE FLOATING CHAIR/RECLINER AND BEACH CHAIR/PAD**

Thomas C. Storey, Tampa, Fla., and Maria I. Kahl, Scarborough, Canada, assignors to Aqua Buoyz, Inc., Tampa, Fla.

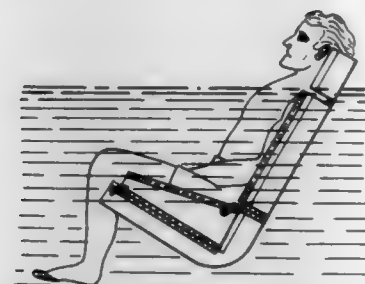
Continuation-in-part of Ser. No. 13,683, Feb. 4, 1993,

abandoned. This application Jul. 26, 1993, Ser. No. 98,412

Int. Cl.<sup>6</sup> B63C 9/30

U.S. Cl. 441-127

14 Claims



1. A multi-purpose tote bag convertible to a semi-submergible floating chair and convertible to a beach chair comprising: at least five planar sections having anterior and posterior sides comprised of a buoyant material and encompassed by a material casing; said planar sections including a front section having a pair of opposing longitudinal edges and a bottom edge, a back section having a pair of opposing longitudinal edges and a bottom edge, and an elongated center section, said center section including a middle section having a pair of opposing first and second longitudinal edges and a pair of opposing end edges and a pair of side sections hingeably affixed to opposing said end edges of said middle section, each said side section having a pair of opposing longitudinal edges;

fastening means associated with each of the planar sections, said fastening means being constructed and arranged such that fastening means disposed on the bottom edge of said front section are fastenable to fastening means disposed on the first longitudinal edge of said center section, fastening means disposed on the bottom edge of said back section are fastenable to fastening means disposed on the second longitudinal edge of said center section, fastening means disposed on each longitudinal edge of said front section are fastenable to each matching longitudinal edge of said side sections, fastening means disposed on each longitudinal edge of said back section are fastenable to each remaining longitudinal edge of said side sections so as to define an

open area between said front section, said side sections and said back section to provide a large storing area; said front section, said elongated center section and said back section having a combined density and thickness sufficient to float an average size adult semi-submerged in a sitting position;

said front section being generally rectangular in shape having a length sufficient to accommodate the length of the average adult's thigh and a width sufficient to accommodate the width of the average adult's buttox;

said elongated center section being generally rectangular in shape and equal in width to the width of said front section; a length of said elongated center section being of sufficient size when combined with the length of said back section to support the back height of the average adult;

said side sections being generally rectangular in shape and equal in length to the length of said elongated center section; the height thereof being no greater than the length of said front section or said back section; the bottom of each said side section is hingeably affixed to each end edge of said elongated center section; and

a headrest cushion attached to said front section, said headrest cushion having sufficient thickness and density to float an average size adult's head above water, said headrest cushion being generally rectangular in shape and hingeably attached to said front section whereby said headrest cushion can be folded inwardly or outwardly, said headrest cushion being of sufficient dimension to permit said headrest cushion to be easily folded into or out of the multi-purpose tote bag.

5,439,406

**METHOD FOR PEELING THE SAFETY PANEL OF A CRT**

Yoshio Fuwa, and Kuninori Hirata, both of Aichi, Japan, assignors to Sony Corporation, Tokyo, Japan

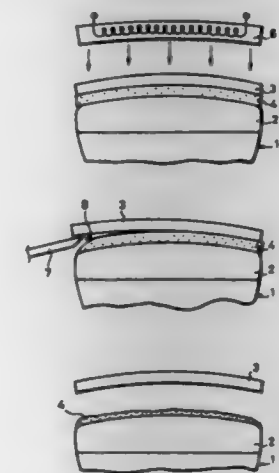
Filed Oct. 8, 1993, Ser. No. 133,318

Claims priority, application Japan, Oct. 9, 1992, 4-271811

Int. Cl.<sup>6</sup> H01J 9/50

U.S. Cl. 445-2

8 Claims



1. A method of peeling a safety panel bonded to a front surface of a cathode ray tube with a resin layer comprising the steps of:

- heating the resin layer through the safety panel to soften the resin layer; and
- applying an external force between the softened resin layer and the safety panel to thereby peel the safety panel from the resin layer.

5,439,407

**DOLL WITH AN IMAGING HEART**

Joan Friedel, 219 Northway, Baltimore, Md. 21218  
Continuation-in-part of Ser. No. 189,648, Feb. 1, 1994. This  
application Jun. 30, 1994, Ser. No. 269,215

Int. Cl.<sup>6</sup> A63H 33/22

U.S. Cl. 446—219

33 Claims



1. A doll comprising a body, said body including a chest portion, means for delineating a predetermined portion within said chest portion, means for illuminating said predetermined portion, and means for creating a silhouette of varying size and shape viewable through said predetermined portion upon the operation of said illuminating means.

5,439,408

**REMOTE CONTROLLED MOVABLE BALL AMUSEMENT DEVICE**

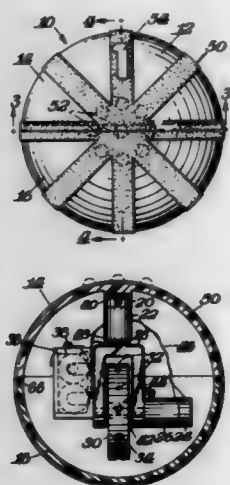
William T. Wilkinson, Severnside Farm, 300 Kyle Rd., Crownsville, Md. 21032-0572

Filed Apr. 26, 1994, Ser. No. 233,451

Int. Cl.<sup>6</sup> A63H 30/04, 29/00

U.S. Cl. 446—409

16 Claims



1. A remote controlled movable ball amusement device comprising a sphere, said sphere being hollow, a propulsion mechanism in said sphere, said propulsion mechanism being cantilevered mounted to said sphere, said propulsion mechanism including a receiver and a drive unit, said drive unit comprising means for causing said sphere to move, a remote transmitter, said remote transmitter including an actuator for

sending signals to said receiver, said receiver actuating said drive unit in response to said signals being received, said drive unit including a motor, a weight movably mounted by said motor, and said weight being eccentrically mounted with respect to the center of said sphere.

5,439,409

**BREAST PROTECTOR AND ASSEMBLY**

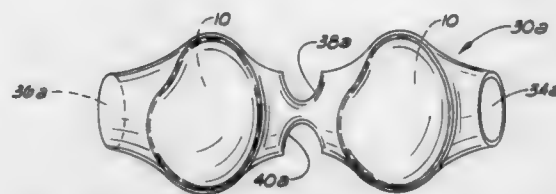
Jamie L. McCracken, and Kathy L. Goff, both of Stillwater, Okla., assignors to Turtle Shells Corporation, Stillwater, Okla.

Filed Jun. 28, 1993, Ser. No. 84,046

Int. Cl.<sup>6</sup> A41C 3/10, 3/14

U.S. Cl. 450—31

1 Claim



1. The breast protector assembly, comprising: two retention cups and a retention cup sleeve connected to a brassiere having support cups, the retention cup sleeve comprising a semi-elastic material and having a continuous sidewall defining an annular opening therethrough, wherein the retention cup sleeve is capable of accepting the two retention cups and holding the retention cups essentially immovable within the sleeve, and wherein the breast protector assembly is at least partially disposed into the support cups of the brassiere.

5,439,410

**POLISHING DRUM**

Svante Larsson, Umea, assignor to SL Innovation AB, Umea

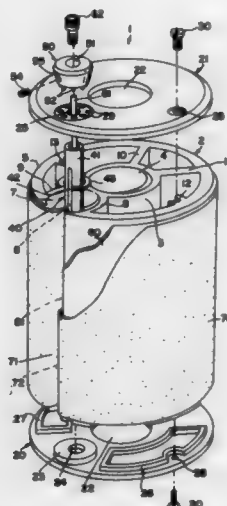
Filed Jan. 11, 1994, Ser. No. 179,928

Claims priority, application Sweden, Jan. 12, 1993, 9300055

Int. Cl.<sup>6</sup> B24B 9/18; B24D 9/04

U.S. Cl. 451—28

18 Claims



1. A polishing drum which is intended particularly for polishing the edge surfaces and outer surfaces of straight and curved workpieces, and which carries an abrasive sheet on a center cylinder, and is intended to be driven for rotation by a drive means, wherein the polishing drum includes a lining

5,439,412

**MACHINE FOR USE IN THE MANUFACTURE OF POWER STEERING VALVES**

Arthur E. Bishop, Sydney, Australia, assignor to A.E. Bishop Associates PTY Limited, North Ryde, Australia

PCT No. PCT/AU91/00495, § 371 Date May 19, 1993, § 102(e)

Date May 19, 1993, PCT Pub. No. WO92/10334, PCT Pub.

Date Jun. 25, 1992

PCT Filed Oct. 28, 1991, Ser. No. 50,327

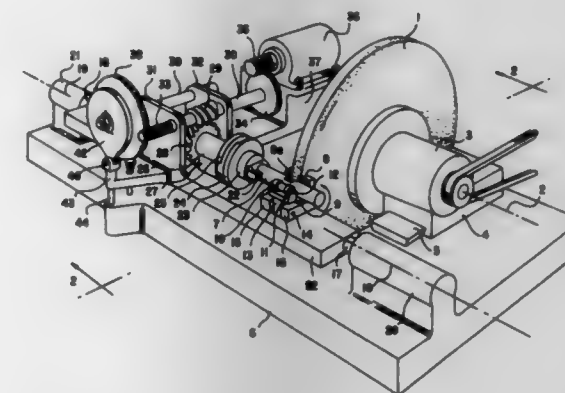
Claims priority, application Australia, Dec. 10, 1990, PK3787

The portion of the term of this patent subsequent to Apr. 5, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B24B 19/02, 5/36

U.S. Cl. 451—227

3 Claims



5,439,411

**SURFACE TREATING APPARATUS AND METHOD**

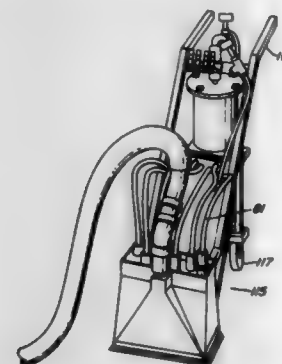
Ellis Griffin, Brownwood, Tex., assignor to Wayne Ward, Fort Worth; Carrol F. Shofner and Scott Ensor, both of Benbrook, all of Tex., a part interest to each

Filed Dec. 1, 1993, Ser. No. 160,925

Int. Cl.<sup>6</sup> B24C 3/00

U.S. Cl. 451—92

2 Claims



1. Apparatus the treating a surface, comprising: a manifold having a plurality of passageways, each passageway having an air inlet, an air and particulate media outlet and a particulate media inlet intermediate said air inlet and said air and particulate media outlet, an upper chamber having an inlet and a plurality of orifice outlets equal in number to the number of said passageways, each of said orifice outlets being coupled to one of said particulate media inlets, a pressure chamber for containing air under pressure and particulate media, a main conduit coupled to said pressure chamber for receiving air and particulate media from said pressure chamber, said main conduit having an air and particulate media conduit portion with a first outlet and a second outlet upstream of said first outlet with an air conduit portion coupled to said second outlet, said first outlet of said air and particulate media conduit portion being coupled to said upper chamber for injecting air and particulate media into said upper chamber to allow said particulate media to drop to the bottom of said upper chamber by gravity for passage into said passageways by way of said orifice outlets and said particulate media inlets, said air conduit portion having an outlet coupled to said air inlets of said passageways for injecting air and particulate media under pressure through said outlets of said passageways, said air conduit portion extending upward from said second outlet of said main conduit for separating air from said particulate media and then downward for conveying air to said inlets of said passageways.

1. A machine for grinding the metering edge contours on edges of axially extending grooves of a power steering valve input-shaft, said machine comprising: support means for supporting said input-shaft for rotation; a substantially cylindrical grinding wheel whose working surface is dressed parallel to axis of said input-shaft; drive means for rotating said input-shaft; means for cyclically increasing and decreasing a distance between said axis of said input-shaft and said grinding wheel several times during each revolution of said input-shaft to grind said metering edge contours, wherein each said metering edge contour ground to have a contour which is a mirror image of the contour of at least one other metering edge contour around the periphery of said input-shaft, therein forming metering edge contours, wherein said support means includes support surfaces which tangentially contact an outside diameter of said input-shaft, a first two of said support surfaces being axially displaced on either side of ends of said grooves, and being arranged one on each side of said grinding wheel on a side of the input-shaft adjacent said grinding wheel and other said support surfaces being arranged substantially at right angles to said first two support surfaces to constrain the input-shaft against motion in a direction parallel to said first two support surfaces, and a pair of pressing members contacting said outside diameter of the input-shaft, one each displaced axially on either side of the ends of said grooves and loaded so as to press said input-shaft in a direction generally towards said first two support surfaces, therein centerlessly supporting the input-shaft during grinding of the metering edge contours.



5,439,413

**FLOOR WORKING MACHINE**

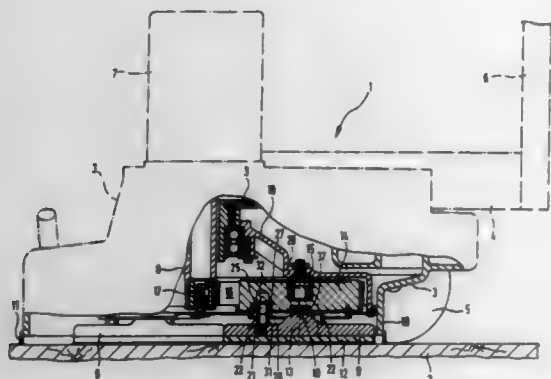
Eugen Lägler, Güglingen-Frauenzimmern, Germany, assignor to Eugen Lägler GmbH, Güglingen-Frauenzimmern, Germany  
Filed Apr. 8, 1994, Ser. No. 224,979

Claims priority, application Germany, Apr. 10, 1993, 43 11 869.0

Int. Cl.<sup>6</sup> B24B 7/18

U.S. Cl. 451—353

15 Claims



1. A floor machine for working a surface of a floor comprising:

- at least one rotary work plate;
- work means for working the floor engaged on a lower side of the rotary work plate;
- a holding part connected over said rotary work plate;
- wherein the holding part is spaced apart from the work plate outside a support area including a center of rotation located between the holding part and the work plate;
- the support area having surface means on the work plate and holding part permitting pivoting of the work plate in relation to the holding part;
- wherein a first surface of said surface means is convex and a second surface of said surface means is flat when disengaged from said first surface;
- attachment means slidably connected between the work plate and the holding part at positions on the holding part distributed around the support area for transmission of rotation from the holding part to the work plate;
- said holding part being driven by a motor of the machine;
- at least a part of the weight of the machine bearing through the holding part and the work plate to the floor when in operation;
- and wherein said attachment means and support area permit limited movement of the work plate in relation to the holding part on an uneven floor.

5,439,414

**NETWORKED FUME HOOD MONITORING SYSTEM**

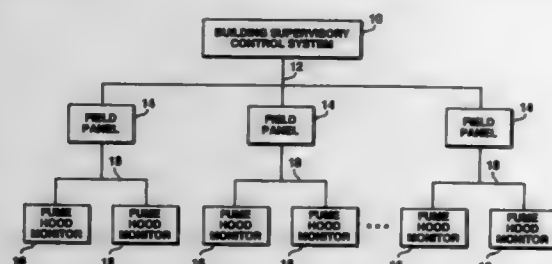
Steven D. Jacob, Roselle, Ill., assignor to Landis & Gyr Powers, Inc., Buffalo Grove, Ill.

Filed Jul. 26, 1993, Ser. No. 97,961

Int. Cl.<sup>6</sup> B08B 15/02

U.S. Cl. 454—61

21 Claims



1. Apparatus for monitoring the operation of a fume hood

which is operable to maintain a flow of air through the fume hood, including any uncovered portion of an opening of a fume hood of the type which has at least one moveable sash door adapted to selectively cover and uncover the opening during movement thereof, the fume hood being in communication with an exhaust duct for expelling air and fumes from the fume hood, the fume hood being located in a building having a supervisory control system for controlling the building heating, ventilating and air conditioning equipment, said apparatus being adapted to generate signals that are indicative of the monitored operation, said apparatus comprising:

- velocity sensing means for measuring the flow of air through the fume hood and generating a flow signal that is indicative of the flow of air through the fume hood;
- an alarm means and a switch of expelling said alarm means if said alarm means is activated;
- processing means for generating a face velocity signal indicative of the average face velocity responsive to said flow signal;
- said processing means being adapted to generate an identification signal which identifies the fume hood which the apparatus is monitoring during operation;
- said processing means including means for specifying a bandwidth defined by a predetermined minimum face velocity signal and a predetermined maximum face velocity signal;
- said processing means being adapted to generate an alarm signal responsive to said face velocity signal being outside of said bandwidth;
- said processing means being adapted to generate an alarm acknowledgement signal responsive to an operator actuating said alarm expel switch;
- means for communicating said identification signal, said face velocity signal, any alarm signal and any alarm acknowledgement signal to the building supervisory control system.

5,439,415

**ROLLING STOCK VENTILATOR AND ITS CONTROL METHOD**

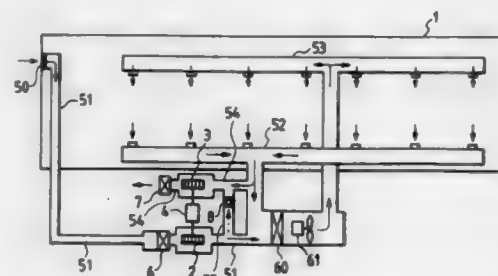
Haruo Hirikawa, Kudamatsu; Shinichiroo Ishikawa, Tokuyama; Sumio Okuno, Kudamatsu; Morishige Hattori, Kudamatsu, and Masakazu Matsumoto, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 28, 1994, Ser. No. 202,467

Int. Cl.<sup>6</sup> B61D 27/00

U.S. Cl. 454—70

13 Claims



10. A rolling stock ventilator comprising:
- an air supply fan for intaking fresh air into a railway car;
  - an exhaust fan for discharging air out of the car;
  - an air supply control for controlling air feed pressure of said air supply fan and said exhaust fan, wherein said air supply fan and said exhaust fan are adapted to permit change of air supply pressure of said air supply fan and said exhaust fan;
  - a tunnel detector for detecting that the car is entering a tunnel and for supplying a control input signal;
  - flow path resistance changers installed in an air flow path

connected to said air supply fan and said exhaust fan to change a flow path resistance of the air flow path; and a controller for supplying a control signal to said air supply control to raise an air feed pressure of said air supply fan and said exhaust fan in dependence upon the control input signal from said tunnel detector, and to supply said flow path resistance changers a control command to increase the flow path resistance;

an air conditioner receiving air from said air supply fan;

an air conditioner operation mode detector for detecting an operation mode of said air conditioner; and

a bypass circuit connecting an air flow path on an exhaust side of said air supply fan and on an air supply side of said exhaust fan, said bypass circuit being provided with a release valve; and

a control rod, responsive to a control input signal from said air conditioner operation mode detector, and wherein said air conditioner operation mode detector supplies an open control command signal to said release valve when said air conditioner is in a cooling mode, even if the car is running through a tunnel.

5,439,416

**COMPOSITE SHAFT WITH INTEGRALLY MOLDED FUNCTIONAL FEATURE**

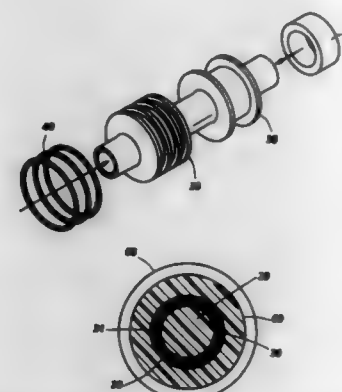
Timothy R. Jaskowiak, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 24, 1990, Ser. No. 633,562

Int. Cl.<sup>6</sup> F16C 3/02

U.S. Cl. 464—181

23 Claims



1. A shaft assembly comprising an elongated member having at least a portion which is tubular, shell like having an inside surface defining a shaft core and an outside surface defining a shaft functional surface, and including at least one molding aperture gate extending through said shaft from said inside surface to said outside surface, said shaft core being filled with a hardened, moldable material, said shaft functional surface having at least one functional feature thereon, which is of hardened, moldable material integrally molded with the hardened, moldable material in said shaft core and connected thereto by hardened, moldable material in said molding gate, said hardened, moldable material being a thermoplastic resin and wherein the coefficient of thermal expansion of the tubular, shell like portion and the shrink rate of the thermoplastic resin are selected to provide intimate contact between the hardened thermoplastic resin and tubular shell like portion.

5,439,417

**ROOF VENTILATING CAP**

Gary L. Sells, Mishawaka, Ind., assignor to Cor-A-Vent, Inc., Mishawaka, Ind.

Filed Nov. 2, 1994, Ser. No. 333,438

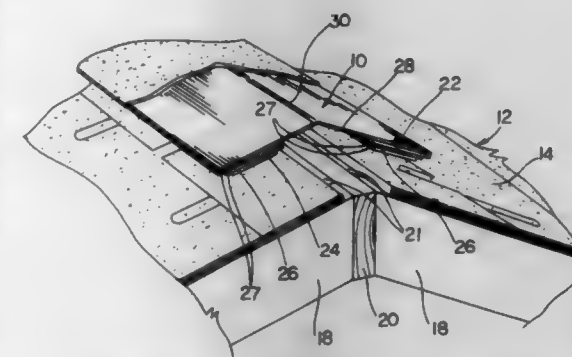
Int. Cl.<sup>6</sup> F24F 7/02

U.S. Cl. 454—365

9 Claims

1. A ventilating cap for the ridge of a roof, said roof having opposed upwardly tapering portions tapering upwardly

toward said ridge, said roof having a longitudinal opening therein extending along said ridge, said ventilating cap comprising a pair of elongated vent parts extending along said upwardly tapering portions on opposite sides of said ridge, each of said vent parts including multiple plies of material defining passages communicating said opening with ambient atmosphere, each of said vent parts further including a bottom ply engaging said roof and an upper ply, said upper ply includ-



ing a connecting portion extending across and along said ridge to interconnect said vent parts, and a groove in said connecting portion and extending along said ridge, said groove having a center portion extending longitudinally along the center of said groove and edge portions extending longitudinally along both of the edges of said groove, said upper ply being folded along said groove to extend over said ridge, said center portion being formed into an arcuate shape.

5,439,418

**MOLDED DISTRIBUTOR RECEIVER AND PIN STORAGE MAGAZINE**

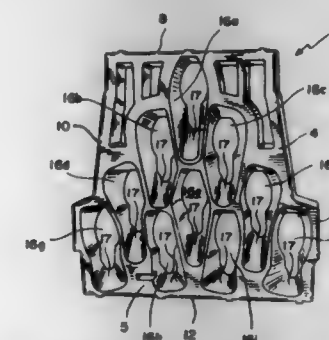
Michael W. Stephens, Richmond, Va., assignor to AMF Bowling, Inc., Mechanicsville, Va.

Filed Aug. 19, 1994, Ser. No. 292,181

Int. Cl.<sup>6</sup> A63D 5/09

U.S. Cl. 473—64

7 Claims



1. A bowling pin storage bin for use with a pin delivery system comprising a molded three dimensional one piece structure having a top and a bottom and two pairs of oppositely disposed sides, a longitudinal axis running between a first pair of sides and a lateral axis running between a second of said pair of oppositely disposed sides, said one piece structure having a plurality of oblong cavities extending through said structure from said top to said bottom, said cavities having a diminishing cross sectional area from said top of said structure toward said bottom of said structure and with each of said cavities having a minimum cross sectional area which defines the general shape of a bowling pin taken along its longitudinal axis but having a cross sectional area slightly larger in width but shorter in length than the cross sectional area of a conventional bowling pin taken along its longitudinal axis so that a conven-

tional bowling pin falling into one of said cavities with its longitudinal axis parallel to the longitudinal axis of said structure will pass through said structure and releasable retaining means in cooperation with each of said cavities for retaining a bowling pin cradled in said cavity with the bowling pin's longitudinal axis generally parallel to the longitudinal axis of said structure, and means for releasing the bowling pin so that it passes through said structure and into a pin delivery system.

5,439,419

# **PULLEY DEVICE FOR CONTINUOUSLY VARIABLE TRANSMISSION**

Masahiko Yamada, Nagoya; Wataru Onuki, Atsugi; Hirofumi Okahara, and Nobuaki Mochizuki, both of Isahaya, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Aichi Machine Industry Co., Ltd., Nagoya, both of Japan

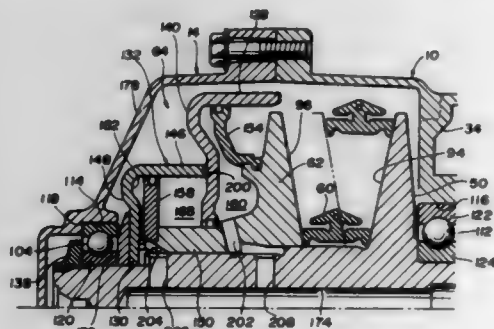
Filed Jan. 27, 1994, Ser. No. 187,285

Claims priority, application Japan, Jan. 27, 1993, 5-031335

Int. Cl.<sup>6</sup> F16H 59/00

U.S. Cl. 474-18

20 Claims



## **1. A pulley device comprising:**

- a first conical pulley component including a shaft portion and a first conical face;
  - a second conical pulley component mounted to said shaft portion for rotation therewith and including a second conical face opposed to said first conical face, said second conical pulley component being slidably mounted to said shaft portion for movement relative to said shaft portion in such a direction as to vary a distance between said opposed first and second conical faces;
  - a cylinder;
  - means for fixedly holding said cylinder with respect to said shaft portion; and
  - a piston fixed to said second conical pulley component, said piston being slidably received within said cylinder;
- wherein said shaft portion includes a reduced diameter end portion and a shoulder connected to said reduced diameter end portion;
- wherein said fixedly holding means include an annular disc portion coupled with said reduced diameter end portion and disposed adjacent to said shoulder, an annular shim disposed between said shoulder and said annular disc portion, and means for keeping said annular disc portion and annular shim in axial tight manner with respect to said shoulder;
- wherein said annular disc portion and said cylinder are fixedly interconnected by an intermediate portion; and
- wherein said intermediate portion includes a cylinder end wall integral with and extending radially inwardly from said cylinder, an auxiliary cylinder having one end portion in engagement with said cylinder end wall and an opposite end, and an auxiliary cylinder end wall integral with and extending radially inwardly from said opposite end of said auxiliary cylinder, said cylinder end wall defining an annular disc portion fixedly coupled with said shaft portion.

5,439,420

# **ACCESSORY DRIVE SYSTEM FOR AN AUTOMOTIVE ENGINE**

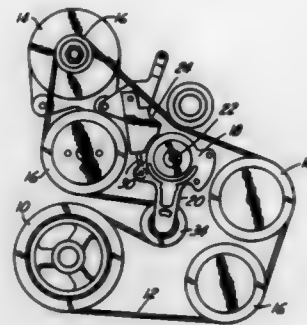
Richard J. Meckstroth, Northville, and Gerard S. Toth, Belleville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 4, 1994, Ser. No. 223,250

Int. Cl.<sup>6</sup> F16H 7/08

U.S. Cl. 474-133

16 Claims



## **1. An accessory drive system for an automotive engine, comprising:**

- a drive pulley attached to an output shaft of the engine;
- a flexible drive belt for connecting the drive pulley with a plurality of driven pulleys, with one driven pulley located upon each of a plurality of driven devices; and
- a tensioner for maintaining the drive belt in contact with each of said drive and driven pulleys, with said tensioner comprising an arm which is rotatably mounted to the engine and which has a wheel for contacting the drive belt, with the wheel being urged into contact with the drive belt by the arm, and with said tensioner further comprising a governor for controlling the rotational motion of the arm such that the arm will be freely able to rotate in the direction in which the tension in the drive belt is increased, with said governor resisting motion of the arm in the direction in which tension in the drive belt is decreased, wherein said governor comprises a hydraulic strut interposed between said tensioner arm and a mounting surface fixed to the engine adjacent the tensioner, such that linear motion of the strut accompanies rotational motion of the arm, with the strut having a connecting rod portion being able to move freely in the direction in which tension in the drive belt is increased, while resisting movement in the direction in which tension in the drive belt is decreased.

5,439,421

# **STRUCTURE COMPRISING SHAFT AND OUTER MEMBER HAVING IMPROVED PLAY-PREVENTING SLEEVE**

Kouji Tanaka, Osaka, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Sep. 23, 1994, Ser. No. 311,549

Claims priority, application Japan, Sep. 30, 1993, 5-057374 U

Int. Cl.<sup>6</sup> F16G 13/00

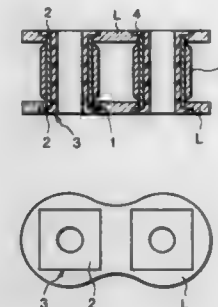
U.S. Cl. 474-206

12 Claims

## **1. A structure comprising:**

- an outer member having first and second ends and a bore with an inner wall extending transverse to said first and second ends;
- a shaft extending through said bore, wherein the shaft is able to move relative to the bore while remaining substantially in coaxial relationship to the bore; and
- means, for eliminating play between the shaft and the bore, comprising a sleeve bonded by molding to said inner wall of the bore, said sleeve having first and second opposite ends and having a flange at each end of said sleeve, said

outer member having a recess at each of said first and second ends of the outer member;



said flange being engaged in said recess and said flange and recess being complementary to each other.

5,439,422

# **DRIVE BELT**

Paulus M. Smeets, Tilburg, Netherlands, assignor to Van Doorne's Transmissie B.V., Netherlands

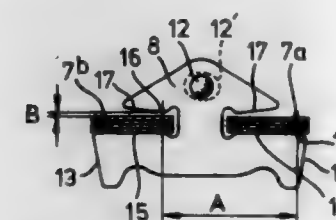
Filed May 24, 1994, Ser. No. 248,264

Claims priority, application Netherlands, May 24, 1994, 9308880

Int. Cl.<sup>6</sup> F16G 1/22

U.S. Cl. 474-242

8 Claims



## **1. A drive belt, comprising:**

- an endless carrier means;
- a first element positioned transversely on said endless carrier means;
- said first element being rotatable relative to said endless carrier means in a plane orthogonal to the longitudinal direction of said carrier means;
- said first element further comprising a bearing surface having a first contact point and a top surface having a second contact point, the shortest distance between said second contact point and said bearing surface exceeding the thickness of said carrier means by a length B, and said first and second contact points disposed to engage opposite sides of said carrier means when said first element rotates, thereby impeding excessive rotation of said first element;
- said first and second contact points defining the hypotenuse of a right triangle having its right angle vertex in the plane of said bearing surface, the distance between said right angle vertex and said first contact point defining a length A; and
- the dimensions of said first element and said carrier means being chosen such that the arctangent of the quotient B/A is greater than about 0.2 degrees but not greater than about 0.8 degrees.

5,439,423

# **CHAIN BELT WHERE LOAD BLOCK HAS GROOVES FOR ENGAGEMENT WITH PROTRUSIONS ON LINK PLATES**

Shigeru Okuwaki, Shizuoka, and Yukio Tomimura, Mie, both of Japan, assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich. and Toyota Jidosha Kabushiki Kaisha, Atchi, Japan

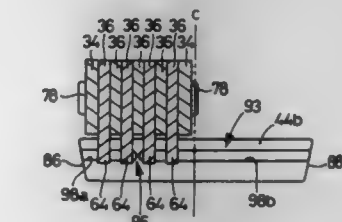
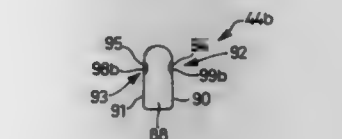
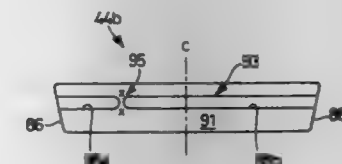
Filed Apr. 8, 1994, Ser. No. 224,823

Claims priority, application Japan, Apr. 9, 1993, 5-107517

Int. Cl.<sup>6</sup> F16G 5/18

U.S. Cl. 474-245

16 Claims



## **1. A power transmission chain belt engageable with pulleys each having a V-groove, comprising:**

- at least two chains arranged in side-by-side parallel relationship with each other, each of said two chains including a plurality of sets of parallel links, and pivot members, said sets of parallel links being connected to each other by said pivot members, said two chains being offset from each other in a longitudinal direction thereof by a distance equal to a half of a pitch of said sets of parallel links;
- a plurality of load block members arranged in spaced-apart parallel relationship with each other and engaging an inner side of said two chains, each of said load block members being oriented transversely to said two chains and having a length which substantially covers a total width of said two chains;
- each of said plurality of sets of parallel links including a plurality of link plates each of which has an inner side end face facing said load block members, and a pair of gripping protrusions formed so as to extend from an intermediate portion of said inner-side end face thereof;
- each of said load block members having opposite end faces which define said length thereof, an outer edge on the side of said load block member, and a pair of engaging grooves formed along said length thereof and in parallel with said outer edge thereof, each of said pair of engaging grooves being open at opposite ends thereof on said opposite end faces, said pair of gripping protrusions on each of said link plates engaging said pair of engaging grooves of said each load block member thereby holding each load block member; and
- stopper means, provided in at least one of said pair of engaging grooves, for inhibiting relative movement between said link plates and said load block members.



5,439,424

## CVT CONTROL SYSTEM

Makoto Sawada, Atsugi; Hiromitsu Sakai, and Nobuaki Mochizuki, both of Isehara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

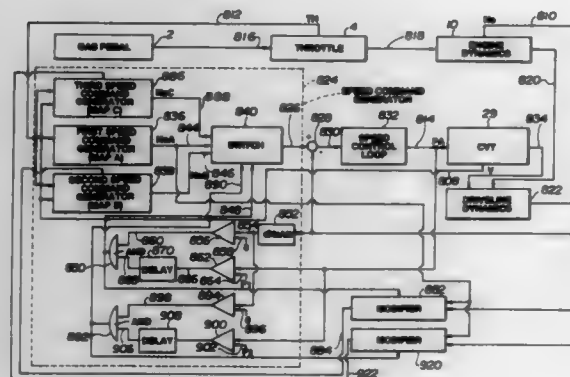
Filed Mar. 3, 1994, Ser. No. 205,362

Claims priority, application Japan, Mar. 3, 1993, 5-067505

Int. Cl.<sup>6</sup> B60K 41/12

U.S. Cl. 477-46

22 Claims



1. In a control system, for a vehicle drivetrain with an engine having various engine speeds and a continuously variable transmission, including hydraulic means including a ratio control element positionable to various command positions in response to a control signal to establish speed ratios between input and output shafts of the continuously variable transmission, and controller means developing a command indicative of the desired engine speed in response to operator power demand and the vehicle speed, developing the control signal in such a manner as to bring the actual engine speed into agreement with the desired engine speed and applying the control signal to the ratio control element, the ratio control element being positionable to a predetermined one command position of the various command positions in response to the control signal to establish a predetermined one of the speed ratios which provides the maximum reduction ratio and to a second predetermined one command position of the various command positions in response to the control signal to establish a second predetermined one of the speed ratios which provides the minimum reduction ratio,

the improvement wherein the controller means determines the desired engine speed as a first function of the operator power demand and the vehicle speed until initiation of a decrease in the actual engine speed after the ratio control element has stayed at the first predetermined command position to provide the maximum reduction ratio; the controller means determines the desired engine speed as a second function of the operator power demand and the vehicle speed upon and after the initiation of the decrease in the actual engine speed;

the controller means determines the desired engine speed as a third function of the operator power demand and the vehicle speed until initiation of an increase in the actual engine speed after the ratio control element has stayed at the second predetermined command position to provide the minimum reduction ratio; and

the controller means determines the desired engine speed as the second function of the operator power demand and the vehicle speed upon and after the initiation of the increase in the actual engine speed.

5,439,425

# METHOD AND APPARATUS FOR CONTROLLING ENGAGEMENT AND DISENGAGEMENT OF THE CLUTCH AS A FUNCTION OF DISPLACEMENTS BETWEEN ENGINE AND VEHICLE BODY

Norbert Ramm, and Frank Zimmermann, both of Braunschweig, Germany, assignors to Volkswagen A.G., Wolfsburg, Germany

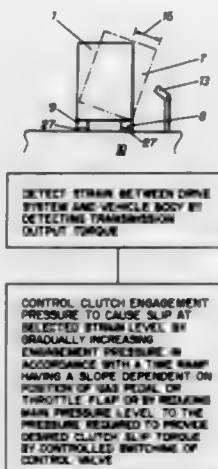
Filed Aug. 23, 1993, Ser. No. 110,352

Claims priority, application Germany, Aug. 26, 1992, 42 28 378.7

Int. Cl.<sup>6</sup> F16H 61/02

U.S. Cl. 477-74

13 Claims



1. A method for controlling engagement of a clutch to which engagement pressure is applied in a transmission of a drive system for a motor vehicle which includes an engine, a body, drive wheels and an electrohydraulically actuatable automatic transmission so as to minimize stationary vibration when the vehicle is at a standstill and in gear with the drive wheels braked, as well as to reduce the concussion of clutch engagement, comprising the steps of detecting the strain between the drive system and the vehicle body by detecting the output torque of the transmission and controlling the engagement pressure of a clutch in the transmission to a level such that the clutch begins to slip when the vehicle is stationary and in gear with the drive wheels braked, or when the vehicle is stationary and out of gear, or when the vehicle is being decelerated to a standstill in gear and the vehicle speed and drive system load fall below a predetermined threshold level.

5,439,426

# SPEED CHANGE CONTROL APPARATUS FOR A VEHICULAR AUTOMATIC TRANSMISSION AND A TROUBLESHOOTING METHOD FOR OPERATING A CONDITION DETECTING DEVICE

Yasuhiro Nakashima, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1993, Ser. No. 73,050

Claims priority, application Japan, Jun. 12, 1992, 4-153173

Int. Cl.<sup>6</sup> B60K 41/06

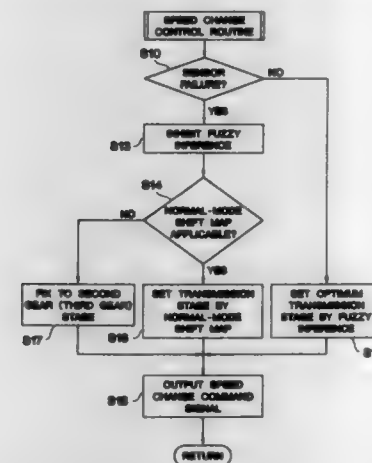
U.S. Cl. 477-125

8 Claims

7. A speed change control apparatus for a vehicular automatic transmission having a plurality of transmission stages, including an operating condition detecting device for detecting operating conditions of a vehicle, which changes a transmission stage of the automatic transmission in accordance with an output value of the operating condition detecting device, said speed change control apparatus comprising:

first transmission stage setting means for setting an optimum transmission stage of the automatic transmission by fuzzy inference based on the output value of the operating condition detecting device;

failure detecting means for detecting a failure of the operating condition detecting device;  
fuzzy inference inhibiting means for inhibiting the first transmission stage setting means from setting the optimum transmission stage by the fuzzy inference when the failure of the operating condition detecting device is detected;  
a vehicle velocity detecting device;  
an engine load detecting device;  
reference transmission stage setting means for setting, in accordance with output values of said vehicle velocity detecting device and said engine load detecting device, the transmission stage to a corresponding one of transmis-



sion stages which are set beforehand in accordance with vehicle velocity and engine load; and  
transmission stage fixing means for fixing the transmission stage to a predetermined transmission stage;  
wherein the transmission stage is set by said reference transmission stage setting means when said fuzzy inference inhibiting means inhibits said first transmission stage setting means from setting the optimum transmission stage by the fuzzy inference; and  
wherein the transmission stage is fixed to the predetermined transmission stage by said transmission stage fixing means when the failure of said vehicle velocity detecting device or said engine load detecting device is detected.

5,439,427

# MULTIPLE STAGE AUTOMATIC TRANSMISSION

Kazunori Enokido; Hidehiko Mishima; Toshihisa Marusue; Tatsutoshi Mizobe; Shigeru Nagayama; Takayuki Sumimoto, all of Hiroshima; Minoru Kuriyama, Higashi-Hiroshima, and Shinya Kamada, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 8, 1993, Ser. No. 43,702

Claims priority, application Japan, Apr. 10, 1992, 4-091254; Apr. 20, 1992, 4-128174; May 29, 1992, 4-163815; Jun. 12, 1992, 4-179279

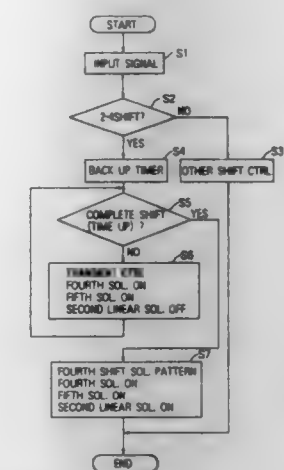
Int. Cl.<sup>6</sup> F16H 61/08

U.S. Cl. 477-130

10 Claims

1. A multiple stage automatic transmission comprising  
a main transmission mechanism,  
a sub-transmission mechanism connected with the main transmission mechanism for introduction of a torque therefrom,

a frictional element connected with the sub-transmission, and



changing means for changing an engaging force of the frictional element in accordance with a shift mode.

5,439,428

# METHOD AND APPARATUS FOR ROBUST AUTOMATIC CLUTCH CONTROL WITH PID REGULATION

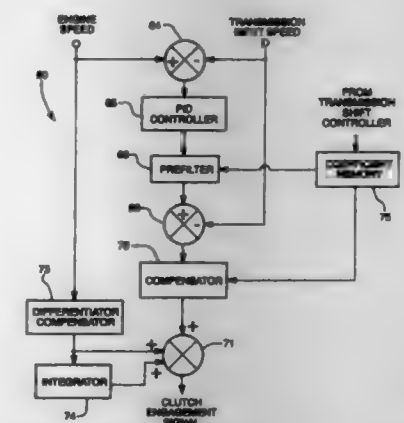
James Slicker, West Bloomfield, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 22, 1994, Ser. No. 199,704

Int. Cl.<sup>6</sup> B60K 41/02, 41/28

U.S. Cl. 477-175

9 Claims



1. In a combination including a source of motive power controlled by a throttle, a friction clutch having an input shaft connected to the source of motive power and an output shaft, and at least one inertially-loaded traction wheel connected to the output shaft of the friction clutch having a torsional compliance exhibiting an oscillatory response to torque inputs, an automatic clutch controller comprising:

an engine speed sensor connected to the source of motive power for generating an engine speed signal corresponding to the rotational speed of the source of motive power;  
a transmission input speed sensor connected to the output shaft of the friction clutch for generating a transmission input speed signal corresponding to the rotational speed of the output shaft of the friction clutch;  
a clutch actuator connected to the friction clutch for controlling engagement of the friction clutch from disengaged to fully engaged according to a clutch engagement signal; and  
a controller connected to said engine speed sensor, said

transmission input speed sensor and said clutch actuator including

- a PID regulator coupled to the engine speed sensor and the input speed sensor for generating a regulated output,
- a prefilter connected to said PID regulator for generating a filtered PID signal,
- a first algebraic summer connected to said transmission input speed sensor and said prefilter generating a first algebraic sum signal corresponding to the difference between (1) said filtered PID signal and (2) said transmission input speed signal, and
- a compensator connected to said first algebraic summer for decreasing closed loop sensitivity and for generating said clutch engagement signal for supply to said clutch actuator for engaging the friction clutch in a manner causing said transmission input speed to asymptotically approach said engine speed.

5,439,429

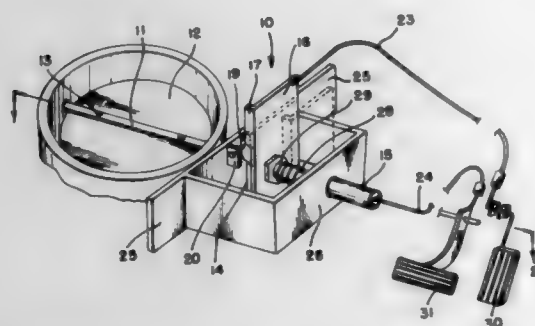
#### VEHICLE SAFETY SYSTEM FOR CORRECTING SIMULTANEOUS ACTUATION OF BRAKE AND ACCELERATION PEDALS

Steven P. Lee, 25 - 5th St., N. Arlington, N.J. 07031  
Filed Nov. 23, 1993, Ser. No. 155,820

Int. Cl.<sup>6</sup> B60K 41/20

U.S. Cl. 477-207

2 Claims



1. A vehicle safety system for correcting simultaneous actuation of accelerator and brake pedals in motor vehicles, said vehicle safety system comprising:

- a linkage for use in a carburetor in the motor vehicles, an accelerator pedal, and a brake pedal, said linkage including,
- a housing having at least upper and lower ends,
- a throttle valve attached to a first end of a rotatable shaft by bolts,
- a tube for slidably and coaxially receiving said rotatable shaft, said tube being connected to said brake pedal by a tube wire,
- a shaft engagement member attached adjacent to a second end of said rotatable shaft, the shaft engagement member having a shaft engagement extension extending perpendicularly from a first side thereof,
- a tube engagement member attached to said tube and selectively engageable with said shaft engagement member, said tube engagement member being linearly movable on and axially rotatable about said rotatable shaft and further having a first tube extension extending perpendicularly from a first side thereof for mating with said shaft engagement extension and a second tube extension extending perpendicularly from a second side thereof for connecting to a spring supported adjacent the lower end of said housing, an accelerator wire being connected to said tube engagement member at a side opposing the first tube extension, wherein the perpendicularly extending first and second tube extensions are such that said first shaft engagement member fits therebetween,
- a first stopper supported in a base of said housing for stopping axial rotation of said shaft engagement mem-

ber at said shaft engagement extension and a second stopper supported on an upper portion and extending to an interior of said housing for stopping said tube engagement member at said tube engagement extension, whereby upon applying the brake pedal and simultaneously depressing the accelerator pedal, said tube engagement member is linearly pulled out of engagement with said shaft engagement member, thereby releasing rotation of said shaft engagement member such that the throttle valve deactivates and in turn, without application of the brake pedal, the throttle valve is actuated by depressing the accelerator pedal, so that the vehicle safety system can effectively prevent unintended acceleration of motor vehicles.

5,439,430

#### RESPIRATORY EXERCISER

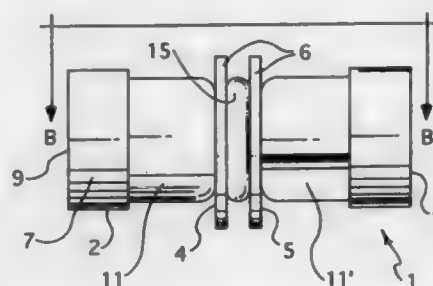
Louis C. Rubens, and Jane R. Rubens, both of 503 Linwood St., Midland, Mich. 48640

Filed May 10, 1993, Ser. No. 58,771

Int. Cl.<sup>6</sup> A63B 23/18

U.S. Cl. 482-13

4 Claims



1. A respiratory exerciser, said respiratory exerciser comprising in combination:

- A. a piston for use in a cylindrical tube including two cups and at least one flexible disk and a fastening means, each said cup being configured essentially identical to the other, each said cup comprising a back and an outside diameter; each said cup joined to the other cup in back to back interfacial relationship to form a piston; said cups having at least one flexible disk centered between their joined backs; each flexible disk having a diameter larger than the largest outside diameter of the cups, said fastening means securing the cups and the flexible disk together;
- B. an elongated cylindrical tube having an inside diameter greater than the largest outside diameter of the piston, but smaller than the largest diameter of the largest flexible disk of the piston;
- C. a mouthpiece attached to at least one end of the elongated cylindrical tube to allow passage of air into the elongated cylindrical tube.

5,439,431

#### MACHINING CENTRE CONSTRUCTED FROM ASSEMBLIES

Norbert Heesbrüggen, Eichenbach, and Heinz Steinbach, Ulm, both of Germany, assignors to EMAG-Maschinen Vertriebs- und Service GmbH, Salach, Germany

Filed Apr. 7, 1993, Ser. No. 43,796

Claims priority, application Germany, Apr. 10, 1992, 42 12 175.2; European Pat. Off., Mar. 14, 1993, 93104144

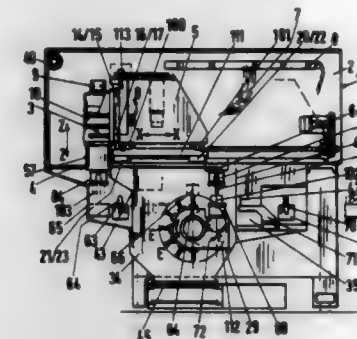
Int. Cl.<sup>6</sup> B23Q 3/157

U.S. Cl. 483-14

54 Claims

1. A machining center composed of a plurality of assemblies, each of said assemblies including a machine base, each machine base includes a compound slide, guides for guiding a movement of the compound slide with respect to the machine base, a motor including a motor spindle driven by said motor, said

motor spindle is attached to the compound slide and is movable along a plurality of axes, facilities for enabling a collection of swarf and coolant, a housing attached to the machine base, wherein said housing is formed by a container, adapted to be mounted on the machine base as a module, for housing at least control elements and a power supply, first openings are provided between the guides of the compound slide and the motor



spindle and the compound slide for enabling removal of the swarf, further openings are provided in the machine structure for accommodating a storage and transportation unit, a probe is incorporated in a machine control for enabling a checking of machined workpieces, and wherein a sheet metal cover is fastened to said compound slide and includes a vertically extending hole therein for enabling penetration of said motor spindle through said sheet metal cover in a sealed manner.

5,439,432

#### FOOT SUPPORTING MEMBER FOR EXERCISE MACHINE

Christopher B. Lundin, Mantua, N.J., and Clive G. Stevens, Taipei, Taiwan, assignors to Physiq, Inc., Bellmawr, N.J.

Filed Jun. 6, 1994, Ser. No. 254,910

Int. Cl.<sup>6</sup> A63B 23/04

U.S. Cl. 482-53

3 Claims



3. In an exercise apparatus of the type having a base frame and right and left foot supporting members for supporting a person's feet during exercise wherein the improvement comprises:

- each of said foot supporting members having an upper surface and a plurality of apertures formed therein;
- right and left compression mats each having a top side and an underside;
- a plurality of barbed extensions extending downwardly from said underside of each of said mats, said barbed extensions on said right compression mat being removably secured in said apertures in said right foot supporting member and said barbed extensions on said left compression mat being removably secured in said apertures in said left foot supporting member, and
- a plurality of projections extending downwardly from said

underside of each of said mats and contacting said upper surface of its corresponding foot supporting member thereby creating space between said underside of each of said compression mats and the upper surface of the corresponding foot supporting member.

5,439,433

#### SUPPORT BAR FOR EXERCISE MACHINE

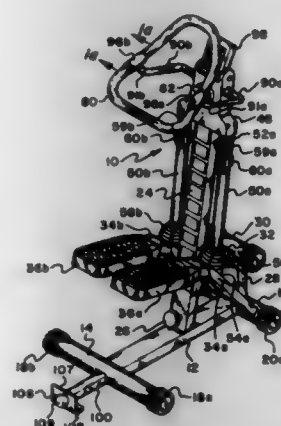
Christopher B. Lundin, Mantua, N.J., and Clive G. Stevens, Taipei, Taiwan, assignors to Physiq, Inc., Bellmawr, N.J.

Filed Jun. 6, 1994, Ser. No. 254,911

Int. Cl.<sup>6</sup> A63B 23/04

U.S. Cl. 482-53

9 Claims



1. A step climber exercise machine comprising:

- a base frame having a longitudinally extending base member, a transverse rear segment and a transverse front segment;
- a pair of laterally spaced stepping members pivotally mounted on said base frame;
- resistance means having tops and bottoms, said bottom of each resistance means being pivotally attached to a different one of said stepping members for providing resistance when a downward force is placed on said stepping members;
- a main strut attached to said base member between said front and rear segments, said main strut extending upwardly from said base member;
- a handlebar for providing support for a person;
- means for adjustably securing said handlebar to the end of said main strut furthest from said base member;
- attachment means for attaching said resistance means to said upper frame, and
- a support bar telescopically mounted in said transverse rear segment and said base frame, said support bar being capable of extending rearwardly from said base frame and rearwardly from the center of said rear transverse segment for preventing tipping of the exercise machine when in use.

5,439,434

#### AUTOMATIC TOOL EXCHANGER

Kyuichi Seto, and Yukio Tamura, both of Niigata, Japan, assignors to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed May 6, 1994, Ser. No. 238,891

Claims priority, application Japan, May 7, 1993, 5-107088

Int. Cl.<sup>6</sup> B23Q 3/157

U.S. Cl. 483-1

16 Claims

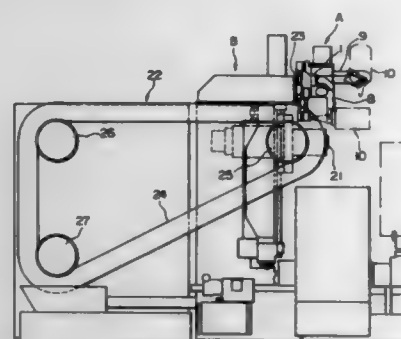
1. An automatic tool exchanger comprising:

- a support frame;
- a driving bevel gear, freely rotatably supported on said support frame;
- a driving means having an output shaft engaged to said driving bevel gear for rotating said driving bevel gear;



a pair of follower bevel gears disposed on both sides of said bevel gear and engaged with said driving bevel gear;  
 a pair of rotating shafts, having an internal part thereof integrally attached to each follower bevel gear, freely rotatably disposed on said support frame on both sides of said output shaft so that a central axis of each of said pair of rotating shafts crosses on a point lying on a line extending from a central axis of said output shaft;  
 a pair of swing arms comprising one swing arm having one gripper disposed on its terminal part and other swing arm having other gripper disposed on its terminal end, and the opposite end of said each swing arm is fixed to an outer end of each of said rotating shafts with a phase separation angle arranged in the direction of rotation;  
 wherein said driving means drives each rotating shaft to swing said pair of swing arms simultaneously in one common direction along a respective arc track lying on mutually intersecting planes, thereby causing one gripper of said one swing arm to remove a used tool from a spindle of a machine while simultaneously causing said other gripper of said other swing arm to insert a new tool in said spindle vacated by said used tool.

9. A method for automatically exchanging a tool between a tool magazine and a spindle of a machine using an automatic tool exchanger comprising a support frame; a driving bevel gear; a driving means operatively attached to said driving bevel gear; a pair of follower bevel gears engaged with said driving bevel gear; a pair of rotating shafts integrally fixed to said follower bevel gears, and freely rotatably disposed on said



support frame on both sides of said output shaft; a pair of swing arms comprising one swing arm having one gripper and other swing arm having other gripper, disposed on a distal end of each of said swing arms which are fixed to an outer end of each of said rotating shafts so as to provide a phase separation angle which is phase shifted in the direction of rotation; wherein when said one gripper and other gripper are both empty, said method comprising the steps of:

- moving said automatic tool exchanger from a ready position to a first exchange position through vertical and horizontal movements towards said tool magazine, and with a grip opening facing downward and empty, inserting said one gripper onto a new tool lying in the direction of said spindle on said tool magazine, and holding said new tool in said one gripper;
- swinging said pair of swing arms and removing said new tool from said tool magazine by swinging said one gripper up along one arc track while simultaneously swinging said other gripper down along other arc track and positioning said other gripper with a grip opening downward facing a vacated tool pot of said tool magazine;
- moving said automatic tool exchanger from said first exchange position to a second exchange position through vertical and horizontal movements towards said machine so as to insert said other gripper onto a used tool disposed in said spindle and holding said used tool in said other gripper;
- swinging said pair of swing arms and removing said used tool disposed in said spindle by swinging said other gripper up along said other arc track while simultaneously

swinging down along said one arc track of said one gripper holding said new tool and inserting said new tool in said spindle; and

- moving said automatic tool exchanger up and disengaging said one gripper from said new tool, and returning said automatic tool exchanger with the gripper opening of said one gripper facing downward and empty to said ready position located between said first tool exchange position and said second tool exchange position.

5,439,435

## METHOD FOR CUTTING A KEYWAY IN A MILL ROLL

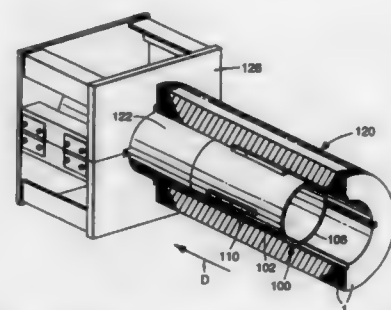
Gary L. Curtis, River Falls, Wis.; Gregory A. Johnson, Dearborn Heights, Mich., and Paula M. Tuebo, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 85,285, Jun. 30, 1993, abandoned, which is a division of Ser. No. 971,940, Nov. 5, 1992, Pat. No. 5,247,740. This application Oct. 27, 1994, Ser. No. 329,509

Int. Cl.<sup>6</sup> B21B 31/08; B23D 37/00

U.S. Cl. 492-41

5 Claims



1. A mill roll having a longitudinally extending keyway portion formed according to the following steps:

- providing a plurality of fabric mill roll discs each having a concentric central aperture;
- aligning the plurality of fabric mill roll discs to form a stack of mill roll discs such that the central apertures collectively form a concentric central bore having a central longitudinal axis, the bore extending from a first end to a second end of the stack of mill roll discs;
- providing a cutting head comprising
  - a body portion having a central longitudinal axis and adapted to pass longitudinally through the central bore, and
  - a cutting tool radially extending from the body portion for cutting the keyway portion in the stack of mill roll discs adjacent and communicating with the central bore;
- aligning the longitudinal axis of the body portion with the longitudinal axis of the central bore at the first end of the stack of mill roll discs;
- inducing relative motion between the cutting head and the stack of mill roll discs along the respective longitudinal axes to drive the cutting head from the first end of the stack of mill roll discs to the second end of the stack of mill roll discs to progressively cut the longitudinally extending keyway portion in the stack of mill roll discs;
- compressing the stack of mill roll discs along the longitudinal axis of the central bore; and
- bonding the stack of mill roll discs together to form a mill roll having a longitudinally extending keyway portion.

5,439,436

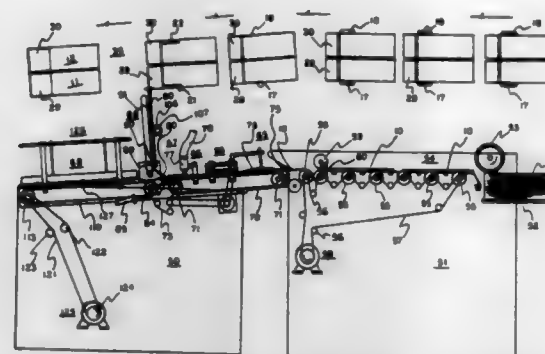
## BOXED POCKET FOLDING MACHINE

Richard J. Moll, 415 Constance Dr., Warminster, Pa. 18974  
 Filed May 18, 1994, Ser. No. 245,439

Int. Cl.<sup>6</sup> B31B 1/60

U.S. Cl. 493-394

5 Claims



1. A folding machine for forming a boxed pocket folder from a prescored paper blank, which blank has score lines which divide it into main panels, a center panel, side panels, glue tabs, intermediate panels, and end flaps, which machine comprises a first stage folding section, a gluing section, a second stage pocket forming section, a delivery section, said first stage folding section includes an endless belt to receive and transport blanks to be folded, at least one guide plate and bar to contact said side panels and said glue tabs to cause said side panels and said glue tabs to be folded along said score lines, said gluing section having glue dispensing means to dispense measured amounts of glue onto said glue tabs, said second stage pocket forming section includes pusher plate means, fold plate means to cooperate with said pusher plate means to form pockets on said blanks, tipper plate means to cause said end flaps to contact said fold plate for folding, and said delivery section having conveyor belt means to receive finished folders and transport them for packaging and shipping.

5,439,437

## CHAIR MOUNTED FOOT MASSAGER

Daniel R. Lyons, 509 Cornelia St., No. Mankato, Minn. 56003  
 Filed Mar. 30, 1994, Ser. No. 220,197

Int. Cl.<sup>6</sup> A61H 15/00

U.S. Cl. 601-115

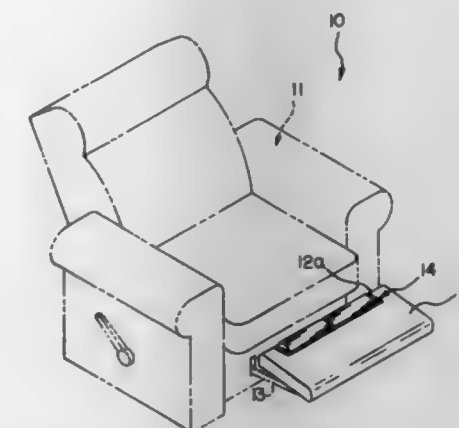
6 Claims

6. A chair mounted foot massager comprising in combination:

- a chair member having a chair body and a foot rest, the chair body having a forward end, with the footrest projecting from the forward end of the chair body, the footrest comprising a substantially planar member having a rear end wall thereof positioned in a facing relationship relative to the forward end of the chair member, the planar member being shaped so as to define a substantially rectangular recess directed into the planar member from the rear end wall thereof;
- a C-shaped support flange positioned within the rectangular recess of the planar member of the footrest from the rear end wall, the C-shaped support flange comprising an elongated connecting web having a first leg plate projecting substantially orthogonally from a first end of the connecting web, a second leg plate projecting substantially orthogonally from a second end of the connecting web, and an intermediate central plate projecting substantially orthogonally from a medial portion of the connecting web

so as to be positioned medially of the first leg plate and the second leg plate, the plates being positioned in a substantially spaced and parallel orientation relative to one another;

a substantially straight roller axle directed between the first and second leg plates and through the central plate;



a first roller rotatably mounted about the roller axle between the first leg plate and the central plate; and,  
 a second roller rotatably mounted about the roller axle between the central plate and the second leg plate.

5,439,438

## HEAT SHRINKABLE BANDAGE COVER

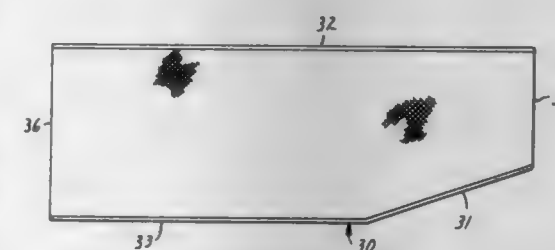
Dean A. Ersfeld, Maplewood, Minn.; Timothy C. Sandvig, Wodoville, Wis.; John F. Reed, Arden Mille, and Paul E. Hansen, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 703,038, May 17, 1991, abandoned, which is a continuation of Ser. No. 242,120, Sep. 9, 1988, abandoned. This application Jan. 28, 1994, Ser. No. 188,647

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-3

38 Claims



1. A covering for an orthopedic cast, which covering comprises a tubular nonwoven web of heat-shrinkable fibers adapted to fit loosely about the orthopedic cast and capable of being heat-shrunk to closely cover the orthopedic cast, wherein a 10 cm x 10 cm piece of said covering shrinks at least 25 percent along one dimension when heated for one minute at 70° C.

5,439,439

## METHOD FOR APPLYING ORTHOPAEDIC BANDAGES

Richard Green, Livingston, and Zale Oser, Bound Brook, both of N.J., assignors to Johnson & Johnson Orthopaedics, Inc., Raynham, Mass.

Filed Jul. 8, 1991, Ser. No. 726,449

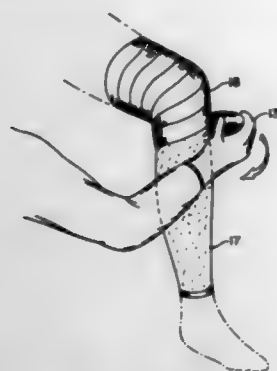
Int. Cl.<sup>6</sup> A61F 5/04

U.S. Cl. 602-6

10 Claims

1. A method of immobilizing a patient's limb comprising:  
 a) immersing a substrate having a water activatable setting

and adhering substance impregnated thereon in a bath of water;  
b) applying said substrate to said limb using gloves having a



coating thereon which becomes lubricous when wetted with water which coating does not substantially effect the activatable and adhering substance; and  
c) permitting the setting and adhering substance to cure.

5,439,440

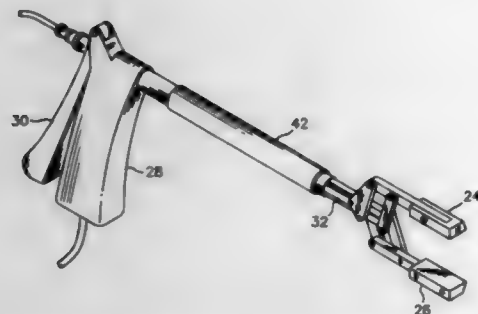
**ELECTROPORATION SYSTEM WITH VOLTAGE CONTROL FEEDBACK FOR CLINICAL APPLICATIONS**  
Gunter A. Hofmann, San Diego, Calif., assignor to Genetronics, Inc., San Diego, Calif.

Filed Apr. 1, 1993, Ser. No. 42,039

Int. Cl.<sup>6</sup> A61N 1/30

U.S. Cl. 604—20

16 Claims



1. An apparatus for the therapeutic application of electroporation to a portion of the body of a patient, comprising:  
field generating means including actuating means for adjustably positioning spaced electrodes for generating an electric field at a preselected location within a body of the patient; and  
means for sensing the distance of the space between said electrodes; and  
means for conveying a signal proportionate to the sensed distance to a pulse generator means; and  
pulse generator means responsive to said conveyed signal for applying an electric signal to the electrodes proportionate to the sensed distance between said electrodes for causing the electrodes to repeatedly generate electric fields of a predetermined amplitude and duration forcing the walls of the preselected cells in the body portion to be transiently permeable for enabling molecules to enter said preselected cells.

5,439,441

**SURGICAL INSUFFLATION SYSTEM WITH IMPROVED DETERMINATION OF BODY CAVITY PRESSURE**

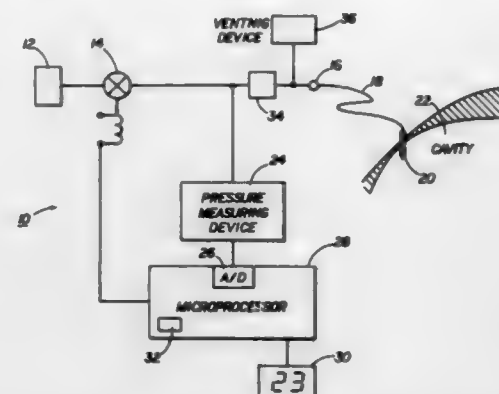
Richard L. Grimsley, and Steven N. Carlisle, both of Cincinnati, Ohio, assignors to Snowden-Pencer, Inc., Tucker, Ga.

Filed Oct. 12, 1993, Ser. No. 134,460

Int. Cl.<sup>6</sup> A61M 13/00

U.S. Cl. 604—26

21 Claims



1. A process for supplying insufflation gas to inflate a body cavity of a patient during an endoscopic procedure, comprising the steps of:

supplying insufflation gas into the body cavity;  
discontinuing the supply of gas into the body cavity;  
measuring pressure in communication with the body cavity to obtain pressure reading values taken at plural discrete intervals of time when no gas is being introduced into the body cavity to obtain a plurality of pressure reading values;  
storing a plurality of said pressure reading values;  
comparing a predetermined number *n* of the most recent pressure reading values to determine the pressure differential between a highest and a lowest pressure reading value therein;  
determining a nominal body cavity pressure when said pressure differential becomes less than a predetermined pressure differential.

5,439,442

**DEVICE FOR MONITORING AND CONTROLLING AN INTRAVENOUS INFUSION SYSTEM**

Francesco Bellifemine, Via Perla 57, Verese, Italy

Filed Sep. 13, 1993, Ser. No. 119,307

Claims priority, application Italy, Sep. 18, 1992, MI92A2153

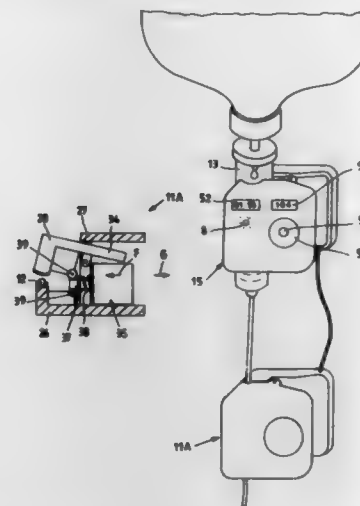
Int. Cl.<sup>6</sup> A61M 5/16

U.S. Cl. 604—65

20 Claims

1. A device for monitoring an intravenous infusion system comprising at least one drip chamber for receiving droplets of a liquid for intravenous infusion, a delivery tube connected to said chamber, sensing means operatively associated with said drip chamber for sensing dripping droplets, an electronic unit including means for memorizing a droplet frequency, a droplet counter for counting the droplets sensed by said sensing means, a comparator means for comparing the frequency of droplets counted by said droplet counter with said memorized droplet frequency, relay means operable by said comparator means when said comparator means detects a difference between the frequency of droplets counted by said counter and said memorized droplet frequency, means operable by said relay means for terminating the flow of liquid through said delivery tube, said liquid flow terminating means including first (26) and third (28) relatively movable jaw means for selectively clamping closed said delivery tube (12), second jaw means (27) movable relative to said first jaw means (26) for clamping engagement to an associated support (12 or 13), second biasing means (30) for normally biasing said first (26) and third (28) jaws toward

a clamping position relative to said delivery tube (12), first biasing means (29) for normally biasing said first (26) and second (27) jaws toward a clamping position relative to an associated support (12 or 13) and preloading said second biasing means (30), means (37, 38) for relatively moving said first



(26) and third (28) jaws to a nonclamping position relative to said delivery tube (12), and means (35) for disabling said moving means (37, 38) whereby said preloaded second biasing means (30) biases said first (26) and third (28) jaws relatively toward each other to said clamping position.

5,439,443

**BALLOON CATHETER**

Shin'ichi Miyata; Tetsuo Toyokawa; Koichi Sakai, all of Yokohama, and Hiroshi Hisaki, Yokosuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1992, Ser. No. 951,951

Claims priority, application Japan, Sep. 30, 1991, 3-278701; Sep. 30, 1991, 3-278702

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

1 Claim

1. In a balloon catheter comprising a catheter and a balloon part attached to the tip of the catheter, the improvement wherein the balloon part is composed of an uncrosslinked film which is formed from at least one polyurethane type polymer selected from the group consisting of polyurethane, polyurethane urea, and polyurethane-silicon block copolymers and having a number average molecular weight of at least 50,000 and an initial tensile modulus at 100% of at least 95 kg/cm<sup>2</sup>.

5,439,444

**PRE-FORMED MEMBER FOR PERCUTANEOUS CATHETER**

Erik Andersen, Gurnee, and David G. Quinn, Grayslake, both of Ill., assignors to Corpak, Inc., Wheeling, Ill.

Continuation-in-part of Ser. No. 646,889, Jan. 28, 1991, Pat. No. 5,308,325. This application Apr. 26, 1994, Ser. No. 233,447

The portion of the term of this patent subsequent to May 3, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61M 29/00

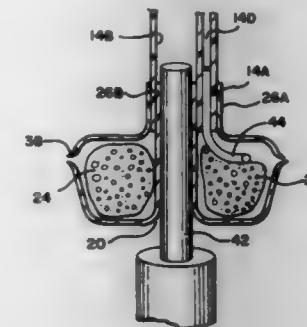
U.S. Cl. 604—96

8 Claims

1. In a single body access tube having an inner tube surface and an outer tube surface defining a fluid lumen and an inflation lumen, the tube including a pre-formed retention member carried near a distal open end of the tube, the pre-formed member having a retention chamber surrounding the outer surface of the tube, the pre-formed member circumferentially secured to the outer surface of the tube, the improvement comprising:

the pre-formed member being circumferentially secured to the distal open end of the tube and to both the inner tube

surface and the outer tube surface, the pre-formed member having an axial opening communicating with the fluid lumen of the tube, wherein the retention chamber of the pre-formed member is substantially filled with a compressible foam, and further wherein the retention chamber extends beyond the distal open end of the tube so that no portion of the tube passes through the chamber; the pre-formed member being collapsible from its pre-formed configuration, and expandable to its non-collapsed, pre-formed configuration by passage of fluid flow through the inflation lumen,



such that when the pre-formed member is in a non-collapsed, pre-formed configuration, the pre-formed member projects beyond the distal end of the tube and has an outer configuration with an outer diameter greater than the outer diameter of the tube, and such that when the pre-formed member is in a collapsed configuration, the pre-formed member collapses upon itself and has an outer collapsed configuration with an outer diameter no greater than the outer diameter of the tube.

5,439,445

**SUPPORT CATHETER ASSEMBLY**

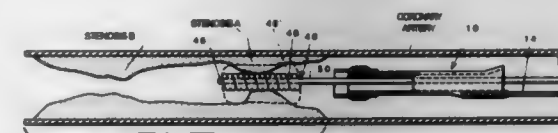
Stavros B. Kontos, Woodcliff Lake, N.J., assignor to Boston Scientific Corporation, Watertown, Mass.

Continuation of Ser. No. 925,864, Aug. 7, 1992, abandoned. This application Jun. 27, 1994, Ser. No. 267,037

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

33 Claims



1. An angioplasty device for use in a vascular procedure in which a balloon dilatation catheter is advanced by a physician into the vasculature of a patient through a previously inserted guiding catheter and beyond the distal end of the guiding catheter into a coronary artery of the patient to the region of a stenotic lesion to be dilated, said device comprising:

a tubular body having a base portion disposed at a proximal end thereof, and having a continuous lumen therethrough from a proximal end to a distal end thereof, said lumen having a cross-section and a length, the cross-section of said lumen being large enough to permit passage therethrough of a balloon of the balloon dilatation catheter, said tubular body being configured to be advanced over the balloon dilatation catheter and to pass through the guiding catheter to the region of the coronary lesion; and a proximal member connected to said tubular body and extending proximally therefrom for providing communication between said tubular body and a region outside of the body of the patient;



wherein said tubular body is further constructed and arranged to be advanced beyond the distal end of the guiding catheter, inserted into a dilated area of the stenotic lesion and maintained in place to inhibit restenosis of the region.

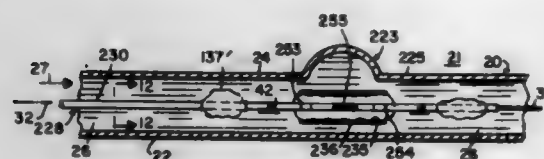
5,439,446

**STENT AND THERAPEUTIC DELIVERY SYSTEM**  
James Barry, Marlboro, Mass., assignor to Boston Scientific Corporation, Natick, Mass.

Filed Jun. 30, 1994, Ser. No. 268,999  
Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

26 Claims



1. A catheter assembly for treating an irregularity in a vessel wall intermediate adjacent normal wall portions by dispensing a stent and administering a therapeutic agent, said catheter assembly comprising:

- A. elongated flexible tube means including an inflation lumen and a delivery lumen and having distal and proximal end portions for delivering a stent positioned distally on said flexible tube means to the site of the irregularity in the vessel;
- B. expandable balloon means positioned distally on said flexible tube means for being inflated and deflated through said inflation lumen, the inflation of said balloon means occluding the vessel; and
- C. port means in said flexible tube means proximate the distal end thereof for delivering the therapeutic agent from said delivery lumen into the vessel so as to contact the stent and adjacent portions of the vessel.

5,439,447

**BALLOON DILATION CATHETER WITH HYPOTUBE**  
Manoochehr Miraki, Aliso Viejo, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 194,086, Feb. 9, 1994, Pat. No. 5,387,193. This application Nov. 3, 1994, Ser. No. 333,911  
Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

6 Claims



1. A dilation catheter comprising:

- a body tube having distal and proximal ends and having a guide wire port adjacent said distal end;
- a relatively stiff, metallic hypotube in said body tube having a proximal end and having an open distal end adjacent said guide wire port, said body tube and hypotube collectively forming inner and outer nested fluid flow passages;
- a dilation balloon fixed to said distal end at a position distally of said guide wire port and in fluid communication with the inner and outer nested fluid flow passages to facilitate inflation of said dilation balloon; and
- a connection fixture at the proximal ends of said body tube and hypotube for flowing fluid through said inner and outer flow passages simultaneously.

5,439,448

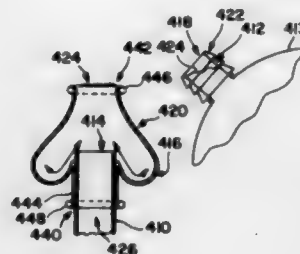
**BUBBLE-FREE CONNECTOR FOR LIQUID CARRYING TUBING**

Boris Leachinsky, Waldwick; Robert B. Schock, Sparta; Robert L. Wilcox, Wanaque, and Clifford E. Schwartz, Maplewood, all of N.J., assignors to Datascope Investment Corp., Montvale, N.J.

Continuation-in-part of Ser. No. 5,334, Jan. 19, 1993, Pat. No. 5,312,352. This application Dec. 8, 1993, Ser. No. 162,771  
Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—122

33 Claims



1. A connector system for a liquid carrying circuit, the system comprising:

- a tube having a lumen therethrough and an open end;
- a tube fitting having a lumen therethrough and an open end; and

connector means, including a generally tubular soft connector having an axis and lumen therethrough from a first connecting port to a second connecting port, and a bubble elimination chamber formed by a wall of said connector means proximate to and axially displaced from the second connecting port and in fluid communication with the lumen of said connector means, for connecting said tube and said tube fitting in a first position, with the open end of the tube fitting and the first connecting port forming a fluid-tight connection, the lumen of said tube, the lumen of said soft connector, and the lumen of said tube fitting forming a continuous fluid circuit and the bubble elimination port being open to the fluid circuit, and for connecting said tube and tube fitting in a second position, the lumen of said tube and the lumen of said tube fitting forming a continuous, fluid-tight circuit and the bubble elimination port being closed to the circuit by the tube fitting.

5,439,449

**FLOW VISUALIZATION NEEDLE SYSTEM**  
Harold C. Mapes, Queensbury; William M. Appling, Hartford; Michael P. Cody, and Eamonn P. Hobbs, both of Queensbury, all of N.Y., assignors to E-Z-Em, Inc., Westbury, N.Y.

Filed Apr. 22, 1994, Ser. No. 231,276  
Int. Cl.<sup>6</sup> A61M 5/00

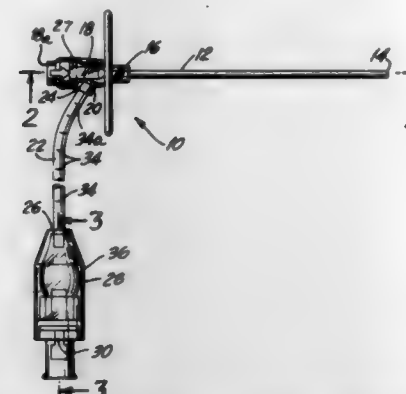
U.S. Cl. 604—164

13 Claims

1. A needle system usable for vascular access, said system comprising:

- an elongated needle having a distal end and a proximal end, the distal end shaped and dimensioned for introduction into a vascular system, said elongated needle having a predetermined volume;
- a needle hub at the proximal end of said needle, said needle hub having a predetermined volume;
- a port positioned between said proximal needle end and proximal hub end;
- a visualization connector tube having a first end and a second end, said first end being in communication with said port, said tube having a predetermined volume and being sufficiently clear to permit visualization of material therein;
- an elastomeric reservoir in free, direct, unrestricted two-way communication with said second end of said tube, said reservoir having an initial unexpanded state and a second expanded state; and

a rigid housing enclosing said elastomeric reservoir; pressure in said needle system increasing when said elongated needle is introduced into the vascular system, said pressure increase causing the air in said needle system to



compress and migrate, said reservoir expanding to said expanded state in response to said compression and migration of air in said needle system, said compression of air causing the volume of air in said needle system to decrease while said volume of air in said reservoir increases.

5,439,450

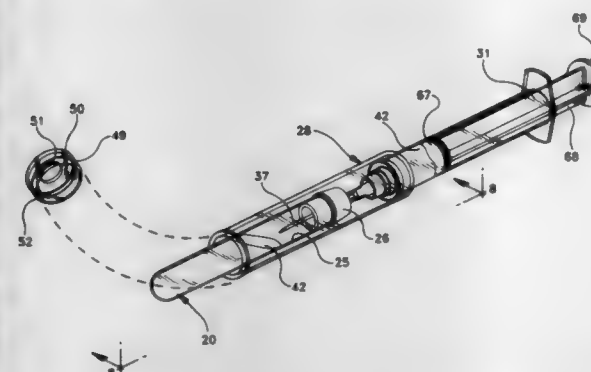
**METHOD OF DELIVERING A BLOOD SAMPLE TO AN EVACUATED RECEPTACLE**

Lori E. Haedt, Marietta, Ga., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 18, 1994, Ser. No. 276,390  
Int. Cl.<sup>6</sup> A61M 5/32

U.S. Cl. 604—198

9 Claims



1. A method of delivering a blood sample to an evacuated receptacle having a closed end, an opposed open end, a cylindrical side wall therebetween defining a cavity, and a pierceable stopper occluding the open end, the cavity being at a subatmospheric pressure, comprising the steps of:

- a) providing a syringe assembly comprising a syringe barrel having an open proximal end, a distal end and a side wall therebetween defining a chamber for retaining fluid, a needle cannula having a sharp distal end and a lumen therethrough connected to said distal end so that said lumen is in fluid communication with said chamber, a cylindrical safety shield having an open distal end and an open proximal end, a cap removably connected to said distal end of said safety shield, said cap having an aperture smaller than the inside diameter of said open distal end of said shield for limiting access to said open distal end of said shield, said safety shield slidably mounted over said syringe barrel for telescoping movement from a proximal position where said needle cannula projects through said aperture to a distal position where said safety shield protectively surrounds said needle cannula, a piston in fluid-tight slidable engagement inside said barrel, a rigid elongated

- gate plunger rod connected to said piston and extending proximally through said open proximal end of said barrel;
- b) piercing a mammalian blood vessel with said sharp distal end of said needle and drawing blood from said blood vessel into said chamber by manipulating said plunger rod;
- c) withdrawing said needle from said blood vessel;
- d) moving said safety shield to said distal needle protecting position;
- e) removing said cap from said distal end of said safety shield;
- f) inserting said evacuated receptacle, stopper first, into said safety shield until said sharp distal end of said needle cannula pierces said stopper and enters said cavity of said receptacle;
- g) allowing blood to flow from said syringe chamber through said lumen into said cavity of said receptacle; and
- h) removing said receptacle from said safety shield when the desired amount of blood has entered said cavity of said receptacle from said chamber.

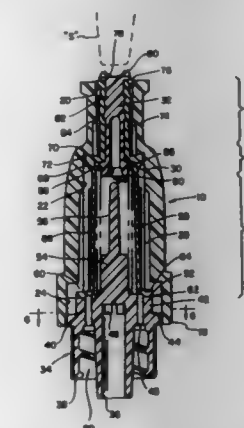
5,439,451

**CAPLESS MEDICAL BACKCHECK VALVE**  
Michael Collinson; Alan K. Plyley; Russell J. Redmond, all of Goleta, and Claude Vidal, Santa Barbara, all of Calif., assignors to B. Braun Medical, Inc., Allentown, Pa.

Continuation of Ser. No. 215,783, Mar. 22, 1994. This application Nov. 30, 1994, Ser. No. 351,206  
Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—247

8 Claims



- 1. A medical backcheck valve comprising
- a hollow housing having an upper end and a lower end, a fitting secured within the lower end of the housing,
- a piston assembly contained within the housing for controlling liquid flow therethrough,
- said piston assembly comprising a substantially rigid plug having one end protruding from the upper end of the housing, and a tubular flexible covering having a relatively small diameter upper end surrounding the plug, with a first flow space between the housing and the sheath, a main seal for controlling flow through said first flow space, and a tubular lower end whose bottom is secured to at least one of the fitting and the housing to prevent liquid from entering within the tubular flexible covering.

5,439,452

**LIMIT STOP VALVE INFUSION DEVICE**

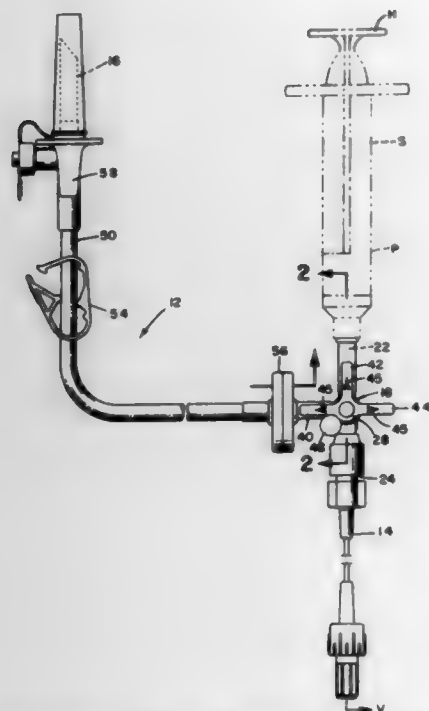
Read S. McCarty, Hingham, Mass., assignor to Children's Medical Ventures, Inc., South Weymouth, Mass.

Filed Jan. 31, 1994, Ser. No. 188,849

Int. Cl.<sup>6</sup> A61M 5/00; F16K 51/00

U.S. Cl. 604-248

2 Claims U.S. Cl. 604-263



1. An apparatus for controlling the flow of fluids from a fluid container toward a patient, comprising:

(a) a first fluid conduit having an inlet and an outlet, said outlet being interconnectable with the patient;

(b) flow control means for controlling fluid flow between the fluid container and said outlet of said first fluid conduit, said flow control means comprising:

(i) a valve body having an internal chamber, first and second fluid inlets and a fluid outlet, said fluid outlet being connected to said inlet of said first fluid conduit said valve body also having first, second and third circumferentially spaced, outwardly extending fingers;

(ii) valve means disposed within said valve body for controlling fluid flow into said first fluid inlet and for selectively controlling fluid flow between said first fluid inlet and said second fluid inlet and between said second fluid inlet and said fluid outlet, said valve means comprising a valve member rotatable within said internal chamber of said valve body, said valve member having first, second, and third circumferentially spaced fluid flow passageways, said valve member being rotatable between a first position permitting fluid flow between said first and second inlet of said valve body and said outlet thereof via said first and third fluid flow passageways, said third finger circumferentially aligned with said third passageway; and

(iii) stop means for positively preventing fluid flow between said first fluid inlet and said fluid outlet, said stop means comprising and outwardly projecting stop post connected to said valve body for engagement with said third finger of said gripping means to prevent alignment thereof with said first inlet of said valve body; and

(c) a second fluid conduit having an inlet interconnectable with the fluid container and an outlet connected to said first fluid inlet of said valve.

5,439,453

**HYPODERMIC NEEDLE STORAGE APPARATUS**

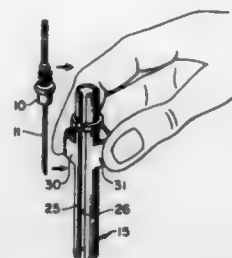
Behnam Kashanchi, 450 N. Bedford Dr., Beverly Hills, Calif. 90210

Filed Mar. 25, 1994, Ser. No. 217,691

Int. Cl.<sup>6</sup> A61M 5/32

2 Claims U.S. Cl. 604-263

2 Claims



1. A hypodermic needle assembly comprising:

(a) a hypodermic needle having a tubular collar and a needle extending axially therethrough;

(b) a needle housing for receiving and storing the hypodermic needle having a resilient, elongated cylindrical wall and an open end and a closed bottom end, said cylindrical wall being severed from the top end to the closed bottom end defining adjacent elongated surfaces of said cylindrical wall being in parallel spaced relation to the axis of said housing;

(c) first and second tabs, each having a top surface, said tabs being secured to said cylindrical wall and being equally spaced from the adjacent first and second elongated surfaces, the top surfaces of said tabs being obliquely oriented with respect to said adjacent elongated surfaces;

(d) closure means for securing said hypodermic needle within said housing slidably coupled about the cylindrical wall of said housing adjacent the top end thereof; and

(e) a bracing member coupled intermediate said first and second tabs.

5,439,454

**COEXTRUDED MEDICAL GRADE PORT TUBING**

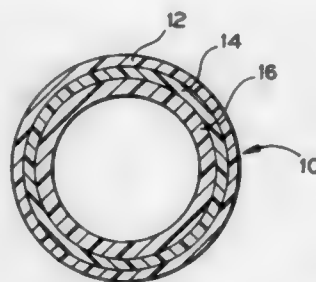
Ying-Ching Lo, Green Oaks; Indrajit T. Patel, Algonquin; Leon Woo, Libertyville, all of Ill.; W. Wilson Cheung, Belchertown, Mass., and Michael T. K. Ling, Vernon Hills, Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed May 14, 1992, Ser. No. 883,001

Int. Cl.<sup>6</sup> A61M 5/00; F16L 11/00; B32B 1/08

U.S. Cl. 604-264

18 Claims



1. A coextruded medical grade port tubing comprising:

an outer layer, having a thickness comprising approximately 2.5 to about 30% of the total cross-sectional thickness of the tubing, and comprising a blend of polypropylene copolymer and styrene-ethylene-butylene-styrene copolymer;

a tie layer, having a thickness comprising approximately 2.5 to about 20% of the total cross-sectional thickness of the port tubing; and

a core layer of polyvinyl chloride, having a thickness comprising approximately 2.5 to about 20% of the total cross-sectional thickness of the port tubing.

prising approximately 50 to about 95% of the total cross-sectional thickness.

at said top portion and a body fluid release means at said bottom portion; and

5,439,455

**COMBINATION INTRODUCER CANNULA AND REDUCER FOR USE THEREIN**

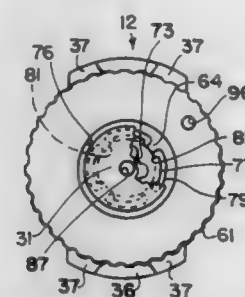
Maciel J. Kieturakis, San Carlos, and Helmut L. Kayan, Redwood City, both of Calif., assignors to General Surgical Innovations, Inc., Palo Alto, Calif.

Filed Aug. 11, 1994, Ser. No. 289,314

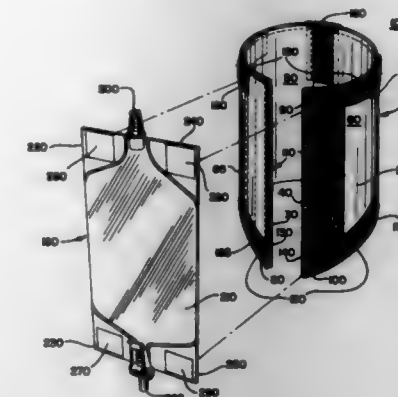
Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604-264

9 Claims



1. A combination of an introducer cannula and a removable reducer for use therewith, the introducer cannula comprising an elongate tubular member having proximal and distal extremities and having a flow passage extending therethrough, a housing mounted on the distal extremity and having a chamber in communication with the flow passage in the tubular member, proximal and distal spaced apart seals are disposed in the chamber and carried by the housing, the reducer comprising a body having proximal and distal extremities, the body having a cylindrical extension having a central opening therein, the cylindrical extension having at least two elongate slots formed therein and extending through the cylindrical extension from the proximal extremity to the distal extremity of the body, said elongate slots extending diametrically of the cylindrical extension and opening into the central opening, a membrane seal carried by the body and overlying the central opening, said membrane seal having a hole therein in alignment with the central opening, said hole in the membrane having a diameter of less than the diameter of the central opening and means carried by the body and by the introducer cannula for securing the reducer to the introducer cannula so that the cylindrical extension of the body of the reducer mates with the proximal seal of the introducer cannula.



means for removably attaching solely said top and bottom portions of said body fluid container directly to said broad strap at said top and bottom edge thereof.

5,439,457

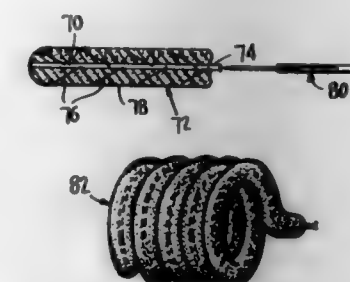
**MULTIFUNCTIONAL DEVICES FOR USE IN ENDOSCOPIC SURGICAL PROCEDURES AND METHODS THEREFOR**

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131 Division of Ser. No. 600,775, Oct. 23, 1990, Pat. No. 5,374,261, which is a continuation-in-part of Ser. No. 556,081, Jul. 24, 1990, Pat. No. 5,074,840. This application Oct. 1, 1993, Ser. No. 130,498

Int. Cl.<sup>6</sup> A61F 13/15, 13/20

U.S. Cl. 604-358

7 Claims



1. A device for use in an endoscopically performed operative procedure wherein a narrow portal is established through the skin to provide access to an operative site and the device is introduced to the operative site through the narrow portal, said device comprising a length of absorbent material and an elongate spine carried by and extending along said absorbent material, at least some portions of said spine having a normally non-straight predetermined configuration, said spine being maintained by said absorbent material in a substantially straight configuration different from said normally non-straight predetermined configuration when said absorbent material is in a dry state and returning to said normally non-straight predetermined configuration when said absorbent material is in a wet state after absorbing body fluids.

5,439,456

**FASTENING SYSTEM FOR BODY FLUID COLLECTION CONTAINERS**

Albert Fabricant, 2970 N. Lake Shore Dr., Chicago, Ill. 60657 Continuation of Ser. No. 853,784, Mar. 19, 1992, Pat. No. 5,267,987. This application Jun. 14, 1993, Ser. No. 76,083

Int. Cl.<sup>6</sup> A61M 1/00

U.S. Cl. 604-327

6 Claims

1. A system for fastening a body waste fluid container having a top and bottom portion to a human leg, said system comprising:

a broad strap for completely encircling the human leg having first and second ends and top and bottom edges, said first and second ends having complimentary fasteners which coact and couple said first end to said second end in an overlapping fashion, said broad strap being frictionally and detachably securable to the human leg;

a body fluid container having a top and bottom portion and defining a length and having a body fluid collection means



5,439,458

**ABSORBENT ARTICLE HAVING RAPID ACQUIRING, MULTIPLE LAYER ABSORBENT CORE**

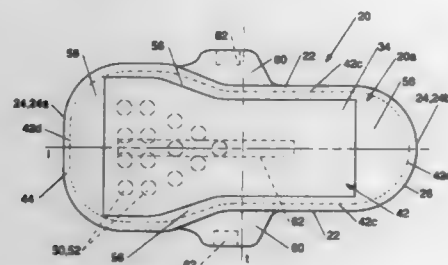
John R. Noel, and Nicholas A. Ahr, both of Cincinnati, Ohio, assignors to The Procter &amp; Gamble Company, Cincinnati, Ohio

Division of Ser. No. 931,122, Aug. 17, 1992, Pat. No. 5,304,161, which is a continuation of Ser. No. 637,090, Jan. 3, 1991, abandoned. This application Aug. 18, 1993, Ser. No. 108,861 The portion of the term of this patent subsequent to Apr. 19, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61F 13/15, 13/20

U.S. Cl. 604—378

43 Claims

**1. An absorbent article comprising:**

- a liquid pervious topsheet;
- a liquid in, pervious backsheet joined to said topsheet;
- a multiple layer absorbent core positioned between said topsheet and said backsheet, said multiple layer absorbent core comprising at least one pair of layers, wherein each pair of layers comprises at least one acquisition/distribution layer and at least one storage layer, each pair of layers being arranged so that at least one storage layer is positioned subjacent each acquisition/distribution layer, wherein each acquisition/distribution layer comprises a material having an acquisition/distribution rate of at least about 2 cubic centimeters of synthetic urine per second when said acquisition/distribution layer is placed under a pressure of about 28 grams per square centimeter; each storage layer at least partially comprises an absorbent gelling material which has a total absorptive capacity of at least about 25 times its dry weight and is capable of absorbing at least about 0.8 grams of synthetic urine per second per gram of absorbent gelling material; and each pair of layers is in liquid communication with each adjacent pair of layers.

5,439,459

**DISPOSABLE DIAPER HAVING SKIN-CONTACTING TOPSHEET PROVIDED WITH ELASTIC OPENING AND METHOD FOR MAKING THE ELASTIC OPENING**

Hiroyuki Tanji; Ichiro Wada; Yoshio Ono, and Hiroyuki Soga, all of Kawano, Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Filed Apr. 19, 1993, Ser. No. 47,403

Claims priority, application Japan, Apr. 30, 1992, 4-111859

Int. Cl.<sup>6</sup> A61F 13/15; B32B 31/08

U.S. Cl. 604—385.2

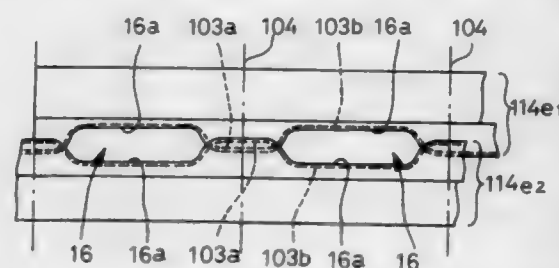
4 Claims

**1. A method of forming a disposable diaper with an elastic opening which comprises the steps of**

- (A) feeding first and second continuous elastic members (17a, 17b) both maintained under elongation onto a first continuous web (114a) longitudinally thereof so that said first and second continuous elastic members (17a, 17b) extend along a central portion of said first continuous web (114a) and are spaced from transversely opposite first and second side edges (101, 102) of said first continuous web, said first and second continuous elastic members (17a, 17b) are spaced from each other transversely of said first continuous web (114a) and alternately describe crests (103a) and relatively wide troughs (103b) with the respective crests (103a) described by said first continuous elastic

member (17a) being opposed to middle portions of the respective troughs (103b) described by said second continuous elastic member (17b) while the respective crests (103a) described by said second continuous elastic member (17b) are opposed to middle portions of the respective troughs (103b) described by said first continuous elastic member (17a) and simultaneously bonding said first and second elastic members to said first continuous web (114a) with use of adhesive in order to form a first continuous composite web (114b);

- (B) bonding a second continuous web (114c) to the first continuous composite web (114b) over an area thereof within which the first and second continuous elastic members (17a, 17b) are fixed to the first continuous composite web (114b) in order to form a second continuous composite web (114d);
- (C) cutting away portions (114d<sub>1</sub>) of the second continuous composite web in the space defined between the first



continuous elastic member (17a) and the second continuous elastic member (17b) so as to form cutout lines (16a) destined to define openings (16) and to also thereby form third and fourth continuous composite web members (114e<sub>1</sub> and 114e<sub>2</sub>);

- (D) longitudinally shifting said third and fourth continuous composite web members (114e<sub>1</sub> and 114e<sub>2</sub>) relative to each other so that respective crests (103a) of said third and fourth continuous composite web members (114e<sub>1</sub> and 114e<sub>2</sub>) are symmetrically opposed to each other in an overlapping relationship transversely of these third and fourth continuous composite web members and respective troughs (103b) thereof are also symmetrically opposed to each other but spaced apart to define openings (16); and
- (E) cutting said third and fourth continuous composite web members (114e<sub>1</sub> and 114e<sub>2</sub>) transversely thereof along imaginary lines vertically dividing the respective pairs of overlapping crests (103a) in halves.

5,439,460

**CROSS-SPIKE PREVENTION SYSTEM**

Bryan J. Hoover, 4636 Baverton Dr., Knoxville, Tenn. 37921

Filed Sep. 7, 1993, Ser. No. 117,729

Int. Cl.<sup>6</sup> A61B 19/00, 19/02

U.S. Cl. 604—403

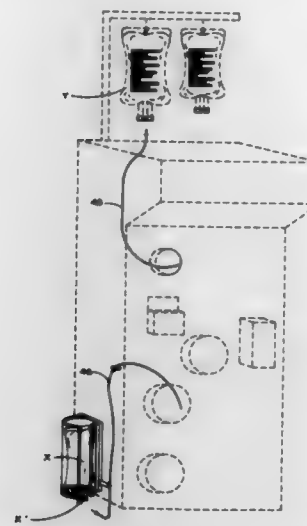
15 Claims

**1. An improved means of assuring separation of respective process and replacement fluids utilized in the operation of a blood plasma collection apparatus, which utilizes, at least, a first fluid bag and a second fluid bag differentially connected thereto, to directly supply a plasmapheresis fluid and a replacement fluid, respectively, the improvement comprising:**

a cross-spike prevention receptacle defining a hollow opening dimensioned such that it will receive the first fluid bag and exclude the second fluid bag;

said receptacle being differentially positioned adjacent to the blood plasma collection apparatus, such that the first fluid bag connected to the collection apparatus will extend to and fit into the receptacle, and the second fluid bag

connected to the apparatus will not extend to and fit into the receptacle;



the first fluid bag being provided in a substantially smaller volume and spatial size than that of the second fluid bag.

5,439,461

**GRIP FOR A SURGICAL INSTRUMENT**

Martin Storz, Schauinslandstrasse 1, D-78532 Tuttlingen, Germany

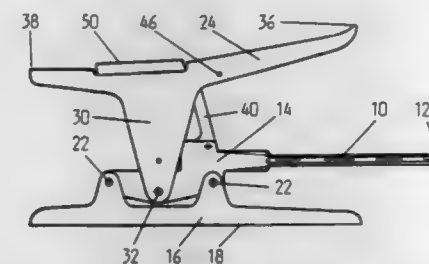
Filed Mar. 24, 1994, Ser. No. 217,452

Claims priority, application Germany, Mar. 24, 1993, 43 09 569.0

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606—1

17 Claims

**1. A grip for a surgical instrument, said surgical instrument comprising:**

- a tubular shaft having a proximal end and a distal end, at least one articulated jaw mounted on said distal end of said tubular shaft,
- an elongated operational element slidably disposed in said tubular shaft and connected to said at least one articulated jaw,
- a hand grip comprising a first grip part having a grip surface for engagement with the palm of a hand and a second grip part having a grip surface for engagement with the fingers of the hand, said grip surfaces being spaced apart from each other,
- said first grip part fixedly connected to the proximal end of said tubular shaft,
- said second grip part constructed as a rocker comprising a pivot and first and second arms extending from said pivot, said rocker being connected at said pivot to said surgical instrument pivotably about a pivot axis which is perpendicular to the shaft tube, said first and second arms each having contact surfaces positioned for making contact with one or more fingers of the hand during gripping of said surgical instrument, said contact surfaces of said first and second arms each describing an angle of less than 30° with respect to said grip surface of said second grip part,

said elongated operational element being connected to said rocker, such that pressing said first rocker arm towards said first grip part causes said second rocker arm to move away from said first grip part and causes said elongated operational element to move axially in a first, operational direction, and such that pressing said second rocker arm towards said first grip part causes said first rocker arm to move away from said first grip part and causes said elongated operational element to move axially in a second, return direction,

wherein said shaft tube is set into a receiving part, said first grip part is securely mounted on said receiving part, and said second grip part is pivotally mounted, with respect to the first grip part, on the receiving part by means of a mounting pin,

and wherein said receiving part is constructed as a block, wherein said grip parts are each provided with two shanks connected with the grip surfaces, and wherein said shanks embrace the receiving part.

5,439,462

**APPARATUS FOR REMOVING CATARACTOUS MATERIAL**

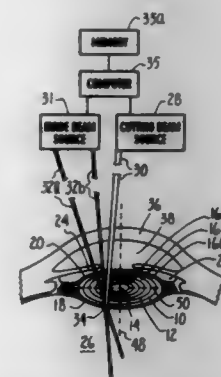
Josef F. Bille, Heidelberg, Germany, and David Schanzlin, St. Louis, Mo., assignors to Intelligent Surgical Lasers, San Diego, Calif.

Continuation-in-part of Ser. No. 841,614, Feb. 25, 1992, Pat. No. 5,246,435. This application Apr. 4, 1994, Ser. No. 124,237

Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606—6

11 Claims

**1. A device for photoablation of tissue, comprising:**

- a cutting laser beam source for generating a cutting laser beam;
- first aiming means for directionally aiming said cutting laser beam along a desired path;
- focussing means for focussing said cutting laser beam at an ablating point at a desired longitudinal position along said path;
- a guide laser beam source for generating first and second guide laser beams;
- second and third aiming means for directionally aiming said first and second guide laser beams, respectively, to intersect at a desired target point to define said target point in three dimensional space at said intersection of said first and second guide laser beams, said second and third aiming means generating directional information defining the respective direction in which each said guide laser beam is aimed; and
- computer means for receiving said directional information from said second and third aiming means, for calculating a three dimensional location of said target point at said intersection of said guide laser beams, and for generating aiming and focussing information as required to control said first aiming means and said focussing means as required to position said ablating point at said three dimensional location of said target point.

5,439,463

## SPINAL CLAMPING DEVICE

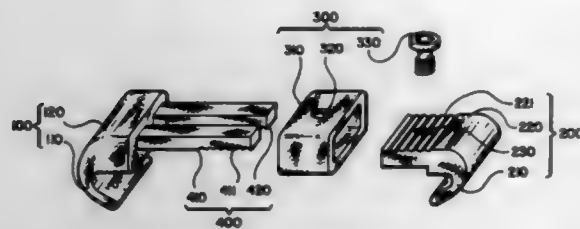
Chih-I Lin, 513 S. Golden Pados Dr., Diamond Bar, Calif. 91765

Filed Nov. 12, 1993, Ser. No. 151,017

Int. Cl.<sup>6</sup> A61B 17/70

U.S. Cl. 606—61

6 Claims



1. A spinal clamping device comprising:
  - a spinal clamping member including a hook-shaped clamping portion adapted to extend about a first vertebral fixation rod and a connecting portion;
  - a clamping adjusting member including a hook-shaped clamping portion adapted to extend about a second vertebral fixation rod that is arranged substantially parallel to the first vertebral fixation rod and a connecting portion which has a rough surface formed on a predetermined portion of a surface thereof;
  - a multibranch distance adjusting bar having one end that is fastened with said connecting portion of said spinal clamping member and having another end that is provided with a rough surface formed on a predetermined portion of a surface thereof, with said rough surface being engageable frictionally with said rough surface of said connecting portion of said clamping adjusting member; and
  - a distance adjusting and fastening means for fixing said rough surface of said connecting portion of said clamping adjusting member and said rough surface of said multibranch distance adjusting bar whereby said spinal clamping device can clamp the first and second vertebral fixation rods together.

5,439,464

## METHOD AND INSTRUMENTS FOR PERFORMING ARTHROSCOPIC SPINAL SURGERY

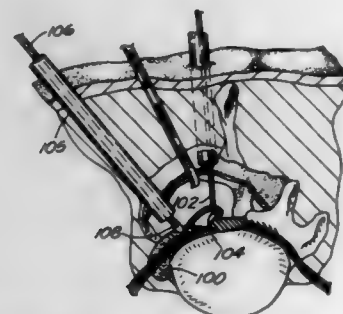
David E. Shapiro, Highland Park, Ill., assignor to Shapiro Partners Limited, Highland Park, Ill.

Filed Mar. 9, 1993, Ser. No. 28,244

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—83

8 Claims



1. A method for arthroscopically accessing a predetermined area of a patient's spinal column including the steps of inserting a first cannula into a patient's back in an area that is in a generally posterolateral position relative to a patient's spine, said first cannula having a first and second end with said first end passing through tissue and having an outwardly directed tissue moving surface; inserting fluid utilizing viewing means through said first cannula, moving muscle and/or tissue through manipulation of the tissue moving surface of the first cannula to

create a working space, said fluid of the viewing means being under pressure with said fluid pressure maintaining the working space created by the manipulation of the first cannula;

inserting a second cannula into the patient's back in a predetermined position relative to the first cannula;

inserting a cutting instrument through the second cannula and into the working space to incise the ligamentum flavum adjacent the working space to expose bone in the area that is generally in a posterolateral position relative to the patient's spine; and

inserting a third cannula into the patient's back in a predetermined position relative to the first and second cannulas, and thereafter conducting an arthroscopic spinal surgical procedure on the spinal column by manipulating instruments through said second and third cannulas.

5,439,465

## BONE COMPRESSION AND DISTRACTION SURGICAL TOOL

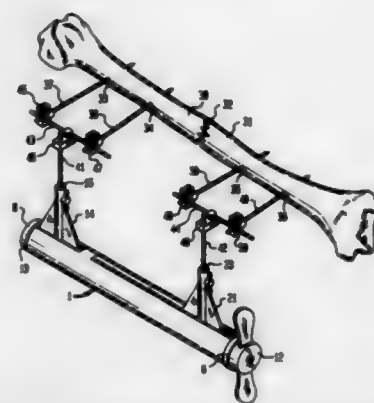
Delfin O. Tumbay, 36 Armstrong Dr., Clark, N.J. 07066

Filed Mar. 11, 1994, Ser. No. 209,080

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—105

14 Claims



1. A bone compression or distraction surgical tool comprising:
  - i. a rigid male threaded shaft;
  - ii. a housing surrounding said shaft having a relatively long slot running parallel to the shaft from a first end of the housing and a relatively short slot running parallel to the shaft from a second end of the housing, said slots being in line with one another;
  - iii. a fixed arm having on one end an internally smooth sleeve, which surrounds the shaft, said arm extending through the short slot and having means for attaching surgical pin apparatus at the other end of the arm;
  - iv. a movable arm having, on one end, a female threaded sleeve, which surrounds the shaft and engages the male threads thereof, said arm extending through the long slot and having means for attaching surgical pin apparatus at the other end of the arm; and
  - v. means for rotating the shaft, the rotation of which moves the movable arm via the threaded connection.

5,439,466

## CIRCUMCISION DEVICE AND METHOD OF ITS USE

V. John Kilejian, 1694 E. McAndrews Rd., Medford, Oreg. 97504

Filed Feb. 17, 1994, Ser. No. 197,876

Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 606—118

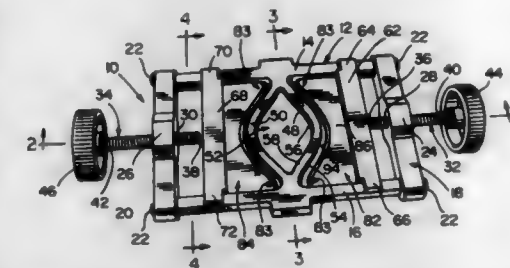
26 Claims

1. A circumcision device comprising:
  - a frame,

a ring located in said frame for surrounding the glans penis during a circumcision operation,

two blades slidably mounted in said frame, and

means for moving said two blades towards said ring to engage portions of the prepuce of the penis between exterior surfaces of said ring and leading edges of said two



blades during a circumcision operation so as to provide guide surfaces for cutting the portions of the prepuce with minimal amounts of prepuce remaining after completion of the circumcision operation,

said frame including two parallel extending legs and two parallel extending cross-piece with said two cross-pieces extending perpendicular to said two legs.

5,439,467

## SUTURE PASSER

Theodore V. Benderev, Laguna Hills; Neil H. Naves, and Mark J. Legome, both of Mission Viejo, all of Calif., assignors to Vesica Medical, Inc., San Clemente, Calif.

Division of Ser. No. 862,847, Apr. 3, 1992, which is a continuation-in-part of Ser. No. 801,747, Dec. 3, 1991, abandoned. This application Jun. 17, 1993, Ser. No. 78,730

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—139

18 Claims



1. A suture passer of the type adapted for releasably retaining a suture, comprising:
  - a handle;
  - an elongate tubular probe guide extending in a distal direction from the handle;
  - an elongate pointed probe axially movably disposed within the tubular probe guide to facilitate penetration of tissue; and
  - a recess on the pointed probe and an opening on the tubular probe guide for receiving a suture, wherein the pointed probe is axially movable with respect to the probe guide between a first position in which the recess is aligned with the opening for receiving a suture therein, and a second position wherein the recess is out of alignment with the opening to trap a suture within the recess, wherein the opening comprises a slot having a first segment generally

extending axially along a first side of the probe guide, a second segment generally extending axially along a second side of the probe guide, said second side being generally opposite said first side, and a third segment joining said first segment and said second segment, said third segment extending transverse to the longitudinal axis of the probe guide.

5,439,468

## SURGICAL CLIP APPLIER

Dale Schulze, Lebanon, Ohio, and Dirk Höppner, Hamburg, Germany, assignors to Ethicon Endo-Surgery, Cincinnati, Ohio

Continuation-in-part of Ser. No. 59,147, May 7, 1993. This application Apr. 11, 1994, Ser. No. 226,192

Claims priority, application Germany, May 24, 1993, 43 17 590.2

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—143

4 Claims



1. Apparatus consisting of a cylindrical rod with a proximal end holding an actuating device and a distal end containing a holding and shaping mechanism comprising:
  - an outer guide tube in which there is arranged an inner sliding sleeve, displaceable coaxially to the outer guide tube;
  - an elongated support rod fixed relative to the outer guide tube and an elongated slide having an anvil at its distal end displaceable on the support rod;
  - said sliding sleeve and support rod projecting from the distal end of the outer guide tube;
  - a movable actuating mechanism contained at the proximal end of the guide tube operatively connected with the slide and the sliding sleeve, in such a way that distal displacement of the sliding sleeve and of the slide causes said slide to strike said anvil;
  - wherein said sleeve and said slide are also retractable in the proximal direction upon release of said actuating lever; and
  - further comprising a sleeve-shaped handle which has a guide bore running in axial direction therethrough, a trigger being housed in said handle in such a way that both the handle and the trigger can be grasped simultaneously by the operator's hand, the transmission of manual force from said trigger taking place via a pressure rod operatively connected to said trigger and axially displaceable in the guide bore of the handle, said pressure rod being connected at its distal end with said sliding sleeve and said slide.

5,439,469

## WOUND CLOSURE DEVICE

Malcolm D. Heaven, Hopewell, and Howard Schryer, Princeton, both of N.J., assignors to Advanced Surgical, Inc., Princeton, N.J.

Filed Nov. 5, 1993, Ser. No. 145,855

Int. Cl.<sup>6</sup> A61B 17/00

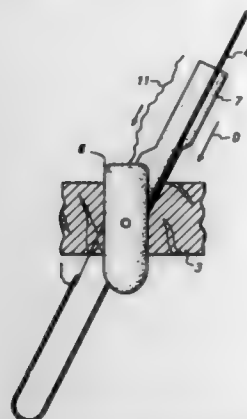
U.S. Cl. 606—144

20 Claims

1. A suture device comprising:
  - a hook needle having a distal portion extending between a longitudinally extending manipulating portion and a longitudinally extending pointed end of the needle, the pointed



end of the needle including means for attaching a suture to the needle; and  
a guide member having a guide groove receiving the manipulating portion of the needle, the manipulating portion of the needle being slidable in the guide groove so as to



advance and retract the pointed end of the needle toward and away from the guide member, the guide member being sized to fit intimately within a cannula used to introduce the guide member within a body cavity and the guide member maintaining pneumoperitoneum following exchange with the cannula.

5,439,470

**SUTURE THROW RUNDOWN TOOL**

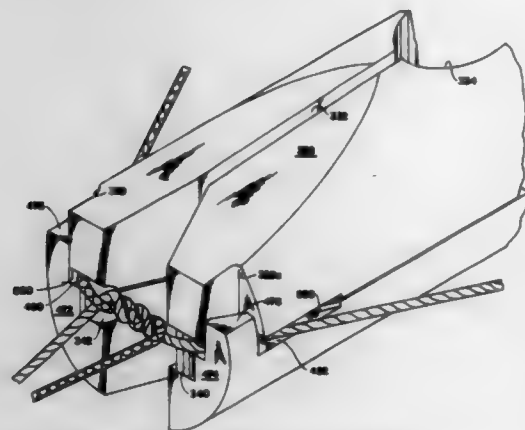
Lehmann K. Li, Wellesley, Mass., assignor to Li Medical Technologies, Inc., Shelton, Conn.

Continuation of Ser. No. 958,913, Oct. 9, 1992, abandoned. This application May 12, 1994, Ser. No. 242,030

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—148

14 Claims



8. A suture throw rundown tool comprising:  
a handle;

an elongated shaft having a longitudinal axis, a proximal end and a first distal tip having a first distal end, said shaft defining a hole therein substantially adjacent said proximal end, and said proximal end being located within and fixedly attached to said handle;

a rod having a proximal end and a second distal tip having a second distal end, said rod extending through said shaft in reciprocable longitudinal relation therewith;

helical spring means having a first end and a second end located within said shaft substantially adjacent its proximal end;

pin means extending through said handle and said hole in said shaft so as to secure said shaft to said handle, said first end of said spring being attached to said pin and said

second end of said spring being attached to said proximal end of said rod; and

actuation means for moving said rod relative to said shaft between a proximalmost position and a distalmost position;

said first and second distal tips being so configured as to mate with each other in longitudinally reciprocal relation such that:

(i) when said rod is in said proximalmost position, said first distal end of said first distal tip and said second distal end of said second distal tip are aligned with one another, and said first and second distal tips together define a distally facing suture throw engagement portion flanked by a pair of passageways, each of said passageways (a) being sized to receive a length of suture in sliding relation therethrough, (b) extending respectively from said suture engagement portion at an acute angle to said longitudinal axis through said mated, aligned first and second distal tips, and (c) being formed by the alignment of a first portion located in said first distal tip and a second portion located in said second distal tip; and

(ii) when said rod is in said distalmost position, said second distal end of said second distal tip is offset distally relative to said first distal end of said first distal tip by a distance at least equal to the length of said passageways measured along said longitudinal axis.

5,439,471

**COMBINED SURGICAL NEEDLE HOLDER AND SCISSORS**

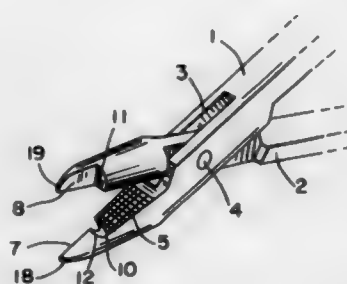
Harry D. Kerr, 4641 N. Ardmore Ave., Whitefish Bay, Wis. 53211

Filed Jan. 5, 1994, Ser. No. 177,599

Int. Cl.<sup>6</sup> A61B 17/06

U.S. Cl. 606—174

10 Claims



1. A surgical instrument, comprising a pair of elongated arms, each arm having a first end and a second end, pivot means for pivoting the arms together at a location intermediate said first and second ends, whereby said first ends are movable between a closed position where said ends are in proximate relation to each other and an open position where said first ends are spaced apart, a generally flat clamping jaw surface disposed on each arm and spaced from the first end of said arm, said clamping jaw surfaces being disposed in flatwise contiguous relation when said first ends are in the closed position, and a scissor blade disposed on each arm and located between the corresponding clamping surface and said first end, said blades being constructed and arranged to be in overlapping cutting relation when said first ends are in the closed position.

5,439,472

**SURGICAL HANDPIECE CHUCK AND BLADE**

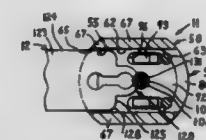
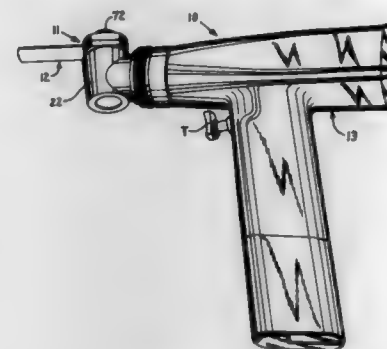
James A. Evans, Kalamazoo, and Gary T. Kalinka, Grand Rapids, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Continuation of Ser. No. 989,975, Dec. 11, 1992, Pat. No. 5,263,972, which is a continuation of Ser. No. 640,028, Jan. 11, 1991, abandoned. This application Jul. 14, 1993, Ser. No. 91,347. The portion of the term of this patent subsequent to Nov. 23, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61B 17/32, 17/14

U.S. Cl. 606—176

33 Claims



1. A saw blade of the kind usable in tools including surgical oscillating and sagittal saws, said blade comprising:  
first and second edge portions;  
cutting means along said first edge portion of the blade to effect cutting upon cutting movement of the blade;  
mounting means defining said second edge portion of said blade, said mounting means comprising safety and final locking means for removably interlocking the blade with a chuck, said final locking means being distinct from said safety locking means, in which said safety and final locking means both are part of slit means opening through the rear end of the blade, said slit means having at least one notch intermediate its ends for locking said blade against unintended removal from said chuck, said notch defining said final locking means.

5,439,473

**SAFETY LANCET**

Peter Jorgensen, Helsingør, Denmark, assignor to Modulohm A/S, Herlev, Denmark

Filed Dec. 13, 1993, Ser. No. 166,450

Int. Cl.<sup>6</sup> A61B 17/34

U.S. Cl. 606—182

3 Claims

1. A lancet assembly comprising:

a. a housing;

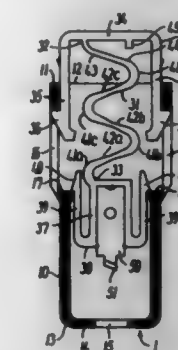
b. a spring at least partially within the housing, the spring being movable between a compressed position and an expanded position, the spring including a first end and a second end, the first end including a blade the spring additionally including a first section, and a second section;

c. means for restricting compression of the second section to a predetermined limit of compression;

d. means for retaining the blade within the housing when the spring is moved to the compressed position; and

e. means for releasing the spring from the compressed position,

the releasing means acting in cooperation with the blade retaining means, whereby when the spring is released and moved into the expanded position, the blade protrudes from the housing, piercing the skin.



5,439,474

**MORCELLATOR SYSTEM**

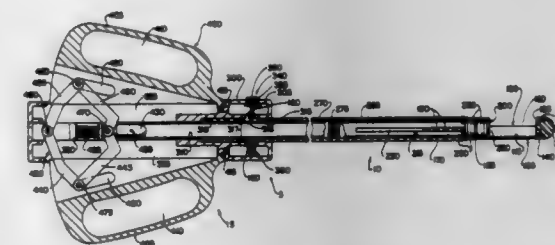
Lehmann K. Li, Milford, Conn., assignor to Li Medical Technologies, Inc., Trumbull, Conn.

Filed Oct. 8, 1993, Ser. No. 134,142

Int. Cl.<sup>6</sup> A61B 17/32, 19/00

U.S. Cl. 606—184

20 Claims



1. A morcellator comprising:

an outer tube having a distal end terminating in a distal end surface, a proximal end, an internal passageway extending from said distal end to said proximal end, and an opening formed in said distal end and communicating with said internal passageway;

an inner tube having a distal end terminating in a distal end surface adapted for morcellating tissue, a proximal end, and an interior passageway connecting said distal end of said inner tube with said proximal end of said inner tube, said inner tube being sized to make a close sliding fit within said outer tube;

a handle assembly comprising a body and actuating means, said proximal end of said outer tube being attached to said body, and said proximal end of said inner tube being attached to said actuating means, with said actuating means being adapted to move said inner tube between (1) a first position wherein said opening formed in said distal end of said outer tube is closed off by said inner tube, and (2) a second position wherein said opening formed in said distal end of said outer tube is at least part way open;

first tissue holding means projecting into said interior passageway of said inner tube for permitting tissue to move proximally through said inner tube, and preventing tissue from moving distally through said inner tube; and

second tissue holding means projecting into said interior passageway of said inner tube for permitting tissue to move proximally through said outer tube, and preventing tissue from moving distally through said outer tube.

5,439,475

# TISSUE GRAFTING METHOD USING AN APPARATUS WITH MULTIPLE TISSUE RECEIVING RECEPTACLES

David M. Bennett, Suite 12, 127 Nerang, St. Southport, Queensland, Australia

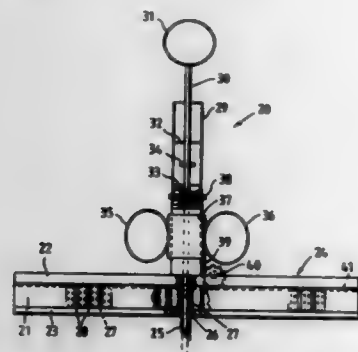
PCT No. PCT/AU91/00286, § 371 Date Jan. 7, 1993, § 102(e) Date Jan. 7, 1993, PCT Pub. No. WO92/00706, PCT Pub. Date Jan. 23, 1992

PCT Filed Jul. 3, 1991, Ser. No. 961,730

Claims priority, application Australia, Jul. 3, 1990, PK0958 Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—187

6 Claims



1. A method for grafting animal tissue from a donor site to a recipient graft site with an apparatus having storage means comprising a plurality of receptacles, each receptacle being configured to receive a prepared portion of tissue, transfer means adapted to transfer said portions of tissue from said receptacles to said recipient graft site, said transfer means being operatively connected to said receptacles, and hollow penetration means extending along said transfer means for penetrating said recipient graft site to a predetermined depth to facilitate deposition of said prepared portion of tissue in a selected region of said recipient graft site, said method comprising the steps of:

- removing a sample of donor tissue from a donor site;
- dividing said sample into a plurality of donor tissue portions of predetermined dimensions;
- loading said plurality of tissue portions into said receptacles of said storage means;
- inserting said hollow penetration means to a predetermined depth in said recipient graft site;
- actuating said transfer means to transfer a donor tissue portion from one of said receptacles via said hollow penetration means to said recipient graft site; and
- withdrawing said hollow penetration means from said recipient graft site to leave said donor tissue portion embedded in said recipient graft site.

5,439,476

# INFLATABLE LAPAROSCOPIC RETRACTOR

Eleni C. Frantzides, Wauwatosa, Wis., assignor to Trigonon, Inc., Wauwatosa, Wis.

Filed Feb. 4, 1993, Ser. No. 13,806

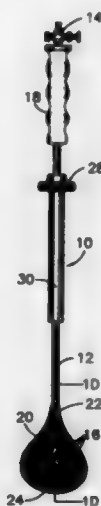
Int. Cl.<sup>6</sup> A61H 29/00; A61M 29/02

U.S. Cl. 606—192

12 Claims

1. An inflatable laparoscopic retraction device for atraumatic retraction of internal organs comprising:
- an introducer tube insertable longitudinally into and removable longitudinally from a cannula;
  - a rigid rod movable longitudinally back and forth in said introducer tube, said rod having an outer surface having a size and shape for extending said rod into and through said introducer tube, said rod further having a bore running from a proximal end to a distal end of said rod for transmitting fluid therethrough;
  - said rod having a perforated portion at a location adjacent said distal end for transmitting fluid from said bore in said rod to said outer surface of said rod;
  - an inflatable balloon affixed tightly upon said outer surface

of said rod at a location spaced from said distal end and there attached for covering said perforated portion of said rod, said balloon having a body portion extending along said outer surface of said rod and attached adjacent to said distal end of said rod, said balloon being wrappable around said outer surface of said rod and said balloon having an outer layer of mesh positioned for atraumatic contact with said internal organs, said balloon when inflated having a relatively broad surface when viewed in a first plane parallel to an axis of said rod and having a



relatively narrow surface when viewed in a second plane 90° from said first plane and parallel to said axis; and means for injecting fluid into or withdrawing fluid from said bore of said rod and thereby inflating said balloon after it has been extended through said introducer tube and said cannula and for deflating said balloon for subsequent re-wrapping of said balloon on said outer surface of said rod between said outer surface of said rod and an inside surface of said introducer tube, and for withdrawal of said introducer tube, said balloon and said rod from said cannula.

5,439,477

# TOURNIQUET APPARATUS FOR APPLYING MINIMUM EFFECTIVE PRESSURE

James A. McEwen, Richmond, Canada, assignor to Abatis Medical Technologies, Ltd., Limerick, Ireland

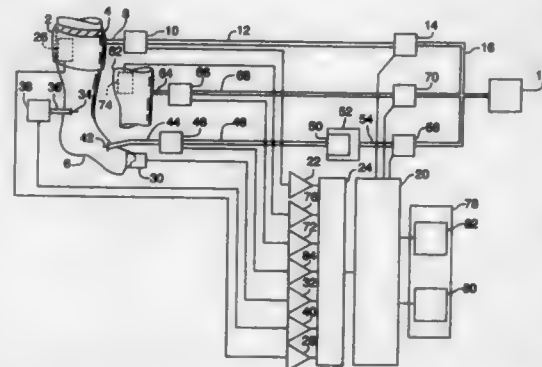
Division of Ser. No. 471,514, Jan. 29, 1990, Pat. No. 5,254,087.

This application Sep. 28, 1993, Ser. No. 128,478

Int. Cl.<sup>6</sup> A61B 5/02

U.S. Cl. 606—203

5 Claims



1. Tourniquet apparatus for maintaining the lowest constant pressure applied by a pressurizing cuff to a limb to stop blood

flow past the cuff for the duration of a surgical procedure, comprising:

- a) a pressurizing cuff responsive to cuff pressure control means for substantially encircling and applying pressure to a limb;
- b) distal flow sensing means for sensing the flow of blood past the pressurizing cuff;
- c) cuff pressure control means for controlling the pressure applied by the pressurizing cuff to the limb in response to a cuff pressure control signal;
- d) signal generating means responsive to the distal flow sensing means for generating a variable signal indicative of varying pressure to be applied by the cuff to the limb;
- e) estimation means for producing an estimate of a pressure level to be applied by the cuff to the limb so that the sensed blood flow is below a threshold level near zero;
- f) constant pressure means for producing a constant signal that is greater than the estimate and is indicative of a constant reference pressure to be applied by the cuff to the limb to stop blood flow past the cuff for the duration of a surgical procedure; and
- g) selection means for selecting either the variable signal or the constant signal to be the cuff pressure control signal.

5,439,478

# STEERABLE FLEXIBLE MICROSURGICAL INSTRUMENT WITH ROTATABLE CLEVIS

Matthew A. Palmer, Miami, Fla., assignor to Symbiosis Corporation, Miami, Fla.

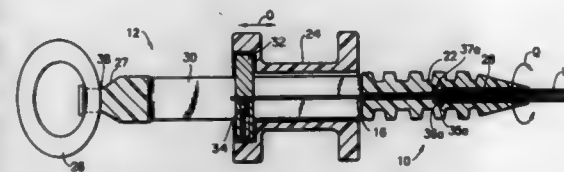
Continuation-in-part of Ser. No. 42,606, Apr. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 16,595, Feb. 11, 1993, which is a continuation-in-part of Ser. No. 865,913, Apr. 9, 1992, Pat. No. 5,228,451, which is a

continuation-in-part of Ser. No. 521,766, May 10, 1990, Pat. No. 5,133,727, said Ser. No. 42,606, is a continuation-in-part of Ser. No. 16,596, Feb. 11, 1993, which is a continuation-in-part of Ser. No. 680,392, Apr. 4, 1991, Pat. No. 5,192,298, and Ser. No. 989,984, Dec. 4, 1992, Pat. No. 5,293,878, which is a continuation-in-part of Ser. No. 780,014, Oct. 21, 1991, Pat. No. 5,171,258. This application Jan. 5, 1994, Ser. No. 177,538

Int. Cl.<sup>6</sup> A61B 17/28

U.S. Cl. 606—205

22 Claims



1. A surgical instrument, comprising:

- a) a flexible member having a proximal end and a distal end, and a lumen extending therethrough;
- b) a flexible but torsionally unyielding pull wire having a proximal end and a distal end and extending through said lumen of said flexible member;
- c) an actuation means coupled to said proximal ends of said flexible member and pull wire for effecting a translational movement of said pull wire relative to said flexible member, said actuation means including rotation means for effecting a rotation of said pull wire relative to said flexible member;
- d) a bushing having a proximal end and a distal end, said proximal end of said bushing being coupled to said distal end of said flexible member;
- e) a clevis rotatably coupled to said distal end of said bushing; and
- f) at least one end effector coupled to said clevis and coupled to said distal end of said pull wire, said pull wire extending freely through said clevis and said bushing, wherein rotation of said pull wire relative to said flexible member

effects a rotation of said at least one end effector and said clevis relative to said bushing and said flexible member.

5,439,479

# SURGICAL CLIP

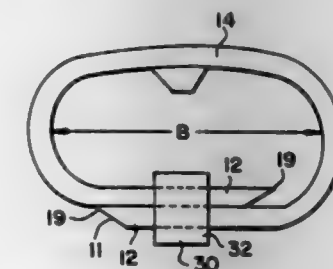
Daniel Shichman, Trumbull, Conn., and Boris Zvenyatsky, Bronx, N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 35,512, Mar. 22, 1993, abandoned, which is a continuation of Ser. No. 631,373, Dec. 20, 1990, abandoned. This application Jan. 4, 1994, Ser. No. 177,639

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—220

21 Claims



1. A surgical clip assembly, comprising:

- a staple having a central portion and first and second legs extending from said central portion, each said leg having gripping means;
- a retainer spaced apart from said central portion and having a central opening dimensioned for passage and retention of an end portion of both said legs, every dimension of said retainer being less than the length of said staple central portion, the length of said staple central portion being measured as the distance between the exterior side surfaces of said staple legs in the open position; and
- means or said retainer for engaging said gripping means to retain said end portion of said legs in said retainer.

5,439,480

# METHOD OF USING A WOVEN CLOTH TO INCREASE OXYGEN PARTIAL PRESSURE IN MUSCULATURE

Gerrit J. Benckhuijsen, Eschen, Liechtenstein, assignor to Temova Etablissement, Schaan, Liechtenstein

PCT No. PCT/EP92/00909, § 371 Date Oct. 25, 1993, § 102(e) Date Oct. 25, 1993, PCT Pub. No. WO92/19180, PCT Pub. Date Nov. 12, 1992

PCT Filed Apr. 24, 1992, Ser. No. 137,119

Claims priority, application Switzerland, Apr. 25, 1991, 1241/91

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 607—1

16 Claims

1. A method of increasing the oxygen partial pressure in musculature of an animal or a human comprising: applying to said musculature a woven cloth comprised of at



least 50% by weight of at least one of polyvinyl chloride fibers and polyamide fibers, said cloth including less than



10% by weight of at least one of cotton fibers and rayon fibers.

5,439,481

### SEMI-AUTOMATIC ATRIAL AND VENTRICULAR CARDIOVERTER DEFIBRILLATOR

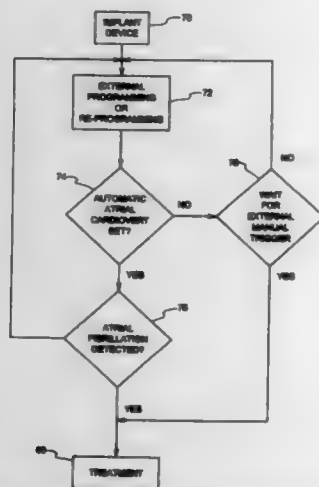
Theodore P. Adams, Edina, Minn., assignor to Angeion Corporation, Plymouth, Minn.

Continuation-in-part of Ser. No. 974,907, Nov. 11, 1992, abandoned, and a continuation-in-part of Ser. No. 841,544, Feb. 26, 1992, Pat. No. 5,306,291. This application Jul. 22, 1993, Ser. No. 96,165

Int. Cl.<sup>6</sup> A61N 1/39

U.S. Cl. 607-5

10 Claims



1. An implantable dual chamber cardioverter defibrillator apparatus for implant within a human patient, for generating and delivering cardioversion defibrillation countershocks of greater than about 0.1 joules to two or more electrodes implanted proximate the heart of the human patient, comprising: an implanted housing of a biocompatible material, the housing containing;

- means for storing an electrical charge;
- means for charging the means for storing to produce the electrical charge; and
- means for selectively controlling a discharge of the electrical charge stored in the means for storing through the two or more implanted electrodes to generate a cardioversion defibrillation countershock waveform, including:
  - means for detecting and automatically treating ven-

tricular dysrhythmias without reference to an external programming stimulus;

c2) selective means for treating atrial dysrhythmias further comprising semi-automatic means for selectively determining whether the treating of atrial dysrhythmias will be automatically initiated upon detection of an atrial dysrhythmia or manually initiated upon detection of an external programming stimulus.

5,439,482

### PROPHYLACTIC IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR

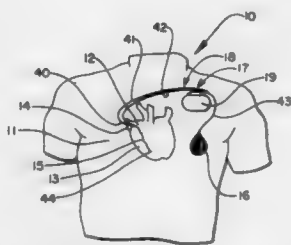
Theodore P. Adams, Edina, and Mark W. Kroll, Minnetonka, both of Minn., assignors to Angeion Corporation, Plymouth, Minn.

Continuation-in-part of Ser. No. 864,789, Apr. 7, 1992, abandoned, Ser. No. 33,632, Mar. 16, 1993, abandoned, Ser. No. 108,130, Aug. 16, 1993, and Ser. No. 125,288, Sep. 22, 1993. This application Sep. 23, 1993, Ser. No. 126,044

Int. Cl.<sup>6</sup> A61N 1/39

U.S. Cl. 607-5

24 Claims



1. A prophylactic implantable cardioverter defibrillator device for subcutaneous positioning within a pectoral region of a human patient capable of internally storing sufficient electrical energy so as to effectively treat a mildly impaired cardiac dysrhythmia condition comprising:

a sealed housing structure, having at least two walls defining an interior space therebetween the at least two walls, constructed of a biocompatible material and having a displacement volume of less than about 75 cc and including one or more connector ports disposed in a wall of said structure for providing electrical connections between said interior space of said structure and electrode leads in said patient;

circuit means, within said interior space, including:

- means for sensing cardiac signals received from said electrode leads;
- means for detecting and confirming a dysrhythmia in said cardiac signals; and
- means for controlling delivery of one or more electrical cardioversion/defibrillation countershocks of at least 0.5 Joules to said patient in response to the detection of a dysrhythmia;

capacitor means within said interior space for storing electrical energy to generate said electrical cardioversion/defibrillation countershocks and having an effective capacitance of less than about 100  $\mu$ F; and

battery means within said interior space for providing electrical energy to said circuit means and said capacitor means and capable of charging said capacitor means to a maximum stored electrical charge energy of less than about 27 Joules,

wherein a total amount of electrical energy stored by said battery means is less than about 12,000 Joules and a budgeted number of electrical cardioversion/defibrillation countershocks is greater than about 100 and less than about 200.

5,439,483

### METHOD OF QUANTIFYING CARDIAC FIBRILLATION USING WAVELET TRANSFORM

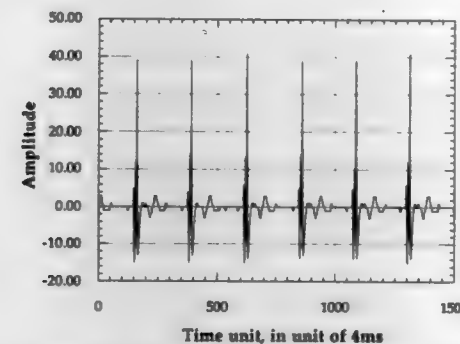
Minh Duong-Van, Palo Alto, Calif., assignor to Ventritex, Inc., Sunnyvale, Calif.

Filed Oct. 21, 1993, Ser. No. 139,953

Int. Cl.<sup>6</sup> A61B 5/046; A61N 1/36

U.S. Cl. 607-5

10 Claims



1. A method of quantifying cardiac fibrillation comprising the steps of:

- sensing the electrical signals of a patient's heart to provide an ECG signal;
- detecting the presence of a fibrillation event;
- performing a wavelet transform on the fibrillation event in said ECG signal; and
- analyzing the resultant wavelet transform by searching for an absence of signal spikes to characterize the fibrillation event.

5,439,484

### DEFIBRILLATOR EMPLOYING TRANSVENOUS AND SUBCUTANEOUS ELECTRODES

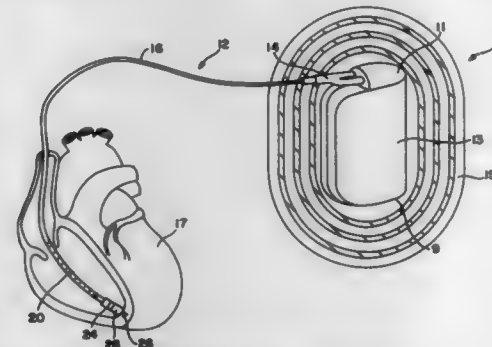
Rahul Mehra, Stillwater, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 21, 1994, Ser. No. 230,962

Int. Cl.<sup>6</sup> A61N 1/39

U.S. Cl. 607-5

7 Claims



1. An implantable cardioverter, comprising:

a hermetically sealed housing having a conductive major surface enclosing a cardioversion pulse generator, said

cardioversion pulse generator having an output coupled to said major conductive surface;

a flexible, generally planar electrode bearing pad having first and second major surfaces generally extending from and generally parallel to said major conductive surface, said electrode bearing pad being formed of a biocompatible, flexible material and having an inner periphery adjacent said housing and an outer periphery spaced therefrom;

an electrode array supported by said electrode bearing pad and having conductive electrode surfaces distributed over said electrode pad between said inner and outer peripheries of said pad and electrically coupled to said conductive major surface of said housing.

5,439,485

### FLEXIBLE DEFIBRILLATION ELECTRODE OF IMPROVED CONSTRUCTION

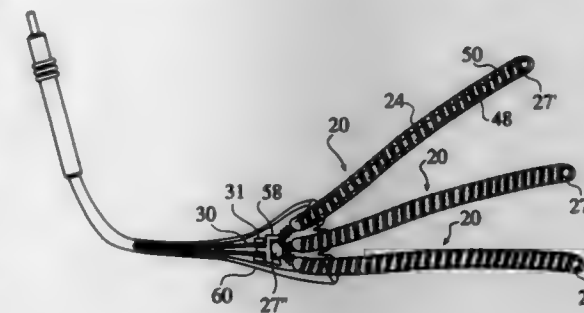
Craig E. Mar, Fremont; Benjamin D. Pless, Menlo Park, and M. Elizabeth Bush, Fremont, all of Calif., assignors to Ventritex, Inc., Sunnyvale, Calif.

Filed Sep. 24, 1993, Ser. No. 126,619

Int. Cl.<sup>6</sup> A61N 1/36

U.S. Cl. 607-119

23 Claims



1. A body implantable lead including at least one electrode having a proximal end and a distal end, comprising:

a flexible tubular supporting core having a lumen there-through;

at least one electrode coil helically wound about said core, said at least one electrode coil having a proximal end corresponding to said electrode proximal end and a distal end corresponding to said electrode distal end and comprising at least one helically wound metal wire and being connected at one of said ends to a conductor; and

a matrix of elastomeric material partially encapsulating said electrode coil and holding said electrode coil in said helically wound position around said core.

# CHEMICAL

5,439,486

## TRIPHENEDIOXAZINES, THEIR PREPARATION AND THE USE THEREOF

Urs Lauk, Zürich, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 784,198, Oct. 28, 1991, Pat. No. 5,268,475. This application Sep. 3, 1993, Ser. No. 116,773

Claims priority, application Switzerland, Oct. 30, 1990, 3443/90

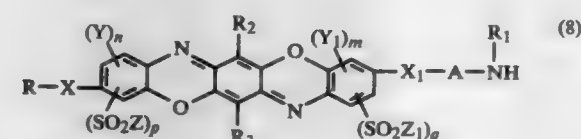
The portion of the term of this patent subsequent to Aug. 3, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> D06P 3/874, 1/40, 1/382; C09B 62/02

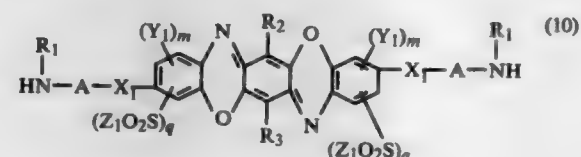
U.S. Cl. 8—532

17 Claims

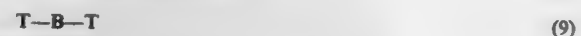
1. A dye mixture obtainable by condensing a compound of the formula



and a compound of the formula



with a compound of formula



wherein

R and R<sub>1</sub> are each independently of the other hydrogen; unsubstituted C<sub>1</sub>-C<sub>4</sub>alkyl or C<sub>1</sub>-C<sub>4</sub>alkyl which is substituted by hydroxy, sulfo, sulfato, chloro, cyano or acetoxy and, with the exception of methyl, may be interrupted by a group —O—; cyclopentyl or cyclohexyl which are unsubstituted or substituted by 1 to 3 methyl groups; unsubstituted phenyl or phenyl which is substituted by sulfo, nitro, chloro, methyl, methoxy, N-methylamino or N-ethylamino, N,N-dimethylamino or N,N-diethylamino, acetylamino, propionylamino, benzoylamino, methoxycarbonyl, ethoxycarbonyl, carboxy or methylsulfonyl; unsubstituted 1- or 2-naphthyl or 1- or 2-naphthyl which is substituted by sulfo, nitro or chloro; or unsubstituted benzyl or benzyl which is substituted by methyl, methoxy, sulfo or chloro,

X is a direct bond, —O—, —S— or —N(R<sub>4</sub>)—, wherein R<sub>4</sub> has the meanings given above for R and R<sub>1</sub>,

X<sub>1</sub> is —O—, —S— or —N(R<sub>4</sub>)—, wherein R<sub>4</sub> has the meanings given above for R and R<sub>1</sub>,

Y and Y<sub>1</sub> are each independently of the other C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, halogen, sulfo, carboxy, carbamoyl, N-mono- or N,N-di-C<sub>1</sub>-C<sub>4</sub>alkylcarbamoyl, N-phenyl- or N,N-diphenylcarbamoyl, sulfamoyl, N-mono- or N,N-di-C<sub>1</sub>-C<sub>4</sub>alkylsulfamoyl or N-phenyl- or N,N-diphenylsulfamoyl,

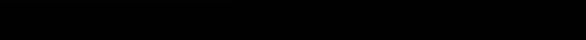
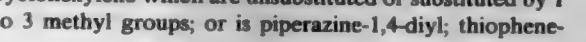
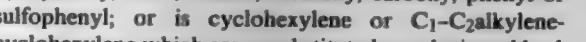
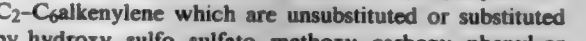
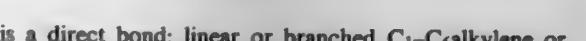
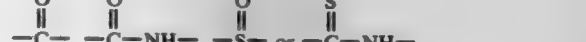
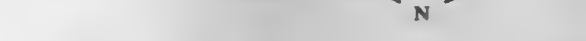
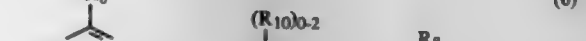
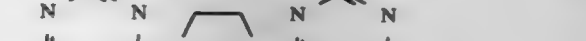
Z and Z<sub>1</sub> are each independently of the other hydroxy or C<sub>1</sub>-C<sub>4</sub>alkyl,

R<sub>2</sub> and R<sub>3</sub> are each independently of the other hydrogen, halogen, cyano, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, sulfo, carboxy, carbamoyl, phenylcarbamoyl or C<sub>2</sub>-C<sub>5</sub>alkanoylamino; or phenyl, benzyl, benzoylamino or phenoxy each of which is unsubstituted or substituted in the phenyl ring by C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, acetylamino, halogen, nitro or sulfo,

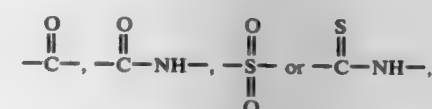
A is a linear or branched C<sub>2</sub>-C<sub>6</sub>alkylene radical which is unsubstituted or substituted by hydroxy, sulfo, sulfato, C<sub>1</sub>-C<sub>4</sub>alkoxy, carboxy, cyano, halogen, phenyl, sulfophenyl or C<sub>2</sub>-C<sub>5</sub>alkoxycarbonyl, and which may be interrupted by 1 or 2 —O— or —N(R<sub>5</sub>)— groups, wherein R<sub>5</sub> is C<sub>1</sub>-C<sub>4</sub>alkyl, acetyl or hydrogen, or by —S— or

—SO<sub>2</sub>—; or is a cyclohexylene radical which is unsubstituted or substituted by 1 to 3 methyl groups; or is a phenylene, biphenylene or naphthylene radical which is unsubstituted or substituted by C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, sulfo, halogen or carboxy; or is a C<sub>1</sub>-C<sub>6</sub>alkylene-phenylene, phenylene-C<sub>1</sub>-C<sub>6</sub>alkylene-phenylene, C<sub>1</sub>-C<sub>3</sub>alkylene-phenylene-C<sub>1</sub>-C<sub>3</sub>alkylene or methylene-naphthylene-methylene radical, wherein the phenylene and naphthylene moieties contain no further substituents or additionally carry 1 or 2 substituents selected from the group consisting of sulfo, carboxy, sulfamoyl, carbamoyl, methyl, ethyl, methoxy, ethoxy, nitro, chloro, amino, N-methylamino and N-ethylamino, N,N-dimethylamino and N,N-diethylamino and phenylamino, m, n, p and q are each independently of one another 0 or 1,

T is halogen and B has the formula



wherein Q is a group



E is a direct bond; linear or branched C<sub>1</sub>-C<sub>6</sub>alkylene or C<sub>2</sub>-C<sub>6</sub>alkenylene which are unsubstituted or substituted by hydroxy, sulfo, sulfato, methoxy, carboxy, phenyl or sulfophenyl; or is cyclohexylene or C<sub>1</sub>-C<sub>2</sub>alkylene-cyclohexylene which are unsubstituted or substituted by 1 to 3 methyl groups; or is piperazine-1,4-diyl; thiophene-



2,5-diyl; biphenyl-4,4'-diyl; stilbene-4,4'-diyl; unsubstituted phenylene or naphthylene or phenylene or naphthylene which are substituted by C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, sulfo, halogen or carboxy; or is C<sub>1</sub>-C<sub>3</sub>alkylene-phenylene or C<sub>1</sub>-C<sub>2</sub>alkylenephylene-C<sub>1</sub>-C<sub>2</sub>alkylene which are unsubstituted or substituted in the phenyl moiety by methyl, methoxy, chloro or sulfo, R<sub>9</sub> is nitro, cyano, C<sub>1</sub>-C<sub>4</sub>alkylsulfonyl, carboxy, chloro, fluoro, C<sub>1</sub>-C<sub>4</sub>alkoxysulfonyl, C<sub>1</sub>-C<sub>4</sub>alkylsulfinyl, C<sub>1</sub>-C<sub>4</sub>alkoxycarbonyl or C<sub>1</sub>-C<sub>4</sub>alkanoxy, R<sub>10</sub> is sulfo, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy or halogen, and R<sub>8</sub> is chloro; hydroxy; C<sub>1</sub>-C<sub>4</sub>alkyl; phenyl; C<sub>1</sub>-C<sub>4</sub>alkoxy; C<sub>1</sub>-C<sub>4</sub>alkylthio; amino; N-mono- or N-di-C<sub>1</sub>-C<sub>4</sub>alkylamino which is unsubstituted or substituted in the alkyl moiety by hydroxy, carboxy, cyano, sulfo, sulfato or C<sub>1</sub>-C<sub>4</sub>alkoxy; cyclohexylamino; phenylamino or N-C<sub>1</sub>-C<sub>4</sub>alkyl-N-phenylamino which are unsubstituted or substituted in the phenyl moiety by C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, phenoxy, carboxy, sulfo or halogen; morpholino or 3-carboxy- or 3-carbamoylpyridin-1-yl.

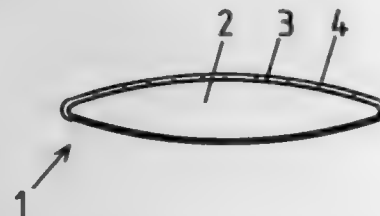
5,439,487

**DEVICE FOR COSMETICALLY PEELING THE SKIN**  
Horst Stanitzok, Rosastr. 1, 79098 Freiburg, Germany  
Filed Feb. 17, 1994, Ser. No. 198,881

Int. Cl.<sup>6</sup> A47K 7/02

U.S. Cl. 15-227

19 Claims



1. A skin-care device for cosmetically peeling skin embodying a hand-held apparatus comprising a textile fabric, said textile fabric comprised of yarns selected from the group consisting of filament yarn and spun yarn made of fibers selected from the group consisting of synthetic fibers and silk fibers; said yarn having a structure selected from the group consisting of twisted, textured, and twisted/textured; said fibers having a size of less than 3 dtex; and said yarn having a size of less than 30 tex.

5,439,488

**APPARATUS FOR MAKING AN ELECTRICAL ENERGY STORAGE DEVICE**

Thomas E. Audit, and Jon K. West, both of Gainesville, Fla., assignors to EV Energy Systems, Ltd., Gainesville, Fla.  
Division of Ser. No. 104,221, Aug. 11, 1993, Pat. No. 5,370,711, which is a continuation-in-part of Ser. No. 94,711, Jul. 21, 1993, abandoned. This application Aug. 24, 1994, Ser. No. 295,106

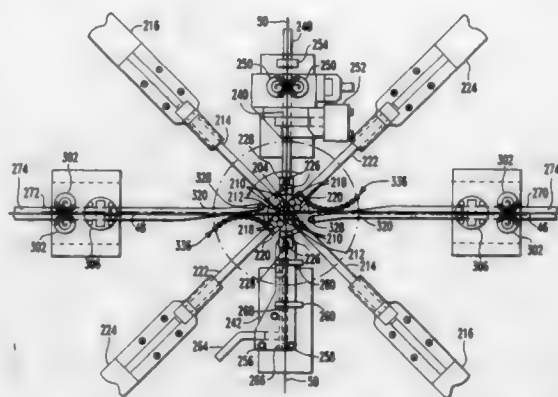
Int. Cl.<sup>6</sup> H01M 6/02

U.S. Cl. 29-730

13 Claims

1. An apparatus for making an electrical energy storage device including a coiled winding having an anode plate, a cathode plate, and a separator, the apparatus comprising: a frame; an arbor rotatably mounted on the frame; means for rotating the arbor to wind the anode plate, the cathode plate and the separator about the arbor to thereby form the winding, the diameter of the winding increasing from an initial diameter to a completed diameter during the winding; a series of rollers arranged on the frame about the arbor and being movable away from the arbor, only a portion of the

series of rollers contacting the winding when the winding is of the initial diameter, and additional rollers contacting



the winding when the winding reaches a first intermediate diameter between the initial and completed diameters.

5,439,489

**METHOD AND APPARATUS FOR PRODUCING A FUEL COMPOSITION**

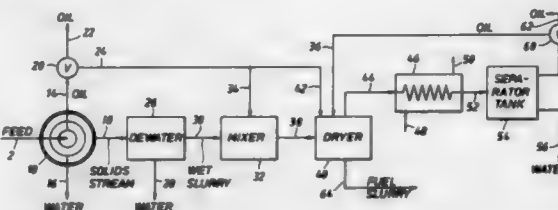
Robert M. Scalliet, Houston; Raymond R. Ruth, Pearland, and Craig A. Koopersmith, Spring, all of Tex., assignors to Scaltech, Inc., Houston, Tex.

Continuation of Ser. No. 83,920, Jun. 28, 1993, abandoned. This application Aug. 17, 1994, Ser. No. 292,165

Int. Cl.<sup>6</sup> C10L 7/02

U.S. Cl. 44-281

5 Claims



1. A process for producing a pumpable fuel composition from a waste stream containing a liquid, organic component, water and a mixture of inorganic solids and combustible organic solids comprising:

separating said waste stream into a liquid, organic fraction, a water fraction and a solids fraction, said solids fraction comprising inorganic solids and combustible organic solids and containing from about 3 to about 15% by weight of said solids, from about 80 to about 98% by weight water and from about 0.5 to about 5% by weight oil; removing water from said solids fraction to produce a de-watered solids fraction containing less than about 60% by weight water; admixing said de-watered solids fraction with oil to produce a feed charge; and heating said feed charge using heat exchange conditions at a temperature and for a time sufficient to evaporate water and produce a pumpable fuel composition comprising less than about 10% by weight water, greater than about 30% by weight solids, and from about 30 to about 70% by weight oil.

5,439,490

**METHOD FOR USE IN A MULTIPLICATION PROCESS OF PLANTS AND A DEVICE FOR CARRYING OUT SAID METHOD**

Edwin O. M. Janus, Gerwen, Netherlands, assignor to Plant Production Systems B.V., Helmond, Netherlands  
PCT No. PCT/NL92/00020, § 371 Date Sep. 28, 1993, § 102(e) Date Sep. 28, 1993, PCT Pub. No. WO92/01344, PCT Pub. Date Aug. 20, 1992

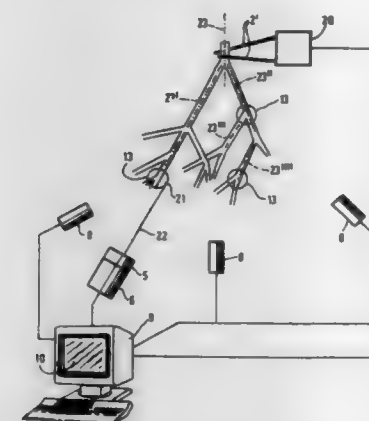
PCT Filed Jan. 28, 1992, Ser. No. 94,139

Claims priority, application WIPO, Feb. 1, 1991, PCT/NL91/00015

Int. Cl.<sup>6</sup> A01G 3/00, 7/00; A01H 4/00

U.S. Cl. 47-58

22 Claims



1. A method for use in a multiplication process of plants, whereby an image is made of a plant, which is converted into electronic display data, which are processed in order to determine data with regard to the co-ordinates of growing points in the image of the plant, said data being used for cutting the growing points out of the plant, characterized in that the process of determining the co-ordinate data of the growing points comprises a determination of only the contour in the image data of the plant, and that the image of said contour is searched for bounded areas, said bounded areas being areas whose circumference is intersected by at least three branches of the contour, and in which at least one growing point is therefore assumed to be present; which method further comprises cutting loose the plant parts containing said growing points.

5,439,491

**FLUIDIZED BED GENERATOR FOR ALLOTHERMIC GASIFICATION OF COAL**

Helmut Kubiak, Herne; Hans J. Schroter, Muhlheim; Gunther Gappa, Gelsenkirchen; Heinrich Kalwitzki, Essen, and Klaus Knop, Geldern, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Continuation of Ser. No. 997,088, Dec. 29, 1992, abandoned, which is a division of Ser. No. 963,284, Oct. 19, 1992, Pat. No. 5,346,515, which is a continuation of Ser. No. 727,644, Jul. 9, 1991, abandoned, which is a division of Ser. No. 348,574, May 19, 1989, Pat. No. 5,064,444. This application Apr. 21, 1994, Ser. No. 231,460

Claims priority, application Germany, Oct. 16, 1986, 36 35 215.2

The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.

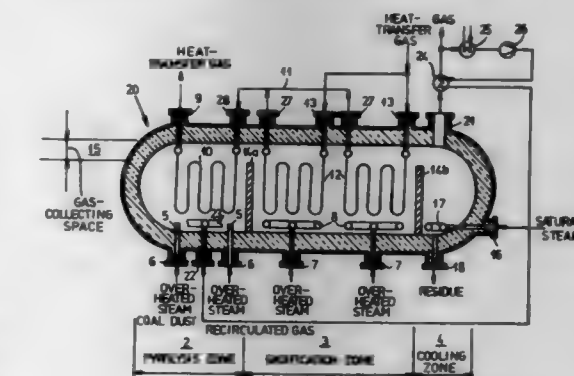
Int. Cl.<sup>6</sup> C10J 3/56

U.S. Cl. 40-99

1 Claim

1. A fluidized bed gas generator comprising: a horizontal cylindrical elongated pressure tank, said tank having a horizontal axis, a cylindrical wall and being provided with a gas outlet at one end of said tank, said tank comprising:

a pyrolysis zone in an upstream area of said tank at an opposite end of the tank;  
a gasification zone located adjacent but downstream from said pyrolysis zone at an intermediate region of the tank between said ends, and  
a cooling zone located adjacent but downstream of said gasification zone at said one end of said tank;  
a coal-supply pipe leading into a bottom of said pyrolysis zone for supplying coal dust to said pyrolysis zone at said bottom of said pyrolysis zone as transported with a gas;  
a steam supply pipe connection leading into said gasification zone and having means for distributing steam from a series of orifices therein;  
a further steam supply connection leading into said cooling zone and having means for distributing steam from a series of orifices therein;  
an evacuation sluice leading from said cooling zone;  
a vertical dam impermeable to gas and solids extending from the bottom of the tank perpendicular to said axis separat-



ing said gasification zone from said pyrolysis zone and having a horizontal edge below a top of said tank;  
a further vertical dam impermeable to gas and solids extending from the bottom of the tank perpendicular to said axis separating said gasification and cooling zones and having a horizontal edge below a top of said tank, first heat-exchange tubes in said gasification zone connected to said top of said tank and reaching below said horizontal edges; further heat-exchange tubes in said pyrolysis zone connected to said top of said tank and reaching below said horizontal edge of said further vertical dam;  
a heat-transfer gas connection for supplying a heat-transfer gas to said first heat-exchange tubes at said top of said tank; and  
means at said top of said tank for connecting said first heat-exchange tubes with said further heat-exchange tubes, said coal dust being pyrolyzed in said pyrolysis zone and gasified in said gasification zone whereby a product gas is discharged from said outlet.

5,439,492

**FINE GRAIN DIAMOND WORKPIECES**

Thomas R. Anthony, Schenectady, and James F. Fleischer, Scotia, both of N.Y., assignors to General Electric Company, Worthington, Ohio

Continuation-in-part of Ser. No. 897,124, Jun. 11, 1992, abandoned. This application Oct. 28, 1992, Ser. No. 967,461

Int. Cl.<sup>6</sup> B24D 11/00

U.S. Cl. 51-295

4 Claims

1. A diamond workpiece with a tubular configuration which varies in three dimensions comprised of a homogeneous self

supporting single layer of polycrystalline CVD diamond having a grain size of less than 1  $\mu\text{m}$  and a thickness in the range



of 150 to 2000  $\mu\text{m}$  wherein said single layer of polycrystalline diamond has no Raman signature at 1332  $\text{cm}^{-1}$ .

5,439,493

#### ABRASIVE COATING REMOVER AND PROCESS FOR USING SAME

Lawrence Kirschner, Flanders, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.  
Division of Ser. No. 854,204, Mar. 20, 1992. This application  
Aug. 3, 1993, Ser. No. 101,003  
Int. Cl.<sup>6</sup> C09C 1/08

U.S. Cl. 51—309

14 Claims

1. A blast media for removing coatings from steel comprising a major amount of a relatively soft granular abrasive which is water soluble and has a hardness of less than 3.5 on the Mohs scale and a minor amount of a relatively hard granular abrasive having a hardness greater than 7 on the Mohs scale, said granular abrasives having a particle size of from about 50 to 2,000 microns and being devoid of silicious material.

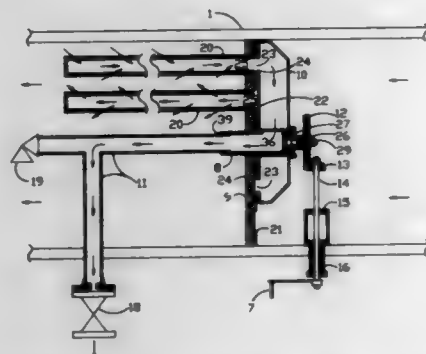
5,439,494

#### SELF-CLEANING GAS FILTERING APPARATUS

Charles G. Tullis, and Bobby A. Hammer, both of P.O. Box 150128, Longview, Tex. 75615  
Filed Jul. 29, 1994, Ser. No. 282,873  
Int. Cl.<sup>6</sup> B01D 46/00

U.S. Cl. 55—283

14 Claims



1. An improvement to reduce the waste of gas within a Self-cleaning Gas Filtering Apparatus having an internal rotatable manifold, manifold pads each having a top and a bottom and each being attached at the top thereof to the rotatable manifold, a support plate, and element entry-ports circumfer-

entially arranged within the support plate and wherein the improvement comprises:

forming a groove, having a base and walls, that passes circumferentially over the entry-ports and extends radially past the entry-ports, such that the manifold pads ride within said groove forming a primary seal between the bottom of the manifold pads and the base of said groove, and a secondary seal between the walls of said groove and the manifold pads.

5,439,495

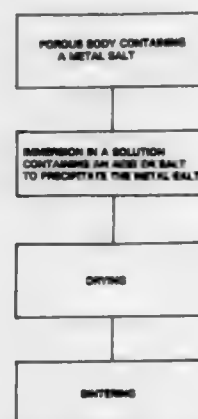
#### SOLUTION DOPING OF SOL GEL BODIES TO MAKE GRADED INDEX GLASS ARTICLES

Hisashi Koike, Machida; Morinao Fukuoka, Hachiohji; Yuko Kurasawa, Hachiohji; Minoru Inami, Hachiohji, and Masayuki Yamane, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed Sep. 10, 1993, Ser. No. 119,735

Claims priority, application Japan, Sep. 11, 1992, 4-269487; May 11, 1993, 5-132958; Jun. 18, 1993, 5-172188  
Int. Cl.<sup>6</sup> C03B 8/00

U.S. Cl. 65—17.2

22 Claims



16. A method for manufacturing a glass element comprising the steps of: providing a porous body containing a metal salt having a metal component; immersing the porous body containing the metal component in an immersion solution containing at least one compound selected from the group consisting of an acid, an ammonium salt and an alkylammonium salt effective to precipitate the metal salt in the pores of the porous body; drying the porous body; and sintering the porous body to obtain a glass element.

5,439,496

#### METHOD FOR THE VITRIFICATION OF WASTE MATERIALS AND APPARATUS TO CARRY OUT THE METHOD

Helmut Pieper, Lohr am Main, Germany, assignor to Beteiligungsgen Sorg G, bh & Co. KG, Lohr am Main, Germany  
Filed Jan. 19, 1994, Ser. No. 183,701

Claims priority, application Germany, Jan. 20, 1993, 43 01 353.8  
Int. Cl.<sup>6</sup> C03B 3/02, 5/02, 5/16

U.S. Cl. 65—27

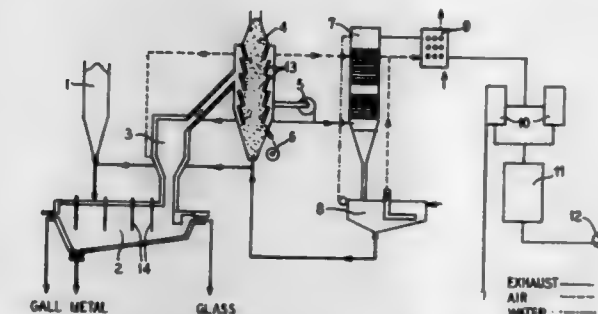
13 Claims

1. A method for the vitrification of waste materials, which contain high quantities of carbon, in an electrically heated glass melting furnace, comprising the steps of:

subjecting waste gases from the glass melting furnace to secondary combustion in a secondary combustion chamber to convert CO into CO<sub>2</sub>,  
using waste gases from said secondary combustion to heat batch components in a batch pre-heater,  
cooling said secondary combustion waste gases by relatively cold air thereby raising a temperature of said air to a

temperature between 150° C. and 400° C. at an outlet of said batch pre-heater,  
passing a part of said raised temperature air to said secondary combustion chamber, and  
cleaning said cooled waste gases prior to releasing them to the atmosphere.

7. An apparatus for vitrifying waste materials containing a high quantity of carbon comprising:  
an electrically heated glass melting furnace;  
a secondary combustion chamber for the combustion of waste gases from said glass melting furnace to convert CO to CO<sub>2</sub>;



a batch pre-heater for receiving batch materials to be fed into said glass melting furnace;  
conduit means for directing said waste gases from said secondary combustion chamber to said batch pre-heater;  
conduit means for directing relatively cold air into said batch pre-heater to raise a temperature of said air to between 150° C. and 400° C. at an outlet of said batch pre-heater;  
conduit means for directing a part of said raised temperature air to said secondary combustion chamber; and  
a gas cleaning means associated with said batch pre-heater for cleaning waste gases prior to releasing them to the atmosphere.

5,439,497

#### UTILIZATION OF LOW-QUALITY AMMONIUM SULFATES

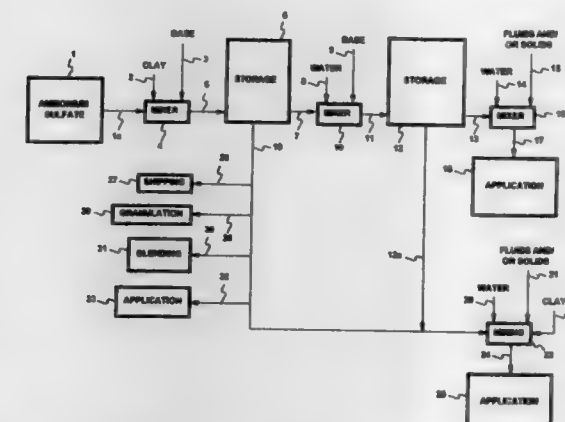
Jeffrey L. Boles, Tuscumbia, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Jul. 25, 1994, Ser. No. 280,640

Int. Cl.<sup>6</sup> C05D 9/00; C05G 5/00

U.S. Cl. 71—63

8 Claims



1. A process for improving the long-term storage, flowability, shipping, handling, and application properties of by-product ammonium sulfate crystals, which process comprises the following steps:

(a) introducing into mixing means for intimately mixing solid materials, amounts of ammonium sulfate solids and

amounts of attapulgite gelling clay, said ammonium sulfate solids containing from about 0.01 percent to about 3 percent by weight moisture and comprising crystals of ammonium sulfate ranging in length from about 100 to about 2000 microns, said amount of ammonium sulfate solids predetermined relative to said amounts of attapulgite gelling clay to provide in said mixing means a later mentioned substantially improved dry ammonium sulfate having an angle of repose ranging between about 30 to about 45 degrees and said attapulgite gelling clay ranging from about 0.5 to about 10 percent by weight of said improved ammonium sulfate, wherein said angle of repose is inversely proportional to the concentration of the attapulgite gelling clay in said ammonium sulfate, inversely proportional to the crystal size of the said ammonium sulfate, and directly proportional to the moisture content of the said ammonium sulfate; and

(b) withdrawing said substantially improved dry ammonium sulfate from said mixing means as product.

5,439,498

#### PROCESS AND SYSTEM FOR THE ON-SITE REMEDIATION OF LEAD-CONTAMINATED SOIL AND WASTE BATTERY CASINGS

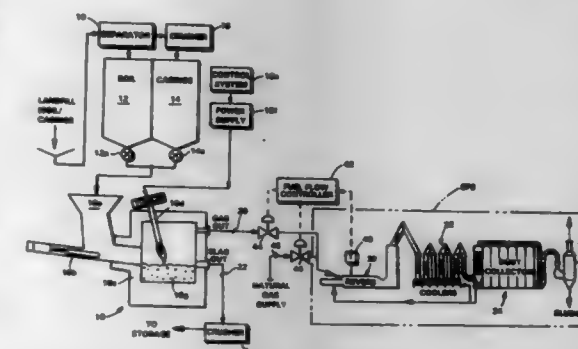
John A. Bitler, Denver, and John P. Baranski, Sinking Spring, both of Pa., assignors to Exide Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 973,236, Nov. 10, 1992, Pat. No. 5,284,503. This application Nov. 9, 1993, Ser. No. 149,343

Int. Cl.<sup>6</sup> C22B 13/02

U.S. Cl. 75—10.19

19 Claims



1. A mobile system for the remediation of a mixture of lead-contaminated soil and waste lead-acid battery casings comprising:

a plasma arc furnace having a plasma arc torch which operates at a sufficiently elevated temperature to (i) convert the battery casings in the mixture into a combustible gas, (ii) volatilize lead contaminants which are present in the mixture and entrain said volatilized lead contaminants as a vapor in the combustible gas, and (iii) vitrify the soil, whereby lead contaminants that were present in the mixture are substantially removed therefrom;

an internal combustion engine-driven generator operatively coupled to said plasma arc furnace for supplying said plasma arc furnace with electrical power; and  
a transfer line which connects said plasma arc furnace to said internal combustion engine-driven generator so as to direct combustible gas generated by said plasma arc furnace to said internal combustion engine-driven generator, wherein said internal combustion engine-driven generator receives the combustible gas from said plasma arc furnace as a fuel source and combusts the combustible gas in order to drive the generator.



5,439,499

**CERMETS BASED ON TRANSITION METAL BORIDES, THEIR PRODUCTION AND USE**

Henri Pastor; Colette Allibert, both of Grenoble; Laurent Otavi, Voiron, all of France; Manuel Albajar, Caldes de Montbui, and Francisco Castro-Fernandez, San Sebastian, both of Spain, assignors to Sandvik AB, Sweden

PCT No. PCT/FR92/00595, § 371 Date Feb. 26, 1993, § 102(e) Date Feb. 26, 1993, PCT Pub. No. WO93/00452, PCT Pub. Date Jan. 7, 1993

PCT Filed Jun. 26, 1992, Ser. No. 979,868

Claims priority, application France, Jun. 28, 1991, 91 08030 Int. Cl.<sup>6</sup> C22C 29/12; B22F 3/12; B24D 17/00

U.S. Cl. 75—232

17 Claims

1. A cermet comprising (i) as a major constituent, a hard phase of a simple boride  $T_xB_y$ , a mixture of simple borides  $T_xB_y + T'_x'B'_y$  or a mixed boride  $(T,T')xBy$ , wherein T and T' are transition metals selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W, and wherein x, x', y and y', may be the same or different and are whole or decimal numbers; (ii) a binder phase of a pure binder metal L, or an alloy with at least two metals L and L' wherein L is a metal chosen from the group consisting of Fe, Ni, Co and Cr and L' is at least one metallic element which, is effective for alloying with L, and when alloyed with L, does not substantially decrease toughness; (iii) a dispersion of particles of an oxycarbonitride of the transition metals T or T' which is the major metallic element in hard phase (i); and (iv) a dispersion of particles of an oxide of metal X chosen from the group consisting of aluminum, the alkaline earth metals, Sc, Y, the lanthanides, the actinides, and alloys formed by iron and the lanthanide metals, with the proviso that the oxycarbonitride forming the dispersion (iii) and the oxide forming dispersion (iv) can be combined as a complex oxide.

5,439,500

**MAGNETO-OPTICAL ALLOY SPUTTER TARGETS**

Daniel R. Marx, West Caldwell, N.J., assignor to Materials Research Corporation, Orangeburg, N.Y.

Filed Dec. 2, 1993, Ser. No. 161,143

Int. Cl.<sup>6</sup> C22C 19/00, 38/00; B22F 3/12

U.S. Cl. 75—246

28 Claims

1. An alloy target for producing a magneto-optical recording medium, said target having a composition comprising at least one rare earth element and at least one transition metal and having a structure with a transition metal constituent and a finely mixed alloy constituent of a rare earth phase and a rare earth/transition metal intermetallic compound, said target containing up to a maximum of about 15 % by weight of said intermetallic compound, said transition metal constituent being a transition metal alloy and said structure containing substantially no unalloyed transition metal.

5,439,501

**METHOD OF PROCESSING HOT DROSS OF ALUMINUM RESULTING FROM AN ALUMINUM SMELTING PROCESS AND A DEOXIDANT OBTAINED FROM SAID METHOD**

Katsuzo Watanabe, and Yoshihito Taki, both of Shizuoka, Japan, assignors to Yamaichi Metal Co., Ltd. and Yamaichi System Produce Co. Ltd., Shizuoka, Japan

Filed Nov. 12, 1993, Ser. No. 151,190

Claims priority, application Japan, Dec. 24, 1992, 4-357214; Jan. 5, 1993, 5-015948

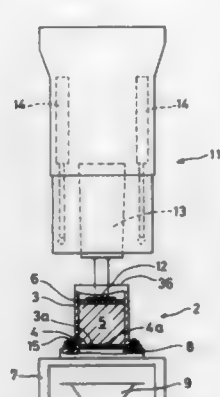
Int. Cl.<sup>6</sup> C22B 7/00

U.S. Cl. 75—313

24 Claims

1. A method of processing hot dross of aluminum resulting from an aluminum smelting process including the steps of: filling the hot dross of aluminum resulting from the aluminum smelting process into a hollow container which has a porous bottom plate closing a bottom opening of said container;

setting a solid plate on said hot dross filled in said container; successively applying an impact load having a value of about 80 horsepower on said hot dross in said container via said



solid plate to solidify the hot dross until said hot dross is substantially no more reduced in volume; and extruding a resultant solidified dross from said container.

5,439,502

**METHOD FOR MAKING SILVER POWDER BY AEROSOL DECOMPOSITION**

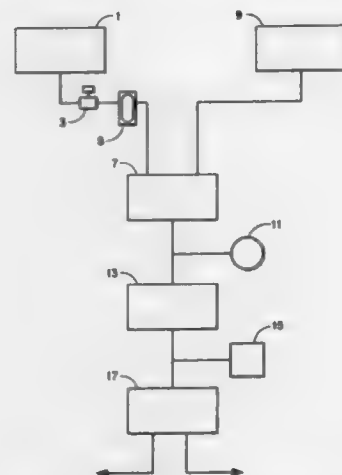
Toivo T. Kodas; Timothy L. Ward, both of Albuquerque, N. Mex., and Howard D. Glicksman, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del. and University of New Mexico, Albuquerque, N. Mex.

Continuation of Ser. No. 956,271, Oct. 5, 1992, abandoned. This application Apr. 8, 1994, Ser. No. 225,413

Int. Cl.<sup>6</sup> B22F 9/24

U.S. Cl. 75—365

5 Claims



1. A method for the manufacture of finely divided, substantially fully dense, spherical silver particles comprising the sequential steps:

- Forming an unsaturated solution of thermally decomposable silver-containing compound in a thermally volatilizable solvent;
- Forming an aerosol consisting essentially of finely divided droplets of the solution from step A dispersed in an inert carrier gas, the droplet concentration being below the concentration where collisions and subsequent coalescence of the droplets would result in a 10% reduction in droplet concentration during the reaction residence time of the following step C;
- Heating the aerosol to an operating temperature of at least 600° C., volatilizing the solvent, whereby the silver-containing compound is decomposed to form finely di-

vided, spherical particles of pure silver, further heating to equal or greater than the densification temperature of the silver particle, but below the melting point of silver by which the silver particles are densified; and  
D. Separating the finely divided, substantially fully dense, spherical silver particles from the carrier gas, decomposition by-products and solvent volatilization products.

5,439,503

**PROCESS FOR TREATMENT OF VOLCANIC IGNEOUS ROCKS TO RECOVER GOLD, SILVER AND PLATINUM**

Lynn E. Burr, 2238 Lucerne Dr., Henderson, Nev. 89014  
Filed Jan. 31, 1994, Ser. No. 188,727

Int. Cl.<sup>6</sup> C23B 3/06

U.S. Cl. 75—421

2 Claims

1. A method for treating iron-bearing igneous ores for the recovery of gold, silver and platinum group metal values contained in such ores by:

- mixing an iron-bearing igneous ore containing gold, silver, and platinum group metal values with a suitable flux and copper to form a mixture of ore, flux and copper;
- heating the mixture of ore, flux and copper to a sufficiently high temperature to produce a molten mass of metal containing copper, iron, gold, silver and platinum group metal values, and a molten slag;
- allowing the molten mass containing copper, iron, gold, silver and platinum group metal values, and slag to settle into at least two layers, so that the molten mass containing copper, iron, gold, silver and platinum group metal values forms a lower molten layer, and the slag forms an upper molten layer;
- separating the upper and lower molten layers;
- cooling the lower molten layer;
- leaching the lower molten layer containing iron, copper, gold, silver and platinum group metal values with a dilute mineral acid to solubilize the iron, copper and most silver values in the presence of increased temperatures of up to about 80 degrees centigrade to form a solubilized iron, copper and silver leachate; leaving an undissolved residue containing gold, some silver and platinum group metal values;
- separating the undissolved residue containing gold, some silver and platinum group metal values from the solubilized iron, copper and silver values leachate;
- treating the undissolved residue containing gold, some silver and platinum group metal values to recover the gold, silver and platinum group metal values therefrom; and
- treating the iron, copper and silver values leachate to recover the silver values from the leachate.

5,439,504

**DIRECT-REDUCTION PROCESS FOR DIRECTLY REDUCING PARTICULATE IRON-OXIDE-CONTAINING MATERIAL**

Karl Czermak, Enns; Konstantin Millionis, Stieffing; Johannes L. Schenk, Linz, and Siegfried Zeller, Leonding, all of Austria, assignors to Vocat-Alpine Industrieanlagenbau GmbH, Austria and Brifer International Ltd., Bridgetown, Barbados, part interest to each

Continuation of Ser. No. 61,306, May 13, 1993, abandoned. This application Nov. 9, 1994, Ser. No. 336,390

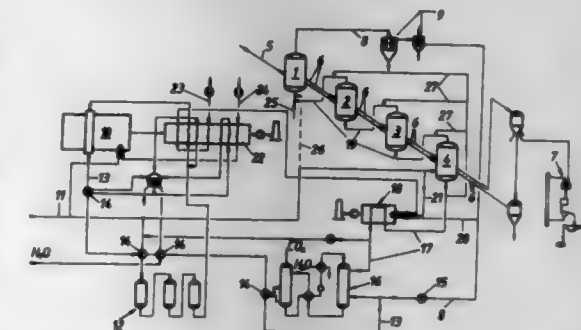
Claims priority, application Austria, May 22, 1992, 1066/92 Int. Cl.<sup>6</sup> C22B 5/14

U.S. Cl. 75—444

13 Claims

1. In a direct reduction process for reducing particulate iron oxide-containing material in a fluidized bed wherein a reducing gas is employed derived from natural gas following reforming thereof and thereby provide reformed natural gas, said reformed natural gas comprising  $H_2$ ,  $CO$ ,  $CH_4$ ,  $H_2O$ ,  $CO_2$  and  $N_2$ , which reformed gas is mixed with recycle top gas formed during the reduction of the iron oxide contained in said material, the improvement which comprises:

scrubbing said top gas to form a scrubbed top gas, compressing said scrubbed top gas to form a compressed top gas, mixing said reformed natural gas with said compressed top gas to form a reducing gas mixture thereof containing  $CO_2$ , subjecting said gas mixture to  $CO_2$  scrubbing and thereby provide a reducing gas for said iron oxide-containing material, heating said reducing gas to an elevated temperature to provide a heated reducing gas mixture sufficient to reduce said iron-oxide-containing material to metallic iron,



causing a stream of said heated reducing gas mixture to flow through serially arranged fluid bed reduction zones to reduce said iron oxide to metallic iron and provide a partially consumed reducing gas as top gas, recycling said partially consumed reducing gas as top gas to heat said iron oxide-containing material prior to the mixing thereof with said reformed natural gas to form a reducing gas mixture; and circulating said reducing gas mixture through said serially arranged fluid bed reduction zones and thereby reduce said contained iron oxide to metallic iron, whereby a substantial saving in energy costs is obtained.

5,439,505

**TREATMENT OF STEEL MILL WASTE FOR RECYCLING**

David Krofchak, 256 Bronte Rd., Oakville, Ontario, Canada L6L 3C6

Filed Oct. 24, 1994, Ser. No. 327,761

Int. Cl.<sup>6</sup> C22B 1/243

U.S. Cl. 75—773

10 Claims

1. A method of treating steel mill waste containing iron oxides, and silica, comprising reacting the said steel mill waste with a strong alkali solution in an amount sufficient to raise the pH to 14 and to solubilize silica to form soluble silicate compounds and silica gels, thereby producing a chemically reactive mixture; and reacting said mixture with silicic compounds to produce a solid, stable, and non-polluting material.

5,439,506

**SEPARATION PROCESS FOR A CHECK PROCESSOR**

Zhongtai Chen, West Bloomfield; Ronald G. Shell, Bloomfield Hills; Randy C. Keller, Canton, and J. Michael Spall, Plymouth, all of Mich., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Feb. 15, 1994, Ser. No. 196,681

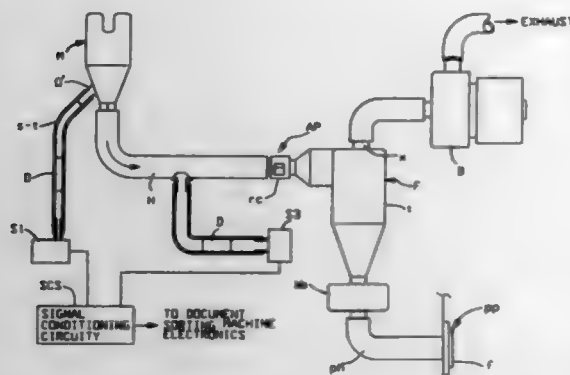
Int. Cl.<sup>6</sup> B01D 45/12

U.S. Cl. 95—19

16 Claims

1. A method for separating multiple overlapped checks, transported along track means of a check processing apparatus; wherein said checks are first subjected to opposed suction, and vacuum forces from a suction system including suction means to separate them at a separation station, and wherein the state of the checks, whether single or multiple, is then determined

by measuring and analyzing the resulting pressure differentials within said suction system; while also providing said system with cyclonic separator means for removing and storing dust and debris entrained within the suction-conducting air flow



and also for helping said suction means and helping to maintain a relatively constant vacuum-generating airflow regardless of the nature or quantity of dust and debris removed, or whether any is to be removed at all.

5,439,507

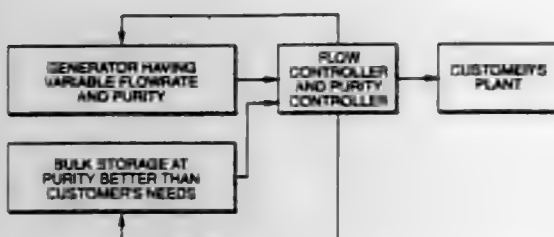
# MEMBRANE GAS GENERATOR IN ASSOCIATION WITH BULK STORAGE FOR INCREASED FLEXIBILITY AND PRODUCTIVITY

Christian Barbe, Fontenay Aux Roses, and Jean-Renaud Brugel, Paris, both of France, assignors to L'Air Liquide, Société Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris Cedex, France  
Continuation of Ser. No. 935,167, Aug. 26, 1992, Pat. No. 5,266,101. This application Sep. 9, 1993, Ser. No. 118,194

Int. Cl.<sup>6</sup> B01D 53/22, 63/04

U.S. Cl. 95-23

21 Claims



1. A process for providing nitrogen gas to a customer at a variable flow rate, but at a purity which is at least equal to  $P_0$  whatever the flow rate of said nitrogen gas, said process comprising providing a first source of high purity nitrogen gas having a purity which is greater than  $P_1$ , with  $P_1 > P_0$ , and a second source of low purity nitrogen gas having a purity which is dependent upon its flow rate, said purity of said low purity nitrogen gas being lower than  $P_0$  when the flow rate thereof is about maximum flow rate and greater than  $P_0$  at lower flow rates, measuring the purity of the low purity nitrogen gas, comparing the measured purity of the low purity nitrogen gas to  $P_0$ , and

when the measured purity of the low purity nitrogen gas is less than  $P_0$ , mixing the high purity nitrogen gas with the low purity nitrogen gas and delivering to the customer a gas mixture whose purity is greater than or at least equal to  $P_0$ , and

when the measured purity of the low purity nitrogen gas is greater than  $P_0$ , directly delivering the low purity nitrogen gas to the customer, the flow rate of the nitrogen gas is adjusted as a function of need thereof.

5,439,508

# PROCESS OF SEPARATING HALOGENATED DIOXINS AND FURANS FROM EXHAUST GASES FROM COMBUSTION PLANTS

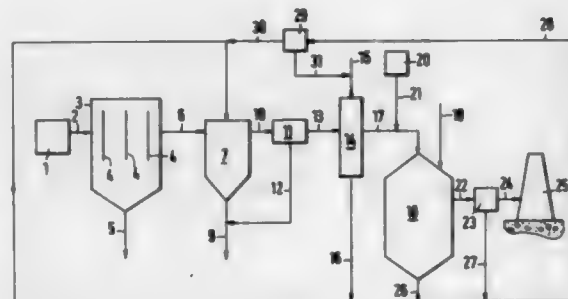
Gernot Mayer-Schwinning, Bad Homburg, and Günter Böning, Frankfurt am Main, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany  
Filed Sep. 10, 1993, Ser. No. 120,578

Claims priority, application Germany, Oct. 3, 1992, 42 33 303.2

Int. Cl.<sup>6</sup> B03C 3/013

U.S. Cl. 95-58

6 Claims



1. A process of separating dioxins and furans from exhaust gases of combustion plants, said process comprising the steps of:

- treating an exhaust gas of a combustion plant to substantially entirely remove dust, HF, HCl, SO<sub>2</sub> and SO<sub>3</sub> to form a prepurified exhaust gas; and
- after said treating of step a), feeding said prepurified exhaust gas to a wet-process electrostatic precipitator and adding 10 to 500 mg activated carbon powder per sm<sup>3</sup> to said prepurified exhaust gas immediately prior to said feeding of said prepurified exhaust gas to said wet-process electrostatic precipitator;
- operating said wet-process electrostatic precipitator at a temperature of 40° to 95° C., with an applied voltage of 20 to 120 kilovolts and a current of 50 to 600 milliamperes and with a water supply rate of 0.002 to 0.2 liters per sm<sup>3</sup> of prepurified exhaust gas and spraying water into the wet-process electrostatic precipitator in the vicinity of an inlet of said precipitator through which said prepurified exhaust gas is fed to form a purified exhaust gas having dioxin and furan contents less than 0.05 ng/sm<sup>3</sup>.

5,439,509

# STRIPPING METHOD AND APPARATUS

Donald R. Spink, and Kim D. Nguyen, both of Waterloo, Canada, assignors to Turbotek Inc., Waterloo, Canada  
Continuation-in-part of Ser. No. 824,110, Jan. 22, 1992, abandoned. This application Dec. 2, 1993, Ser. No. 160,662  
Claims priority, application United Kingdom, Jan. 22, 1991, 9101336

Int. Cl.<sup>6</sup> B01D 19/00

U.S. Cl. 95-166

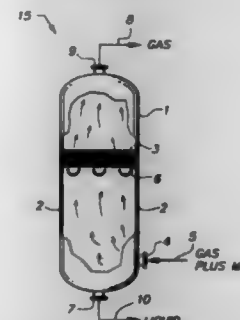
30 Claims

20. A method for the removal of a solute gas from a gas stream containing the same using a regenerable aqueous solvent for said solute gas, which comprises:

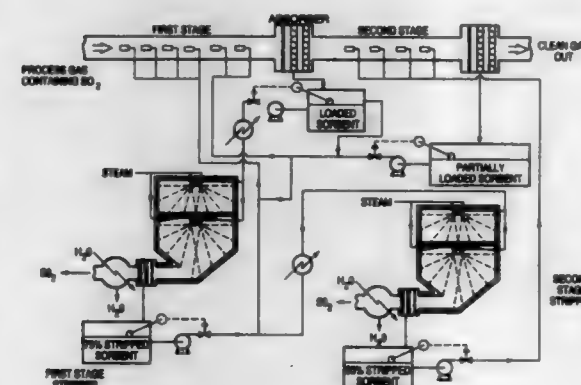
- effecting removal of solute gas from said gas stream to form a purified gas stream by the steps of:
  - passing said gas stream through a chamber having an inlet thereto and an outlet therefrom,
  - injecting said regenerable aqueous solvent directly into said solute gas containing gas stream from at least two dual-fluid spray nozzles located in longitudinally spaced-apart relationship in said chamber by atomizing gas to form a spray pattern of said regenerable aqueous solvent in said chamber from each said nozzle and

containing liquid droplets ranging in size from about 5 to about 100 microns,

- absorbing solute gas from said gas stream into said liquid droplets at a first temperature,
  - agglomerating said liquid droplets contained in said chamber to remove entrained liquid droplets from said gas stream to form a solute gas-laden aqueous solvent, and
  - discharging said purified gas stream from said downstream end of said chamber;
- B. effecting regeneration of said solute gas-laden aqueous solvent to remove and recover dissolved solute gas and regenerate the solvent for recycle to step A for use as said regenerable aqueous solvent therein by steps of:
- providing a further chamber having an inlet thereto and an outlet therefrom and heating means operatively associated therewith for maintaining the temperature therein above the adiabatic saturation temperature of steam,
  - heating and then injecting said solute gas-laden aque-



substantially in a second direction following gravity and in parallel with the vessel's vertical axis, whereby the discharge of liquid from said assembly is into a gas-quietest flow region, thus enhancing the discharge of liquid at high gas velocities without limitation by re-entrainment of said discharged liquid by said gas plus mist stream flow.



ous solvent directly into said further chamber from at least one dual-fluid spray nozzle located in said further chamber by atomizing steam to form a spray pattern of said heated solute gas-laden liquid solvent in said further chamber from each said nozzle and containing liquid droplets ranging in size from about 5 to about 300 microns,

- desorbing dissolved solute gas and water vapor from said liquid droplets of solute gas-laden aqueous solvent to form at least in part a flowing gas stream in said further chamber,
  - agglomerating said liquid droplets contained in said further chamber to remove entrained liquid droplets from said flowing gas stream to form a regenerated aqueous solvent, and
  - discharging a gaseous mixture comprising solute gas and steam from said outlet from said further chamber and recovering said solute gas from said gaseous mixture; and
- C. recycling said regenerated aqueous solvent to step A as said regenerable aqueous solvent.

5,439,510

# HIGH-VELOCITY, HIGH-CAPACITY MIST ELIMINATOR ASSEMBLY AND METHOD

Bernard J. Lerner, Pittsburgh, Pa., assignor to BECO Engineering Company, Oakmont, Pa.

Filed Jan. 21, 1994, Ser. No. 184,662

Int. Cl.<sup>6</sup> B01D 46/10

U.S. Cl. 95-273

7 Claims

1. A mist eliminator assembly suitable for liquid mist removal from gas plus mist streams, comprising: a filamentary pad or bed disposed in a vessel through which said gas plus mist stream flows substantially in a first direction opposing gravity, and at least one impermeable liquid drainage member placed substantially perpendicular to the gas plus mist stream

5,439,511

# COATING VARNISH COMPOSITION AND ANTIFOULING COATING COMPOSITION

Hiroyuki Tanaka, Mito; Seiji Tai, and Koichi Kamijima, both of Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jan. 12, 1994, Ser. No. 180,348

Claims priority, application Japan, Jan. 20, 1993, 5-007095; Jan. 29, 1993, 5-013720; Feb. 15, 1993, 5-025692; Apr. 7, 1993, 5-079944; Apr. 7, 1993, 5-079946; Apr. 13, 1993, 5-085028; Apr. 13, 1993, 5-085029; Apr. 13, 1993, 5-085030; May 28, 1993, 5-127101; Oct. 5, 1993, 5-248388; Nov. 25, 1993, 5-294818

Int. Cl.<sup>6</sup> C09D 5/14

U.S. Cl. 106-18.32

11 Claims

1. A coating varnish composition comprising (A) a polymer obtained by polymerizing 1 to 50 mol % of (a) at least one unsaturated acid anhydride and 99 to 50 mol % of (b) at least one other unsaturated monomer copolymerizable therewith, and (B) at least one additive selected from the group consisting of triazole derivatives, benzothiazole derivatives, thiadiazole derivatives, polyethers and carboxylic acid anhydride derivatives in an amount of 0.01 to 50% by weight based on the weight of the polymer (A).

9. An antifouling coating composition comprising a coating varnish composition set forth in claim 1, and 1 to 500% by weight, based on whole amount of polymer solids, of an antifouling agent containing a copper compound in an amount of 50 to 100% by weight based on weight of total antifouling agent.

5,439,512

# RESIN COMPOSITION AND ANTIFOULING PAINT

Koichi Kamijima; Seiji Tai, both of Hitachi, and Hiroyuki Tanaka, Mito, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jan. 12, 1994, Ser. No. 180,359

Claims priority, application Japan, Jan. 21, 1993, 5-008005; Apr. 7, 1993, 5-079943; Apr. 7, 1993, 5-079945; Apr. 8, 1993, 5-081004; Apr. 13, 1993, 5-085026; Apr. 13, 1993, 5-085027; Oct. 5, 1993, 5-248387; Nov. 25, 1993, 5-294819

Int. Cl.<sup>6</sup> C09D 5/14

U.S. Cl. 106-18.32

11 Claims

1. A coating varnish composition comprising (A) a polymer obtained by polymerizing 1 to 99% by mole of (a) one or more unsaturated carboxylic acids and 99 to



1% by mole of (b) one or more unsaturated monomers copolymerizable with the unsaturated carboxylic acids, and

(B) at least one additive selected from the group consisting of triazole derivatives, thiazole derivatives and benzothiazole derivatives in an amount of 0.1 to 50% by weight based on the weight of the polymer (A).

9. An antifouling coating composition comprising  
(i) a coating varnish composition of claim 1, and  
(ii) 1 to 500% by weight, based on weight of total polymer solids, of an antifouling agent containing a copper compound in an amount of 50 to 100% by weight based on weight of the total antifouling agent.

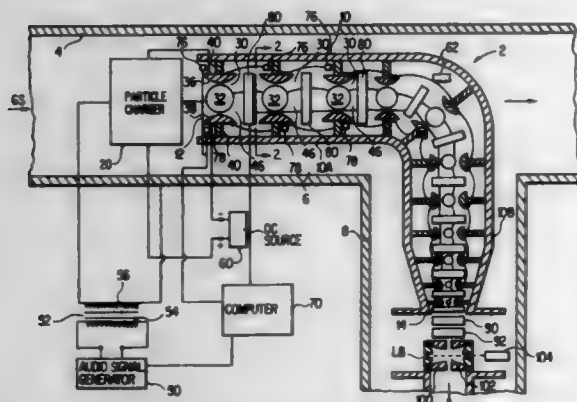
5,439,513

# DEVICE FOR FOCUSING PARTICLES SUSPENDED IN A GAS STREAM

Ravindran Periasamy, Cary; David S. Ensor, Chapel Hill, and Robert P. Donovan, Durham, all of N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.  
Continuation of Ser. No. 890,147, May 29, 1992, abandoned.  
This application May 31, 1994, Ser. No. 251,643  
Int. Cl.<sup>6</sup> B03C 3/40

U.S. Cl. 96—25

39 Claims



31. A device for controlling the motion of particles suspended in a gas stream, comprising:

a pipe, through which at least a fraction of the gas stream flows, having an inlet end for receiving said fraction of the gas stream and an outlet end for expelling said fraction of the gas stream;

means for supplying an AC voltage having an amplitude and a frequency;

means for supplying a DC voltage;

means, coupled to the means for supplying an AC voltage and to the means for supplying a DC voltage and positioned within said pipe, for generating an inhomogeneous electric field for focussing the particles suspended in the gas stream so they concentrate into a narrow axial region in the center of the pipe while they remain suspended in the gas stream, wherein the means for generating is located outside of the narrow axial region;

said means for generating comprising a plurality of electrodes, including a first set of electrodes and a second set of electrodes, the first set of electrodes is located outside of a first region of the narrow axial region, the second set of electrodes is located outside of a second region of the narrow axial region that is separate from and spaced downstream of the first region;

wherein the first set of electrodes are disposed around the first region of the narrow axial region and define a first diameter of the narrow axial region along the first region; and

wherein the second set of electrodes are disposed around the second region of the narrow axial region and define a second diameter of the axial region which is less than the first diameter of the narrow axial region, thereby resulting

in focussing of a set of particles suspended in the gas stream that is flowing consecutively past the first set of electrodes and then past the second set of electrodes.

5,439,514

# INK, PRODUCTION THEREOF, AND INK-JET RECORDING METHOD AND APPARATUS EMPLOYING THE SAME

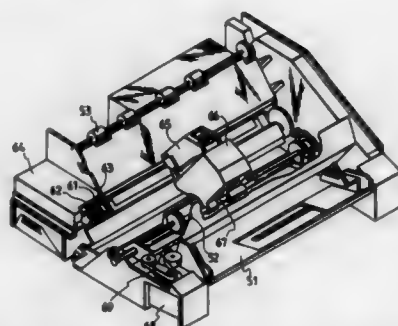
Akio Kashiwazaki, Yokohama; Yuko Suga, Tokyo, and Aya Takaide, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Mar. 30, 1994, Ser. No. 220,445

Claims priority, application Japan, Apr. 1, 1993, 5-075891

Int. Cl.<sup>6</sup> C09D 11/00, 11/02

U.S. Cl. 106—20 C

16 Claims



1. An ink which contains a pigment and a dispersing agent in an aqueous medium, the ink further containing at least one fine particulate white inorganic material selected from the group consisting of fine particulate titanium dioxide and fine particulate alumina, wherein the ratio of primary particle diameter of the fine particulate white inorganic material to primary diameter of the pigment ranges from 1:10 to 5:1.

5,439,515

# INK, AND INK-JET RECORDING METHOD AND INSTRUMENT USING THE SAME

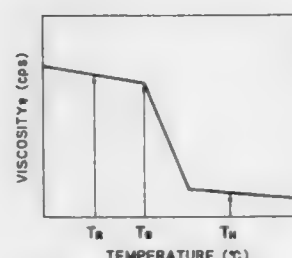
Yutaka Kurabayashi; Makoto Aoki, both of Yokohama, and Yoshihisa Takizawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Jul. 13, 1993, Ser. No. 90,548

Claims priority, application Japan, Jul. 30, 1992, 4-203885; Feb. 22, 1993, 5-054593

Int. Cl.<sup>6</sup> C09D 11/10, 11/14

U.S. Cl. 106—20 R

27 Claims



1. An ink comprising at least a recording agent, a liquid medium dissolving the recording agent therein and a compound having thermo-reversible gelation property, wherein the ink is in a homogeneous solution system at 25° C., and the compound having thermo-reversible gelation property separates out in the ink solution in a temperature range of from 30° C. to 65° C., so that the ink becomes a dispersion state.

5,439,516

# HEAT SENSITIVE COLOR DEVELOPING MATERIAL

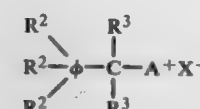
Hisake Tanabe, Kiyoto; Shingi Nakano; Yasuhiko Nakae, both of Osaka; Satoshi Urano, Kyoto, and Yoshio Eguchi, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan  
Continuation-in-part of Ser. No. 727,671, Jul. 9, 1991, abandoned. This application Dec. 30, 1993, Ser. No. 175,692  
Claims priority, application Japan, Jul. 9, 1990, 2-181878  
The portion of the term of this patent subsequent to Jul. 20, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> C09D 11/00

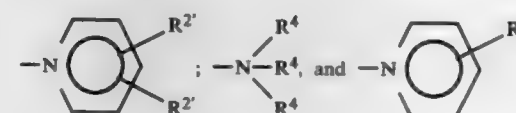
U.S. Cl. 106—21 R

13 Claims

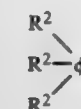
1. A heat sensitive color developing material comprising:  
(A) an electron donating color forming organic compound;  
(B) a heat activating compound wherein said heat activating compound is selected from the group consisting of compounds I and II:



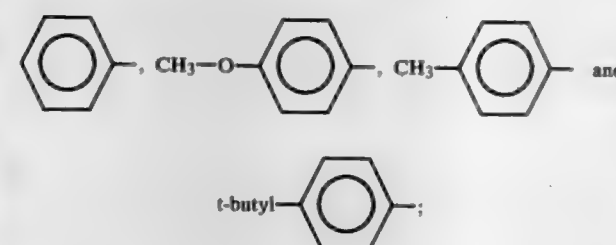
R<sup>2</sup> is independently selected from the group consisting of —H, —CN and Cl, R<sup>3</sup> is independently selected from the group consisting of H, —R, halogen atom and methyl, A is selected from the group consisting of



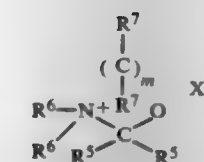
R<sup>2</sup> is selected from the group consisting of H, CN, and Cl, R<sup>3</sup> is methyl,



is selected from the group consisting of



R<sup>4</sup> is independently selected from the group consisting of alkyl, alkenyl, and alkenyl substituted by a group selected from the group consisting of hydroxy, carboxy, nitro, cyano, alkoxy of 1-4 carbon atoms, alkanoyloxy of 1 to 4 carbon atoms, phenyl, and phenyl substituted by a group selected from the group consisting of halogen, nitro, cyano, —NR<sup>2</sup>, —R, and —OR, R is selected from the group consisting of an alkyl radical of 1 to 4 carbon atoms and a cycloalkyl radical, R' is selected from the group consisting of H, —R, —OR, a halogen atom and a nitro group, X includes at least one member selected from the group consisting of AsF<sub>6</sub><sup>−</sup>, SbF<sub>6</sub><sup>−</sup>, BF<sub>4</sub><sup>−</sup>, BF<sub>6</sub><sup>−</sup>, PF<sub>6</sub><sup>−</sup>, ClO<sub>4</sub><sup>−</sup>, FeCl<sub>4</sub><sup>−</sup>, CF<sub>3</sub>SO<sub>3</sub><sup>−</sup>, RSO<sub>3</sub><sup>−</sup>, and RCOO<sup>−</sup>;



R<sup>5</sup> is independently selected from the group consisting of H, —R, an alkenyl radical of 2 to 3 carbon atoms and R<sup>8</sup>, R<sup>6</sup> is independently selected from the group consisting of —R, an alkenyl radical of 2 to 3 carbon atoms and R<sup>8</sup>, R<sup>7</sup> is independently selected from the group consisting of H, OH, —R, —OR, and —R<sup>8</sup>, —R<sup>8</sup> includes at least one member selected from the group consisting of a phenyl radical, and a phenyl radical substituted by a group selected from the group consisting of a halogen atom, hydroxy, nitro, cyano, —NHR, —R, and —OR, m is an integer of 1 to 4 and R and X are as defined above.

5,439,517

# BLACK INK COMPOSITION EXCELLENT IN BLACK

Miharu Yoshida, and Hiroko Hayashi, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan  
Filed Nov. 9, 1993, Ser. No. 149,298

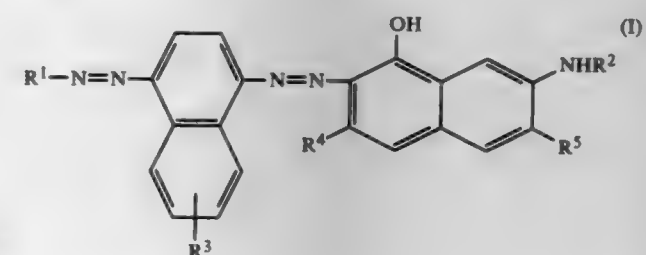
Claims priority, application Japan, Nov. 9, 1992, 4-298856; Feb. 24, 1993, 5-035723; Feb. 24, 1993, 5-035724; Feb. 24, 1993, 5-035725; May 6, 1993, 5-105579

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—22 K

12 Claims

1. An ink composition comprising a first dye represented by formula (I):



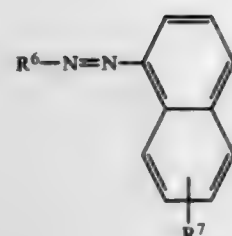
wherein

R<sup>1</sup> represents a phenyl or naphthyl group which may be substituted by a hydroxyl group, —NH<sub>2</sub>, —SO<sub>3</sub>M or —COOM wherein M represents a hydrogen atom or a cation species derived from an alkali metal, ammonia or an amine,

R<sup>2</sup> represents a hydrogen, a carboxyalkyl group wherein the carboxy group may form a salt with an alkali metal or ammonia, a substituted or unsubstituted alkoxyalkyl group or a substituted or unsubstituted phenyl or alkanoyl group, and

R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup>, which may be the same or different, each independently represent a hydrogen atom or —SO<sub>3</sub>M wherein M is as defined above, provided that R<sup>1</sup> does not represent a phenyl group substituted with —SO<sub>3</sub>M when R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> all represent —SO<sub>3</sub>M;

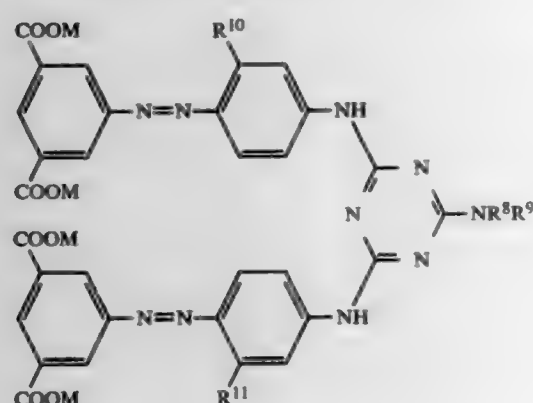
and a second dye selected from the group consisting of C.I. Direct Yellow 86, 132 and 144 and compounds represented by formula (II):



wherein

$R^6$  represents a phenyl or naphthyl group which may be substituted by a hydroxyl group,  $-NH_2$ ,  $-SO_3M$  or  $-COOM$  wherein  $M$  represents a hydrogen atom or a cation species derived from an alkali metal, ammonia or an amine, and

$R^7$  represents a hydrogen atom or  $-SO_3M$  wherein  $M$  is as defined above; or formula III:



wherein

$R^8$  and  $R^9$ , which may be the same or different, each independently represent a hydrogen atom, an alkyl group or a hydroxyalkyl group, provided that  $R^8$  and  $R^9$  do not simultaneously represent a hydrogen atom, and  $R^{10}$  and  $R^{11}$ , which may be the same or different, each independently represent a hydrogen atom, an alkyl group, a hydroxyalkyl group or an alkoxy group;

said first dye being present in the composition in an amount sufficient to enable the composition to form a print image having a black hue on a recording medium, said second dye being present in the composition in an amount sufficient to improve vividness of the black hue or sharpness of the image or both.

5,439,518

## FLYASH-BASED COMPOSITIONS

Hubert C. Francis, Lithonia, and Anne H. Ksionzyk, Decatur, both of Ga., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

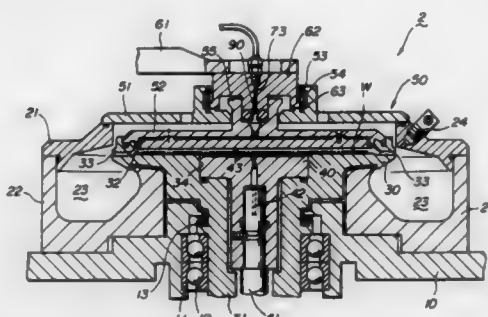
Filed Jan. 6, 1993, Ser. No. 1,295  
Int. Cl.<sup>6</sup> C04B 18/06

U.S. Cl. 106—705

28 Claims

1. A binder composition comprising about 10–89 wt.% of a Class C flyash, about 10–89 wt.% gypsum hemihydrate, and at least about 0.05 wt.% of an additive selected from: a setting retarder, dispersant, or pigment, said composition capable of setting when mixed with sufficient water to form a hardened material in less than about 90 minutes, said hardened material having a compressive strength of at least about 1,000 psi after about 1 hour after set.

- (II) **5,439,519**  
**SOLUTION APPLYING APPARATUS**  
Hiroyoshi Sago; Hirotugu Kumazawa; Futoshi Shimai; Shigemi Fujiyama; Hiroki Endo, and Hideya Kobari, all of Kanagawa, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan  
Continuation-in-part of Ser. No. 994,364, Dec. 21, 1992. This application Jan. 3, 1994, Ser. No. 176,204  
Claims priority, application Japan, Apr. 28, 1992, 4-136125; Jun. 30, 1993, 5-162901  
Int. Cl.<sup>6</sup> B05C 11/02, 5/00  
U.S. Cl. 118—52 23 Claims



1. A solution applying apparatus comprising:  
an outer cup having an upper opening;  
a rotatable inner cup disposed in said outer cup and having an upper opening, for housing a planar workpiece therein which is to be coated with a coating solution;  
a lid assembly having an outer cup lid for closing the upper opening of said outer cup and an inner cup lid for closing the upper opening of said inner cup, said inner cup lid being rotatable with respect to said outer cup lid;  
said inner and outer cup lids having respective engagement surfaces selectively engageable together such that said inner and outer cup lids are movable together in a vertical direction; and  
said inner cup having draining means in an outer circumferential portion thereof for providing communication between a space within said inner cup and a space outside of said inner cup to drain excessive coating solution from said inner cup, said outer cup having an annular collection passage defined therein along the outer circumferential portion of said inner cup, said draining means being exposed to said annular collection passage.

5,439,520

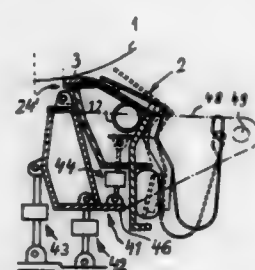
## APPLICATOR FOR COATING WEBS OF PAPER OR CARDBOARD

Stefan Reich, Heidenheim, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany  
Filed Sep. 2, 1993, Ser. No. 116,264

Claims priority, application Germany, Sep. 10, 1992, 42 30 241.2

U.S. Cl. 118—410

10 Claims



1. An applicator system for use in production of fiber webs, comprising:  
an applicator for coating a fiber web; and

a backing roll having a shell surface, said backing roll supporting said fiber web at least in an area adjacent said applicator;

wherein said applicator comprises:

a first support beam;

a nozzle for supplying coating mixture, said nozzle being supported by said support beam; and

a guide surface connected to said support beam, said guide surface including an angular, sharp parting edge on a downstream end thereof, said guide surface and said shell surface defining a converging flow path, said guide surface at said parting edge disposed at an angle of less than or equal to  $10^\circ$  relative to a plane extending tangent to said shell surface at a location adjacent said parting edge, said guide surface being non-deflectable relative to said backing roll, said guide surface and said backing roll defining an applicator gap therebetween, said applicator gap effecting a hydrodynamic pressure of said coating mixture therein, a plurality of jacks, said applicator mounted to said jacks, said jacks providing adjustment of said applicator relative to said backing roll in at least one direction corresponding to:

a first plane extending generally transverse to said backing roll;

a second plane extending generally transverse to said backing roll and parallel to said first plane;

rotation about an axis extending generally parallel to a longitudinal axis of said backing roll; and

wherein said support beam supports said nozzle and said guide surface, and further comprising a second support beam for supporting said first support beam, said second support beam adjustable relative to said backing roll utilizing at least one of said plurality of jacks.

5,439,521

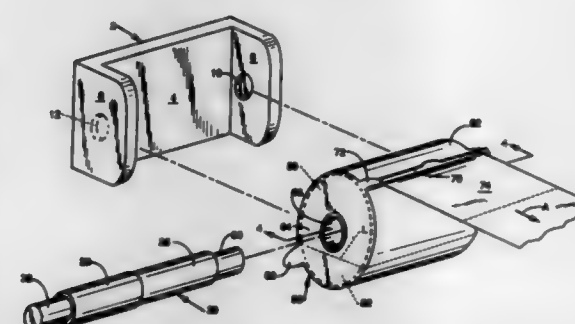
## DISPENSER FOR STORING AND DISPENSING MOISTENED TOILET TISSUE

Muralidhara S. Rao, 2481 Cortland Dr., Pittsburgh, Pa. 15241  
Continuation of Ser. No. 912,259, Jul. 13, 1992, abandoned. This application May 6, 1994, Ser. No. 239,472

Int. Cl.<sup>6</sup> B05C 3/02

U.S. Cl. 118—415

26 Claims



1. A dispensing container for moist toilet tissue adapted to be supported by a conventional toilet tissue holder comprising: an elongated housing having a longitudinal axis, a circumferential wall and a pair of endwalls, a dispensing opening for permitting removal of said toilet tissue from said housing,

said housing being structured to be rotatably mountable on a conventional toilet tissue holder and having rotation resisting means for resisting full axial rotation of said housing by engaging a portion of said toilet tissue holder supporting said dispensing container,

a supply of toilet tissue disposed within said housing having a tubular support rod opening extending from one said endwall to another said endwall for rotatable securement to said conventional toilet tissue holder by means of a rod passing through said support rod opening, and said rotation resisting means being so positioned with respect

to said dispensing opening that rotation of said housing will be stopped with said dispensing opening readily accessible for removal of said toilet tissue.

5,439,522

## DEVICE FOR LOCKING A FLAT, PREFERABLY DISC SUBSTRATE ONTO THE SUBSTRATE PLATE OF A VACUUM COATING APPARATUS

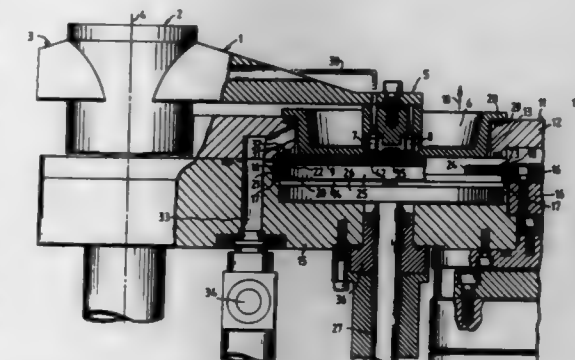
Jaroslav Zejda, Rodenbach, Germany, assignor to Leybold Aktiengesellschaft, Hanau am Main, Germany  
Filed Jun. 21, 1994, Ser. No. 262,962

Claims priority, application Germany, Sep. 25, 1993, 43 32 674.9

Int. Cl.<sup>6</sup> B05C 13/00

U.S. Cl. 118—500

3 Claims



1. Device for locking a flat substrate provided with a central opening, onto a substrate plate provided with a centering post projecting above a substrate bearing surface of a vacuum coating apparatus comprising: a centering post having a cross-sectional area which enables the centering post to pass through a central opening of a flat substrate and having an annular groove which runs approximately at a level of an upper surface of the substrate remote from the plane of a substrate bearing surface, an endless coil spring shaped into a toroid structure being disposed in the annular groove, a spiral area ( $W$ ) determined by a coil forming an angle ( $\alpha$ ) that is greater than  $45^\circ$  degrees with a plane ( $E$ ) determined by a rotation axis ( $R$ ) and a place where the coil contacts an inner wall of the groove in the centering post, so that upon the application to the spring of a force acting radially on an axis of rotation, the angle ( $\alpha$ ) is augmented, and then a toroid surface enveloping the spring flattens and thus locks the substrate pushed over the spring in the area of the upper edge of the opening, in the manner of a snap fastening.

5,439,523

## DEVICE FOR SUPPRESSING PARTICLE SPLASH ONTO A SEMICONDUCTOR WAFER

Akira Yamaguchi, Utsunomiya, Japan, assignor to MEMC Electronic Materials, Inc., St. Louis, Mo.

Filed Feb. 14, 1994, Ser. No. 195,766  
Int. Cl.<sup>6</sup> B05C 13/00; C23C 16/00

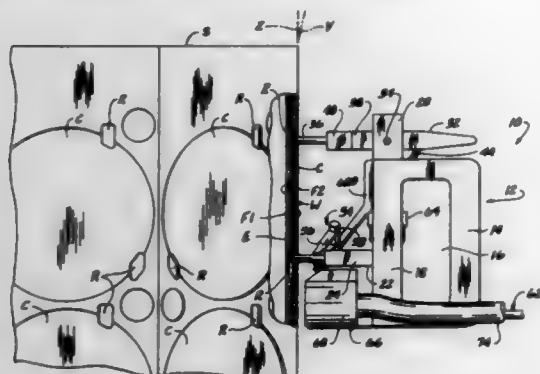
U.S. Cl. 118—503

25 Claims

1. A device for suppressing the splash of particles onto a semiconductor wafer to facilitate maintenance of a clean wafer surface and inhibit the creation of defects, the device comprising: a mount, means attached to the mount for directing a flow of gas, said means for directing a flow of gas comprising a conduit for delivering pressurized gas and orifice means, means engageable with the wafer for orienting the wafer relative to said gas flow directing means, said orienting means being supported on the mount, said gas flow directing means being disposed relative to said orienting means such that, when the wafer is oriented relative to said gas flow directing means by said orienting means, said orifice means is spaced from the



wafer and disposed inwardly of the periphery of the wafer within a cylindrical projection of the periphery of the wafer,



and arranged for directing a flow of gas obliquely to the wafer and generally toward a peripheral edge portion of the wafer.

5,439,524

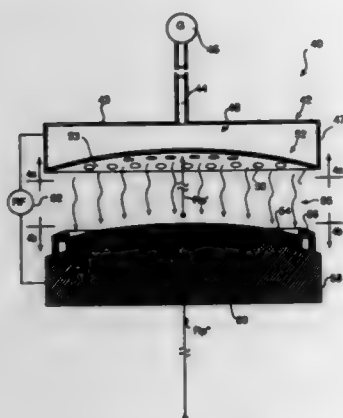
## PLASMA PROCESSING APPARATUS

John L. Cain, Schertz; Michael P. Relue, San Antonio; Michael E. Costabile, San Antonio, and William P. Marsh, San Antonio, all of Tex., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Apr. 5, 1993, Ser. No. 42,921

Int. Cl.<sup>6</sup> C23C 16/50; H01L 21/00

U.S. Cl. 118—723 E



1. A fluid distribution head for a plasma processing system for processing a workpiece surface having a convex section, the fluid distribution head comprising:

- an enclosure section;
- a gas inlet communicating with said enclosure section;
- a source of process gas coupled to said gas inlet; and
- a non-planar dispersion plate attached to said enclosure section such that said enclosure section and said dispersion plate cooperate to form a chamber, said dispersion plate being provided with a plurality of apertures formed therethrough to permit a flow of said process gas onto said workpiece surface having said convex section, said dispersion plate having a concave section which provides an even distribution of said process gas over said workpiece surface;

wherein said concave section of said dispersion plate is a concave, spherical section and wherein said convex section of said workpiece is a convex, spherical section.

### 5,439,525 DEVICE FOR COATING HOLLOW WORKPIECES BY GAS DIFFUSION

Lothar Peichl, Dachau, and Heinrich Walter, Friedberg, both of Germany, assignors to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Germany

PCT No. PCT/EP91/02039, § 371 Date May 7, 1993, § 102(e) Date May 7, 1993, PCT Pub. No. WO92/08821, PCT Pub. Date May 29, 1992

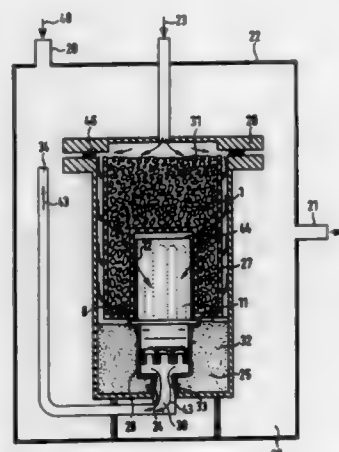
PCT Filed Oct. 29, 1991, Ser. No. 50,271

Claims priority, application Germany, Nov. 10, 1990, 40 35 789.9

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—726

11 Claims



1. A gas diffusion coating device for coating hollow workpieces made of heat-resistant alloys, said hollow workpieces having their outer and inner surfaces connected with one another by bores, the device comprising:

- a container having at least one gas supply line and at least one gas removal line, said gas removal line being connected to the hollow space within the inner surfaces of the workpiece to be coated;
- a donor metal, in the form of a donor metal body, completely surrounding the outer and inner surfaces of the workpiece while maintaining a gap between the donor metal body and the outer surfaces;
- workpiece holders arranged in the container, said holders holding the workpieces at a height geodetically below the donor metal;
- wherein the hollow space within the inner surfaces are free of donor metal and wherein the gas removal line is constructed as one of an overflow opening for as removal arranged at an uppermost surface of the workpiece and a positioned between an overflow opening and the gas removal line of the container, the siphon having an overflow level positioned at the uppermost surface of the workpiece to be coated.

5,439,526

### PROCESS FOR FRACTIONATING WHEAT FLOURS TO OBTAIN PROTEIN CONCENTRATES AND PRIME STARCH

Zuzanna Czuchajowska, Moscow, Id., and Yeshajahu Pomeranz, Pullman, Wash., assignors to Washington State University Research Foundation, Pullman, Wash.

Filed Oct. 1, 1993, Ser. No. 131,061

Int. Cl.<sup>6</sup> C08B 30/00; C13F 1/06

U.S. Cl. 127—67

6 Claims

1. A process for fractionating wheat flour into components including a protein concentrate, prime starch, and water solubles, wherein said process consists essentially of the following steps:

- A) forming a gluten-containing dough comprising liquid and

flour wherein said dough is formed by mixing said flour and said liquid;

- B) adding additional liquid to the gluten-containing dough produced in step A to achieve a total liquid to flour ratio about 2 to 1 to about 2.5 to 1;
- C) dispersing the composition produced in step B by high speed blending; and
- D) centrifuging the composition produced in step C in order to obtain distinct layers of protein concentrate, prime starch and water solubles, wherein said dough is not heated to temperatures exceeding 50° C.

5,439,527

### METHOD FOR FIXING BLAST/CLEANING WASTE

D. J. Rapp, Dubuque, Iowa; Redmond R. Clark, North Barrington, Ill., and Michael McGrew, Novi, Mich., assignors to The TDJ Group, Inc., Cary, Ill.

Continuation-in-part of Ser. No. 750,959, Aug. 28, 1991, Pat. No. 5,266,122. This application Nov. 4, 1993, Ser. No. 148,587

Int. Cl.<sup>6</sup> B08B 7/00

U.S. Cl. 134—7

13 Claims

1. A method for blast cleaning non-metallic surfaces comprising the steps of:

- directing a blast of abrasive mixture containing hydraulic cement material onto a non-metallic surface covered with heavy metal contaminated paint to be removed and thereby abrasively removing said heavy metal contaminated paint from said non-metallic surface, said heavy metal contaminated paint removed from said surface containing hazardous residue; and
- chemically fixing said hazardous residue with said hydraulic cement material employed in the blasting to produce a non-hazardous waste product.

5,439,528

### LAMINATED THERMO ELEMENT

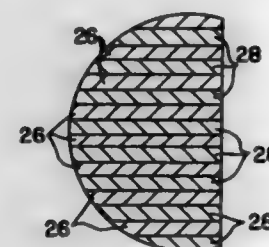
Joel Miller, 14340 Trinidad Rd., San Leandro, Calif. 94577

Continuation-in-part of Ser. No. 164,698, Dec. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 989,631, Dec. 11, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,506

Int. Cl.<sup>6</sup> H01L 35/16

U.S. Cl. 136—200

12 Claims



- 1. A thermoelement which comprises:
  - a stack of a plurality of films, each film having a composition which is different from a composition of either one of its neighboring films;
  - at least one of said films being aluminum;
  - said stack of films having a first end surface and a last end surface;
  - a first substrate contacting said first end surface and a second substrate contacting said last end surface;
  - said first and second substrates being composed of material selected from a group of materials which consists of p type and n type semiconductors.

5,439,529

### HEAT SEALING OF THREAD TO A WEB

Geoffrey W. Vernon, Kenilworth; James Goodwin, Coventry; Andrew Cleall, Radford, and Thomas W. Bailey, Berkswell, all of England, assignors to Thomas J. Lipson Co., Division of Conopco, Inc., Englewood Cliffs, N.J.

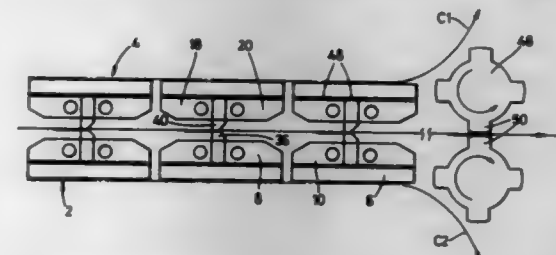
Filed Sep. 14, 1993, Ser. No. 122,034

Claims priority, application United Kingdom, Sep. 17, 1992, 9219657

Int. Cl.<sup>6</sup> B29C 65/18; B65B 29/04

U.S. Cl. 156—176

6 Claims



1. A method of attaching a thermoplastic thread to a tubular web and transversely sealing the tubular web comprising the steps of:

- providing a thermoplastic thread extended along a tubular web with the thread on a first face of the web;
- attaching the thermoplastic thread to the web at intervals and transversely sealing the tubular web at each interval to define a series of separate compartments for producing discrete articles;
- wherein the thread and web are held between a first pair of elements and heat is applied from one of the first pair of elements to a second face of the web, which is opposite said first face, to render the thread plastic, attach the thread to the web at one of the intervals and form a portion of a transverse seal at said one of the intervals; and
- heat is applied from one of a further pair of elements to the web to form another portion of the transverse seal at said one of the intervals at the same time as heat is applied from said one of the first pair of elements to the second face of the web.

5,439,530

Patent Not Issued For This Number

5,439,531

### METHOD AND SYSTEM FOR MAINTAINING THE EFFICIENCY OF PHOTO-VOLTAIC CELLS

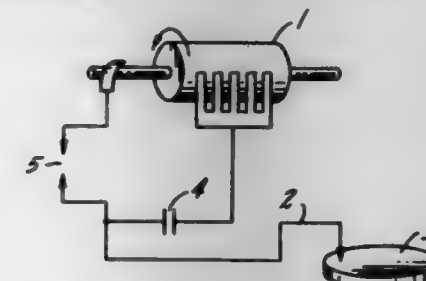
Anthony W. Finkl, 445 E. Royal Flamingo Dr., Sarasota, Fla. 34236

Filed Dec. 14, 1993, Ser. No. 167,270

Int. Cl.<sup>6</sup> H01L 31/06, 31/042

U.S. Cl. 136—243

9 Claims



1. In a method of maintaining the efficiency of terrestrial photo-voltaic cells, the steps of:

- (a) placing an electro-static charge on a surface of a terrestrial photo-voltaic cell(s) or its respective facial housing;
- (b) discharging said electro-static charge at a given maximum voltage.

5,439,532

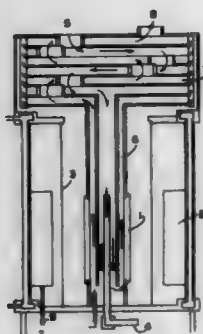
**CYLINDRICAL ELECTRIC POWER GENERATOR USING LOW BANDGAP THERMOPHOTVOLTAIC CELLS AND A REGENERATIVE HYDROCARBON GAS BURNER**  
Lewis M. Fraas, Issaquah, Wash., assignor to JX Crystals, Inc., Issaquah, Wash.

Continuation-in-part of Ser. No. 47,477, Apr. 19, 1993, Pat. No. 5,383,976, which is a continuation-in-part of Ser. No. 906,452, Jun. 30, 1992, Pat. No. 5,312,521. This application Jun. 15, 1994, Ser. No. 260,910

Int. Cl.<sup>6</sup> H01L 31/058; H02N 6/00

U.S. Cl. 136—253

9 Claims



1. A thermophotovoltaic electric generator in which a hydrocarbon gas fuel and air mixture is burned in a central vertical cylindrical burner/emitter, resulting in the emission of infrared radiation which is received by low bandgap photovoltaic cells and converted to electric power, wherein said burner/emitter is comprised of three concentric ceramic tubes, an outer emitter tube, an inner fuel injector tube, and a mid diameter air injector tube, where both the air and fuel injector tubes pass through the emitter tube, said fuel injector tube being open at its top end and said air injector tube being open at its bottom end, wherein combustion in steady state occurs at the top of the fuel injector tube and the hot combustion gases then travel downward between the fuel and air injector tubes and then upward between the air and emitter tubes, wherein the three tube diameters and lengths are adjusted to achieve a uniform temperature along the length of the emitter tube.

5,439,533

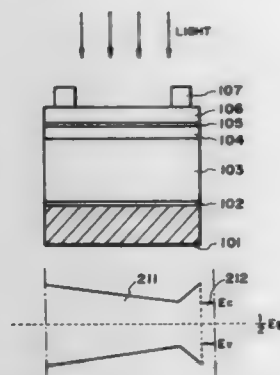
**PHOTOVOLTAIC DEVICE, METHOD OF PRODUCING THE SAME AND GENERATING SYSTEM USING THE SAME**

Keishi Saito; Jinsho Matsuyama; Toshimitsu Kariya; Koichi Matsuda; Yuza Koda, and Naoto Okada, all of Nagahama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 83,284, Jun. 29, 1993, abandoned. This application Nov. 7, 1994, Ser. No. 337,195

Claims priority, application Japan, Jun. 30, 1992, 4-196048  
Int. Cl.<sup>6</sup> H01L 31/075, 31/18

U.S. Cl. 136—258

44 Claims



1. A photovoltaic device comprising a p-type semiconductor

region, an i-type non-single crystal semiconductor region, and an n-type semiconductor region, wherein said i-type non-single crystal semiconductor region comprises a first i-type semiconductor region containing silicon and carbon atoms on the side of said n-type semiconductor region, said first region having a minimum energy band gap between the center thereof and said p-type region, and a second i-type semiconductor region containing silicon atoms and having a thickness of 30 nm or less on the side of said p-region.

5,439,534

**METHOD OF MANUFACTURING AND APPLYING HEAT TREATMENT TO A MAGNETIC CORE**

Masato Takeuchi; Yoshihiko Hirota; Hiroshi Ohmori, and Masaru Yoshimura, all of Sodegaura, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP92/00256, § 371 Date Nov. 4, 1992, § 102(e) Date Nov. 4, 1992, PCT Pub. No. WO92/15997, PCT Pub. Date Sep. 17, 1992

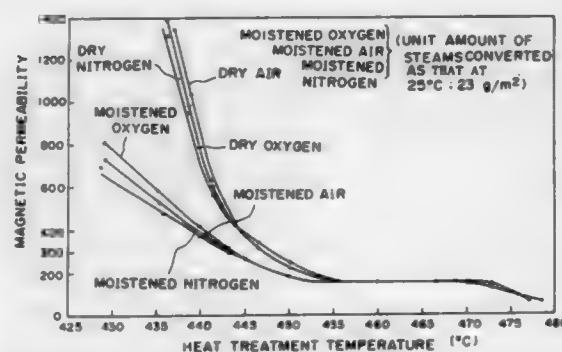
PCT Filed Mar. 4, 1992, Ser. No. 941,113

Claims priority, application Japan, Mar. 4, 1991, 3-037642; Mar. 4, 1991, 3-037643; Mar. 4, 1991, 3-037644; Mar. 4, 1991, 3-037645

Int. Cl.<sup>6</sup> C21D 1/76

U.S. Cl. 148—105

13 Claims



1. A method of manufacturing a magnetic core having a magnetic permeability in the range of 100–600, which comprises applying a heat treatment to a magnetic core main body comprising an iron based amorphous alloy in a wet atmosphere containing 5 to 500 g/m<sup>3</sup> of steam, based on the amount of steam measured at 25° C. and atmospheric pressure.

5,439,535

**PROCESS FOR IMPROVING STRENGTH AND PLASTICITY OF WEAR-RESISTANT WHITE IRONS**

Leonid M. Snagovskiy; Polina F. Nizhnikovskaya; Emil Y. Vasilev; Juri N. Taran, and Viktoriya A. Bol'shakova, all of Dnepropetrovsk, Ukraine, assignors to DMK Tek, Inc., Ann Arbor, Mich.

Filed Oct. 18, 1993, Ser. No. 138,688

Int. Cl.<sup>6</sup> C21D 8/00

U.S. Cl. 148—544

13 Claims



1. A method of improving strength and plastic properties of wear-resistant cast iron, comprising the steps of:

5,439,538

**DECORATIVE ARTICLE AND METHOD FOR MAKING THE SAME**

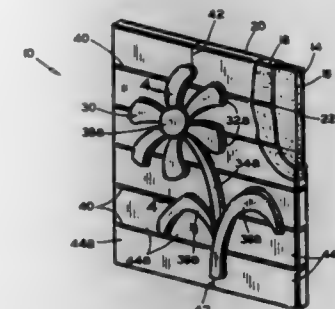
Gayle E. Perry, 3915 N. Park Ave., Studio #1, Tucson, Ariz. 85719

Filed Apr. 30, 1993, Ser. No. 56,116

Int. Cl.<sup>6</sup> B44F 7/00

U.S. Cl. 156—63

8 Claims



1. A method for making a decorative article having a generally planar surface with a pattern formed thereon, said method comprising:

- cutting a planar, elastic foam material in a desired peripheral shape for the planar surface of the decorative article, said foam material having a back surface, a front surface, and a peripheral edge;
- cutting a rigid, light-weight, planar backing in the same peripheral shape as said foam material and securing said backing to said foam material;
- drawing a pattern on the front surface of said foam material;
- cutting a plurality of slits along the pattern in the front surface of said foam material such that the slits and the periphery of said foam material define peripheries for a plurality of pattern pieces in the foam material, said slits being cut generally perpendicular to the front surface of said foam material to form parallel, elastic walls for each of said slits;
- cutting pieces of batting in the same pattern as each of the pattern pieces, said pieces of batting provided with an extended margin for securing the pieces of batting atop said pattern pieces;
- positioning the pieces of batting on the entire front surface of said foam material to cover the respective pattern pieces such that the margins of said pieces of batting are adjacent a slit or the periphery of said foam material, applying a force to separate the elastic walls of said slits in said foam material, simultaneously inserting the adjacent margins of the batting into corresponding slits, and removing the force on the elastic walls to secure the batting between the elastic walls of said slits;
- cutting pieces of cloth material in the same pattern as each of the pattern pieces, said pieces of cloth material provided with an extended margin for securing the pieces of cloth material atop said batting pieces and said pattern pieces;
- positioning the pieces of cloth material on the entire front surface of said foam material to cover the respective pieces of batting and pattern pieces such that the margins of said pieces of cloth are adjacent a slit or the periphery of said foam material, applying a force to separate the elastic walls of said slits in said foam material, simultaneously inserting the adjacent margins of the cloth material into corresponding slits, and removing the force on the elastic walls to secure the cloth material between the elastic walls of said slits; and
- stretching the margins of the batting and the cloth material which are adjacent the periphery of said foam material around the peripheral edge of said foam material and securing the margins to a back surface of said backing.

5,439,536

**METHOD OF MINIMIZING STRENGTH ANISOTROPY IN ALUMINUM-LITHIUM ALLOY WROUGHT PRODUCT BY COLD ROLLING, STRETCHING AND AGING**

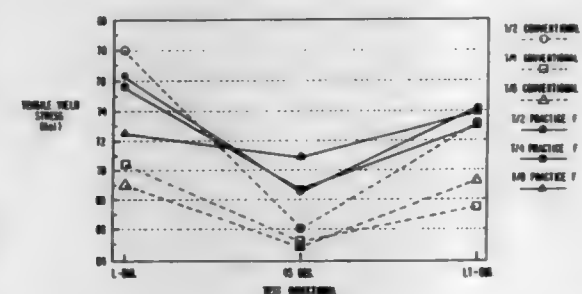
Alex Cho, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 957,318, Oct. 6, 1992, Pat. No. 5,393,357.  
This application May 2, 1994, Ser. No. 236,811

Int. Cl.<sup>6</sup> C22F 1/04

U.S. Cl. 148—697

19 Claims



1. A method of reducing strength anisotropy in a solution heat treated and quenched aluminum-lithium alloy wrought product comprising the steps of:

- cold rolling a solution heat treated and quenched aluminum-lithium alloy wrought product in at least one pass in an amount of at least 3% reduction;
- stretching said cold rolled product an amount between 0.5 and 10%; and
- aging said cold rolled and stretched product to increase its strength whereby the combined cold rolling and stretching reduce the strength anisotropy in the aged product.

5,439,537

**THERMITE COMPOSITIONS FOR USE AS GAS GENERANTS**

Jerald C. Hinshaw, Ogden, and Reed J. Blau, Richmond, both of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Aug. 10, 1993, Ser. No. 103,768

Int. Cl.<sup>6</sup> C06B 43/00, 47/10, 33/00

U.S. Cl. 149—22

44 Claims

1. A solid gas-generating composition comprising an oxidizable inorganic fuel and an oxidizing agent, wherein said oxidizing agent comprises at least one member selected from the group consisting of a metal hydroxide, a metal hydrous oxide, a metal oxide hydrate, a metal oxide hydroxide and mixtures thereof, and water vapor is the major gaseous reaction product generated by said gas-generating composition wherein said oxidizing agent is present in an amount from about 0.5 to about 3 times the stoichiometric amount of oxidizing agent necessary to completely oxidize the fuel present.



5,439,539

**COMPUTER CONTROLLED HEAT-SEALING MACHINE**  
Jack R. McLean, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

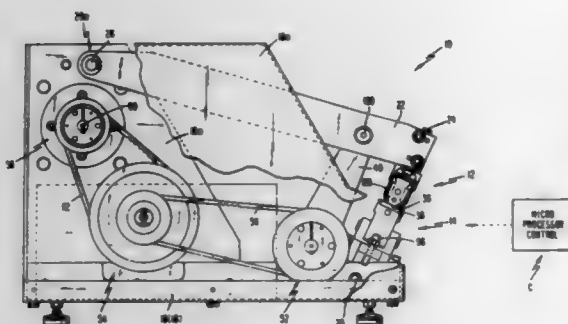
Division of Ser. No. 881,288, May 16, 1992, Pat. No. 5,322,586.

This application Mar. 4, 1994, Ser. No. 205,454

Int. Cl.<sup>6</sup> B32B 31/00, 31/20, 35/00

U.S. Cl. 156-64

5 Claims



1. A method of heat-sealing together portions of a fusible film or coated material, comprising the steps of:

- providing a pair of sealing jaws and relatively moving said sealing jaws into clamping engagement with said portions and fusing the clamped portions with heat provided by a heating element included with at least one of said jaws to form a heat seal;
- sensing the clamping pressure during a sealing dwell period when said jaws are in clamping engagement with said portions, said sensing being accomplished with a load cell connected to one of said jaws; and
- setting, monitoring and adjusting the clamping pressure throughout substantially the entire sealing dwell period to maintain said clamping pressure at a preselected level during said period,

wherein said sealing jaws are respectively mounted to top and bottom seal bar assemblies, wherein the bottom seal bar assembly includes a support link connected to a machine frame, said load cell is mounted to said support link, a support bar is mounted to the support link to be at least substantially entirely supported by the load cell, and a bottom seal pad is provided on the support bar, said fusible film or coated material being positioned on the bottom seal pad during said sealing.

5,439,540

**METHOD AND APPARATUS FOR APPLYING SHEET MATERIAL TO A BASE SURFACE**

Glen W. Lippman, Broomfield; James S. Reznay, Arvada, and James F. Coos, Lafayette, all of Colo., assignors to TechnoCorp Inc., Northglenn, Colo.

Filed Sep. 18, 1992, Ser. No. 947,138

Int. Cl.<sup>6</sup> B32B 31/20

U.S. Cl. 156-71

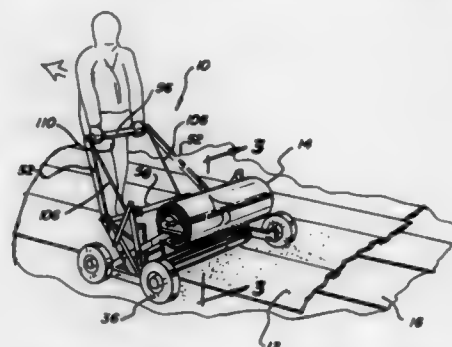
24 Claims

1. A method for heating and applying sheet material to a supported base surface which prevents overheating of the sheet material, said method comprising the steps of;

- providing a welding apparatus including; mobile frame means for supporting a roll of sheet material and permitting the roll to be unrolled;
- a moveable heating platen for heating the sheet material along its width when said heating platen is in its heating operating position;
- moveable pressure means for pressing the sheet material against said heating platen when said moveable pressure means is in its heating operating position and said moveable heating platen is in its heating operating position, the pressing of the sheet material against said heating platen facilitating heating of the sheet material; and
- release means cooperating with said moveable heating

platen and said pressure means for moving said heating platen and said pressure means in unison to and from their heating operating positions and their release positions, said heating platen and said pressure means being sufficiently spaced from each other when they are in their release positions so that a sheet of material located therebetween is prevented from contacting and being heated by said heating platen;

loading sheet material into the welding apparatus; heating the sheet material along its width to a temperature which enables it to bond to the supported base surface



by passing it between the heating platen and the pressure means of the welding apparatus when the pressure means is pressing the sheet material against the heating platen;

applying the sheet material to the supported base surface so that it bonds thereto; and

separating the sheet of material from the heating platen by moving the heating platen in unison with [relative to] the pressure means so that the sheet material is prevented from contacting and being overheated by the heating platen.

5,439,541

**METHOD FOR PRODUCING AND USING CROSSLINKED COPOLYESTERS**

James Economy, Urbana, Ill., assignor to The Board of Trustees of the University of Illinois, Urbana, Ill.

Filed Feb. 8, 1994, Ser. No. 193,561

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156-182

6 Claims

1. A method for bonding adherends using a crosslinked copolyester that comprises the steps of:

- combining at least one oligomer having carboxylic acid end groups with at least one oligomer having ester end groups, where at least one of the oligomers is branched, to form a crosslinkable mixture;
- applying the mixture of oligomers to a portion of at least two adherends;
- curing the mixture on the adherends;
- positioning the adherends to be bonded such that the cured mixtures contact; and
- heating the cured mixture to form a bond.

5,439,542

**COMPOSITE ARTICLE MADE FROM USED OR SURPLUS CORRUGATED BOXES OR SHEETS**Henry L. Liebel, 10 Tower Dr., Newport, Ky. 41071  
Division of Ser. No. 994,205, Dec. 21, 1992, Pat. No. 5,366,790, which is a continuation-in-part of Ser. No. 715,442, Jun. 14, 1991, abandoned. This application Jul. 26, 1994, Ser. No. 280,364Int. Cl.<sup>6</sup> B32B 31/00; B29D 31/00

U.S. Cl. 156-182

4 Claims

1. A method of forming a composite article useful as a material of construction comprising the steps of:

- providing a source of individual pieces of corrugated cardboard cut from scrap corrugated boxes or sheets,
- aligning said individual pieces of corrugated cardboard,
- applying an adhesive to a surface of said individual pieces of corrugated cardboard,
- disposing said individual pieces of corrugated cardboard with respect to one another such that they lie in a shingle-shaped configuration, a configuration of unconnected pieces being adjoined by a piece deposited on top thereof

creating grooves in said impregnated fiberglass means; placing said passive shim means in at least some of said grooves; placing said shim cover means over said placed passive shim means; and retaining said placed shim cover means over said placed passive shim means by said holding means.

5,439,544

**NO-CRUSH ROLL SYSTEM AND METHOD IN A DOUBLE BACKER**

William H. Bory, Baltimore, Md., assignor to Chesapeake Corporation, Baltimore, Md.

Filed Sep. 20, 1993, Ser. No. 122,943

Int. Cl.<sup>6</sup> B30B 3/00; B31F 5/04; B32B 31/20

U.S. Cl. 156-210

14 Claims



- and spanning said unconnected pieces, or a combination thereof, said individual pieces of corrugated cardboard being adhered to adjacent pieces as an array,
- cutting said array into predetermined lengths,
- applying an adhesive to the surface of said cut lengths of said array, and
- stacking said cut lengths to form a composite article comprised of multiple, generally planar layers comprised of said individual corrugated cardboard pieces having a length only a fraction of the full length of the article.

5,439,543

**APPARATUS AND METHOD FOR PASSIVE SHIMMING OF A SUPERCONDUCTING MAGNET WHICH IMAGES HUMAN LIMBS**

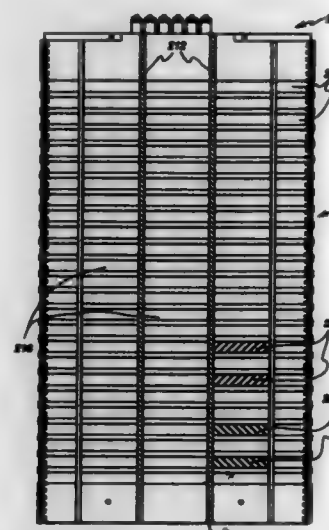
Bizhan Dorri, Clifton Park; Evangelos T. Laskaris; Kenneth G. Herd, both of Schenectady, and Raymond E. Gabis, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 346, Jan. 4, 1993, Pat. No. 5,317,298. This application Jan. 19, 1994, Ser. No. 183,375

Int. Cl.<sup>6</sup> B65H 81/00

U.S. Cl. 156-184

4 Claims



1. A method for forming an integral passive shim/gradient coil assembly including a gradient coil means, a fiberglass means, an epoxy means, a passive shim means, a shim cover means, and a holding means, wherein said method is comprised of the steps of: wrapping said fiberglass means around an outer diameter of said gradient coil means; impregnating said wrapped fiberglass means with said epoxy means;

13. A method of eliminating crush in a double backer of a corrugator used in the manufacture of corrugated cardboard having a pair of outer sheets and a corrugated internal liner sheet glued between said outer sheets, comprising the steps of:

- conveying the cardboard along a bottom support within the double backer;
- applying pressure against an upwardly exposed surface of the cardboard through a series of overhead rollers mounted to a support frame through bearings connected to said support frame, said pressure corresponding to the weight of the rollers; and
- maintaining said pressure so that it does not exceed the weight of the roller across substantially the entire length of the roller by allowing the bearings to float in relation to the support frame so that the elevation of the roller along its length can self adjust in response to changes in thickness of the cardboard through height adjustment movement of one or both ends of the roller relative to the associated bearing's point of connection to said support frame.

5,439,545

**PROCESS FOR PRODUCING FINGER-TOUCH KEY FOR MANIPULATION SWITCH**

Yutaka Nakanishi, and Yasushi Sasaki, both of Tokyo, Japan, assignors to Fuji Polymertech Co. Ltd., Tokyo, Japan

Filed Jun. 17, 1993, Ser. No. 79,143

Claims priority, application Japan, Jun. 19, 1992, 4-184640; Sep. 16, 1992, 4-270721

Int. Cl.<sup>6</sup> B32B 31/00

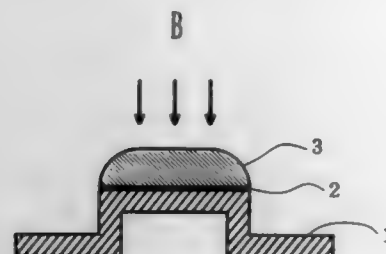
U.S. Cl. 156-273.3

11 Claims

1. A process for producing a finger touch key for a manipulation switch, comprising treating a surface of a key base piece made of a silicone rubber to be bonded with a key top layer made of a resin different from that of the key base piece by exposing it to one or more short wave length UV-rays in order to subject the surface to a chemical activation,

applying then a coupling agent based on silane to the so-treated surface of the key base piece, providing thereon with a layer of a resin curable by UV-irradiation or by heating of an adequate configuration and exposing said resin layer to a UV-irradiation or a heating to cause curing of said resin layer.

3. A process for producing a finger touch key, the process comprising:



molding silicone rubber into a key base piece; exposing a surface of said key base piece to short wavelength UV-rays to chemically activate said surface; applying a silane based coupling agent to said chemically activated surface; applying an uncured layer of resin curable by UV-irradiation or by heat to said coupling agent; curing said layer of resin on said key base piece.

5,439,546

# PROCESS FOR WELDING PROFILES, IN PARTICULAR PLASTIC PROFILES

Wolf-Jürgen Brickenstein, Am Deverhafen 4, D-2990 Papenburg, Germany

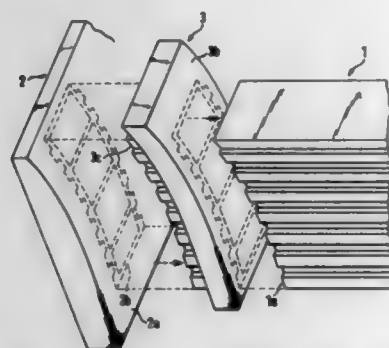
Continuation of Ser. No. 165,543, Dec. 13, 1993, abandoned, which is a continuation of Ser. No. 974,308, Nov. 10, 1992, abandoned, which is a continuation of Ser. No. 852,895, Mar. 17, 1992, abandoned, which is a continuation of Ser. No. 515,750, Apr. 30, 1990, abandoned. This application Dec. 2, 1994, Ser. No. 353,314

Claims priority, application Germany, May 5, 1989, 39 14 826J

Int. Cl.<sup>6</sup> B29C 65/20

U.S. Cl. 156—304.2

5 Claims



1. A method of forming a traverse joint between a facial surface of a free end portion of a first elongated plastic member having a predetermined outer periphery shape and a normally closed surface of a second plastic member, the configuration of said free end portion surface of said first member matching that of said surface of said second plastic member, said method comprising the steps of:

interposing a heating tool between said first and second plastic members, said heating tool having opposite heating surfaces configured to correspond to said configuration of said surface of said second plastic member, a cross-sectional area of a heating surface facing said closed surface of said second member having an outer periphery substan-

tially matching that of said free end portion of said first member;

heating said facial surface of said free end portion at a welding temperature at least at its outer periphery shape to render it plasticized;

heating said closed surface of said second plastic member at a welding temperature to render it plasticized only over an area matching the outer periphery of said free end portion of said first plastic member to form an impression of said end portion in said closed surface at the location where said first plastic member is to be joined to said closed surface of said second plastic member; and joining said heated, plasticized surfaces together to form said traverse joint.

5,439,547

# SEMICONDUCTOR MANUFACTURING APPARATUS WITH A SPARE VACUUM CHAMBER

Hiromi Kumagai, Tokyo, Japan, assignor to Tokyo Electron Kabushiki Kaisha, Japan

Continuation of Ser. No. 889,409, May 28, 1992, abandoned.

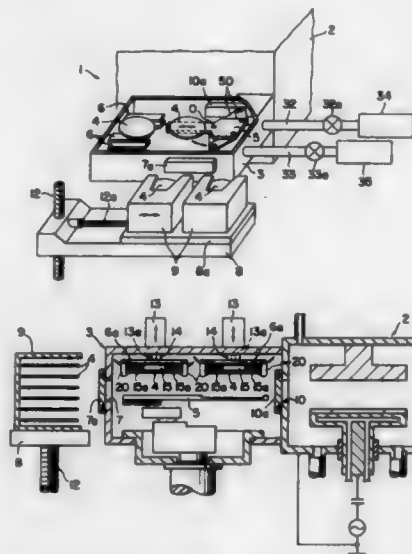
This application Oct. 25, 1993, Ser. No. 140,887

Claims priority, application Japan, May 29, 1991, 3-124261

Int. Cl.<sup>6</sup> C23F 1/02

U.S. Cl. 156—345

11 Claims



1. A semiconductor manufacturing apparatus comprising: a vacuum processing chamber for implementing a processing to an object of processing under an atmosphere of reduced pressure; and

a single spare vacuum chamber which is provided adjacent said vacuum processing chamber, said single spare vacuum chamber being provided therein with a conveyor arm to convey an object of processing,

said conveyor arm having support portions for supporting at least two objects of processing, said conveyor arm being configured so that at least one object to be processed and one object that has been processed can be simultaneously conveyed by said conveyor arm, whereby an object of processing is conveyed to said vacuum processing chamber through said single spare vacuum chamber, and an object of processing is conveyed from said vacuum processing chamber through said single spare vacuum chamber.

5,439,548

# APPARATUS FOR AND METHOD OF RESTORING A DAMAGED COATING OF A DRUM

Klaus Kalwar, Alte Landwehr 10, 33803 Steinhagen, Germany

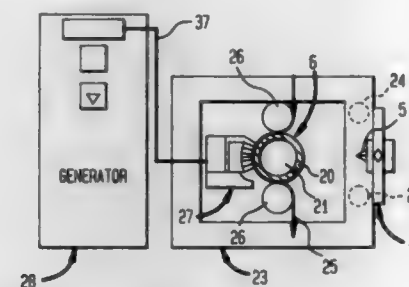
Filed Feb. 9, 1994, Ser. No. 194,175

Claims priority, application Germany, Feb. 10, 1993, 93 01 808 U

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—350

13 Claims



1. Apparatus for restoring a damaged area of a coating on a drum body, comprising a treatment station having a frame, coating-removal means supported by said frame for mechanically freeing the damaged area from remaining coating, cleaning means supported by said frame for cleaning the freed damaged area, bonding means supported by said frame for uniting a patch inserted in the damaged area with neighboring coating material through hot vulcanization or hot pressing, with the patch having a material composition corresponding to the coating material, and mechanical finishing means supported by said frame for surface finishing the restored coating.

5,439,549

# DOUBLE EDGED PRESSURE SENSITIVE FOLDED TAPE APPLICATION APPARATUS

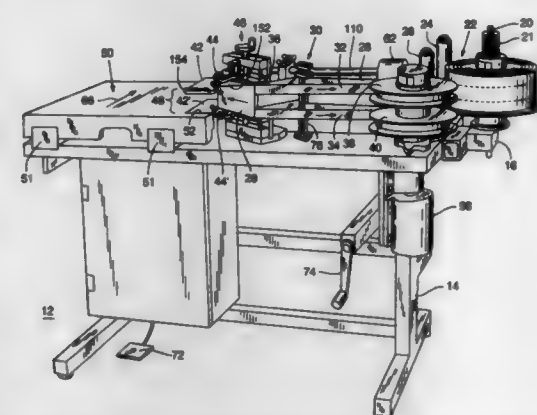
Oldrich Fryc, Renton; David J. Layton, Federal Way, and Howard A. Storhoff, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 28, 1993, Ser. No. 175,255

Int. Cl.<sup>6</sup> B32B 31/10

U.S. Cl. 156—461

17 Claims



14. A tape applicator for applying adhesive tape to the edges of an insulation blanket comprising:

first and second tape folders in spaced relation to one another for folding portions of first and second edges of the adhesive tape, each said first and second tape folders comprising:

a substantially planar pressing portion for receiving the insulation blanket thereagainst with the folded tape edge therebetween and for pressing the folded tape edge against the insulation blanket,

an inclined portion, that extends away from the substantially planar portion at an angle thereto, wherein said planar portion and said inclined portion meet at a folding slot defined between said inclined portion and said planar portion and wherein an edge portion of the adhesive tape feeds along said inclined portion through said folding slot and underneath said planar portion, thereby folding said edge portion of said tape to an orientation corresponding to the substantially planar portion of said tape folder.

5,439,550

# APPARATUS FOR LONGITUDINAL WELDING WITH FAST AND RELIABLE TRIMMED SCRAP REMOVAL

Aris Ballestrazzi, and Lamberto Tassi, both of Savignano Sul Panaro, Italy, assignors to Sitma S.p.A., Modena, Italy

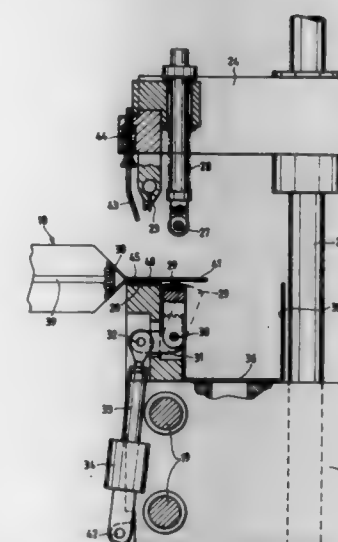
Filed Nov. 9, 1993, Ser. No. 149,527

Claims priority, application Italy, Nov. 11, 1992, MI92U0977

Int. Cl.<sup>6</sup> B32B 35/00; B65B 51/14; B26D 7/18

U.S. Cl. 156—515

5 Claims



1. An apparatus for longitudinal welding and trimmed scrap removal which can be coupled to a product conveyor for conveying products to be packaged in a plastic sheet material or a plastic film material comprising:

a carriage reciprocating in a longitudinal direction; a longitudinal welding unit disposed on said carriage, said longitudinal welding unit including at least one welder element and one counter-welder element, with said welder element movable toward and away from said counter-welder element to form a longitudinal seam in a plastic material of a package within which a product is at least partially wrapped, and wherein a pressing element is disposed adjacent said welder element and a counter-pressing element is disposed adjacent said counter-welder element such that said pressing element and said counter-pressing element clamp a longitudinal portion of said plastic material, the longitudinal welding unit further including an actuator for laterally turning said counter-pressing element, and wherein said pressing element includes a roller;

wherein said welder element and said counter-welder element are disposed adjacent to a conveyor upon which packages to be sealed are fed to thereby longitudinally seal a side end portion of said packages;

said actuator of said counter-pressing element including an actuator cylinder having a stem which is connected to a bell crank by a pin, and wherein said counter-pressing element is laterally turned over about a pivot by said actuator and said bell crank; and

a sucking element disposed adjacent said counter-pressing



element for sucking a trimmed scrap, said sucking element including a tank having an opening at a bottom thereof which is connected to a suction tube, and wherein said counter-pressing element turns toward said sucking element such that trimmed scraps are deposited in said sucking element.

5,439,551

# CHEMICAL-MECHANICAL POLISHING TECHNIQUES AND METHODS OF END POINT DETECTION IN CHEMICAL-MECHANICAL POLISHING PROCESSES

Scott Meikle, and Trung T. Doan, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

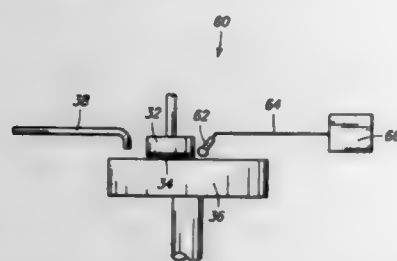
Filed Mar. 2, 1994, Ser. No. 205,312

The portion of the term of this patent subsequent to Jun. 29, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> H01L 21/304

U.S. Cl. 156—626.1

6 Claims



1. A semiconductor processing method of detecting polish end point in a chemical-mechanical polishing planarization process comprising the following steps:

chemical-mechanical polishing an outer surface of a semiconductor substrate using a chemical-mechanical polishing pad;

during such chemical-mechanical polishing, measuring sound waves emanating from the chemical-mechanical polishing action of the substrate against the pad;

detecting a change in the sound waves as the surface being chemical-mechanical polished becomes substantially planar; and

ceasing chemical-mechanical polishing upon detection of the change.

5,439,552

# PROCESS OF FABRICATING AN ENLONGATED MICROSTRUCTURE ELEMENT ON A SUBSTRATE

Jean-Marc Moret, Cortaillod, Switzerland, assignor to CSEM - Centre Suisse d'Electronique et de Microtechnique SA, Neuchâtel, Switzerland

Filed Nov. 4, 1993, Ser. No. 145,697

Claims priority, application France, Nov. 4, 1992, 92 13352

Int. Cl.<sup>6</sup> B44C 1/22

U.S. Cl. 216—2

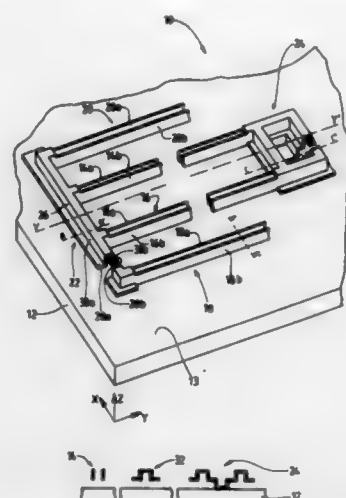
10 Claims

1. A process of fabricating a generally elongated structural element (14) on a substrate (12) which is made of a first material and which has a substantially flat upper surface (13), said element (14), made of a second material, comprising at least a first wing (14a) parallel to a plane perpendicular to said upper face (13), said process comprising the following successive steps:

forming a sacrificial layer (32) on said upper face (13), structuring said sacrificial layer (32) by selectively etching said sacrificial layer in a direction perpendicular to said upper face so as to define at least a first wall (34a) perpendicular to said upper face (13),

depositing a first layer (44) of said second material on the surface of said structured sacrificial layer (32) so that at least said first wall is covered by a part of said first layer, selectively etching said layer (44) of said second material so

as to leave at least said part of said layer (44) of said second material which extends along said wall (34a), and



eliminating said sacrificial layer (32) at least in the region of and under said part of the first layer of said second material so as to form said first wing (14a).

5,439,553

# CONTROLLED ETCHING OF OXIDES VIA GAS PHASE REACTIONS

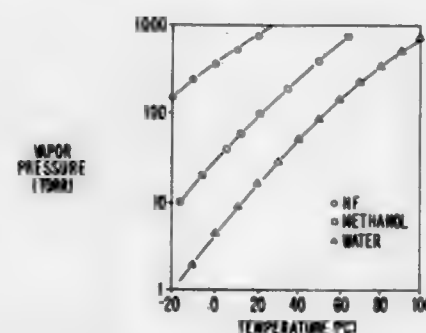
Robert W. Grant, Allenstown; Jerzy Ruzyllo, and Kevin Torek, both of State College, all of Pa., assignors to Penn State Research Foundation, University Park, Pa.

Filed Mar. 30, 1994, Ser. No. 219,961

Int. Cl.<sup>6</sup> H01L 21/311

U.S. Cl. 216—58

12 Claims



1. A method of etching oxides on a surface of a substrate, said substrate being at a temperature, said method comprising etching with a gas phase mixture of a halide-containing species, an organic material having a higher vapor pressure than water at standard conditions of room temperature and pressure of 1 atmosphere and water, in an enclosed chamber at a pressure such that water is substantially maintained in the gas phase and condensation of species present on the etched surface is minimized.

5,439,554

# LIQUID JET RECORDING HEAD FABRICATION METHOD

Hideo Tamura, Nagahama, and Keiichi Murakami, Hachioji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

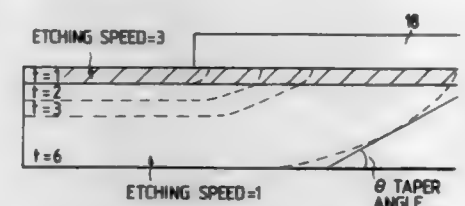
Filed Jun. 9, 1993, Ser. No. 73,388

Claims priority, application Japan, Jun. 10, 1992, 4-150667

Int. Cl.<sup>6</sup> B44C 1/22; C23F 1/02

U.S. Cl. 216;16

5 Claims



1. A method for fabricating a liquid jet recording head having a base containing heat acting portions, liquid channels aligned over said heat acting portions and communicating to orifices for liquid discharge and a top plate covering said liquid channels, said method comprising the steps of

(a) forming said base containing heat acting portions by a method comprising the steps of: (i) forming a heat generating resistive layer over a substrate; (ii) forming an electrode layer over said heat generating resistive layer; (iii) wet etching said electrode layer to form pairs of electrodes, wherein a wet etching rate is higher on an upper portion of said electrode layer in a direction of a film thickness of said electrode layer than on a lower portion of said electrode layer; and (iv) covering said pairs of electrodes with at least one protective covering layer;

(b) forming said liquid channels communicating to said orifices for liquid discharge over said heat acting portions on said base; and

(c) covering said liquid channels with a top plate.

5,439,555

# MINIMUM ADVERSE ENVIRONMENTAL PULP WITH FEED TO CHLORATE MANUFACTURE

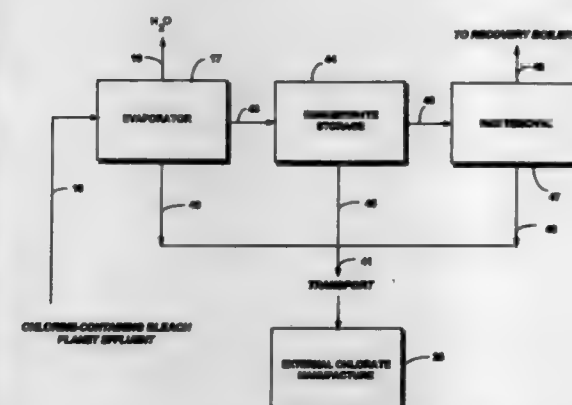
Hans G. Lindberg, Glens Falls, N.Y., assignor to Kamy, Inc., Glens Falls, N.Y.

Continuation-in-part of Ser. No. 997,306, Dec. 23, 1992, Pat. No. 5,300,191, which is a continuation-in-part of Ser. No. 922,334, Jul. 30, 1992, Pat. No. 5,374,333. This application Aug. 31, 1993, Ser. No. 113,644

Int. Cl.<sup>6</sup> D21C 11/00

U.S. Cl. 162—30.1

12 Claims



1. A method of handling chloride containing liquid streams from a cellulose pulp mill having a bleach plant including at

least one chlorine containing stage, and a recovery boiler, comprising the steps of automatically and sequentially:

(a) concentrating liquid effluents containing chlorides from the bleach plant to produce a liquid stream having a higher solids consistency;

(b) treating the concentrated liquid stream from step (a) to remove substantially all sodium chloride therefrom to produce a sodium chloride containing stream and a chloride-depleted stream;

(c) transporting the sodium chloride containing stream to a chlorate production site off the mill premises;

(d) at the chlorate production location off the mill site, producing chlorates from the sodium chloride containing stream from step; and

(e) transporting the chloride-depleted stream, with sufficient solids consistency to be combusted in the recovery boiler, to the recovery boiler for burning therein.

5,439,556

# OXIDATION OF WHITE LIQUOR USING A PACKING COLUMN

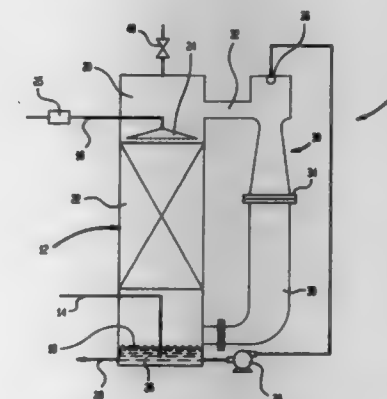
Rustam H. Sethna, New Brunswick; Mark J. Kirschner, Morris-town, and Richard W. Potthoff, Scotch Plains, all of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 107,102, Aug. 16, 1993, abandoned. This application Nov. 1, 1993, Ser. No. 143,590

Int. Cl.<sup>6</sup> D21C 11/04

U.S. Cl. 162—30.11

10 Claims



1. A method of oxidizing sodium sulfide present within white liquor to sodium sulfate, thereby to produce oxidized white liquor, said method comprising:

contacting an oxygen containing gas and the white liquor in a column having structured packing to contact said oxygen containing gas with said white liquor at a temperature of at least about 110° C. and a total pressure of at least about 9.2 atmospheres absolute by introducing a white liquor stream made up of said white liquor and an oxygen containing gas stream of said oxygen containing gas into top and bottom regions, respectively, of said column, thereby to form the oxidized white liquor as a column bottom and a tower overhead containing unreacted oxygen from the oxygen containing gas stream;

withdrawing a tower overhead stream from said top region of said column and reintroducing said tower overhead stream into said bottom region of said column to recirculate the unreacted oxygen as a saturated gas and at said temperature for further contact with said white liquor to conserve oxygen and create more uniform temperature and composition throughout the column; and

withdrawing a product stream composed of the oxidized white liquor from the bottom region of the column.

5,439,557

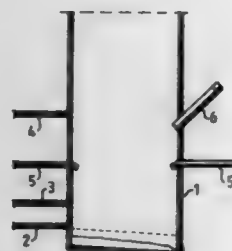
**METHOD OF RECOVERING ENERGY AND CHEMICALS FROM A SPENT LIQUOR, USING LOW FREQUENCY SOUND IN A RECOVERY BOILER**  
Bengt Nilsson, Skoghall, Sweden, assignor to Gotaverken Energy Aktiebolag, Goteborg, Sweden  
PCT No. PCT/SE92/00350, § 371 Date Nov. 30, 1993, § 102(e)  
Date Nov. 30, 1993, PCT Pub. No. WO92/21815, PCT Pub. Date Dec. 10, 1992

PCT Filed May 25, 1992, Ser. No. 150,126

Claims priority, application Sweden, May 30, 1991, 9101648  
Int. Cl.<sup>6</sup> D21C 11/04

U.S. Cl. 162—30.11

10 Claims



1. A method of recovering energy and chemicals from a spent liquor which, after thickening to a dry content of 50–90%, is continuously fed in finely divided form into a reaction chamber of a soda recovery boiler in which a plurality of temperature zones are maintained, said method comprising the simultaneous steps of:

- converting a liquid phase in said spent liquor to a steam phase;
- thermally decomposing said spent liquor to produce gaseous organic substances and at least one of solid and molten organic and inorganic substances; and
- reducing said solid and molten substances and oxidizing said gaseous substances produced during said thermal decomposition, wherein said steps a, b and c are exposed to low frequency sound, and wherein oxygen or oxygen-containing gas being supplied to said reaction chamber in a controlled amount in order to maintain reactions comprising combustion of organic substances, and a bed of said at least one of solid and molten substances being formed in a lower temperature zone in said reaction chamber.

5,439,558

**PRINT SUBSTRATE**

Werner Bergmann, Brüggem, and Paul H. Dähling, Elsdorf-Each, both of Germany, assignors to Stora Feldmühle AG, Düsseldorf, Germany

PCT No. PCT/EP93/00540, § 371 Date Aug. 16, 1994, § 102(e)  
Date Aug. 16, 1994, PCT Pub. No. WO93/22500, PCT Pub. Date Nov. 11, 1993

PCT Filed Mar. 10, 1993, Ser. No. 284,642

Claims priority, application Germany, Apr. 25, 1992, 42 13 745.2

Int. Cl.<sup>6</sup> D21H 19/54, 19/40

U.S. Cl. 162—135

12 Claims

1. A print substrate of paper or cardboard comprising:
- a coat on one or both sides containing ungelatinized starch granules and kaolin as coating pigment; and, optionally, one or more additional mineral pigments; and a binder, and wherein
- the content of the ungelatinized starch granules is 2 to 25 percent by weight with respect to the total coating pigment;
- the binder proportion—with respect to the total coating pigment is less than 12 percent by weight calculated as parts by weight when dry;
- the gloss of the coat after calendaring is greater than 40% as measured at an angle of 75° according to Lehmann;
- the mineral coating pigment comprises at least 60 percent by

weight of kaolin and the mineral pigment component and starch granules make up the remainder to 100 percent by weight of the total coating pigment.

5,439,559

**HEAVY-WEIGHT HIGH-TEMPERATURE PRESSING APPARATUS**

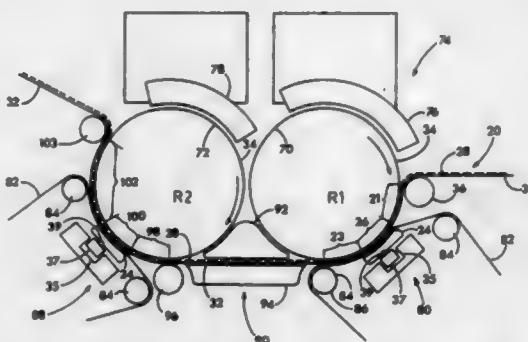
Jere W. Crouse, Beloit, Wis., assignor to Beloit Technologies, Wilmington, Del.

Filed Feb. 14, 1994, Ser. No. 195,522

Int. Cl.<sup>6</sup> D21F 3/04, 5/02

U.S. Cl. 162—358.5

6 Claims



1. An apparatus for pressing and drying a formed web, comprising:

- a first dryer roll mounted for rotation and having a cylindrical surface;
- a felt which underlies the web;
- a shoe and a belt which engages the felt and the web against the first dryer roll cylindrical surface, forming an extended nip press;
- a heater which heats portions of the first dryer roll surface;
- a second roll upstream of the first dryer roll, wherein the felt and the web pass over the second roll and are engaged against the first dryer roll surface at a position ahead of the extended nip press, thereby defining a preheating region between the second roll and the extended nip press;
- a third roll downstream of the first dryer roll, wherein the felt and the web pass over the third roll and are engaged by the third roll against the first dryer roll surface at a position downstream of the nip press to define a post heat zone;
- a steam shower positioned ahead of the second roll to discharge heated water steam onto the web in advance of the first dryer roll;
- a second dryer roll having a cylindrical surface, located downstream of the first dryer roll, wherein the felt and the web pass over the third roll and thence to the second dryer roll;
- a second heater which heats the second dryer roll cylindrical surface;
- a second shoe and belt which engages the felt and the web against the second dryer roll cylindrical surface, forming a second extended nip press through which the web passes subsequent to engagement with the first dryer roll; and
- an outfeed roll downstream of the second shoe and belt, over which the felt and the web pass.

5,439,560

**LOW PRESSURE EVAPORATION CONCENTRATING APPARATUS FOR A PHOTOGRAPHIC PROCESS WASTE DISPOSAL**

Masayuki Kurematsu, and Nobutaka Goto, both of Hino, Japan, assignors to Konica Corporation and Sanyo Electric Co., Ltd., Japan

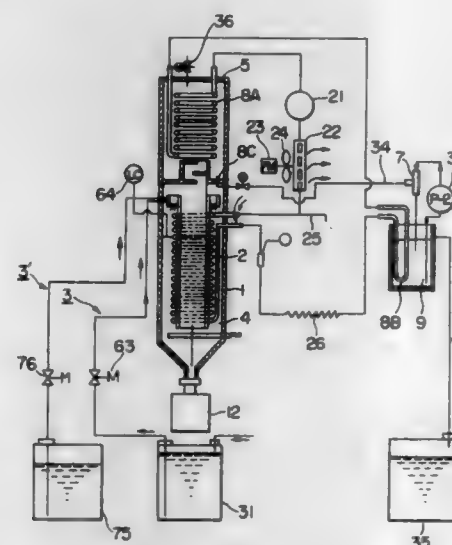
Continuation of Ser. No. 855,112, Mar. 17, 1992, abandoned, which is a continuation of Ser. No. 658,202, Feb. 20, 1991, abandoned. This application Sep. 26, 1994, Ser. No. 312,442

Claims priority, application Japan, Feb. 22, 1990, 2-41616; Apr. 9, 1990, 2-93578

Int. Cl.<sup>6</sup> B01D 3/10

U.S. Cl. 202—186

7 Claims



1. An apparatus for concentration of waste liquid comprising:

- an evaporator including an evaporation chamber and a heater, wherein said evaporator, by said heater, evaporates at least a part of said waste liquid in said evaporation chamber to concentrate said waste liquid;
- a condenser including a condensation chamber, a reservoir, and a first cooler, wherein said condensation chamber is in communication with said evaporation chamber to receive an evaporated gas, said first cooler condensing at least a part of said evaporated gas to form a first condensed liquid, said reservoir storing said first liquid;
- a pressure reducer including an ejector, in communication with said condensation chamber, to reduce pressure on said condensation chamber by taking said evaporated gas and said first liquid out of said condensation chamber;
- a liquid collector having a second cooler, wherein said liquid collector receives said gas and said first liquid from said reservoir and said second cooler cools said gas and said first liquid whereby substantially all said gas present with said first liquid is condensed to a second condensed liquid;
- a pump for circulating said second liquid out of said liquid collector, through said ejector and back to said liquid collector, said ejector removing said first liquid and said evaporated gas from said condensation chamber by suction generated by said second liquid and ejecting said first liquid, said evaporated gas, and said second liquid to said liquid collector; and
- a heat pump circuit having a looped sequence of a compressor, a heat radiating portion, an expander, and a heat absorbing portion, and a heat transfer fluid circulating in said heat pump circuit, wherein said heat radiating portion is a heat source for said heater and said heat absorbing portion is a cooling source for said first cooler and said second cooler.

5,439,561

**SEPARATION OF 3-METHYL-2-BUTANOL FROM 2-PENTANOL BY AZEOTROPIC**

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Nov. 28, 1994, Ser. No. 345,906

The portion of the term of this patent subsequent to Apr. 18, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> B01D 3/36; C07C 29/82, 31/125

U.S. Cl. 203—58

1 Claim

1. A method for recovering 3-methyl-2-butanol from a mixture of 3-methyl-2-butanol and 2-pentanol which comprises distilling a mixture of 3-methyl-2-butanol and 2-pentanol in the presence of an azeotrope forming agent, recovering the 3-methyl-2-butanol and the azeotrope forming agent as overhead product and obtaining the 2-pentanol as bottoms product, wherein said azeotrope forming agent consists of one material selected from the group consisting of ethyl ether, t-butyl methyl ether, t-amyl methyl ether, 3-methyl pentane, pentane, 2,2-dimethyl butane, dimethoxymethane, dioxane, ethyl acetate, n-butyronitrile, methylene chloride and carbon tetrachloride.

5,439,562

**ELECTROCHEMICAL DECONTAMINATION OF RADIOACTIVE METALS BY ALKALINE PROCESSING**

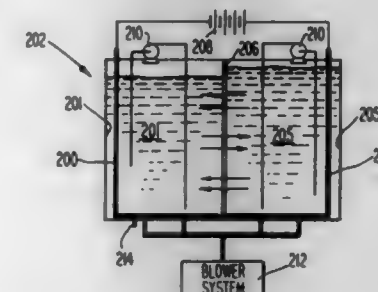
Thomas S. Snyder, Oakmont, Pa., and Dwight Goad, Kingston, Tenn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 17, 1994, Ser. No. 261,862

Int. Cl.<sup>6</sup> C25C 1/06

U.S. Cl. 204—1.5

20 Claims



1. A method for decontaminating radiocontaminated nickel comprising, in an electrorefining cell having a semi-permeable membrane, cathodically depositing substantially radio-free nickel from an alkaline solution containing electrolyte, nickel ions, and radioactive ions; wherein said solution is maintained at a pH of at least about 10 (as measured at the cell temperatures, and wherein said radioactive contaminant is at least one contaminant selected from the group consisting of the transition and actinide metals.

5,439,563

**ELECTROLYTIC PRODUCTION OF MAGNESIUM METAL WITH FEED CONTAINING MAGNESIUM CHLORIDE AMMONIATES**

Olivo G. Sivilotti, Kingston, Canada, assignor to Alcan International Limited, Canada

Filed Aug. 25, 1993, Ser. No. 111,388

Int. Cl.<sup>6</sup> C25C 3/04

U.S. Cl. 204—70

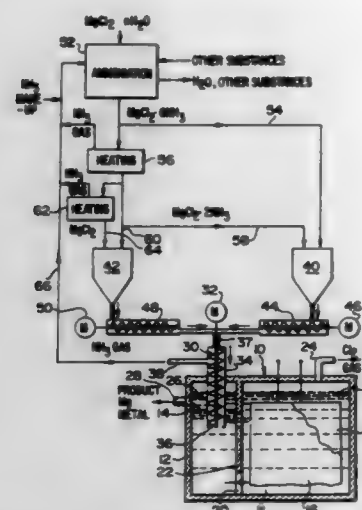
11 Claims

1. A process for producing magnesium metal from magnesium chloride including the steps of

- subjecting a molten salt electrolyte containing dissolved  $MgCl_2$  to electrolysis in a cell chamber for converting the  $MgCl_2$  into molten magnesium metal and chlorine gas, with heating of the electrolyte,
- recovering the molten metal, and



- (c) separately collecting the chlorine gas, wherein the improvement comprises:
- (d) supplying to the heated electrolyte a feed comprising at least one magnesium chloride ammoniate for decomposi-



tion into  $MgCl_2$  and ammonia gas by heat of the electrolyte at a locality at which the ammonia gas does not come into reactive contact with the chlorine gas, thereby to abstract heat from the electrolyte while replenishing its  $MgCl_2$  content as electrolysis proceeds.

5,439,564

# METHOD OF PROCESSING ORGANIC QUATERNARY AMMONIUM HYDROXIDE-CONTAINING WASTE LIQUID

Shumpei Shimizu; Toshitsura Cho, both of Tokyo, and Shigeo Iiri, Kawasaki, all of Japan, assignors to Tama Chemicals Co. Ltd., Tokyo, Japan

Filed Nov. 10, 1993, Ser. No. 149,827

Claims priority, application Japan, Nov. 10, 1992, 4-323814; Nov. 26, 1992, 4-337835

Int. Cl.<sup>6</sup> B01D 61/42

U.S. Cl. 204-102

5 Claims

1. A method of processing an organic quaternary ammonium hydroxide-containing waste liquid for recovering an organic quaternary ammonium hydroxide from a waste liquid containing at least the organic quaternary ammonium hydroxide, the method comprising an adsorbing step of bringing the waste liquid into contact with a cation-exchanging material to make the organic quaternary ammonium ions in the waste liquid adsorbed by the cation-exchanging material, an eluting step of bringing an eluent into contact with the cation-exchanging material which has adsorbed the organic quaternary ammonium ions to elute the organic quaternary ammonium ions from the material, and an electrolyzing step of electrolyzing the eluate obtained in the eluting step to recover an aqueous solution of the organic quaternary ammonium hydroxide.

5,439,565

# METHOD OF MANUFACTURING ELECTRODE FOIL FOR ALUMINIUM ELECTROLYTIC CAPACITORS

Takeshi Torii, Kyoto; Katsumori Suzuki, Yawata; Tetsuo Sonoda, Joyo, and Kouichi Kojima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 16, 1994, Ser. No. 212,575

Claims priority, application Japan, Mar. 19, 1993, 5-059942

Int. Cl.<sup>6</sup> C25F 3/04

U.S. Cl. 204-129.1

31 Claims

1. A method of manufacturing electrode foil for aluminium

electrolytic capacitors made by carrying out an etching process divided into at least two stages, comprising the steps of: electrically etching aluminium electrode foil passing through any of nitric acid, sulfuric acid and a mixed acid thereof each added with at least one selected from the group consisting of chromic acid, oxalic acid, citric acid, phosphoric acid, boric acid, succinic acid and malonic acid as an additive in an etching process of a final stage for increasing the diameter of pits created in a preceding stage to a diameter suitable for a formation voltage; and in the electrical etching, controlling the concentration of dissolved aluminium to 5 to 25 g/l by any of said nitric acid, said sulfuric acid and said mixed acid thereof.

5,439,566

# SCALE CONTROL DEVICE AND METHOD

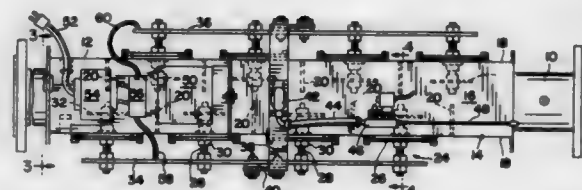
Jerry Zucker, 16 Buckingham Dr., Charleston, S.C. 29407

Filed Apr. 11, 1994, Ser. No. 225,659

Int. Cl.<sup>6</sup> C02F 1/461

U.S. Cl. 204-149

9 Claims



1. A water scale control device comprising an elongate chamber having a length and having a water inlet and outlet, means for providing a continuous flow of water between said inlet and outlet wherein the water has scale forming compounds therein near the saturation point, means for creating an undulating flow path of water through said chamber comprising a plurality of spaced, staggered baffles arranged along the length of said chamber, a plurality of plate electrodes within said chamber disposed in said undulating flow path near said baffles in a staggered relation, an external electrical supply means connected to said electrodes for applying opposite charges to adjacent plate electrodes and causing scale to be deposited on said electrodes, and vibrator means connected to said plate electrodes for periodically vibrating and flexing said plate electrodes for removing scale deposited thereon.

5,439,567

# PROCESS FOR TREATMENT OF A FLUID AND APPARATUS THEREFOR

Brian G. Cook, 44-131 Berkley Road, St. Catharines, Ontario, Canada L2M 6W6

Filed Jun. 20, 1994, Ser. No. 262,666

Int. Cl.<sup>6</sup> C02F 1/461

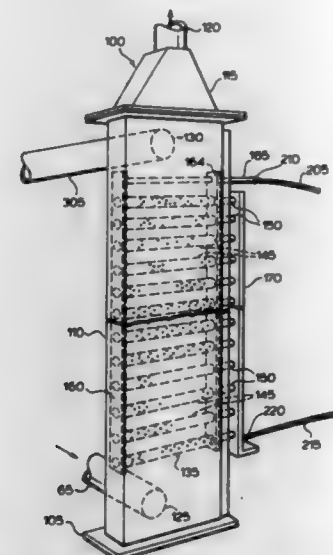
U.S. Cl. 204-149

40 Claims

1. A process for treatment of a fluid in need of treatment, the process comprising the steps of:

- feeding the fluid in need of treatment to a fluid treatment chamber having a fluid inlet and a fluid outlet;
- passing the fluid in need of treatment through the fluid inlet into the treatment chamber;
- disposing at least one electrolytic cell substantially transverse to the flow of fluid, the electrolytic cell comprising a channel defined by an outer, fluid permeable first electrode and an inner, coaxially disposed second electrode;
- substantially filling the cross-section of the housing with the at least one electrolytic cell;
- forcing substantially all of the fluid in need of treatment through the least one fluid permeable electrolytic cell;

- applying a current density of from about 4 to about 80 milliamps/in<sup>2</sup> to each electrolytic cell;
- subjecting the fluid in need of treatment to electrolysis as it passes through the channel;



- forcing the fluid to the fluid outlet; and
- allowing the fluid to exit the fluid outlet.

5,439,568

# METHOD FOR TREATING OZONE LAYER DEPLETING SUBSTANCES

Hiroshi Uchiyama, Hirakata, Japan, assignor to E. C. Chemical Co., Ltd., Osaka and Itochu Fine Chemical Corporation, Tokyo, all of Japan

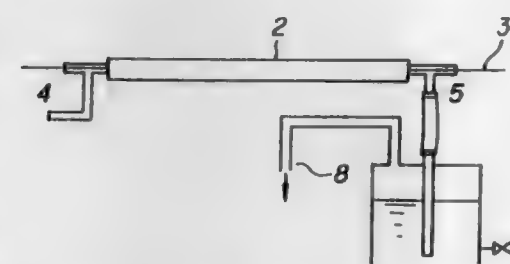
Filed Dec. 8, 1993, Ser. No. 163,077

Claims priority, application Japan, Dec. 18, 1992, 4-339198

Int. Cl.<sup>6</sup> H05F 3/00

U.S. Cl. 204-164

10 Claims



1. A method for treating ozone layer depleting substances comprising introducing helium, argon, a mixture of helium and argon or a gaseous mixture of argon and a ketone at a pressure of from about 500 torr to about atmospheric pressure into a plasma reactor comprising opposing electrodes and a solid dielectric interposed between said opposing electrodes and disposed on a surface of at least one of said opposing electrodes, thereby forming a gaseous atmosphere at a pressure of from about 500 torr to about atmospheric pressure within said plasma reactor, generating an atmospheric pressure glow discharge in the gaseous atmosphere, introducing gaseous ozone layer depleting substances into the glow discharge to decompose the substances, and absorbing resulting decomposition products in water.

5,439,569

# CONCENTRATION MEASUREMENT AND CONTROL OF HYDROGEN PEROXIDE AND ACID/BASE COMPONENT IN A SEMICONDUCTOR BATH

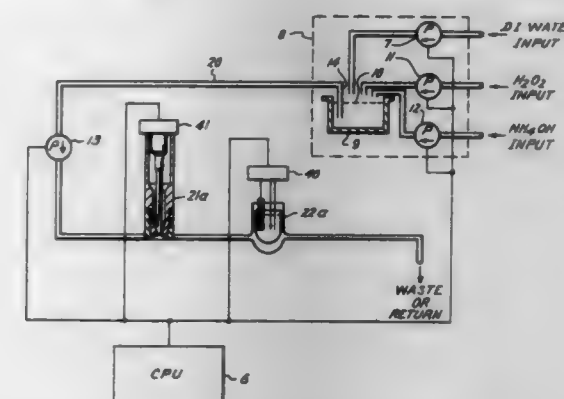
Ronald A. Carpio, Austin, Tex., assignor to Sematech, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 17,224, Feb. 12, 1993, Pat. No. 5,364,510. This application Jul. 20, 1994, Ser. No. 277,688. The portion of the term of this patent subsequent to Nov. 13, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G01N 27/26

U.S. Cl. 204-153.1

19 Claims



1. A method for monitoring concentration levels of a first chemical specie, which is hydrogen peroxide ( $H_2O_2$ ), and a second chemical specie, which is either an acid or a base, in a multi-component aqueous bath utilized in semiconductor processing, in order to provide feedback to control an amount of said  $H_2O_2$  and said second chemical specie present in said bath comprising the steps of:

- sampling said bath to obtain a solution sample;
- performing a potentiometric detection of said sample to measure concentration of said second chemical specie in said sample;
- performing an amperometric detection of said sample to measure concentration of said  $H_2O_2$  in said sample;
- analyzing concentration measurements of said sample to determine if said  $H_2O_2$  and said chemical specie in said bath are within set concentration levels;
- introducing additional  $H_2O_2$ , said second chemical specie, other compensating chemical or diluting agent into said bath to adjust said bath to within said set concentration levels, if adjustment is needed;
- wherein said bath is monitored and compensated to maintain said set concentration levels of  $H_2O_2$  and said second chemical specie in said bath.

5,439,570

# WATER SOLUBLE TEXAPHYRIN METAL COMPLEXES FOR SINGLET OXYGEN PRODUCTION

Jonathan L. Sessler; Gregory W. Hemmi, and Tarak D. Mody, all of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 822,964, Jan. 21, 1992, Pat. No. 5,282,720, which is a continuation-in-part of Ser. No. 771,393, Sep. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 539,975, Jun. 18, 1990, Pat. No. 5,162,509, which is a division of Ser. No. 320,293, Mar. 6, 1989, Pat. No. 4,935,498. This application Aug. 25, 1993, Ser. No. 112,871

The portion of the term of this patent subsequent to Mar. 8, 2011, has been disclaimed.

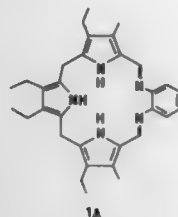
Int. Cl.<sup>6</sup> C07C 27/00

U.S. Cl. 204-157.15

25 Claims

1. A method of light induced singlet oxygen production comprising: administering to a host a water soluble hydroxy-substituted

aromatic pentadentate expanded porphyrin analog metal complex retaining lipophilicity and having intrinsic biocalization selectivity; and



exposing the host to light in the presence of oxygen to produce singlet oxygen.

5,439,571

# APPARATUS AND METHOD FOR ENHANCED RESOLUTION CONTINUOUS FLOW ZONE ELECTROPHORESIS

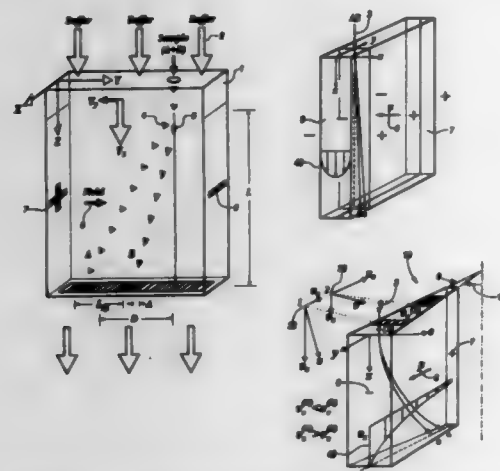
David W. Sammons, and Rizwan Sharnez, both of Tucson, Ariz.,  
assignors to Bioseparations, Inc., Tucson, Ariz.

Filed Nov. 19, 1991, Ser. No. 794,078

Int. Cl.<sup>6</sup> G01N 27/26, 27/447

U.S. Cl. 204—180.1

25 Claims



1. A method of continuous flow zone electrophoresis, comprising the steps of:

- introducing a sample containing at least two populations of charged components into a buffer fluid;
- flowing the buffer fluid containing the sample into a separator chamber; and
- selectively increasing a residence time of a faster charged component over a slower charged component within the chamber and separating said faster charged component from said slower charged component by imposing a negative gradient in bulk fluid velocity along a direction of the electrophoresis.

5,439,572

# LENS PROTECTIVE ENCASEMENT PACKET

Mark L. Pankow, Chicago, Ill., assignor to Isoclear, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 800,686, Dec. 12, 1991, Pat. No. 5,227,039. This application Jul. 12, 1993, Ser. No. 90,300

Int. Cl.<sup>6</sup> G02C 13/00

U.S. Cl. 204—180.1

6 Claims

6. Method for removing contaminants from a contact lens with the application of electrical charges, said lens having a

dominant convex surface, a dominant concave surface, and a surrounding edge, said method comprising:

- positioning a lens on inner faces of a treatment packet including a formable pliant substance by which a lens can be treated, and a pair of outer membrane layers formed of electrically conductive material impervious to the contaminants;



closing said packet such that said dominant convex surface, said dominant concave surface, and said surrounding edge of said lens are completely covered by said substance; aligning said outer membrane members with respective ones of said dominant lens surfaces on the outer surface of said substance; and charging said outer membrane members such that at electric current is caused to pass through the lens whereby said lens is decontaminated.

5,439,573

# CONCENTRATING ELECTROELUTION APPARATUS

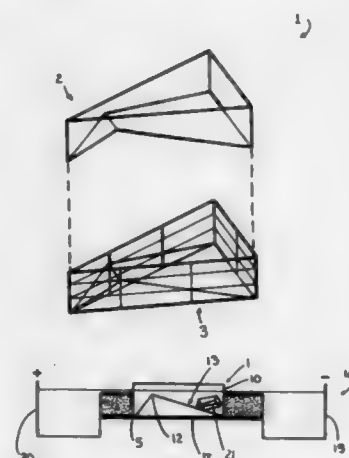
Xiao-Zhong Luo, 625 Brister St. #11, Memphis, Tenn. 38111

Filed Jan. 12, 1994, Ser. No. 180,343

Int. Cl.<sup>6</sup> G01N 27/26, 27/447

U.S. Cl. 204—182.8

9 Claims



6. A method for extracting biological molecules from a separation gel through electroelution comprising:

- cutting a band containing biological molecules of interest from a separation gel to produce a gel slice;
- casting a gel around the frame of the apparatus according to claim 1, thereby securing the frame within an electrophoresis device;
- placing said gel slice into said apparatus;
- placing said apparatus into an electrophoresis device which includes an electrophoresis tank, a positive electrode within said tank, a negative electrode within said tank, buffer solution within said tank, and a power source electrically connected to said positive electrode and said negative electrode, such that the gel slice containing the molecules of interest is close to the negative electrode, and the apex of the semi-permeable membrane is close to the positive electrode;
- applying an electric current by engaging said power source with sufficient voltage and for sufficient time such that the molecules of interest are substantially eluted out

of said gel slice and onto the semi-permeable membrane at the area proximate the apex; and  
f) collecting concentrated biological molecules from said apparatus from the area proximate the apex by pipet.

5,439,574

# METHOD FOR SUCCESSIVE FORMATION OF THIN FILMS

Masahiko Kobayashi, and Nobuyuki Takahashi, both of Tokyo, Japan, assignors to Anelva Corporation, Fuchu, Japan

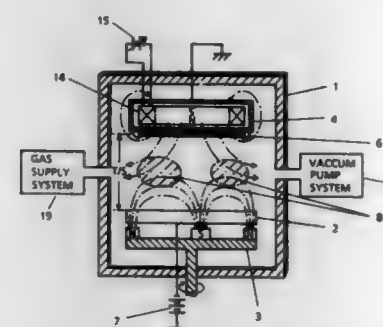
Continuation of Ser. No. 36,368, Mar. 24, 1993, abandoned. This application Jul. 19, 1994, Ser. No. 277,950

Claims priority, application Japan, Apr. 9, 1992, 4-116805

Int. Cl.<sup>6</sup> C23C 14/34; H01L 21/44

U.S. Cl. 204—192.12

23 Claims



1. A method for successive deposition of at least two thin films of different materials in a metallization process in manufacturing a semiconductor device, comprising the following steps:

- depositing on a substrate a first thin film comprised of particles sputtered out of a target by:
  - establishing in a system a plasma by creating mutually perpendicular electric and magnetic fields in a space between the target and the substrate;
  - introducing into the system a first process gas; and
  - applying an additional magnetic field of a first level with a variable electromagnet arranged on a side of the substrate opposite the target, the additional magnetic field being constant and extending through the substrate and is uniformly distributed over a surface of the substrate to produce a first magnetic flux density such that said first thin film is deposited at a uniform thickness on said substrate;
- depositing on the first thin film a second thin film formed of at least two elements resulting from particles sputtered out of the target reacting with particles of a gas molecule in a second process gas comprising at least two different gases by:
  - establishing in the system a plasma by creating perpendicular electric and magnetic fields in the space between the target and the substrate;
  - introducing the second process gas into the system; and
  - adjusting the variable electromagnet to apply an additional magnetic field of a second level with the variable electromagnet, the additional magnetic field being constant and extending through the substrate and is uniformly distributed over a surface of the substrate to produce a second magnetic flux density such that said second thin film is deposited at a uniform thickness on the first thin film;

wherein:

- process (a) and process (b) are conducted in a continuous sequence;
- a distance between the target and the substrate is maintained fixed throughout process (a) and process (b);
- the magnetic field is maintained perpendicular to the electric field during both process (a) and process (b); and
- the magnetic flux density set during process (a) differs

from that set during process (b) by varying the magnetic flux density of the additional magnetic field.

5,439,575

# HYBRID METHOD FOR DEPOSITING SEMI-CONDUCTIVE MATERIALS

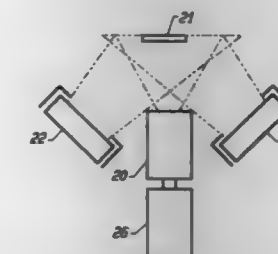
John A. Thornton, deceased, late of Champaign, Ill. by Joy Crane Thornton, legal representative; Timothy Lommason, Champaign, Ill., and Angus Rockett, Champaign, Ill., assignors to Board of Trustees of the University of Illinois, Champaign, Ill.

Filed Jun. 30, 1988, Ser. No. 213,698

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—192.25

12 Claims



1. A process of depositing an alloy on a substrate, said process comprising the steps of:

- positioning a substrate in a deposition chamber;
  - independently controlling a first sputtering source to establish a first flux of copper in said deposition chamber;
  - independently regulating a second sputtering source to establish a second flux of indium in said deposition chamber; and
  - providing an evaporation source to establish a supersaturated flux of selenium in said deposition chamber, said supersaturated flux of selenium being two to three times larger than the combination of said first flux of copper and said second flux of indium; said first flux of copper, said second flux of indium, and said supersaturated flux of selenium producing an alloy layer on said substrate with predetermined quantities of copper, indium, and selenium.
5. A product formed by the process of claim 1.

5,439,576

# APPARATUS FOR THE STERILIZATION OF WATER

Meinolf Schoeberl, Geigelsteinstrasse 8, Prien D-8210, Germany

PCT No. PCT/EP91/02459, § 371 Date Oct. 1, 1992, § 102(e) Date Oct. 1, 1992, PCT Pub. No. WO92/11209, PCT Pub. Date Jul. 9, 1992

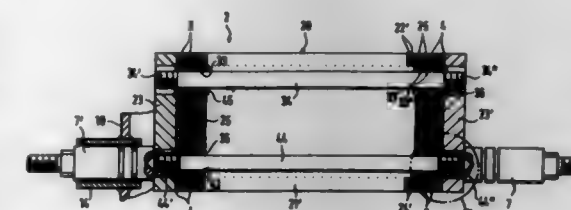
PCT Filed Dec. 19, 1991, Ser. No. 920,510

Claims priority, application Germany, Dec. 19, 1990, 40 40 694.6

Int. Cl.<sup>6</sup> C02F 1/461

U.S. Cl. 204—263

3 Claims



1. An apparatus for sterilizing water by anodic oxidation comprising:

- a reactor having at least one anode and at least one cathode, the reactor having a gap of constant width between mutu-



ally confronting surfaces of the anode and the cathode, the anode comprising a material that has a greater overvoltage with respect to oxygen generation and with respect to chlorine generation;

a power supply means connected to the anode and the cathode in series for supplying an electric current between the anode and the cathode;

a plurality of electrode modules, each electrode module having a plurality of anodes and cathodes alternatively arranged within the module;

anode spacer elements disposed between each anode, the anode spacer elements contacting a contact surface of each anode to electrically connect the anodes to each other;

cathode spacer elements disposed between each cathode, the cathode spacer elements contacting a contact surface of each cathode to electrically connect the cathodes to each other; and

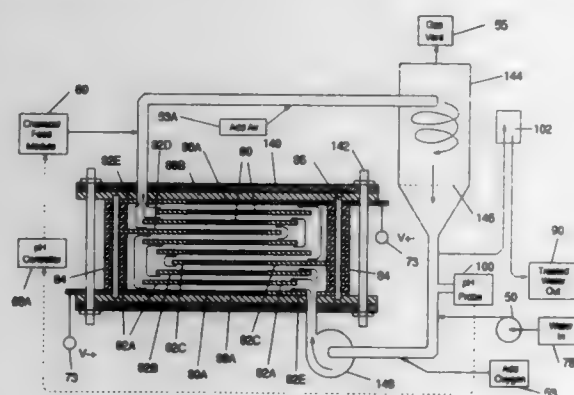
means for pressing the anode and cathode spacer elements together under high pressure to generate a high specific surface pressure at the contact surfaces of the anodes and the cathodes.

5,439,577

**ELECTROCHEMICAL DEVICE FOR GENERATING HYDROXYL FREE RADICALS AND OXIDIZING CHEMICAL SUBSTANCES DISSOLVED IN WATER**  
Oleh Weres, P.O. Box 116, Vineburg, Calif. 95487, and Michael R. Hoffman, 1625 Laurel St., South Pasadena, Calif. 91030  
Continuation-in-part of Ser. No. 213,980, Mar. 16, 1994, Pat. No. 5,364,508. This application Nov. 10, 1994, Ser. No. 337,288  
Int. Cl.<sup>6</sup> C02F 1/461, 1/467

U.S. Cl. 204—268

19 Claims



1. A water treatment module for decomposing chemical substances dissolved or dispersed in an electrically conductive aqueous medium, including

a bipolar electrochemical cell, wherein said bipolar electrochemical cell includes an array of bipolar electrodes, wherein said bipolar electrodes include a surface part and an internal part, wherein

said surface part has a semiconducting metal oxide composition including an additive metal having valence states, wherein at least part of said additive metal is in a valence state which n-dopes said semiconducting metal oxide composition, and

wherein concentration of platinum group metals in said semiconducting metal oxide composition is zero or too small to exert a significant electrocatalytic effect favoring the generation of oxygen, and

wherein said cell is provided with water circulation means, and consists of further providing

flow baffles defining a serpentine fluid flow path through said array of bipolar electrodes, and

insulating baffles substantially blocking electrical conduction paths through said electrically conductive aqueous medium between bipolar electrodes which are not immediately adjacent within said array.

5,439,578

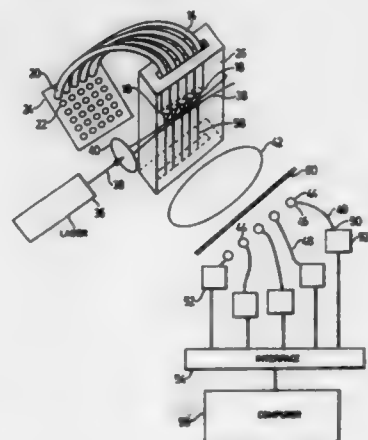
**MULTIPLE CAPILLARY BIOCHEMICAL ANALYZER**  
Norman J. Dovichi, and Jian Z. hang, both of Edmonton, Canada, assignors to The Governors of the University of Alberta, Edmonton, Canada

Filed Jun. 3, 1993, Ser. No. 72,096

Int. Cl.<sup>6</sup> G01N 27/26, 27/447

U.S. Cl. 204—299 R

63 Claims



1. An analyzer for analyzing an organic sample, the analyzer comprising:

a plurality of capillary tubes arrayed side by side, each capillary tube having first and second ends, the second ends of the capillary tubes terminating adjacent each other and the first ends being connectable to a source of organic sample;

a flow chamber having an interior cavity, the second ends of the capillary tubes terminating inside the interior cavity;

means to supply sheath fluid into the interior cavity of said flow chamber to provide a flow of sheath fluid past the second ends of the capillary tubes such that any organic sample in said capillary tubes is drawn by the flow of sheath fluid in individual sample streams from the second ends of the capillary tubes;

an electrophoretic voltage source connected across said capillary tubes to force said organic sample through the capillary tubes from the first ends of the capillary tubes to the second ends of the capillary tubes, said flow chamber being held essentially at ground potential;

a detector positioned to detect organic sample in the individual sample streams emerging from the capillary tubes; and

an outlet for draining said sheath flow fluid and entrained streams directly from said flow chamber to waste, said outlet having a substantially larger flow area than said capillary tubes to thereby permit non-capillary flow there-through.

5,439,579

**SENSOR PROBE FOR MEASURING HYDROGEN CONCENTRATION IN MOLTEN METAL**

Kunihiro Koide, Nagoya, and Tamotsu Yajima, Gifu, both of Japan, assignors to Tokyo Yogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1992, Ser. No. 981,873

Claims priority, application Japan, Nov. 26, 1991, 3-310984; Dec. 27, 1991, 3-347383; Dec. 27, 1991, 3-347384; Dec. 27, 1991, 3-347385; Dec. 27, 1991, 3-347386; Dec. 27, 1991, 3-347387; Dec. 27, 1991, 3-347388; Jan. 28, 1992, 4-013468; Jan. 28, 1992, 4-013469; Jan. 28, 1992, 4-013470

Int. Cl.<sup>6</sup> G01N 27/406, 27/411

U.S. Cl. 204—422

6 Claims



1. A sensor probe for measuring hydrogen concentration in molten metal, comprising:

a tubular sensor element made of proton conductive solid electrolyte having a perovskite structure and enclosed at one end,

a reference electrode constituted of a porous material formed on the inner surface of said sensor element,

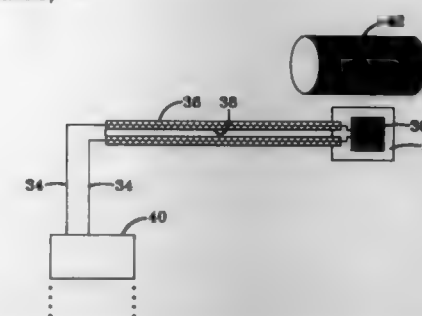
a measuring electrode constituted of a porous material formed on the outer surface of said sensor element,

sealing material separating and preventing gas communication between said reference electrode and said measuring electrode,

a ceramic sleeve fixed on the outer surface of said sensor element so as to create a gas space in the sleeve between the molten metal and the measuring electrode, thereby at least a part of said measuring electrode on the outer surface of said sensor element being located in the gas space, said sleeve, in a portion thereof which protrudes from said sensor element, being filled with a ceramic fiber to prevent the penetration of molten metal into the sleeve, and

a metal film having a thickness of at least 3  $\mu$ m covering the outer surface of a portion of said sleeve to be dipped into said molten metal to increase the wettability of said sleeve with said molten metal.

b) means disposed to pass an electric current through said ceramic;



c) means to measure changes in current characteristics when said ceramic is exposed to an atmosphere containing at least one of the gases hydrogen and carbon monoxide.

5,439,581

**SOLID ELECTROLYTE SENSOR**

Martin Schmäh, Frankfurt, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

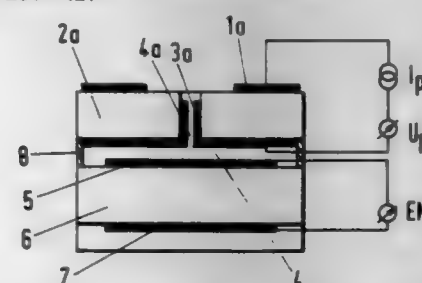
Filed Apr. 7, 1994, Ser. No. 224,160

Claims priority, application Germany, Apr. 7, 1993, 43 11 985.9

Int. Cl.<sup>6</sup> G01N 27/26

U.S. Cl. 204—427

7 Claims



1. A solid electrolyte sensor device for determining gas concentrations in measurement gas, comprising: a sensor formed by a solid electrolyte which is arranged between at least two gas permeable electrodes, the sensor producing output values; electrical means for detecting and processing concentration-dependent sensor output values; and adjustable oxygen source electrodes arranged at a distance from one of the sensor electrodes so that the oxygen source and the one sensor electrode face one another and the measurement gas, whereby one of oxygen and oxygen radicals are introduced into the measurement gas for oxidation of the measurement gas; and at least one spacer which holds the oxygen source and the sensor electrode at a distance from one another to form a measurement space which is closed except for at least one through-opening, a volume of the measurement space and a maximum adjustable amount of oxygen introduced from the oxygen source into the measurement gas are dimensioned so that a maximum measurement gas flow in a given application is no more than the maximum adjustable amount of oxygen introduced from the oxygen source.

5,439,580

**SOLID-STATE GAS SENSOR FOR CARBON MONOXIDE AND HYDROGEN**

Sheikh A. Akbar, Abdul M. Azad, and Lora B Younkman, all of Columbus, Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed Nov. 5, 1993, Ser. No. 147,711

Int. Cl.<sup>6</sup> G01N 27/26

U.S. Cl. 204—425

12 Claims

1. A sensor for sensing carbon monoxide and hydrogen in a mixture of gases comprising:

a) a sensing ceramic comprising an anatase TiO<sub>2</sub>;

5,439,582

**PROCESS FOR PRODUCING MULTICOLOR DISPLAY**

Takeshi Oka, Suita; Takahito Kishida, Yao; Atsushi Kawakami, Suita; Masashi Ohata, Osaka, and Akira Matsumura, Hirakata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jun. 1, 1993, Ser. No. 70,352

Claims priority, application Japan, Oct. 2, 1991, 3-255121

Int. Cl.<sup>6</sup> C25D 5/02

U.S. Cl. 205—135

5 Claims

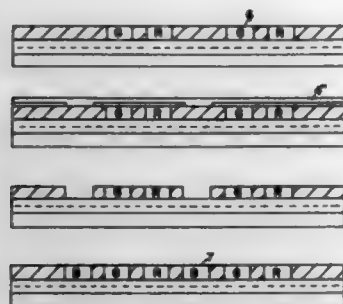
1. A process for producing a multicolor display consisting essentially of the following steps:

(I) a photosensitive resin layer formed on an electric conduc-

tive layer is exposed to light through a mask having a desired pattern which is placed on the photosensitive resin layer, and developed to bare partially the surface of the electric conductive layer;

(II) a colored layer is formed on the bared surface of the electric conductive layer by an electrodeposition process; and

(III) the above steps (I) and (II) are repeated desired times



and then the remaining photosensitive resin layer is eluted with a removing solution which preferentially or selectively dissolves the photosensitive layer, to bare the remaining surface of the electric conductive layer, wherein said photosensitive resin layer is formed from a resin composition comprising a polymer having branched groups unstable to carboxylic acid and a photopolymerization initiator which produces acid upon exposure to light.

5,439,583

#### SULFUR REMOVAL SYSTEMS FOR PROTECTION OF REFORMING CRYSTALS

Richard C. Robinson, San Rafael; Robert L. Jacobson, Vallejo; Harris E. Klukodahl, San Rafael; William A. Blanton, Woodacre; Dennis L. Holtermann, Crockett, and Leslie A. Field, Portola Valley, all of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Continuation of Ser. No. 357,297, May 26, 1989, abandoned, which is a continuation-in-part of Ser. No. 166,588, Mar. 10, 1988, Pat. No. 4,925,549, which is a continuation of Ser. No. 667,505, Oct. 31, 1984, Pat. No. 4,741,819. This application Jan. 4, 1993, Ser. No. 243

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.<sup>6</sup> C01G 35/06

U.S. Cl. 208—62

25 Claims

1. A method for removing residual sulfur from a naphtha feedstock comprising:

- contacting said feedstock with hydrogen under mild reforming conditions in the presence of a first reforming catalyst to carry out some reforming reactions, convert trace sulfur compounds to H<sub>2</sub>S and form a first effluent;
- contacting said first effluent with a solid sulfur sorbent to remove the H<sub>2</sub>S, to form a second effluent which contains less than 0.1 ppm sulfur; and
- contacting said second effluent with a highly selective reforming catalyst.

5,439,584

#### SYSTEM FOR REDUCING CONSUMPTION OF FRESH WATER AND ENERGY COSTS USED IN A PHOTOFINISHING OPERATION

Gerson J. Rosenfield, 27 High Pasture Rd., Kittery Point, Me. 03905

Filed May 29, 1992, Ser. No. 891,428

Int. Cl.<sup>6</sup> C02F 9/00

U.S. Cl. 210—136

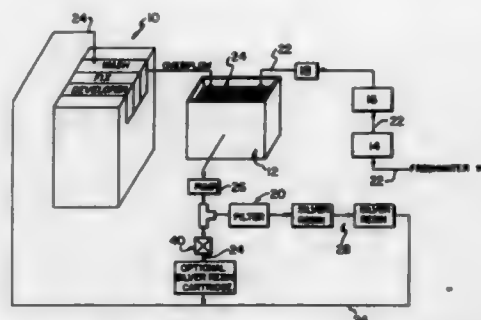
19 Claims

1. Apparatus for automatically reducing the concentration of silver in the wash water effluent from a film processing system and recirculating a predetermined amount of wash

water back to the film processing system providing a closed loop system comprising, in combination:

(a) a collection tank in operative association with the wash water tank of a film processing system for the receiving and holding of a predetermined amount of wash water effluent from said film processing system mixed with a predetermined amount of fresh water;

(b) means associated with the collection tank for periodically providing a predetermined amount of fresh water into the collection tank to be mixed with the wash water effluent from the film processing system;



(c) means for pumping a predetermined amount of wash water mixed with fresh water from the collection tank to a silver recovery means and for recirculation of the wash water effluent from the silver recovery means back to the wash water tank in the film processing system;

(d) means for recovering silver from the wash water and fresh water mixture discharged from the collection tank; and

(e) means for periodically and simultaneously causing an amount of wash water mixed with fresh water equivalent to the amount of fresh water provided to the collection tank to be diverted from the silver recovery means and pumped from the collection tank to waste.

5,439,585

#### OIL FILTERING DEVICE FOR MOTOR BICYCLE

Hidetoshi Arakawa, Hamamatsu, Japan, assignor to Suzuki Kabushiki Kaisha, Japan

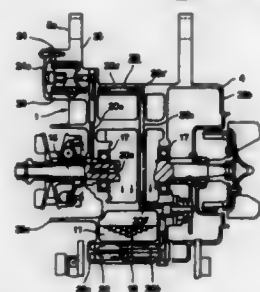
Filed Sep. 3, 1993, Ser. No. 116,281

Claims priority, application Japan, Feb. 10, 1993, 5-023018

Int. Cl.<sup>6</sup> F01M 1/10

U.S. Cl. 210—168

9 Claims



1. In a motor bicycle having a longitudinal axis and a pair of wheels spaced apart along said longitudinal axis, and an engine

for driving one of said wheels, said engine having a crank shaft and a crank case, said crank shaft having a transverse axis of rotation extending generally parallel to an axis of rotation of the driven one of said wheels and generally perpendicularly to said longitudinal axis, said engine having a pair of opposed sides spaced apart in the direction of said transverse axis and extending transversely of said transverse axis, and an oil filtering system, the improvement comprising: oil pumping means for pumping oil from a base of the crank case through a lubrication passage to parts of the engine; first filtering means located on one of said opposed sides of the crank case and disposed upstream of the pumping means in the lubrication passage for filtering the oil, the first filtering means having a first filter member insertable into and withdrawable out of the first filtering means; and second filtering means located on the said one of said opposed sides of the crank case and disposed in the lubrication passage downstream of the pumping means and the first filtering means for further filtering the oil filtered by the first filtering means before delivery thereof to the parts of the engine, the second filtering means having a second filter member insertable into and withdrawable out of the second filtering means.

5,439,586

#### MAGNETIC FILTER WITH ORDERED WIRE ARRAY

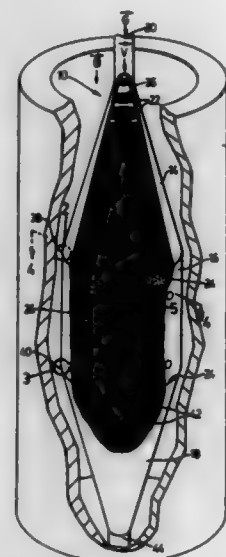
Adrian J. Richards, Ashgrove, Australia, and Peter M. Lansdorp, Vancouver, Canada, assignors to The Terry Fox Laboratory of the British Columbia Cancer Agency, Vancouver, Canada and The University of Southampton, Highfield, England

Filed Sep. 15, 1993, Ser. No. 121,098

Int. Cl.<sup>6</sup> B01D 35/06

U.S. Cl. 210—222

16 Claims



1. A device for separating magnetic materials from non-magnetic materials in fluid using an applied magnetic field, the device having a longitudinal axis along which fluid flows and comprising:

- upstream fluid flow expansion and distribution means for expanding and uniformly distributing the fluid flow from a smaller transverse cross-section to a larger transverse cross-section, comprising an inverted upstream funnel with a smaller input end and larger output end, and a plurality of non-magnetisable flow-smoothing surface means extending transversely of the longitudinal axis across the funnel and spaced apart from one another along the longitudinal axis;
- filter means for magnetically filtering the magnetic materials from the fluid while allowing non-magnetic materials to pass through when a magnetic field is applied thereto, comprising a filter input and a filter output and a coaxial

filter chamber located on the longitudinal axis with the filter input coupled to the output end of the upstream funnel and the filter chamber having mounted therein an ordered array of magnetisable wires; and

c) downstream flow contraction and distribution means for contracting and uniformly distributing the fluid flow from a larger transverse cross-section to a smaller transverse cross-section, comprising a downstream funnel having a larger input end coupled to the filter output and a smaller output end, and a plurality of non-magnetisable flow-smoothing surface means extending transversely of the longitudinal axis across the funnel and spaced apart from one another along the longitudinal axis.

5,439,587

#### SELF PRIMING FILTER APPARATUS

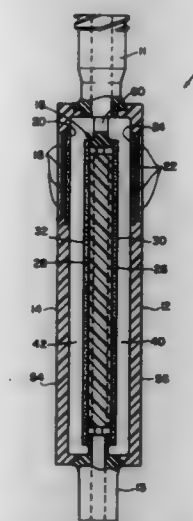
Ralph J. Stankowski, Westford; Michael C. Heath, Chelmsford, and Douglas A. Boucher, Billerica, all of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Jul. 27, 1993, Ser. No. 98,171

Int. Cl.<sup>6</sup> A61M 5/165; B01D 19/00

U.S. Cl. 210—321.64

20 Claims



8. A filter apparatus comprising a first housing portion first periphery, a second housing portion having a second periphery and a core portion having a third periphery on a first surface and a fourth periphery on a second surface, first periphery being sealed to said third periphery and said second periphery being sealed to said fourth periphery thereby to form a first space between said first housing portion and said core and to form a second space between said second housing portion and said core portion, an inlet to said first space and second space, said inlet being positioned at a first end of said filter apparatus, each of said first surface and said second surface having ridges to define a plurality of flow paths and at least one channel, said flow paths being sealed at a distant end of their respective surface remote from said inlet and being open at an opposing end of their respective surface adjacent said inlet, said flow paths being connected to said at least one channel, said at least one channel being connected to an outlet positioned at a second end of said filter apparatus opposite said first end thereby to effect fluid flow in each of said at least one channel in a direction opposite fluid flow in said flow paths, said at least one channel being positioned on substantially the same plane as said flow paths, said first surface being sealed from said first space by a first hydrophilic membrane, said second surface being sealed from said second space by a second hydrophilic membrane, said inlet and said outlet being formed integrally on said core.



5,439,588

**COALESCING FILTER USING AN EXPANDABLE BED FIBER**

Philip K. Chown, Addlestone; Simon Clarke, Staines; Eric C. Green, Whyteleafe; Anthony S. MacFarlane, Lightwater; Philip A. C. Medlicott, Pryford, and Anna C. Lawrence, Hampton, all of England, assignors to Kalsep Limited, Berkshire, England

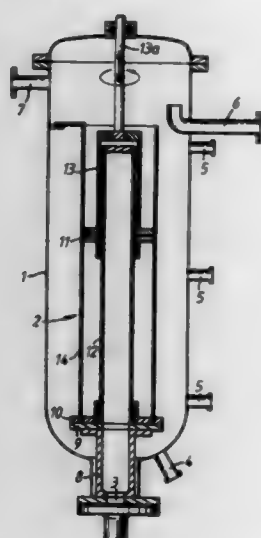
Continuation of Ser. No. 922,255, Jul. 30, 1992, abandoned, which is a division of Ser. No. 752,196, Aug. 20, 1991, Pat. No. 5,174,907, which is a continuation of Ser. No. 399,408, Aug. 25, 1989, abandoned, which is a division of Ser. No. 880,825, Jul. 1, 1986, abandoned. This application Mar. 29, 1994, Ser. No. 219,858

Claims priority, application United Kingdom, Jul. 5, 1985, 851714

Int. Cl.<sup>6</sup> B01D 29/07

U.S. Cl. 210—350

10 Claims



1. A filter coalescer cartridge for removing contaminants from a liquid which cartridge comprises:

- a first support at one end of the cartridge;
- a second end support at the other end of the cartridge said end support being moveable relative to each other both rotationally and longitudinally, and
- a filter coalescer element in a compressed position or state comprising a first, second and third zone, the second zone being between said first and third zones and being made of a plurality of fibrous yarns, each yarn made up of a number of crimped fibres, the first and third zones being sealed strips secured to the first and second end supports, and
- a drive mechanism connected to one of the end supports.

5,439,589

**SEALING MEANS FOR SLIDE PLATE SCREEN CHANGER**

Timothy W. Whitman, Hamilton, Mass., assignor to Trafalgar House Inc., South Attleboro, Mass.

Filed May 9, 1994, Ser. No. 239,736

Int. Cl.<sup>6</sup> B01D 29/96

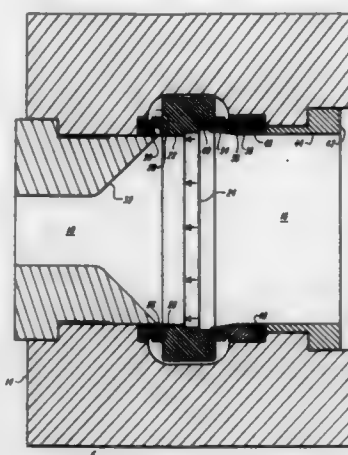
U.S. Cl. 210—436

10 Claims

1. In combination with a screen changer comprising a body forming upstream and downstream passages defining a fluid flow direction, having a filter channel extending transversely of said direction and having a closed annular downstream sealing surface extending between said channel and the downstream passage, and a slide plate movable through the filter channel, having opposed, closed annular upstream and downstream bearing surfaces and supporting a filter therebetween, the downstream bearing surface being in annular contact with the downstream sealing surface, the body a closed annular first

surface located on the upstream side of the slide plate, said first surface having a uniform cross section in said direction, the body having a closed annular second surface forming a wall portion of the upstream passage and a shoulder facing the slide plate and extending between said first and second surfaces, seal means comprising, in combination,

a rigid ring shaped seal having a closed annular surface slidably fitting said first surface and an upstream sealing surface in annular contact with the upstream bearing surface,



- a ring shaped sleeve located between the shoulder and the slide plate, having an inner annular surface forming a wall portion of the upstream passage and having an outer annular surface, the seal means being formed to define a ring shaped cavity external to the upstream passage and enclosed by the seal, said outer annular surface and the shoulder, and
- a pliable ring substantially filling and being confined by the cavity, the sleeve being formed to provide at least one aperture for transmitting upstream passage pressure to the pliable ring, whereby the pliable ring transmits said pressure to the seal in said direction.

5,439,590

**METHODS FOR TREATING TOXIC MATERIAL**

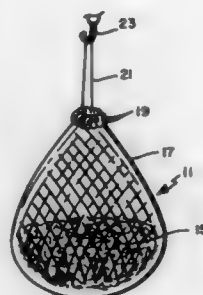
Robert J. Steffan, Newtown Bucks, Pa., assignor to Envirogen, Inc., Lawrenceville, N.J.

Filed May 25, 1993, Ser. No. 68,116

Int. Cl.<sup>6</sup> C02F 3/06

U.S. Cl. 210—616

7 Claims



1. A method of processing waste material held in an aqueous medium, which aqueous medium has a concentration of waste material which is toxic to organisms capable of degrading such waste material, comprising:

- adding a sorbent to the aqueous medium, said sorbent reducing the effective concentration of said waste material in the aqueous medium said sorbent comprising rubber derived from tires;

- biodegrading the waste material in the aqueous medium with microorganisms, said sorbent desorbing said waste material as the waste material in solution is degraded by the microorganisms to allow removal of said waste material from the aqueous medium.

5,439,591

**DISPLACEMENT CHROMATOGRAPHY PROCESS**

Diana Pliura, Mississauga; Diane Wiffen, Georgetown; Salman Ashraf, Mississauga, and Anthony Magnin, Willowdale, all of Canada, assignors to Hemosol Inc., Etobicoke, Canada

Filed Jan. 27, 1994, Ser. No. 187,316

Claims priority, application Canada, Sep. 21, 1993, 2106612

Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—635

11 Claims



1. A process of separating a preselected hemoglobin from a crude solution thereof which also contains contaminating proteinaceous substances, said process comprising:

- in a first chromatographic stage, feeding the crude solution to a chromatographic column and subjecting it to chromatography under either anionic exchange conditions under which components of the crude solution more acidic than said preselected hemoglobin have preferential binding affinity thereover, or to cationic exchange conditions under which components of the crude solution more basic than said preselected hemoglobin have preferential binding affinity thereover;

continuing the feed of the crude solution in the first chromatographic stage until the column is substantially fully loaded with hemoglobin species and components of greater affinity;

further continuing the feed of the crude solution in the first chromatographic stage to cause column overload and subsequent displacement of the hemoglobin species therefrom;

in a second chromatographic stage, feeding the hemoglobin species-containing eluent from the first stage to a chromatographic column and subjecting it to chromatography under said anionic exchange conditions or cationic exchange conditions not selected for said first stage;

continuing the feed of said eluent in the second chromatographic stage until the column is substantially fully loaded with hemoglobin species and components of greater affinity under said second stage conditions;

further continuing the feed of said eluent in the second chromatographic stage to cause column overload and consequent displacement of the hemoglobin species therefrom.

5,439,592

**METHOD FOR REMOVAL OF WATER SOLUBLE ORGANICS FROM OIL PROCESS WATER**

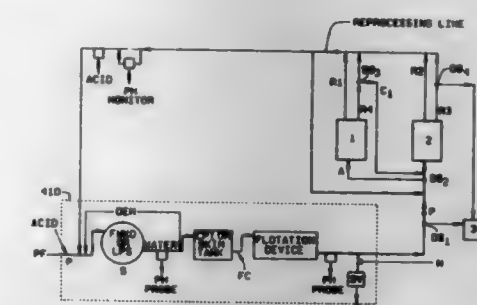
Thomas J. Bellos, St. Louis, and Richard D. Keating, Bridgeton, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 954,370, Sep. 30, 1992, abandoned. This application Sep. 1, 1994, Ser. No. 299,681

Int. Cl.<sup>6</sup> B01D 61/00

U.S. Cl. 210—651

28 Claims



1. A method for removal of water soluble organics from acidified oil process water containing water, oil, salts and water soluble organics, the method being a continuous-flow process comprising the steps of:

- removing free oil and thus water soluble organics from the acidified oil process water by continuous-flow, water-wet ultrafiltration through an ultrafiltration unit to produce a water-rich filtrate stream and an oil-rich reject stream;
- further removing water soluble organics from the water-rich filtrate stream by passage of the water-rich filtrate stream from the ultrafiltration unit through a reverse osmosis membrane to produce a WSO-depleted stream and a WSO-rich reject stream; and
- recycling at least one of the reject streams back for re-treatment by at least one of the ultrafiltration unit and the reverse osmosis membrane to produce an oil and WSO-depleted stream.

5,439,593

**SOLID PHASE EXTRACTION APPARATUS**

Thomas E. Price, St. Georges, Del., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 940,020, Sep. 3, 1992, abandoned. This application Nov. 23, 1993, Ser. No. 158,179

Int. Cl.<sup>6</sup> B01D 15/00

U.S. Cl. 210—660

22 Claims



22. A method of flowing a fluid through a sorbent contained in a vessel for automatic insertion into a fluid flow system having a top probe for engaging a first end of the vessel and a

bottom probe for engaging a second end of the vessel, comprising the steps of:

- providing a vessel comprised of a body substantially filled with a material, the body having two ends, a first, open end sealed by a cap having a sealing surface for engagement with the top probe, to create an axially movable seal between the body and the cap and a second, closed end comprising an sealing surface to provide a seal between the vessel and the bottom probe;
- aligning the top probe and a substantially axial passageway in the cap;
- aligning the bottom probe and a substantially axial passageway in the second end; and
- moving the top probe and the bottom probe to create an axial compressive force on the vessel, whereby the cap slidably mounted within the body is urged against the material within the body to create a compressive force that urges the top probe into sealing engagement with the cap and the bottom probe into sealing engagement with the second end, wherein the angle of the sealing surfaces is less than 45 degrees from a horizontal plane perpendicular to the vertical axis, such that a sealing engagement between the second end and the fluid flow system only exists during the application of axial compression between the second end and the fluid flow system, and upon release of the axial compression, there is no resistance to the removal of the second end from the fluid flow system.

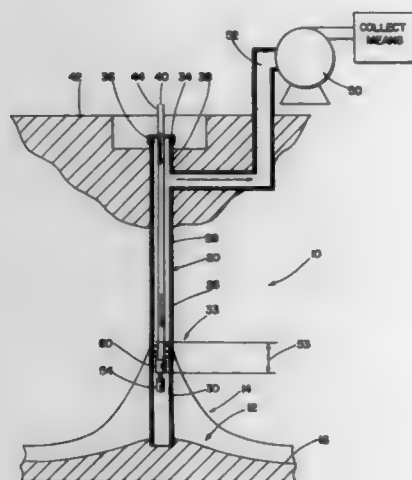
5,439,594

**METHOD FOR SUBSURFACE VAPOR EXTRACTION**  
Terence R. Regan, Newburyport, and Boris Dynkin, Newton, both of Mass., assignors to Geraghty & Miller, Inc., Denver, Colo.

Filed Jun. 23, 1993, Ser. No. 81,427  
Int. Cl.<sup>6</sup> C02F 1/20; E21B 43/00

U.S. Cl. 210—747

4 Claims



1. A method of extracting a liquid-phase hydrocarbon from a borehole extending through a water table wherein the liquid-phase hydrocarbon is floating on top of the water in a subsurface ground water table, the method comprising the steps of: Placing a conduit within said borehole and extending said conduit through said liquid-phase hydrocarbon zone and at least partially into said subsurface ground-water table;

- Connecting an upper end of said conduit to a vacuum source means for extracting said liquid-phase hydrocarbon;
- Providing a tube into said conduit, said tube extending into said liquid-phase hydrocarbon zone, said tube extends to a point just above said ground-water table;
- Allowing an upper end of said tube to remain open to the atmosphere;
- Admitting a quantity of air into said liquid-phase hydrocarbon zone from a lower end of said tube; and
- Operating, said vacuum source to create a negative pressure within said conduit sufficient to cause said contaminant in said liquid-phase hydrocarbon zone to vaporize and be drawn up through said conduit to be received into collecting means at the ground surface.

5,439,595

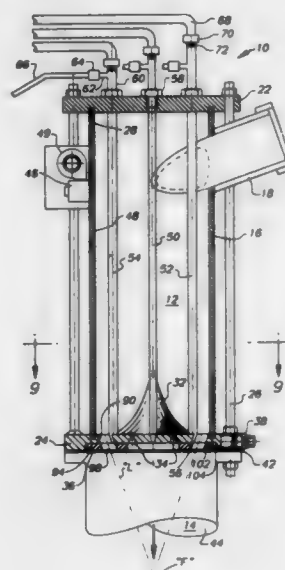
**WATER DECONTAMINATION METHOD USING PEROXIDE PHOTOLYSIS IONIZER**

Wayne F. Downey, Jr., 4501 Eland Downe, Phoenixville, Pa. 19460

Filed Aug. 25, 1993, Ser. No. 111,988  
Int. Cl.<sup>6</sup> B01D 17/06; C02F 1/48

U.S. Cl. 210—748

6 Claims



1. A method for the removal of contaminants from water, comprising the steps of:
  - a. providing a first and a second reaction chamber and a source of ultraviolet radiation operatively associated therewith;
  - b. introducing into the first reaction chamber a stream of water;
  - c. providing a stream of oxidizing reagent out of fluid contact with the stream of water;
  - d. simultaneously subjecting the water and the oxidizing reagent to the ultraviolet radiation to irradiate them and hydrolyze the reagent;
  - e. introducing the irradiated water and hydrolyzed reagent to the second reaction chamber; and
  - f. mixing the water and the reagent in the second chamber while subjecting the water and the reagent to ultraviolet radiation from the source.

5,439,596

**METHOD OF PRODUCING PURE WATER, SYSTEM THEREFOR AND CLEANING METHOD THEREFOR**

Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku, Miyagi-ku Sendai-shi, Japan, and Isamu Sugiyama, Miyagi, Japan, assignors to Tadahiro Ohmi, Sendai, Japan

PCT No. PCT/JP92/00837, § 371 Date Dec. 23, 1993, § 102(e) Date Dec. 23, 1993, PCT Pub. No. WO93/01134, PCT Pub. Date Jan. 21, 1993

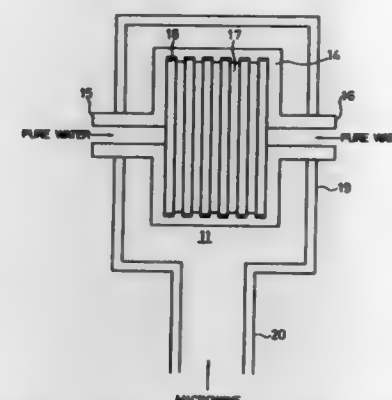
PCT Filed Jul. 2, 1992, Ser. No. 167,981

Claims priority, application Japan, Jul. 2, 1991, 3-188145

Int. Cl.<sup>6</sup> C02F 1/30

U.S. Cl. 210—748

9 Claims



1. A method for preparing pure water for use in cleaning a semiconductor body, said method comprising the step of applying microwaves to water while said water and a catalyst are brought into contact.

5,439,597

**METHOD FOR REMOVING CHEMICAL CONTAMINANTS FROM MATERIAL AND APPARATUS FOR SAME**

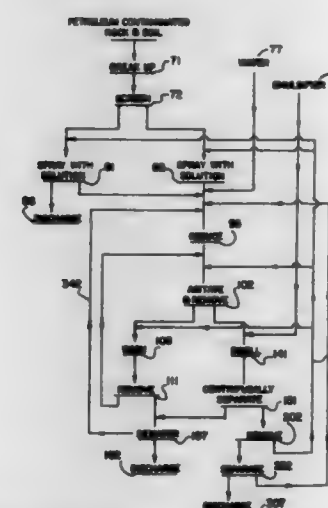
Peter A. Allen, Calistoga, Calif., assignor to Unique Products, Inc., San Mateo, Calif.

Filed Jun. 11, 1993, Ser. No. 76,351

Int. Cl.<sup>6</sup> B01D 67/00

U.S. Cl. 210—767

15 Claims



1. A continuous method for removing petroleum contaminants from larger-size and smaller-size petroleum-bearing earthen material using a movable apparatus comprising the steps of loading larger-size and smaller-size petroleum-bearing earthen material onto the movable apparatus, screening larger-size petroleum-bearing earthen material from smaller-size pe-

troleum-bearing earthen material, spraying larger-size petroleum-bearing earthen material with an aqueous cleansing solution having a biodegradable emulsifier therein to remove petroleum contaminants therefrom and create substantially cleansed larger-size earthen material, discharging substantially cleansed larger-size earthen material from the movable apparatus, introducing the smaller-size petroleum-bearing earthen material into an aqueous cleansing solution having a biodegradable emulsifier therein to form a slurry having heavier and lighter smaller-size petroleum-bearing earthen material therein, gently agitating the slurry to separate petroleum contaminants from lighter smaller-size petroleum-bearing earthen material and create substantially cleansed lighter smaller-size earthen material, washing heavier smaller-size petroleum-bearing earthen material to remove petroleum contaminants therefrom and create substantially cleansed heavier smaller-size earthen material, removing substantially cleansed heavier and lighter smaller-size earthen material from the slurry, dewatering substantially cleansed heavier and lighter smaller-size earthen material, discharging substantially cleansed heavier and lighter smaller-size earthen material from the movable apparatus, removing petroleum contaminants from aqueous cleansing solution and discharging petroleum contaminants from the movable apparatus.

5,439,598

**INDUSTRIAL FILTRATION APPARATUS AND METHOD FOR THE SEPARATION OF SOLIDS FROM A FLUID STREAM**

George F. G. Clough, Macclesfield, England, assignor to North West Water Group plc, Warrington, England

Continuation of Ser. No. 844,678, Apr. 13, 1992, abandoned.

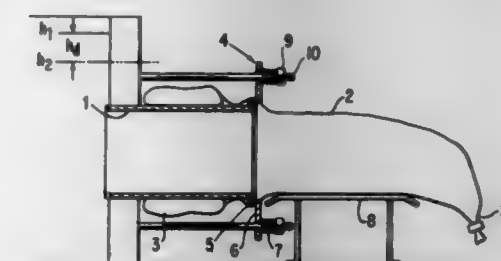
This application Aug. 17, 1994, Ser. No. 291,499

Claims priority, application United Kingdom, Aug. 23, 1990, 9018497

Int. Cl.<sup>6</sup> B01D 33/64

U.S. Cl. 210—770

18 Claims



1. Industrial filtration apparatus for the separation of solids entrained in a fluid stream, the apparatus comprising: a flexible perforated filtering sleeve including means on the exterior of the sleeve which together with the material of the sleeve, structurally closes one end of said sleeve and said sleeve being open at the other end, and further including a reserve amount of sleeve adjacent the open other end, whereby the fluid stream may flow into the open other end; and fluid from said fluid stream may pass through perforations in the sleeve and entrained solids of a predetermined size will be retained within the sleeve behind the closed end of the sleeve; the apparatus further comprising structure, including a discharge pipe for the fluid stream, said pipe having a discharge orifice, and means for maintaining said reserve amount of sleeve on said pipe including means for holding the other end of said sleeve on said pipe and around said discharge orifice at a point between the closed and open ends of the sleeve, said means for holding providing a restraining force for restraining movement of the sleeve from said pipe part and away from the discharge orifice and enabling sufficient holding force on the sleeve so that said sleeve and said closed end provides a predetermined hydraulic fluid pressure, derived from flow of said fluid stream into said sleeve, within the sleeve between its closed end and said discharge orifice which creates a force that draws a fresh portion



of the sleeve from said reserve amount of sleeve into a position forward of the pipe discharge orifice to expose said drawn fresh portion of sleeve to the fluid stream, said means for holding and providing a restraining force comprising: a first abutment means interior of the sleeve secured to the perimeter of the discharge pipe adjacent the discharge orifice, and a second abutment means exterior of said sleeve and adjacent the first abutment means having means providing a resilient bias of said second abutment means towards the first abutment means, said sleeve being gripped between the two abutment means; said predetermined fluid pressure exceeding said resilient bias and directly causing fresh sleeve to be provided from said reserve amount of sleeve at a rate governed by the rate of retention of solids within the sleeve behind its said closed one end.

5,439,599

# PROCESS FOR TREATING PHOTOGRAPHIC EFFLUENTS BY MEANS OF ULTRAVIOLET RADIATION AND HYDROGEN PEROXIDE

Guy M. Gehin, Ozoir-La-Ferrière, and Oliver A. G. Caillaud, Chalon-Sur-Saône, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 22, 1994, Ser. No. 231,216

Claims priority, application France, Apr. 30, 1993, 93 05412 Int. Cl.<sup>6</sup> C02F 1/48

U.S. Cl. 210—748

12 Claims

1. Process for eliminating organic compounds in aqueous photographic effluents with a chemical oxygen demand (COD) greater than 5 g/l and thereby reduce the COD of said effluents to a desired level, by means of irradiation with ultraviolet light in the presence of hydrogen peroxide comprising subjecting the aqueous photographic effluents ultraviolet light coming from a polychromatic source, the quantity of light energy provided by this source being sufficient to allow the desired reduction in COD; the quantity of oxygen provided by the hydrogen peroxide expressed in grams per liter being between 0.5 and 3 times the COD of the effluent to be treated; and the pH of the treatment being equal to or less than 10.5.

5,439,600

# APPARATUS AND METHOD FOR REMOVAL OF FLOATING DEBRIS

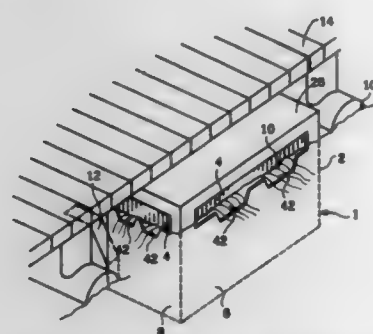
Louis W. Paoz, 2947 Calle Frontera, San Clemente, Calif. 92672

Filed Feb. 7, 1992, Ser. No. 832,795

Int. Cl.<sup>6</sup> C02F 1/40

U.S. Cl. 210—776

20 Claims



13. A method for collecting debris floating on a water surface of a marina or harbor, said method which comprises: selecting a pumping means for maintaining a substantially constant flow of water; disposing said pumping means within an openable body; placing said openable body within said marina or harbor, said openable body having at least one side wall with a plurality of inlet openings therethrough having at least one weir notch; attaching said openable body to a dock or floating platform

so that said plurality of inlets at a surface water level of said water surface; pumping water out of said openable body at a pumping rate so that an interior water level within said body is lower than said surface water level whereby water containing said debris is drawn toward and into said openable body through said plurality of inlets; and collecting said debris with a collection means disposed within said openable body.

5,439,601

# METHOD OF FILTERING USING A COMMERCIAL FILTERING SYSTEM

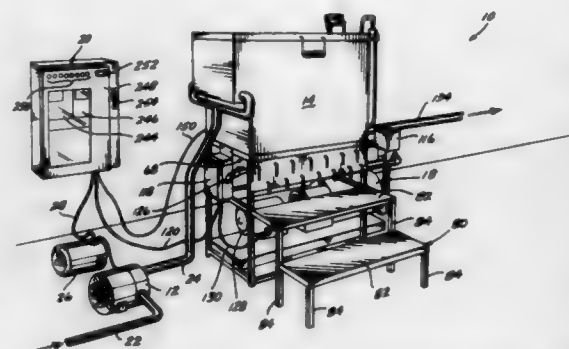
Sidney A. Burkland, Bothell, and Terry D. Olson, Auburn, both of Wash., assignors to Filtercorp Partners L.P., Woodinville, Wash.

Division of Ser. No. 827,944, Jan. 29, 1992, Pat. No. 5,330,638, which is a continuation-in-part of Ser. No. 695,580, May 3, 1991, Pat. No. 5,143,604, which is a continuation-in-part of Ser. No. 527,566, May 22, 1990, Pat. No. 5,075,000. This application Nov. 18, 1993, Ser. No. 154,923

Int. Cl.<sup>6</sup> B01D 41/04

U.S. Cl. 210—798

18 Claims



1. A method of filtering a contaminated fluid housed within a supply source, the method including the steps of: (a) withdrawing the contaminated fluid from the supply source; (b) introducing a first flow of the contaminated fluid into a filter tank; (c) drawing the contaminated fluid under vacuum through a plurality of filter pads disposed within the filter tank to yield a filtered fluid, said drawing step defining a forward direction of flow; (d) returning a second flow of filtered fluid from the filter tank to the supply source, said first flow being substantially matched to said second flow; (e) periodically reversing flow through the plurality of filter pads upon the occurrence of a first filtering process condition; and (f) periodically interrupting flow through the plurality of filter pads upon the occurrence of a second filtering process condition.

5,439,602

# OVERBASED SULFONATES COMBINED WITH PETROLEUM OXIDATES FOR METAL FORMING

Alan D. Eckard, Chester, N.Y., and Igor Riff, Chatham, N.J., assignors to Witco Corporation, Greenwich, Conn.

Filed Jul. 6, 1994, Ser. No. 271,153

Int. Cl.<sup>6</sup> C10M 107/02

U.S. Cl. 252—18

39 Claims

1. An oil-soluble non-gelling composition of matter comprising (a) petroleum oxidate comprising the product that is produced by oxidizing petroleum feed material with an ox-

dizing agent and having a total acid number no greater than 35; and (b) overbased calcium sulfonate having a total base number of at least about 150 and a strong total base number less than 10; wherein the weight ratio of component (a) to component (b) is 10:1 to 1:10 wherein said composition of matter is free of, or contains no more than trace amounts of, carboxylic acids containing 8 or fewer carbon atoms.

5,439,603

# LUBRICATING OIL ADDITIVES, THEIR PREPARATION AND USE

William D. Carlisle, Hull, England, assignor to BP Chemicals (Additives) Limited, London, England

Continuation of Ser. No. 674,654, Mar. 25, 1991, abandoned.

This application Apr. 19, 1993, Ser. No. 49,068

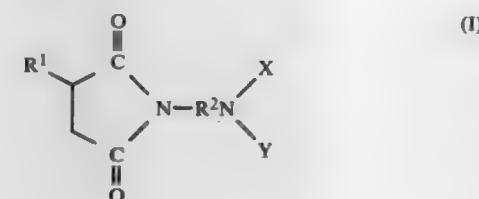
Claims priority, application United Kingdom, Mar. 31, 1990, 9007335

Int. Cl.<sup>6</sup> C10M 133/56

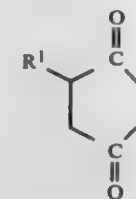
U.S. Cl. 252—51.5 A

11 Claims

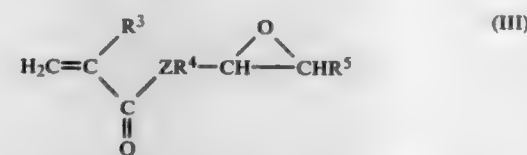
1. A lubricating oil soluble compound suitable for use as a dispersant additive which compound is obtainable by reacting at a temperature above ambient and below the decomposition temperature of any of the components of the reaction mixture a dispersant having at least one reactive nitrogen-containing moiety selected from the group consisting of (i) succinimides of the formula (I):



wherein R<sup>1</sup> is a polyalkene group having more than 30 carbon atoms and R<sup>2</sup> is a divalent group derived such that H<sub>2</sub>NR<sup>2</sup>XY is alkylene amine, an alkanolamine, a polyetheramine or an aromatic or araliphatic amine, and X and Y are independently hydrogen, an alkyl group or a hydroxyalkyl group or together form a group:



and (ii) long chain hydrocarbons having a polyamine attached directly thereto, with an epoxyacrylate having the formula (III):



wherein R<sup>3</sup> and R<sup>5</sup> are independently either hydrogen, a hydrocarbyl or a hetero-substituted hydrocarbyl group, R<sup>4</sup> is a alkylene, alkylene glycol, aryl or a group containing at least one of an acrylate, acrylamide or oxirane group, and Z is oxygen or =NR<sup>6</sup> where R<sup>6</sup> is hydrogen or an alkyl group, the dispersant being reacted with epoxyacrylate having the formula (III) in two or more sequential steps, in a first step reacting the dispersant with the epoxyacrylate using at least 0.75

equivalents of the epoxyacrylate for each amino hydrogen present in the dispersant, and in a subsequent step, or steps, reacting the product from the preceding step with further dispersant using from 0.5 to 15 equivalents of dispersant per equivalent of dispersant used in the first step.

5,439,604

# OIL SOLUBLE ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

Malcolm Waddoups, Westfield; Jacob Emert, Brooklyn, both of N.Y.; Antonio Gutierrez, Mercerville, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 335,644, Apr. 10, 1989, abandoned, which is a continuation of Ser. No. 940,984, Dec. 12, 1986, abandoned. This application Jan. 14, 1994, Ser. No. 182,875

Int. Cl.<sup>6</sup> C10M 129/26

U.S. Cl. 252—32.7 E

38 Claims

1. A composition comprising: (a) a nitrogen- or ester-containing dispersant material selected from the group of (i) dispersant derived from reaction of an amine compound or a hydroxy compound and a hydrocarbyl substituted monounsaturated mono- or dicarboxylic acid producing reaction product formed by reacting olefin polymer of C<sub>2</sub> to C<sub>10</sub> monoolefin having a number average molecular weight greater than about 900 and acrylic acid or a C<sub>4</sub> to C<sub>10</sub> monounsaturated mono- or dicarboxylic acid material or, (ii) a high molecular weight Mannich base dispersant derived from a hydrocarbyl substituted mono- or polyhydroxy benzene having a molecular weight greater than about 1,000, (b) a high total base number detergent material, (c) a zinc dihydrocarbyl dithiophosphate antiwear material, (d) a compatibilizing material of a copper salt of a hydrocarbyl substituted monounsaturated mono- or dicarboxylic acid producing reaction product, which reaction product is formed by reacting olefin polymer of C<sub>2</sub> to C<sub>10</sub> monoolefin having a number average molecular weight greater than about 700 and acrylic acid or a C<sub>4</sub> to C<sub>10</sub> monounsaturated mono- or dicarboxylic acid material, and (e) a copper antioxidant.

5,439,605

# PHOSPHORUS AND PHOSPHORUS-FREE LOW AND LIGHT ASH LUBRICATING OILS

Behrooz A. Khorramian, 130 Woodridge Pl., Leonia, N.J. 07609

Continuation-in-part of Ser. No. 70,854, Jun. 3, 1993, Pat. No. 5,346,635. This application Oct. 12, 1993, Ser. No. 134,674

Int. Cl.<sup>6</sup> C10M 141/08, 141/10

U.S. Cl. 252—33.3

18 Claims

1. A lubricating oil comprising: a. about 80% of an oil selected from the group consisting of a semisynthetic base oil and a synthetic base oil; b. about 1 to about 3% of a magnesium salt of an alkylated aryl sulfonic acid or calcium salt of benzene sulfonic acid; c. about 0.0005% of a compounded silicone fluid; d. about 0.05 to about 0.10% of 1H-Benzotriazole-1-Methanamine N,N-bis(2-Ethyl Hexyl)-Methyl; e. about 0.05 to about 0.1% of a 2,5-dimercapto-1,3,4-thiadiazole derivative; f. about 0.50% of a diethanolamine derivative; g. about 9 to about 10% of an ethylenepropylene copolymer or about 4 to about 8% of a hydrogenated polyisoprene radial polymer; h. about 6.5 to about 10% of a dispersant selected from the group consisting of borated polyisobutenyl succinic anhydride; ethylenepolyamine reacted with polybutenyl succinic anhydride; and a polyisobutenyl succinate ester; i. about 0.3% of a dialkyl fumarate/vinyl acetate copolymer or about 0.1 to about 0.2% of a polymethacrylate; and j. about 0.05% of a rust inhibitor selected from the group

consisting of (tetrapropenyl)-butanedioic acid, monoester with 1,2-propanediol (tetrapropenyl)-butanedioic acid wherein said the lubricant oil is absolutely free of ZDTP or metal DTPs.

5,439,606

# MODIFIED SUCCINIMIDE OR SUCCINAMIDE DISPERSANTS AND THEIR PRODUCTION

Andrew G. Papay, Manchester, Mo., assignor to Ethyl Petroleum Additives, Inc., Richmond, Va.

Continuation of Ser. No. 114,381, Aug. 30, 1993, abandoned, which is a division of Ser. No. 766,127, Sep. 27, 1991, Pat. No. 5,256,324, which is a division of Ser. No. 601,240, Oct. 22, 1990, abandoned, and a division of 313,021, Feb. 21, 1989, 5,164,103, which is a continuation-in-part of Ser. No. 167,875, Mar. 14, 1988, Pat. No. 4,855,074. This application Oct. 7, 1994, Ser. No. 320,844

The portion of the term of this patent subsequent to Nov. 17, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> C10M 153/00, 137/00

U.S. Cl. 252-49.9

15 Claims

1. An automatic transmission fluid having a viscosity in the range of 6.5 to 8.5 cSt at 100° C. and comprising a major amount of lubricating oil and a minor amount of a phosphorus-containing succinimide or succinamide formed by a process which comprises contacting a partially hydrolyzed phosphorus ester and a succinimide or succinamide dispersant such that phosphorus-containing succinimide or succinamide is formed.

5,439,607

# MULTIFUNCTIONAL VISCOSITY INDEX IMPROVER-DISPERSANT ANTIOXIDANT

Abhimanyu O. Patil, Westfield, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 30, 1993, Ser. No. 175,917

Int. Cl.<sup>6</sup> C10N 145/00

U.S. Cl. 252-51.5 R

9 Claims

1. Oil soluble additive, useful as a viscosity index improver-dispersant exhibiting improved antioxidant properties for oleaginous compositions, comprising the reaction products of:

- an oil soluble ethylene copolymer comprising from about 15 to 90 wt. % ethylene and from about 10 to 85 wt. % of at least one C<sub>3</sub> to C<sub>28</sub> alpha-olefin, having a number average molecular weight of from about 20,000 to 500,000, grafted with an ethylenically unsaturated carboxylic acid material having 1 or 2 acid or anhydride moieties;
- organic polyamine having at least two primary amino groups;
- an aldehyde;
- a hydroxy aromatic reactant containing at least one -OH group attached to the aromatic ring; and
- a hydrocarbyl substituted dicarboxylic acid material.

5,439,608

# METHODS FOR THE COLLECTION AND IMMOBILIZATION OF DUST

Nicholas Kondrats, 5702 Cathedral Oaks Rd., Santa Barbara, Calif. 93117

Filed Jul. 12, 1993, Ser. No. 90,426

Int. Cl.<sup>6</sup> C09K 3/22

U.S. Cl. 252-88

10 Claims

1. A method of preparing a substantially airborne-dust-free room, comprising the steps of:

- applying a substantially continuous layer of a surface coating composition to the floor of the room, said coating including one part of a surface coating concentrate containing:
  - between 5 and 20%, by weight of said concentrate, of a cationic surfactant;
  - a mixture containing between 1 and 5%, by weight of said concentrate, of a glycol ether and between 10 and 20%, by weight of said concentrate, of mineral oil; and
  - the balance being water;

and between 10 and 40 parts water.

5,439,609

# AQUEOUS CLEANING COMPOSITION FOR HARD SURFACES

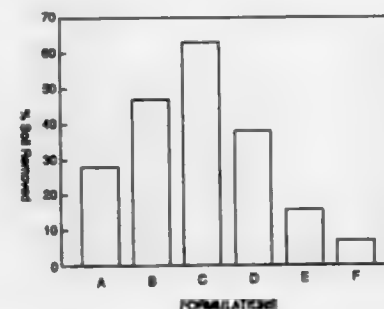
Leon E. Paszek, Mountainside, N.J., assignor to Reckitt & Colman Inc., Montvale, N.J.

Filed Dec. 28, 1993, Ser. No. 174,078

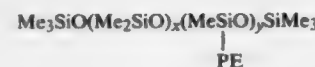
Int. Cl.<sup>6</sup> C11D 3/37, 3/075

U.S. Cl. 252-174.15

10 Claims



1. An aqueous cleaning composition comprising:
- from about 0.1 weight % to about 5 weight % of a siloxane block polymer structurally represented by the formula:



wherein PE is  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{O}(\text{PO})_n\text{Bu}$ , PO is 1,2-propyleneoxy, Bu is butyl and the coefficients x, y and n are positive integers such that said siloxane block polymer has a molecular weight ranging from about 3000 to about 4000;

- from about 0.1 weight % to about 5 weight % of a C<sub>9</sub>-C<sub>15</sub> ethoxylate;
- from about 1 weight % to about 10 weight % of a C<sub>4</sub>-C<sub>9</sub> alkylene glycol C<sub>1</sub>-CH<sub>3</sub> monoalkyl ether; and
- from about 5 weight % to about 15 weight % of a chelating agent, wherein all weight percentages used herein represent active ingredient weight percentages based on the total weight of the aqueous composition.

5,439,610

# CARPET CLEANER CONTAINING FLUORINATED SURFACTANT AND STYRENE MALEIC ANHYDRIDE POLYMER

Tracy A. Ryan, River Vale, and Catherine A. Pitserski, Saddle Brook, both of N.J., assignors to Reckitt & Colman Inc., Wayne, N.J.

Continuation of Ser. No. 139,240, Oct. 19, 1993, abandoned. This application Sep. 16, 1994, Ser. No. 308,067

Int. Cl.<sup>6</sup> C11D 3/37, 3/60; D06B 1/00; D06M 13/244

U.S. Cl. 252-174.23

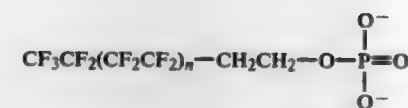
11 Claims

1. An aqueous cleaning composition having a pH level falling within a range of from about 4 to about 9.5 comprising:

- from about 0.75% to about 1.15% by weight of sodium lauryl sulfate;
- from about 0.65% to about 0.85% by weight ethylene glycol monohexyl ether;
- from about 0.025% to about 0.17% by weight of a fluorinated surfactant selected from a mixture of (i) a perfluoropropionate of the Formula I



wherein n is an integer having a value of 6 to 12; and (ii) a perfluoroalkyl phosphate of formula II



MONO/BIS-DIETHANOLAMINE SALT

wherein n is an integer having a value of 6 to 12; and the weight ratio of (i) to (ii) being from about 1:1 to about 1:2;

- from about 0.025% to about 0.05% by weight of a styrene maleic anhydride polymer; and wherein the weight ratio of (c) to (d) is about 2.7:1; and
- from about 0.3% to about 0.45% by weight of a chelating agent selected from the group consisting of diethylenetriaminepentaacetic acid, ethylenediaminetetraacetic acid, N-hydroxyethylethylenediaminetriacetic acid, sodium or potassium salts thereof, and mixtures thereof, wherein said weight percentages are based on the total active ingredient weight of the aqueous composition.

5,439,611

# STABILIZATION OF HYDROXYALKYLIDENE PHOSPHONATE SCALE INHIBITORS AGAINST DEGRADATION BY BROMINE AND CHLORINE BIOCIDES

Ann M. Sherbondy, Pittsburgh, and Daniel P. Vanderpool, Coraopolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 880,113, May 7, 1992, abandoned. This application Oct. 21, 1994, Ser. No. 327,211

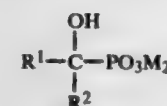
Int. Cl.<sup>6</sup> C02F 5/10, 5/14

U.S. Cl. 252-180

17 Claims

1. An aqueous system containing scale-forming salts and characterized by high calcite saturation wherein the pH is from 6.0 to 10.0, and further characterized by the presence of a biocide therein comprising chlorine or bromine or mixtures thereof;

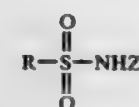
said aqueous system further containing, in an amount sufficient to establish a concentration of from 10 to 50 mg/L, of a hydroxyalkylidene phosphonate of the formula:



where M is hydrogen or a suitable cation; and R<sup>1</sup> and R<sup>2</sup> may be the same or different and each is independently selected from:

- hydrogen; H;
- carboxylic acid and alkyl esters:  $-\text{COOR}^3$ , where R<sup>3</sup> is hydrogen or C<sub>1-4</sub>alkyl;
- C<sub>1-4</sub>alkoxy;
- phosphonate/alkylene phosphonate:  $(\text{CH}_2)_n\text{PO}_3\text{M}_2$ , where n is 0-4;
- C<sub>1-4</sub>alkyl, optionally monosubstituted by R<sup>4</sup>, where R<sup>4</sup> is hydroxyl, carboxyl and C<sub>1-4</sub>alkyl esters thereof, and C<sub>1-4</sub>alkoxy;
- phenyl and phenylC<sub>1-4</sub>alkyl, optionally monosubstituted by R<sup>4</sup>, where R<sup>4</sup> is as defined above;

said phosphonate being subject to degradation by said biocide, wherefore said aqueous system also further contains an organic sulfonamide stabilizing composition for inhibiting said degradation comprising a compound of the formula:



wherein:

- Z is selected from hydrogen; and alkali and alkaline earth metal salt-forming ions; and
- R is methyl, phenyl, or phenyl substituted by methyl; sufficient to provide a concentration ratio, based on equivalent weights, of organic sulfonamide to chlorine, bromine or mixture thereof of from 0.5:1 to 2.0:1, respectively.

5,439,612

# CYCLOHEXYLPHENYLPYRIMIDINES, PROCESS FOR THEIR PREPARATION, AND THEIR USE IN LIQUID-CRYSTALLINE MIXTURES

Gerd Illian, Frankfurt am Main; Rainer Wingen, Hattersheim am Main, and Ingrid Müller, Niedernhausen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 765,551, Sep. 25, 1991, Pat. No. 5,200,521.

This application Aug. 19, 1992, Ser. No. 932,065

Claims priority, application Germany, Sep. 27, 1990, 40 30 579.1

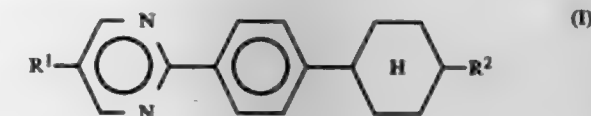
The portion of the term of this patent subsequent to Apr. 6, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> C09K 19/34; G02F 1/13

U.S. Cl. 252-299.61

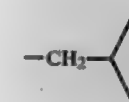
11 Claims

1. A ferroelectric liquid-crystalline mixture, which comprises from 0.1 to 25 mol-% of at least one cyclohexylphenylpyrimidine of the formula (I)



in which

R<sup>1</sup> is straight-chain or branched, chiral or achiral alkyl or alkenyl having 2 to 16 carbon atoms, in which one or two nonadjacent  $-\text{CH}_2-$  groups may be replaced by  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{CO}-$ ,  $-\text{COO}-$ ,  $-\text{OCO}-$ ,  $-\text{Si}(\text{CH}_3)_2-$  or  $-\text{C}(\text{CH}_3)_2-$ , and in which one or more hydrogen atoms of the alkyl or alkenyl radical may also be replaced by fluorine atoms, and in which the terminal CH<sub>3</sub> group of the alkyl may also be replaced by



R<sup>2</sup> is straight-chain or branched, chiral or achiral alkyl having 1 to 10 carbon atoms.

5,439,613

# LIQUID CRYSTAL COMPOSITION

Fusayuki Takeshita, Shigaken; Taku Hirose, Chibaken; Kanetsugu Terashima, Shigaken, and Shinichi Sawada, Chibaken, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Dec. 27, 1993, Ser. No. 173,068

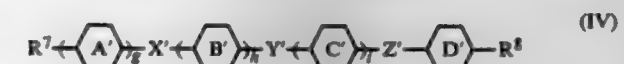
Claims priority, application Japan, Dec. 28, 1992, 4-360271

Int. Cl.<sup>6</sup> C09K 19/30, 19/32, 19/12; G02F 1/13

U.S. Cl. 252-299.63

8 Claims

1. A liquid crystal composition consisting essentially of at least one achiral compound expressed by the following formula (IV):

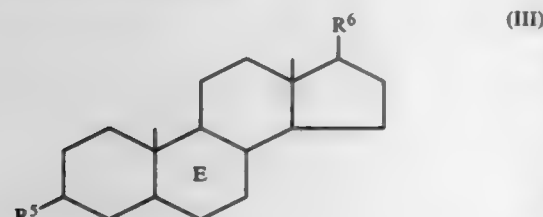


wherein six-membered rings A', B', C' and D' each independently represent trans-1,4-cyclohexylene, 1-cyclohexene-1,4-

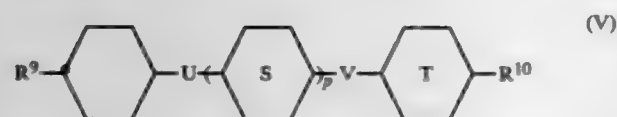


diyl or 1,4-phenylene; g, h and i each represent 0 or 1;  $(g+h+i) \leq 1$ ; X', Y' and Z' each independently represent a single bond,  $-\text{CH}_2\text{CH}_2-$ ,  $-\text{CH}=\text{CH}-$  or  $-\text{C}=\text{C}-$ ; R<sup>7</sup> represents  $-\text{C}_n\text{H}_{2n+1}$ ,  $-\text{C}_n\text{H}_{2n-1}$  or  $-\text{C}_n\text{H}_{2n+1}\text{OC}_k\text{H}_{2k}$ ; R<sup>8</sup> represents  $-\text{C}_m\text{H}_{2m+1}$ ,  $-\text{C}_m\text{H}_{2m-1}$ , F,  $\text{CHF}_2\text{O}-$  or  $\text{CF}_3\text{O}-$ ; n and m each independently represent an integer of 1 to 18; k represents an integer of 1 to 17;  $(n+k)$  represents an integer of 2 to 18; at least one of X', Y' and Z' represents a single bond; when ring D' represents 1,4-phenylene and R<sup>8</sup> represents F,  $\text{CHF}_2\text{O}-$  or  $\text{CF}_3\text{O}-$ , H at its ortho-position relative to R<sup>8</sup> may be replaced by F; and when g represents 1 and ring B' or C' represents 1,4-phenylene, H at the side position of the ring may be replaced by F; and

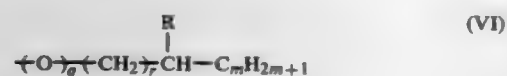
at least one chiral compound selected from the group consisting of optically active compounds expressed by the following formulas (III) and (V):



wherein R<sup>5</sup> represents H, F,  $-\text{C}_n\text{H}_{2n+1}$ ,  $-\text{C}_n\text{H}_{2n+1}\text{O}-$ ,  $-\text{C}_n\text{H}_{2n+1}\text{COO}-$ ,  $-\text{C}_n\text{H}_{2n+1}\text{OCO}-$ ,  $-\text{C}_n\text{H}_{2n-1}$ ,  $-\text{C}_n\text{H}_{2n-1}\text{O}-$ ,  $-\text{C}_n\text{H}_{2n-1}\text{COO}-$ ,  $-\text{C}_n\text{H}_{2n-1}\text{OCO}-$ ,  $-\text{C}_n\text{H}_{2n+1}-\text{Ph}-\text{COO}-$  or  $-\text{C}_n\text{H}_{2n+1}-\text{Ph}-\text{OCO}-$  wherein n represents an integer of 1 to 18 and Ph represents 1,4-phenylene; R<sup>6</sup> represents H,  $-\text{C}_n\text{H}_{2n+1}$  or  $-\text{C}_n\text{H}_{2n-1}$  wherein n represents an integer of 1 to 18; and ring E represents a condensed ring having only one double bond at its 5-6, 6-7 or 7-8 position or a condensed ring wherein the hydrogen atom(s) at its 5- or 6-position may be replaced by an alkyl group or an alkoxy group of 1 to 18 carbon atoms;



wherein six-membered rings S and T each represent trans-1,4-cyclohexylene or 1,4-phenylene; when ring T represents 1,4-phenylene, then H at its 2- or 3-position may be replaced by F; p represents 0 or 1; U and V each represent a single bond or  $-\text{C}_2\text{H}_4-$ , but are not simultaneously  $-\text{CH}_2\text{CH}_2-$ ; R<sup>9</sup> represents  $-\text{C}_n\text{H}_{2n+1}$ ; n represents an integer of 1 to 18; R<sup>10</sup> is expressed by the following partial formula (VI):



wherein q and r each independently represent 0 or 1; m represents an integer of 2 to 12; and R represents F or  $\text{CH}_3-$ .

**5,439,614**  
**OXIDATION INHIBITED FLUID COMPOSITIONS**  
John S. McConaghy, Jr., St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.  
Filed Aug. 30, 1990, Ser. No. 575,511  
Int. Cl.<sup>6</sup> B01J 13/00; C09K 5/00, 15/32; C10M 129/34  
U.S. Cl. 252-308 22 Claims

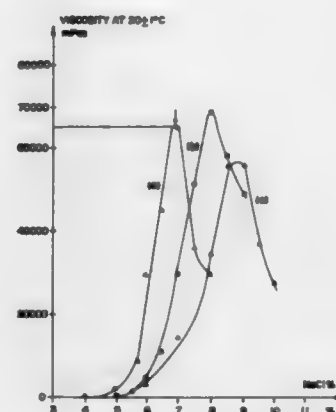
1. A fluid composition comprising a colloidal dispersion of:  
(a) an aromatic ether represented by the formula



wherein R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> independently are phenyl biphenyl, and terphenyl and n is an integer of from zero (0) to 5, and

(b) an oxidation inhibiting amount of an alkali metal salt of oxalic acid, the fluid composition being characterized by being transparent when subjected to visual inspection with white light shining through the fluid composition at a 180° angle to the line of sight.

**5,439,615**  
**THICKENED CLEANER COMPOSITIONS**  
Ginette Lefebvre, Bosc Roger en Roumois, and Line Fiquet, Rouen, both of France, assignors to Witco Corporation, Greenwich, Conn.  
Filed Dec. 15, 1993, Ser. No. 167,773  
Int. Cl.<sup>6</sup> C11D 3/32, 7/32  
U.S. Cl. 252-548 9 Claims



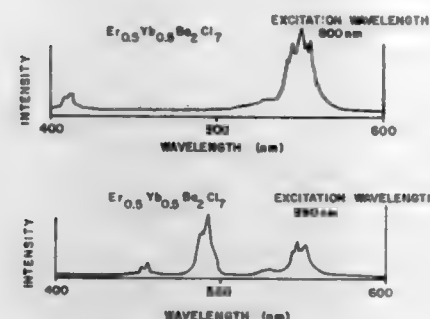
1. A thickened fluid cleaner composition comprising: a dilute aqueous solution of at least one surface active agent and a thickening agent, in an amount from about 0.05% to about 5.0% by weight based on the total weight of the composition, comprising a mono N-beta-hydroxyalkyl-amide of a branched fatty acid having at least 16 carbon atoms.

**5,439,616**  
**INFRARED LIGHT-EXCITED LIGHT-EMITTING SUBSTANCE**  
Shoji Ishiwata; Etsuji Kimura; Michihiro Tanaka; Yasuhiro Hanaue; Yuhu Wang; Shinobu Nagahama, and Naruhito Sawanobori, all of Saitama, Japan, assignors to Mitsubishi Materials Corporation, Japan  
Filed Aug. 3, 1994, Ser. No. 285,050  
Claims priority, application Japan, Aug. 6, 1993, 5-214935  
Int. Cl.<sup>6</sup> G02B 5/20; C09K 11/08  
U.S. Cl. 252-584 13 Claims

1. An infrared light-excited light-emitting substance expressed by a general formula given by

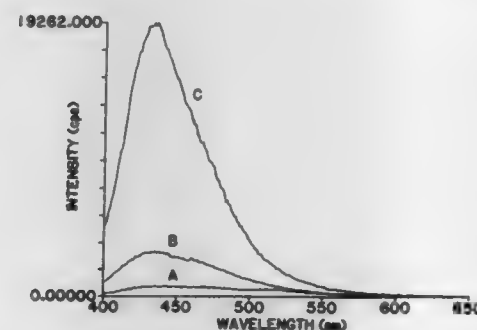


where R<sub>1</sub> is at least one light-emitting rare-earth element x, satisfies a relation  $0.01 < x \leq 1$ , R<sub>2</sub> is at least one emission-



assisting rare-earth element, and z satisfies a relation  $1 < z < 4$ .

**5,439,617**  
**POLYMERIC PHOSPHONIUM SALTS PROVIDING ENHANCED CHEMILUMINESCENCE FROM 1,2-DIOXETANES**  
Hashem Akhavan-Tafti, Sterling Heights, Mich., assignor to Lumigen, Inc., Southfield, Mich.  
Division of Ser. No. 855,537, Mar. 20, 1992. This application Feb. 14, 1994, Ser. No. 195,100  
Int. Cl.<sup>6</sup> C09K 3/00  
U.S. Cl. 252-700 27 Claims



1. A composition which comprises:  
(a) a stable 1,2-dioxetane; and  
(b) a poly(vinylLinktriAylphosphonium group)-containing polymer wherein Link is a linking group between the polymer and the phosphonium cation containing 1 to 20 carbon atoms and A is selected from the group consisting of alkyl containing 1 to 20 carbon atoms and alkyl and aralkyl groups each containing 1 to 20 carbon atoms wherein enhanced chemiluminescence is produced in a solution or on a surface in the presence of a sufficient quantity of the polymer compared to the chemiluminescence obtained in the absence of the polymer.

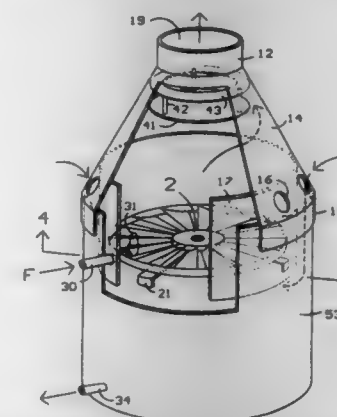
**5,439,618**  
**TURBINE WATER ATOMIZER**  
Michael A. Trapasso, 3580 1st Ave. SW., Naples, Fla. 33964  
Filed Aug. 9, 1994, Ser. No. 288,183  
Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261-25 5 Claims  
1. A water atomizer for cooling, aeration, and gas scrubbing, comprising:  
(a) any number of multiple blade fans of suitable size and blade arrangement  
(b) support brackets with attached fan shafts  
(c) high velocity water nozzles of a predetermined specification attached to feed water inlet pipes  
(d) a conically shaped tower cap with the large open end of

said conically shaped tower cap being the inlet at the bottom, and attached and covering the top of a vertical cylindrical tank or tower, with the smaller end of the tower cap having a circular exhaust opening of sufficient size to allow air or gasses to exit through said exhaust opening at the top

(e) a cylindrical fan shroud of smaller diameter than said vertical tank or tower, placed concentric with the towers centerline inside the tower cap, with said cylindrical fan shroud being attached and sealed around its upper edge to the inside sloping conical walls of the tower cap

(f) means for attaching said support brackets directly to the inner walls of the cylindrical fan shroud, with said fan shafts positioned vertically and with said multiple blade



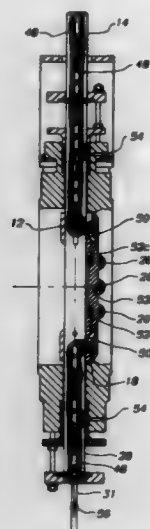
fans mounted on and free to rotate about the fan shafts in the horizontal plane of the tank or tower

(g) means for positioning said water nozzles below the fans and pointed upward at a specific predetermined angle relative to sloping fan blades, thus permitting feed water exiting the nozzles to propel and rotate the fans by deflecting off the bottom of said sloping fan blades into the tower cap above said rotating fans, and further allowing said feed water to become atomized water droplets by falling downward from gravitational forces into the rotating fan blades and deflecting back up into the tower cap, which further permits air or gasses being propelled upward by the rotating fan to travel through said atomized water droplets.

**5,439,619**  
**STEAM CONDITIONING BUTTERFLY VALVE**  
Max Küffer, Blue Bell, Pa., assignor to Keystone International Holdings Corp., Wilmington, Del.  
Filed Dec. 9, 1993, Ser. No. 164,371  
Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261-41.4 8 Claims  
1. A steam conditioning valve for use in a steam line to reduce pressure and temperature in a flow of superheated steam by supplying water from a water source including water valve means, which valve comprises  
a valve body defining a valve seat;  
a pivotal disc valve member, including an upstream face and a downstream face, attached to a valve shaft;  
the valve shaft rotating the valve member between a fully open position, where the upstream face is substantially parallel to the flow of steam through the steam line, and a fully closed position, where the upstream face is substantially perpendicular to the flow of steam through the steam line, the valve member forming a pressure tight seal against the valve seat when it is in a fully closed position; the valve member having at least one water feed nozzle in its downstream face for delivering water into the flow of steam when the valve is in at least a partially open position;

wherein water is supplied to the water feed nozzle through a water supply line within the valve shaft, the flow of water from a water source to the water feed nozzle being controlled by water valve means; and



said valve member containing a channel in its periphery which is an extension of said water supply line, each of said water supply nozzles being in communication with said channel.

5,439,620

#### LIQUID DISTRIBUTOR TO BE USED IN SUBSTANCE AND/OR HEAT EXCHANGING

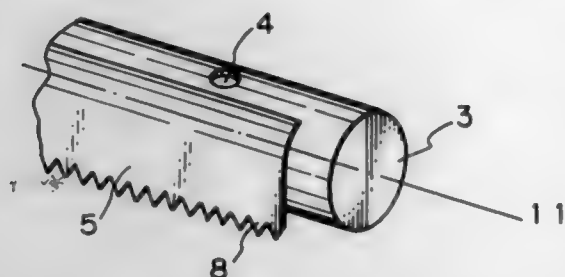
Yutaka Maeda, Yokohama, Japan, assignor to Mitsubishi Corporation, Tokyo, Japan, a part interest

Filed Jan. 12, 1994, Ser. No. 180,656

Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261-97

19 Claims



1. A liquid distributor for use in a substance and/or heat exchanging tower, the liquid distributor comprising: a plurality of distributing tubes for distributing and supplying a liquid to be treated from an upper part of an inside portion of the tower to an area of the inside of said tower, said plurality of distributing tubes extending along a lateral axis of said tower, and said distributing tubes each having at least one nozzle hole provided on a top surface thereof; and a sheet-like material fixed on a surface of each of said distributing tubes at a position lower than said at least one nozzle hole such that said sheet-like material contacts the surface of said distributing tube and liquid discharges from said nozzle hole above said material; said sheet-like material extending in an axial direction of said distributing tube and said sheet-like material having a lower end which is spaced apart from the surface of said distributing tube; and said sheet-like material having zigzag notches formed on said lower end thereof; and wherein at least one of (i) a side part of said distributing tube

located lower than said at least one nozzle hole and (ii) an upper part of said sheet-like material, having a surface which is inclined in a direction which is inclined relative to the axis of said distributing tube.

5,439,621

#### METHOD OF MAKING AN ARRAY OF VARIABLE FOCAL LENGTH MICROLENSSES

Timothy L. Hoopman, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

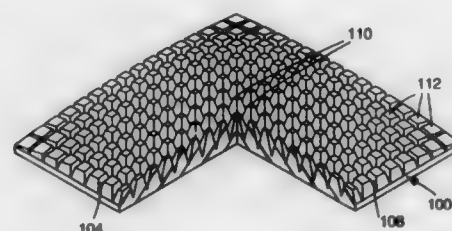
Continuation of Ser. No. 46,067, Apr. 12, 1993, abandoned. This application Dec. 8, 1993, Ser. No. 164,310

The portion of the term of this patent subsequent to Apr. 5, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B29D 11/00

U.S. Cl. 264-2.5

8 Claims



1. A method of making a mold for forming an array of microlenses having variable focal lengths, comprising: (a) forming an array of receptacles having generally polygonal apertures, wherein the receptacles are not all of equal depth; (b) applying a shrinkable, hardenable liquid to the array of receptacles so that the receptacles are substantially filled with the liquid, whereby a plurality of menisci are formed in the receptacles; and (c) shrinking and hardening the liquid to form a plurality of concave lens mold surfaces in the receptacles, wherein deeper concave lens surfaces will result from deeper receptacles and shallower concave lens surfaces will result from shallower receptacles, thereby forming a mold capable of forming a microlens array having variable focal lengths.

5,439,622

#### METHOD AND APPARATUS FOR PRODUCING MOLDED PARTS

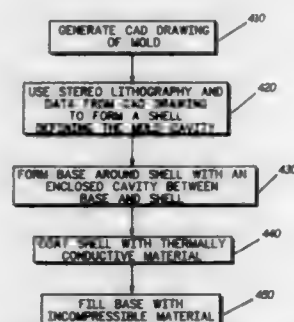
Robert W. Pennisi, Boca Raton, and Glenn W. Urbish, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 7, 1993, Ser. No. 116,632

Int. Cl.<sup>6</sup> B29C 33/48, 33/56

U.S. Cl. 264-22

15 Claims



1. A method of constructing a mold, comprising the steps of: directly applying stereolithography to form a shell having a back surface and a mold surface;

directly applying stereolithography to form a shell base integral to the shell by extending the shell to define an enclosed cavity about the back surface of the shell; filling the enclosed cavity with a substantially incompressible material.

5,439,623

#### METHOD FOR INTRODUCING ADDITIVES INTO AN EXTRUDER

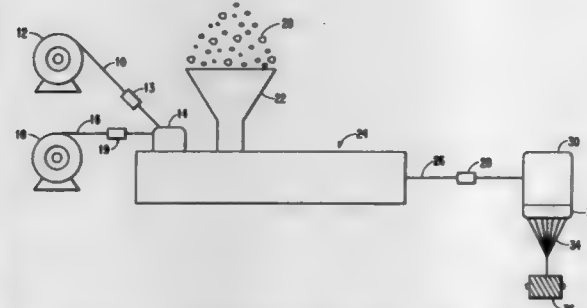
William A. Fintel, Lewes, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 29, 1994, Ser. No. 236,749

Int. Cl.<sup>6</sup> B29C 47/92; D01F 1/04

U.S. Cl. 264-40.1

14 Claims



1. A method for introducing additives into an extruder for making thermoplastic shaped articles comprising the steps of feeding additives in the form of a plurality of strands to a cutter, wherein each strand is cut into pellets, and then feeding said pellets to the extruder, wherein the feeding of the strands to the cutter is controlled by the steps comprising:

- calculating a feed rate for each strand, said feed rate being different for at least two of the strands;
- calculating a velocity for each strand, said velocity being the same for each strand;
- calculating a delta position for each strand per feed interval, said delta position being different for at least two of the strands; and
- feeding each strand at the calculated velocity for the time needed to move the calculated delta position per feed interval.

5,439,624

#### METHOD FOR FORMING POROUS CERAMIC MATERIALS

Marc A. Anderson, and Lixin Chu, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 14, 1994, Ser. No. 196,341

Int. Cl.<sup>6</sup> C04B 38/00

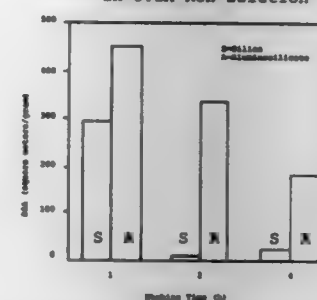
U.S. Cl. 264-66

18 Claims

1. A method of making a porous ceramic material, the method comprising the steps of: providing an acidified silica sol comprising particles of silicon dioxide, each of said particles having a surface comprising silicon and oxygen; combining the acidified sol with a sufficient amount of a solution comprising cations of a metal wherein a fraction of the silicon at the surface of each of the silicon dioxide

particles is replaced by cations of the metal to form a substituted sol;

Specific Surface Area of Aluminosilicate and Silica Gels in 0.1M KOH solution



drying the substituted sol to form a gel; and firing the gel until a porous ceramic material is formed.

5,439,625

#### TRACK CROSSING INSTALLATION, MOLDED BODY FOR A TRACK CROSSING INSTALLATION AND METHOD FOR PRODUCING A MOLDED BODY FOR A TRACK CROSSING INSTALLATION

Peter Schmidt, and Peter Michalkiewicz, both of Waldkraiburg, Germany, assignors to Gummiwerk Kraiburg Development GmbH, Waldkraiburg, Germany

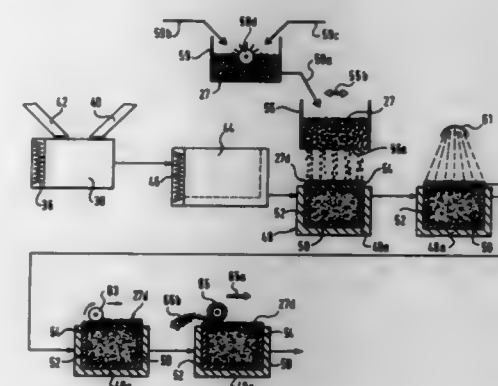
Continuation-in-part of Ser. No. 44,130, Apr. 7, 1993, abandoned. This application Dec. 9, 1993, Ser. No. 164,378

Claims priority, application Germany, Sep. 2, 1992, 42 29 289.1; European Pat. Off., Sep. 2, 1993, 93114097

Int. Cl.<sup>6</sup> B29C 39/12

U.S. Cl. 264-71

28 Claims



1. A method for producing a molded body of a track crossing installation, the molded body having a traffic-carrying surface layer containing hard particles and a body layer underlying the surface layer and substantially free of the hard particles, comprising the following steps: a first curable mold material is prepared for the body layer; a second curable mold material is prepared for the surface layer; the hard particles are added to and mixed with the second curable mold material; predetermined quantities of the first curable mold material and the mixture of the second curable mold material and the hard particles are introduced into a mold in mutually adjacent layered relationship to form a precursor of the molded body; pressure is exerted on the precursor in a direction transverse to the layers; and the precursor is then cured.



5,439,626

**PROCESS FOR MAKING HOLLOW NYLON FILAMENTS**  
James P. Bennett, Hixson, Tenn.; Benjamin H. Knox, Wilmington, Del., and Dennis R. Schafluetzel, Hixson, Tenn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 14, 1994, Ser. No. 213,307

Int. Cl.<sup>6</sup> D01D 5/24, 5/253; D02J 1/08, 1/22

U.S. Cl. 264—103

17 Claims

1. A melt spinning process for making nylon hollow filaments comprising extruding molten nylon polymer having a relative viscosity (RV) of at least about 50 and a melting point ( $T_M$ ) of about 210° C. to about 310° C. from a spinneret capillary orifice with multiple orifice segments providing a total extrusion area (EA) and an extrusion void area (EVA) such that the fractional extrusion void content, defined by the ratio [EVA/EA] is about 0.6 to about 0.95, and the extent of melt attenuation, defined by the ratio [EVA/(dpf)<sub>S</sub>], is about 0.05 to about 1.5, in which (dpf)<sub>S</sub> is the spun denier per filament, said (dpf)<sub>S</sub> being selected such that the denier per filament at 25% elongation (dpf)<sub>25</sub> is about 0.5 to about denier 20; withdrawing the multiple melt streams from the spinneret into a quench zone under conditions which causes substantially continuous self-coalescence of the multiple melt streams into spun filaments having at least one longitudinal void and a residual draw ratio (RDR) of less than 2.75; and stabilizing the spun hollow filaments to provide hollow filaments with a residual draw ratio (RDR) of about 1.2 to about 2.25.

5,439,627

# PROCESS FOR MANUFACTURING REINFORCED COMPOSITES

Gui G. De Jager, Noordwijk, Netherlands, assignor to Flexline Services Ltd., Cyprus, a part interest

PCT No. PCT/NL91/00109, § 371 Date Feb. 23, 1993, § 102(e) Date Feb. 23, 1993, PCT Pub. No. WO92/00182, PCT Pub. Date Jan. 9, 1992

PCT Filed Jun. 25, 1991, Ser. No. 977,425

Claims priority, application Netherlands, Jun. 29, 1990, 90201719

Int. Cl.<sup>6</sup> B29C 59/00

U.S. Cl. 264—129

5 Claims

1. A process for manufacturing a composite product reinforced by forming a molded preform to a desired shape and subsequently processing the preform into a final shaped composite product, comprising the steps of:

- chopping a ribbon comprising a number of continuous longitudinally oriented fibers which are spaced from each other by uniformly distributed particles bonded therebetween by a flexible precursor binder;
- mixing the chopped ribbon with a binder and at least one of a lubricant and a matrix material to form a mixture;
- forming moldings from the mixture by a molding method;
- converting the precursor binder into matrix material, thereby leaving voids between the fibers and the particles; and
- filling the voids between the fibers and the particles with additional matrix material.

5,439,628

# METHOD FOR MANUFACTURING POLYPROPYLENE FILM AND SHEET

Hwang-Wen Huang, Taipei, Taiwan, assignor to Intoplast Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 35,212, Mar. 22, 1993, abandoned. This application Jan. 25, 1994, Ser. No. 187,086

Int. Cl.<sup>6</sup> B29C 43/24

U.S. Cl. 264—175

15 Claims

1. A process of manufacturing polypropylene film comprising the steps of:

- formulating a polypropylene composition containing:

- a resin, said resin consisting essentially of:

- polypropylene resin ranging in concentration from about 70 to about 100 parts per hundred parts by weight of said resin (PHR); and
  - polyethylene resin ranging in concentration from about 0 to about 30 PHR;
- a matrix modifier ranging in concentration from about 2 to about 40 PHR;
  - a filler ranging in concentration from about 100 to about 450 PHR; and
  - a processing aid ranging in concentration from about 0 to about 5 PHR;

- mixing said composition using a high intensity/high shear mixer having at least one rotor to obtain a homogeneous and plasticized mixture;
- calendering said mixture into a film using a calender unit having a multiplicity of rolls, said rolls having a surface temperature between about 200° C. and about 250° C.;
- removing said film from said calender unit using take-off rolls; and
- cooling said film to ambient temperature.

5,439,629

# METHOD AND APPARATUS FOR PRODUCING PREFABRICATED COMPONENTS FROM PRETENSIONED PRESTRESSED CONCRETE

Joachim Heintz, Graefelfing; Peter Auer, Ottobrunn; Helmut Lieske, and Peter Plica, both of Munich, all of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

PCT No. PCT/EP93/00289, § 371 Date Dec. 23, 1993, § 102(e) Date Dec. 23, 1993, PCT Pub. No. WO93/15889, PCT Pub. Date Aug. 19, 1993

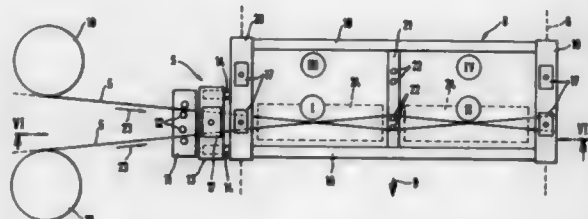
PCT Filed Feb. 8, 1993, Ser. No. 133,061

Claims priority, application Germany, Feb. 11, 1992, 42 03 895.2

Int. Cl.<sup>6</sup> B28B 1/16

U.S. Cl. 264—228

12 Claims



1. A method of manufacturing precast components of pretensioned prestressed concrete comprising taking tensioning wires from at least one wire roll and immediately subsequently inserting the tensioning wires by a longitudinal feeding procedure into a tensioning frame, initially anchoring the tensioning wires at a first end of the tensioning frame, subsequently tensioning the tensioning wires by a tensioning device arranged outside of the tensioning frame and resting against a second end of the tensioning frame opposite the first end of the tensioning frame, anchoring the tensioning wires at the second end of the tensioning frame, then severing the anchored tensioning wires from the wire roll, and casting concrete about the tensioning wires in the tensioned state in a formwork moved over the tensioning wires anchored in the tensioning frame, and after hardening of the concrete, separating the tensioning wires from the tensioning frame.

4. An apparatus for manufacturing precast components of pretensioned prestressed concrete comprising at least one tensioning frame and anchoring devices mounted at the tensioning frame for anchoring the tensioning wires, a feed device for taking the tensioning wires in a feed direction from at least one wire roll and for inserting the tensioning wires into the tensioning frame, a support device for a level support of the

tensioning frame, a severing device for severing the tensioning wires arranged in feed direction in front of the support device, the support device comprising a tensioning device for tensioning the tensioning wires, wherein the tensioning device is arranged outside of the tensioning frame and so as to rest against the tensioning frame.

5,439,630

# METHOD FOR MOLDING A TRIM PANEL WITH INTEGRALLY FORMED SIMULATED LEATHER APPLIQUES

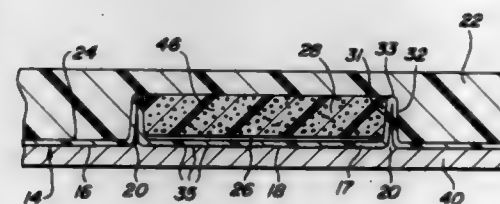
Michael J. Gallagher, Hampton, and Lawrence R. Nichols, Dover, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Sep. 2, 1993, Ser. No. 114,928

Int. Cl.<sup>6</sup> B29C 39/12; B32B 31/04

U.S. Cl. 264—263

7 Claims



7. A method of integrally molding a simulated deformable applique with a plastic panel of an interior trim component for a motor vehicle, said method characterized by the steps of: forming a thin plastic outer shell having a back surface and front surface, said shell having a simulated applique section having a texture distinctive from a surrounding area of said front outer surface; positioning said thin plastic shell in a mold having a standing knife edge about the simulated applique section of said plastic shell; fitting a member at the back surface of said shell behind the simulated applique section such that an air pocket is formed between said simulated applique section of said shell and said member within confines defined by a shell section that abuts said knife edge of said mold; applying a moldable and curable substrate on said back surface of said shell and on a back surface of said member wherein said member prevents said substrate from filling said air pocket; curing said substrate; and removing the mold such that a rigid trim panel is formed with said shell with a simulated applique located in front of said air pocket and a simulated seam where the knife edge of said mold was located about said simulated applique section.

5,439,631

# PROCESS FOR MANUFACTURING A GRID-PATTERNED MEMBRANE

Paul R. Schneider, 12524 Aqueduct Dr., E. Tacoma, Wash. 98445, and Gregory L. Lindstrom, 3018 Marne, Auburn, Wash. 98002

Filed Mar. 16, 1994, Ser. No. 214,399

Int. Cl.<sup>6</sup> B29C 33/68, 59/02

U.S. Cl. 264—293

10 Claims

1. A process for manufacturing a grid patterned membrane, comprising the following steps:

- selecting a sheet of mesh material;
- selecting a sheet of uncured elastomeric material approximately equal in length and width to said sheet of mesh material;
- selecting a thin sheet of separator material approximately equal in length and width to said sheet of mesh material;
- simultaneously aligning said sheet of elastomeric material over said sheet of mesh material and simultaneously aligning said thin sheet of separator material over said sheet of

elastomeric material and then winding said aligned sheets onto a drum to create a continuous roll structure;

- autoclaving said continuous roll structure with sufficient pressure and temperature until the elastomeric material partially extrudes through the openings on the sheet of mesh material and makes contacts with the thin sheet of separator material located on the opposite surface of said sheet of mesh material to create a grid pattern in said sheet of elastomeric material;
- allowing said sheet of elastomeric material to cure; and
- separating said sheet of elastomeric material from the sheets of mesh material and separator material to form a sheet of grid-patterned membrane.

5,439,632

# PROCESS FOR PRETREATMENT OF NON-ISOTROPIC CYLINDRICAL PRODUCTS

David C. Leach, Orange, Calif., and John Barnes, Doncaster, England, assignors to ICI Composites, Inc., Tempe, Ariz.

Filed Feb. 5, 1993, Ser. No. 14,187

Int. Cl.<sup>6</sup> B29C 33/76, 67/20

U.S. Cl. 264—313

18 Claims

1. A method of preconditioning a cylindrical member capable of being fitted onto a mandrel to create an interference fit at a minimum operating temperature, said mandrel having an outside diameter greater than the inside diameter of said cylindrical member at the minimum operating temperature, including the steps of:

- providing a cylindrical member of a non-isotropic composite of a thermoplastic resin and a reinforcing fiber;
- providing a mandrel having an outside diameter greater than the inside diameter of said cylindrical member at the minimum operating temperature;
- cooling said mandrel and/or cylindrical member, thereby allowing said cylindrical member to be fitted onto said mandrel;
- heating said mandrel and said fitted cylindrical member to an elevated temperature sufficient to cause thermal deformation of said mandrel and substantially irreversible thermal deformation of said cylindrical member, said mandrel having a higher radial coefficient of thermal expansion and higher radial stiffness than that of said non-isotropic composite at said elevated temperature; and
- cooling said mandrel and cylindrical member.

5,439,633

# PLASTIC EXTRUDER HAVING A MIXING VALVE WITH AUTOMATIC SHUT-OFF

Michael F. Durina, Poland; Shawn P. Bodnar, East Palestine, both of Ohio, and Timothy W. Womer, Edinburg, Pa., assignors to Spirex Corporation, Youngstown, Ohio

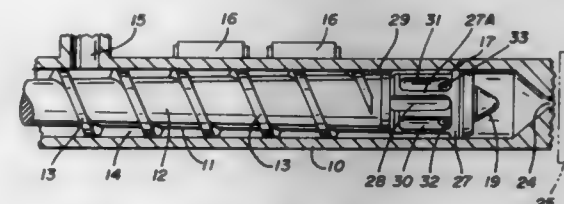
Filed Jul. 27, 1994, Ser. No. 281,230

The portion of the term of this patent subsequent to Nov. 17, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> B29B 7/14; B29C 45/52

U.S. Cl. 264—328.17

8 Claims



1. A method for mixing molten resin material within a mixing valve which automatically shuts-off the flow of molten plastic during an extrusion process, said extrusion process being of the type wherein solid resinous material is fed to a screw which has a helical flight, said screw is rotated within a cylinder defining a spiral channel between said helical flight



and the inner wall of the cylinder which simultaneously conveyorizes and heats the material as it is transported through the spiral channel so that the solid material is transformed into a molten state, the improvement comprising:

- directing said molten material into a automatic shut-off and mixing valve which is connected at the downstream end of said screw, the mixing valve has a unitary valve body, the molten material is directed through an infeed groove formed within said valve body, said infeed groove being closed at the downstream end, a mixing land is positioned on the rotational trailing side of said infeed groove;
- simultaneously mixing and filtering the molten material as it restrictively flows from the infeed groove over the mixing land, said mixing land having a reduced diameter to form a mixing passageway between the mixing land and the inner wall of the cylinder;
- flowing the mixed and filtered molten material from the mixing passageway into a discharge groove, said discharge groove formed within said valve body, said discharge groove being closed at the upstream and downstream ends, said discharge groove having an outlet opening which leads to a flow passageway through said valve body, said flow passageway leading to a flow control means which has a valve opening formed from a facing surface on a popper and a complementary seating surface on said valve body, said popper being at the downstream end of said valve body and having a rod-like poppet stem extending through a longitudinal axial bore formed through said valve body, said popper being axially moveable and rotatable within said valve body, an elastic means mounted on said poppet stem and positioned in the interior of said valve and out of contact with molten plastic is cooperatively positioned to urge said popper towards said valve body to maintain the valve opening in a normally closed position;
- channelling the molten material from the discharge groove into said flow passageway; and
- pressurizing the flow of molten plastic through said flow passageway and toward the poppet thereby simultaneously applying a force to the elastic means and the popper, thereby pushing the poppet away from the facing surface of the valve body which opens the valve.

5,439,634

#### METHOD AND DEVICE FOR SEPARATING RUNNERS/SPRUES FROM PARTS AS THEY ARE EJECTED FROM A MOLD

Robert R. North, Shreveport, La., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 8, 1993, Ser. No. 163,962  
Int. Cl.<sup>6</sup> B29C 37/02

U.S. Cl. 264—334

11 Claims

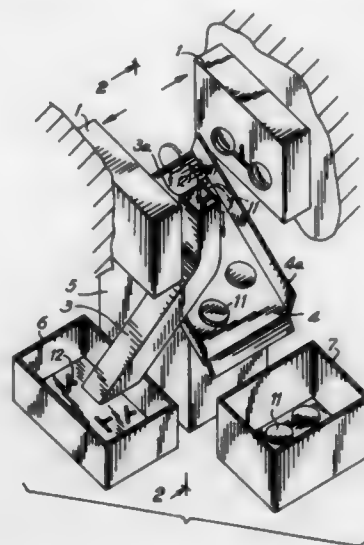
1. An apparatus used with injection molding machines for separating an injection molded product from runners formed with the injection molded product in injection molds which are moveable between open and closed positions along a mold axis comprising:

product-receiving means underlying said injection molds for receiving said product after said molds have been opened; said product-receiving means comprising an inclined means having an initial receiving portion underlying said molds and a discharge portion displaced from a mold-underlying position such that the product passes from said initial receiving portion to said discharge portion and are thereby carried in a lateral direction generally perpendicular to said mold axis to said position laterally displaced from said molds;

runner-receiving means underlying said injection molds for receiving said runners after said molds have been opened, said runner-receiving means being operable to carry said runners in a longitudinal direction generally perpendicular

lar to said lateral direction to a position longitudinally displaced from said molds,

said runner-receiving means comprising a conduit having an inlet section underlying said molds and a carrying section displaced from a mold-underlying position such that the product passes from said inlet section to said carrying section and are thereby carried to said position longitudinally displaced from said molds, said inlet section of said conduit having a conduit axis which is generally vertically disposed and said carrying section of said conduit has a



conduit axis which inclines relative to vertical, said inlet section of said conduit overlying said initial receiving portion of said inclined means;

said product-receiving means and said runner receiving means being positioned relative to said molds and relative to each other such that said product falls into said product-receiving means while being precluded from falling into said runner-receiving means and said runners fall into said runner-receiving means while being precluded from falling on said product-receiving means.

5,439,635

#### UNITARY VACUUM BAG FOR FORMING FIBER REINFORCED COMPOSITE ARTICLES AND PROCESS FOR MAKING SAME

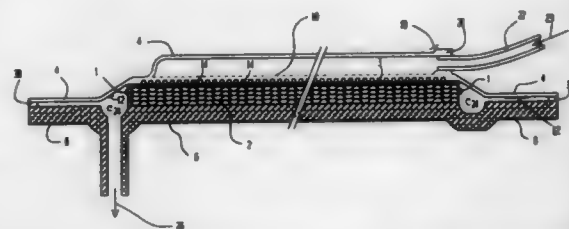
William Seemann, Pass Christian, Miss., assignor to Scrimp Systems, LLC, Warren, R.I.

Continuation-in-part of Ser. No. 18,827, Feb. 18, 1993, Pat. No. 5,316,462. This application May 27, 1994, Ser. No. 250,169. The portion of the term of this patent subsequent to May 31, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B29C 33/40, 33/42, 70/48

U.S. Cl. 264—510

11 Claims



1. A vacuum bag for forming a fiber reinforced composite structure by vacuum bag molding comprising in a flexible structure:

a vacuum bag having a periphery and an inner surface; a tubular resin distribution conduit connected into said inner

surface, connected with a repeating, internal plurality of small channels on said inner surface; said structure being formed to fit, covering the fiber reinforced composite structure on a rigid mold.

5,439,636

#### LARGE CERAMIC ARTICLES AND METHOD OF MANUFACTURING

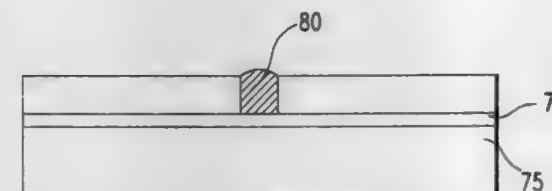
Raschid J. Bezama, Mahopac; Jon A. Casey, LaGrange; Mario E. Ecker, Poughkeepsie; Shaji Farooq, Hopewell Junction; Irene S. Frantz, Leeds; Katharine G. Frase, Peekskill; David H. Gabriels, Cold Springs; Lester W. Herron, Hopewell Junction; John U. Knickerbocker, Hopewell Junction; Sara H. Knickerbocker, Hopewell Junction; Govindarajan Natarajan, Pleasant Valley; John Thomson, Lake Carmel; Yee-Ming Ting, Cornwall; Sharon L. Tracy, LaGrangeville; Robert M. Troncillito, Marlboro; Vivek M. Sura, Hopewell Junction; Donald R. Wall, Wappingers Falls, all of N.Y., and Gai V. Yen, Seattle, Wash., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 18, 1992, Ser. No. 836,675

Int. Cl.<sup>6</sup> B22F 3/00

U.S. Cl. 419—3

26 Claims



1. A method of fabricating a large ceramic greensheet article for electronic applications from a plurality of greensheet segments comprising the steps of:

- applying metal wiring patterns to a plurality of said greensheet segments;
- joining said plurality of greensheet segments, edge to edge, to form a larger greensheet;
- repeating steps a and b to form a plurality of said larger greensheets;
- connecting at least two of said metal wiring patterns, where said two metal wiring patterns are on different greensheet segments; and
- stacking said larger greensheets so that the joint between greensheet segments is shifted with respect to the joint between greensheet segments in the larger greensheet above it or below it;

wherein said step of connecting said two metal wiring patterns comprises utilizing a wiring feature that traverses the joint between adjacent greensheet segments but is on a layer different from that of said adjacent greensheet segments.

5,439,637

#### DEBRAZING OF STRUCTURES WITH A POWDERED WICKING AGENT

Craig R. Moyer, Muncie, Ind., assignor to Pyromet Group, Inc., Muncie, Ind.

Filed Jul. 20, 1994, Ser. No. 277,974

Int. Cl.<sup>6</sup> B22F 7/00

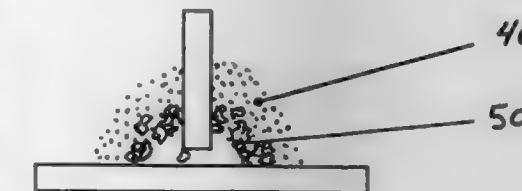
U.S. Cl. 419—26

14 Claims

1. A process for disassembling a brazed structure, of the type having two or more components bonded by metallic braze alloy in a joint, comprising the steps of:

- applying a viscous slurry, comprising a powdered wicking agent and a liquid binder, to uniformly overlay said joint, said wicking agent being a powder having a melting temperature higher than that of said braze alloy and being

wettable by said braze alloy when said joint is heated above the melting temperature of said braze alloy; b) heating the joint overlaid with said slurry to an elevated temperature sufficient to allow the braze alloy to flow out of the joint and into the powdered wicking agent;



- cooling the joint to room temperature so that the wicking agent and braze alloy solidify together to form a loosely consolidated mass adjacent the joint;
- removing substantially all said consolidated mass from adjacent the joint; and
- separating the components from one another.

5,439,638

#### METHOD OF MAKING FLOWABLE TUNGSTEN/COPPER COMPOSITE POWDER

David L. Houck, Towanda; Nelson Kopatz, Sayre, both of Pa.; Muktesh Paliwal, Owego, and Sanjay Sampath, Coram, both of N.Y., assignors to OSRAM Sylvania Inc., Danvers, Mass.

Filed Jul. 16, 1993, Ser. No. 92,727

Int. Cl.<sup>6</sup> B22F 1/00, 9/04

U.S. Cl. 419—30

5 Claims

1. A method of making a flowable tungsten/copper composite powder suitable for pressing and sintering and containing between 5 and 60 weight percent copper and the balance tungsten, comprising the steps of:

- forming a uniform mixture of a desired weight ratio of tungsten powder, copper oxide powder and, optionally, less than 0.5 weight percent cobalt powder;
- milling said mixture in an aqueous medium to cause an exothermic reaction between said aqueous medium, said tungsten powder and said copper oxide powder, said milling further acting to form a slurry in which said tungsten and copper oxide powders are intimately mixed, said slurry being maintained at a temperature between about 25° C. to about 35° C. to control said exothermic reaction;
- removing the liquid from said slurry to form spherical, flowable agglomerates; and
- subjecting said spherical, flowable agglomerates to a reducing atmosphere to form said flowable tungsten/copper composite powder.

5,439,639

#### TIN-SILVER-BISMUTH SOLDERS FOR ELECTRONICS ASSEMBLY

Paul T. Vianco, and Jerome A. Rejent, both of Albuquerque, N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.

Filed Jan. 5, 1994, Ser. No. 177,504

Int. Cl.<sup>6</sup> C22C 13/02

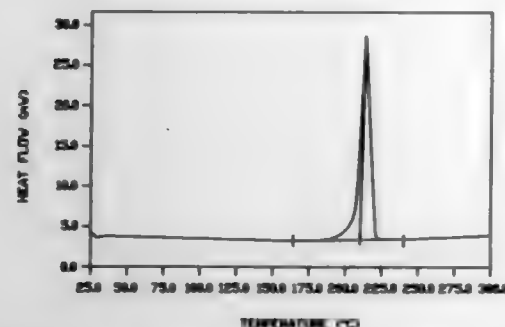
U.S. Cl. 420—562

8 Claims

1. A solder alloy composition for electronic assembly applications consisting essentially of tin, silver, and bismuth, said tin and silver being present in a ratio substantially equal to the eutectic composition of the tin-silver binary, wherein said silver-tin ratio is substantially 0.036, and said bismuth being present in an amount greater than 3 percent by weight based on



the total composition weight, and the bismuth remains in solid solution in the solder alloy at room temperatures and the solder



alloy composition has a melting temperature no greater than 219° C.

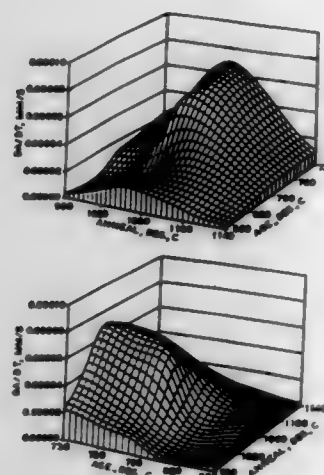
5,439,640

**CONTROLLED THERMAL EXPANSION SUPERALLOY**  
Karl A. Heck, Proctorville, Ohio; Melissa A. Moore, South Point, Ohio; Darrell F. Smith, Jr.; Larry I. Stein, both of Huntington, W. Va.; and John S. Smith, Proctorville, Ohio, assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Sep. 3, 1993, Ser. No. 116,651  
Int. Cl.<sup>6</sup> C22C 19/00

U.S. Cl. 420—585

21 Claims



1. A controlled coefficient of thermal expansion alloy consisting essentially of in weight percent, about 26–50% cobalt, about 20–40% nickel, about 20–35% iron, about 4–10% aluminum, about 0.5–5% total niobium plus  $\frac{1}{2}$  of tantalum weight percent, about 1.5–10% chromium, about 0–1% titanium, about 0–0.2% carbon, about 0–1% copper, about 0–2% manganese, about 0–2% silicon, about 0–8% molybdenum, about 0–8% tungsten, about 0–0.3% boron, about 0–2% hafnium, about 0–2% rhenium, about 0–0.3% zirconium, about 0–0.5% nitrogen, about 0–1% yttrium, about 0–1% lanthanum, about 0–1% total rare earths other than lanthanum, about 0–1% cerium, about 0–1% magnesium, about 0–1% calcium, about 0–4% oxides dispersoid and incidental impurities and said controlled coefficient of thermal expansion alloy having a crack growth rate of less than  $1 \times 10^{-4}$  mm/s at a stress intensity of 33 MPa $\sqrt{m}$  at a temperature of 538° C.

5,439,641  
**UNDECYLENATE DEODORIZATION OF PAPER MILL EFFLUENTS**

Henri-Jean Caupin, Versailles, and Aim Menassa, Paris, both of France, assignors to Elf Atochem S.A., Puteaux and Delta Agro Industries, Paris, both of France

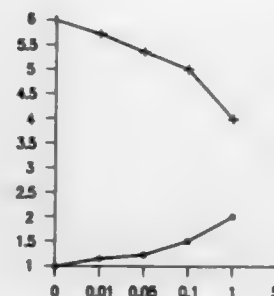
Filed Jul. 28, 1993, Ser. No. 98,105

Claims priority, application France, Jul. 30, 1992, 92 09457  
The portion of the term of this patent subsequent to Aug. 16, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61L 9/01

U.S. Cl. 422—5

10 Claims



1. A process for the deodorization of a malodorous paper mill effluent, comprising treating such effluent with an effective deodorizing amount of an alkyl or polyoxyalkylene ester of undecylenic acid, the polyoxyalkylene moiety of said undecylenate having from 2 to 10 alkylene oxide recurring structural units.

5,439,642

**METHOD OF SURFACE-CLEANING AND/OR STERILIZING OPTICAL COMPONENTS, ESPECIALLY CONTACT LENSES**

Peter Hagmann, Hösbach-Bahnhof; Peter Höfer, Aschaffenburg, and Peter Herbrechtsmeier, Königstein, all of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

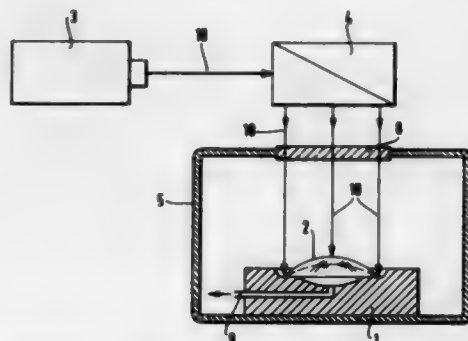
Continuation of Ser. No. 5,922, Jan. 19, 1993, abandoned, which is a continuation of Ser. No. 765,604, Sep. 25, 1991, abandoned.  
This application Mar. 31, 1994, Ser. No. 220,943

Claims priority, application Switzerland, Oct. 2, 1990, 3208/90

Int. Cl.<sup>6</sup> A61L 2/08, 2/10

U.S. Cl. 422—22

13 Claims



1. A method of treating the surface of an optical component having a defined geometry and desirable bulk material properties, comprising the steps of:

- generating radiation by means of a laser, said radiation having a preselected wavelength and a preselected energy density;
- applying said radiation to the surface of an optical component for a period of time sufficient to simultaneously photoablatively remove impurities adhering to said surface of said optical component and sterilize said surface;

wherein said wavelength, energy density, and period of time of application of said radiation are selected such that said radiation does not substantially alter either the desirable bulk material properties of said optical article or the geometry of said optical component.

5,439,643

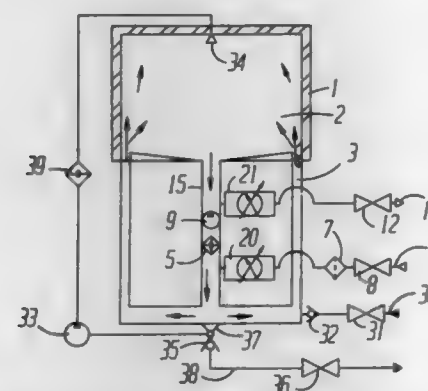
**METHOD AND APPARATUS FOR TERMINAL STERILIZATION**

Richard T. Liebert, 12 Kristen Dr., Ballston Spa, N.Y. 12020  
Filed Nov. 3, 1993, Ser. No. 146,957

Int. Cl.<sup>6</sup> A61L 2/06; B01J 3/04

U.S. Cl. 422—25

9 Claims



1. A method-for terminal sterilization of pre-filled packages comprising:

- providing a super-atmospheric pressure and temperature sterilization chamber, wherein said chamber includes temperature sensing devices for monitoring a temperature of a formulation within a pre-filled package;
- inserting at least one package, having a formulation pre-filled therein, into said super-atmospheric pressure and temperature sterilization chamber;
- providing a non-steam gas, having a humidity of 0 to 100%, within said sterilization chamber;
- heating said gas and increasing the pressure of said gas to super-atmospheric pressure; and
- cooling said gas, wherein said heating and cooling steps further include: regulating and monitoring at least one of the pressure and temperature of said gas such that said pre-filled package does not fail and monitoring at least one of said temperature sensing devices until the calculation of an adequate  $F_0$  value has been indicated, such that a vapor is generated within said pre-filled package which provides the necessary lethal reduction in pathogens and microorganisms.

5,439,644

**APPARATUS FOR THE REGISTRATION OF THE CONTENTS OF HUMIDITY AND ACID IN A COOLANT**  
Asger Gramkow, Gammelgaard 27, DK-6440 Augustenborg, and Jeppe C. Bastholm, Sønderborg, both of Denmark, assignors to Asger Gramkow, Augustenborg, Denmark

PCT No. PCT/DK92/00109, § 371 Date Jan. 19, 1994, § 102(e) Date Jan. 19, 1994, PCT Pub. No. WO92/22809, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 17, 1992, Ser. No. 162,197

Claims priority, application Denmark, Jun. 18, 1991, 1184/91

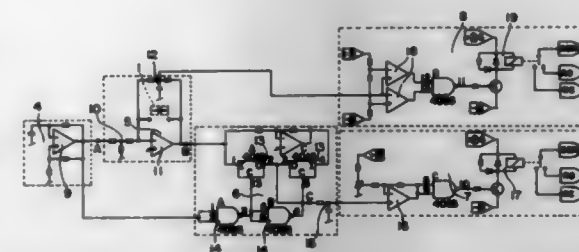
Int. Cl.<sup>6</sup> G01N 27/10

U.S. Cl. 422—62

9 Claims

1. In an apparatus for the registration of the humidity and acid content of a refrigerant or of another non-polar liquid, the apparatus comprising a capacitive sensing element for placing in contact with the refrigerant or liquid, said sensing element having electrodes consisting of two different metals with different normal potentials, and in which apparatus the determination of humidity is carried out by measuring a resistive loss

in the sensing element, the improvement including A.C. voltage source means connected to said sensing element, and an electrical circuit connected to said sensing element, said electrical circuit comprising means for converting the resistive



A.C. loss in the capacitive sensing element to an absolute D.C. voltage when measuring humidity and means for determining the absolute D.C. current delivered by the sensing element when measuring acid.

5,439,645

**APPARATUS FOR AUTOMATICALLY, SELECTIVELY HANDLING MULTIPLE, RANDOMLY ASSOCIATED HEMATOLOGICAL SAMPLES**

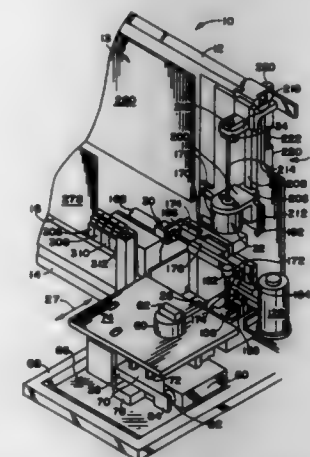
Francisco J. Saralegui, Miami, and Alex W. Schlunkmann, Plantation, both of Fla., assignors to Coulter Corporation, Miami, Fla.

Filed Jan. 25, 1993, Ser. No. 9,190

Int. Cl.<sup>6</sup> B01F 11/00; G01N 35/02

U.S. Cl. 422—64

13 Claims



1. Apparatus for automatically and selectively transferring multiple, randomly associated hematological samples from a group of samples to an operably associated cytometric apparatus comprising,

- at least one sample container, each containing a preselected, individually identifiable hematological sample,
- sample container carrier means for moving said sample containers on a path of movement including means for supporting a plurality of sample containers thereon,
- movable sample receiving means for pressurizing said sample prior to passing said sample to a cytometric apparatus,
- means for moving said sample container carrier means normal to the path of movement of said sample receiving means,
- sample resuspending and mixing means operably associated with said sample container carrier means for automatically removing a sample container from said carrier means and engaging said sample container with said sample receiving means, so that activation of said sample resuspending and mixing means resuspends and mixes said

sample, a movable member having means for contacting said sample container and vertically lifting said container from said carrier means into temporary sealing engagement of said sample container with said sample receiving means and for translating the vertical lifting movement into circular, vortexing movement so as to vortex the contents of said sample container, said movable member including a vertically disposed member having a slidable counter balance affixed at one end, permitting said movable member to automatically adjust its position from off-center to center as it is moved with respect to a sample container,

said sample container carrier means including an opening in said supporting means below each sample container and said movable member contacting means moves through said opening to lift said container from said carrier means, and

aspirating means operably engagable with said sample receiving means for delivering said sample from said sample container to said cytometric apparatus in response to the pressurizing of said sample.

5,439,646

**BLOOD COAGULATION ANALYZER**

Koji Tanimizu, Kyoto, and Toshimi Kadota, Uji, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

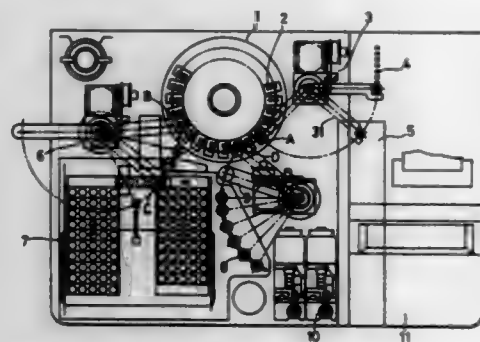
Filed Sep. 15, 1993, Ser. No. 121,375

Claims priority, application Japan, Sep. 30, 1992, 4-286950

Int. Cl.<sup>6</sup> G01N 35/02

U.S. Cl. 422—64

11 Claims



1. A blood coagulation analyzer, comprising:

- a reaction part comprising a plurality of movable measuring modules with each module having a removable cell and measuring means for measuring coagulation of a sample solution contained in said cell;
- a cell supply/discharge mechanism for supplying and discharging each cell to and from said measuring modules at a cell mounting/dismounting position of said reaction part;
- a sample dispenser for dispensing a sample into each said cell being located on a sample dispensing position of said reaction part;
- a reagent dispenser for dispensing a reagent into each said cell being located on a reagent dispensing position of said reaction part;
- a driving mechanism for moving and stopping each of said plurality of modules of said reaction part to and at said cell mounting/dismounting position, said sample dispensing position and said reagent dispensing position of said reaction part; and
- a control part for simultaneously measuring each of said cells in said plurality of modules.

5,439,647

**CHIP LEVEL WAVEGUIDE SENSOR**

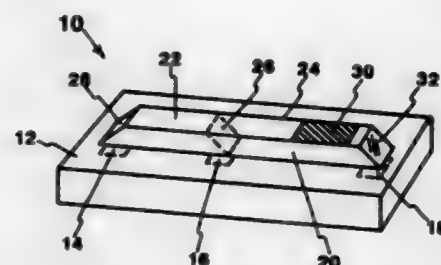
Devinder P. Saini, Henderson, Nev., assignor to FiberChem, Inc., Las Vegas, Nev.

Filed Feb. 25, 1994, Ser. No. 201,796

Int. Cl.<sup>6</sup> G01N 21/00

U.S. Cl. 422—82.11

22 Claims



1. An optical waveguide chemical sensor comprising:
  - a modular substrate having at least one light source and at least one light detector formed internally therein and covered by an optically transparent material;
  - a waveguide structure mounted on said substrate and extending over said at least one source and at least one detector, said waveguide structure including direction turning means for guiding light from said at least one source into said waveguide structure and direction turning means for guiding light from said waveguide structure to said at least one detector; and
  - a sensing chemistry formed on or in a portion of the waveguide structure.

5,439,648

**GAS INDICATOR FOR A PACKAGE**

Simon N. Balderson, Telford, and Robert J. Whitwood, Stafford, both of United Kingdom, assignors to Trigon Industries Limited, Auckland, New Zealand

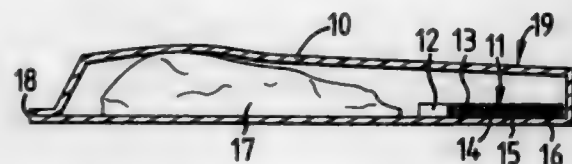
Filed May 26, 1994, Ser. No. 249,446

Claims priority, application United Kingdom, Jun. 3, 1993, 9311426; Jan. 27, 1994, 9401557

Int. Cl.<sup>6</sup> G01N 33/02, 31/22

U.S. Cl. 422—86

14 Claims



1. A food package (19) comprising:
  - a sealed envelope (10) containing a food product (17);
  - a predetermined ratio of gases inserted into the envelope (10) prior to sealing; and
  - an indicator (11) which changes color when there is a change in the concentration of at least one gas of said ratio and further changes color when the sealed envelope (10) is opened.

5,439,649

**AUTOMATED STAINING APPARATUS**

Ken Tseung, Wai Bun Wong, both of Fremont; Glenn K. Takayama, Danville; Christopher M. Jones, Walnut Creek, and Krishan L. Kalra, Danville, all of Calif., assignors to BioGenex Laboratories, San Ramon, Calif.

Filed Sep. 29, 1993, Ser. No. 129,243

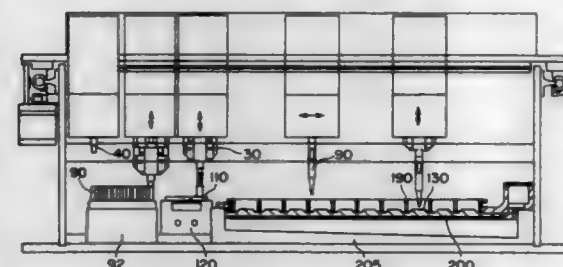
Int. Cl.<sup>6</sup> B01L 11/00

U.S. Cl. 422—99

24 Claims

1. An automatic apparatus for staining a microscope slide, comprising:

- a supporting framework;
- an arm moveable in three dimensions attached to said framework;
- means for moving said arm;
- a hollow tip head located on said arm;
- means for alternatively supplying positive or negative gas pressure to said hollow tip head to withdraw or dispense gas or liquid through said hollow tip head;
- a removable wash/blow tip having an exit slit substantially equal in length to the width of said microscope slide, said wash/blow tip being adapted to be removably attached to said hollow tip head by a preselected movement of said arm;
- a wash/blow tip holder at a first fixed location on said framework;
- a reagent application tip holder at a second fixed location on said framework for holding a reagent application tip, said



- reagent application tip being adapted to be removably attached to said hollow tip head by a preselected movement of said arm;
- a reagent container holder at a third fixed location on said framework;
- a microscope slide holder at a fourth fixed location on said framework, said microscope slide holder being adapted to removably contain said microscope slide; and;
- control means operatively connected to said means for moving said arm and said means for alternatively supplying positive or negative gas pressure, for controlling movement of said arm between said locations, to cause said tip head to pick up said wash/blow tip or said reagent application tip and to move to one or more of said locations to withdraw a reagent from said reagent container or to dispense said reagent on said slide through said reagent application tip or to dispense a gas or liquid over said slide through said wash/blow tip.

5,439,650

**REACTION VESSEL**

Akira Tsugita, Kashima; Masaharu Kamo, Noda; Toyooki Uchida, Tokyo; Ikuo Nanno, Narashino; Yasuhiro Nomoto, and Seitaro Takahashi, both of Tokyo, all of Japan, assignors to Seiko Instruments Inc. and Seiko Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 449,528, Dec. 11, 1989, abandoned.

This application Nov. 3, 1992, Ser. No. 970,941

Claims priority, application Japan, Dec. 9, 1988, 63-311317  
The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.

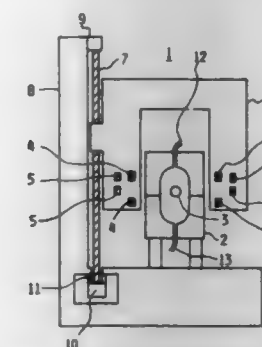
Int. Cl.<sup>6</sup> B01S 8/20; G05F 7/00

U.S. Cl. 422—108

16 Claims

1. A reaction apparatus comprising: means composed of nonmagnetic material defining at least one reaction chamber; fluid conveying means in communication with the reaction chamber for charging reagent and solvent needed for a reaction into the reaction chamber and for discharging reagent and solvent from the reaction chamber; a sample carrier movably disposed in the reaction chamber and comprised of a magnetic material core and a surface coating; magnetic means disposed outside the reaction chamber for generating a magnetic force effective to levitate the sample carrier within the reaction chamber; supporting means for supporting the magnetic means; sensing means for sensing a position of the sample

carrier and generating detecting signals; and controlling means operative according to the detecting signals from the sensing



means for controlling the magnetic force generated by the magnetic means to thereby adjust the position of the sample carrier.

5,439,651

**CATALYZER SUPPORT SYSTEM FOR EXHAUST CLEANING OF OUTBOARD MOTOR**

Masahiko Kato, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

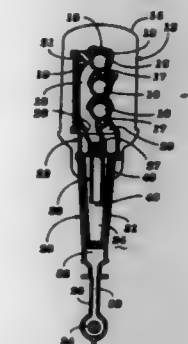
Filed Sep. 24, 1993, Ser. No. 126,913

Claims priority, application Japan, Sep. 25, 1992, 4-279196

Int. Cl.<sup>6</sup> B01D 53/94

U.S. Cl. 422—179

8 Claims



1. A catalytic exhaust treatment system for an outboard motor comprised of an internal combustion engine having an exhaust outlet port, an exhaust pipe having an inlet end communicating with said exhaust port, an outlet end and an inner surface defining a gas flow path from said inlet end to said outlet end for communicating exhaust gases to the atmosphere, a catalyst support in said exhaust pipe extending at least in part across said gas flow path, said catalyst support comprising cross bars upon which a catalyst is supported, said catalyst having an upstream end facing said inlet end and a downstream end facing said outlet end, said downstream end being supported on said catalyst support, said catalyst having an outer periphery between said upstream end and said downstream end spaced inwardly from said inner surface of said exhaust pipe, said catalyst being supported on said catalyst support for movement of said outer periphery transversely relative to said inner surface of said exhaust pipe, wherein the catalyst is configured so as to permit exhaust gases to flow through said catalyst and also wherein the outer periphery of the catalyst is adapted to treat the exhaust gases flowing between the catalyst and the inner surface of the exhaust pipe.



5,439,652

# USE OF CONTROLLED PERIODIC ILLUMINATION FOR AN IMPROVED METHOD OF PHOTOCATALYSIS AND AN IMPROVED REACTOR DESIGN

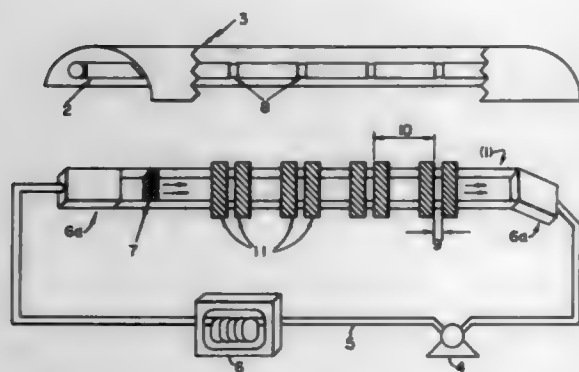
Jeffrey G. Szezechowski, Longmont; Carl A. Koval, Golden, and Richard D. Noble, Boulder, all of Colo., assignors to The Regents of the University of Colorado, Boulder, Colo.

Filed Sep. 30, 1993, Ser. No. 129,849

Int. Cl.<sup>6</sup> B01J 19/12

U.S. Cl. 422—186.3

42 Claims



1. A photocatalytic reactor wherein a slurry of photoreactive material is exposed to controlled periodic illumination comprising:

- (a) an irradiation chamber;
- (b) an illumination source;
- (c) means for periodically exposing the slurry of photoreactive material in the irradiation chamber to the source of illumination for a first select amount of time and preventing exposure of the slurry to the source of illumination for a second select amount of time; and
- (d) means for uniformly exposing the entire slurry of photoreactive material to the source of illumination.

5,439,653

# APPARATUS FOR LIQUIFYING SUBSTANCES

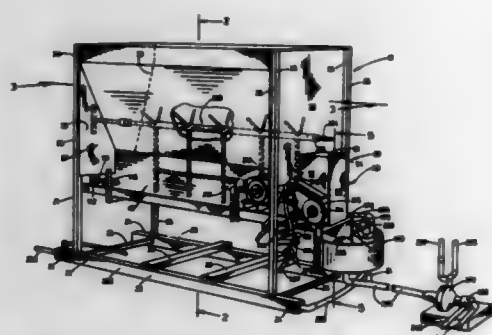
Abel A. Avila, Sr., 16565 Jackson Ave., Lemoore, Calif. 93245

Filed Apr. 30, 1993, Ser. No. 54,299

Int. Cl.<sup>6</sup> B01D 12/00

U.S. Cl. 422—261

11 Claims



1. An apparatus for liquifying a substance comprising a receptacle containing a quantity of said substance above a delivery position defined by side walls extending to lower edges bounding said delivery position for gravitationally feeding said substance to the delivery position; a liquifying station; means for supplying liquid to the liquifying station; and a conveyor operatively associated with the liquifying station and operable to engage the substance in the delivery position and to transport the substance toward the liquifying station, said conveyor having conveyor chains individually outwardly disposed relative to said lower edges of said side walls interconnected by flight bars passing through said delivery position and in juxtaposition to said lower edges whereby said con-

veyor chains are substantially separated from the substance in the delivery position by the lower edges of the side walls for gravitational receipt of the substance in the delivery position and between adjacent flight bars substantially separated from said conveyor chains for transport of the substance toward the liquifying station by said flight bars.

5,439,654

# CUTTER FOR OPENING STERILANT REAGENT CUPS

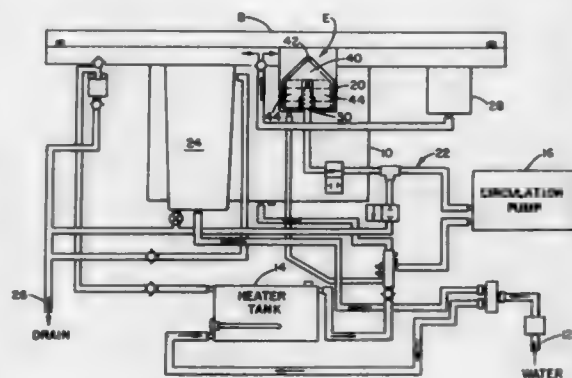
Werner W. Kuchte, Kent, Ohio, assignor to Steris Corporation, Mentor, Ohio

Continuation-in-part of Ser. No. 209,412, Mar. 10, 1994. This application Jun. 23, 1994, Ser. No. 264,736

Int. Cl.<sup>6</sup> A61L 2/00

U.S. Cl. 422—292

18 Claims



1. A decontamination system comprising:

- a body portion including a water receiving inlet, a drain outlet, a decontamination region for receiving items to be decontaminated, and a well which receives a reagent cup;
- means for defining fluid flow paths among the inlet, the reagent cup receiving well, the decontamination region, and a rinse fluid source;
- a fluid circulating means for selectively circulating fluid through the fluid flow paths and among the inlet, the heating means, the rinse fluid source, the decontamination region, and the reagent cup receiving well;
- a cutting blade assembly disposed in the reagent cup receiving well, the cutting assembly comprising:
  - a central shaft extending vertically upward from the base of the well, the shaft defining a hollow interior passage and receiving fluid flow from the fluid circulating system, the shaft further having at least two apertures communicating between the hollow interior passage and the outside of the shaft for directing fluid flow into a received reagent cup;
  - a cutting blade mounted on the central shaft and having an apex for puncturing a bottom of the received reagent cup, the cutting blade being divided by the central shaft to form two opposite blade sections on opposing sides of the central shaft;
  - each blade section having a cutting edge for cutting the received reagent cup and a curvilinear configuration for camming opening the reagent cup and deflecting fluid flow into the cup to promote complete flushing of reagents from the received reagent cup.

5,439,655

# APPARATUS FOR WASHING AND STERILIZING RUBBER PLUGS OR THE LIKE WHICH MAY BE USED IN PHARMACEUTICAL CONTAINERS

Fortunato Fedegari, Pavia, Italy, assignor to Fedegari Autoclavi S.p.A., Pavia, Italy

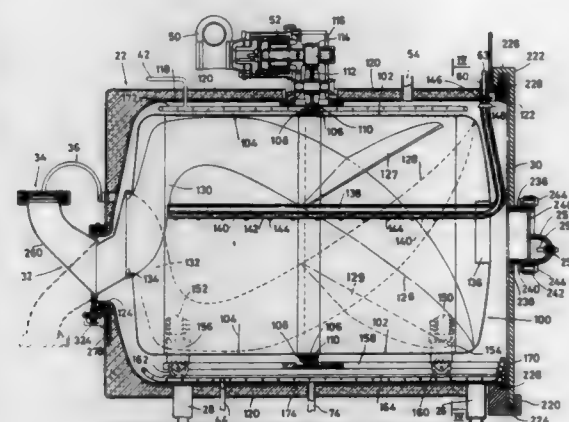
Filed Jun. 15, 1993, Ser. No. 76,758

Claims priority, application Italy, Jun. 19, 1992, MI92A1522

Int. Cl.<sup>6</sup> A61L 2/00

U.S. Cl. 422—297

18 Claims



1. An apparatus for washing, rinsing, sterilizing and drying delicate components and capable of loading and unloading the delicate components in an axial direction of the apparatus, comprising:

- (1) an autoclave chamber;
- (2) a substantially cylindrical basket disposed within the autoclave chamber and having a lateral inside wall, which basket is rotatable about a longitudinal axis thereof;
- (3) an inlet opening at a first axial end of the basket;
- (4) an outlet opening at a second axial end of the basket;
- (5) two opposed axially extending helical members radially projecting inside the basket with internal rounded edges and fixed to the lateral inside wall such that the helical members connect the inlet opening and the outlet opening such that the components are transportable from the inlet opening, through the basket, and out of the outlet opening by the helical members; each helical member terminating in a chute near the outlet opening, which chute of one helical member merges inside the outlet opening with the chute of the other helical member, wherein the components are mixed within the basket during a washing, rinsing, sterilization or drying thereof when the basket is rotated about the longitudinal axis in a first direction and are unloaded from the basket when the basket rotates about the longitudinal axis in a second opposite direction.

5,439,656

# METHOD FOR THE PREPARATION OF A RARE EARTH OXIDE POWDER

Yuji Kimura, and Shigeru Sakai, both of Fukui, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1994, Ser. No. 227,323

Claims priority, application Japan, Apr. 27, 1993, 5-101104

Int. Cl.<sup>6</sup> C01F 17/00

U.S. Cl. 423—21.1

3 Claims

1. A method for the preparation of a powder of a rare earth oxide which comprises the successive steps of:

- (a) admixing an aqueous solution of an inorganic salt of a rare earth element with an aqueous solution of a water-soluble alkaline carbonate in a concentration of 5 to 25% by weight at a temperature in a range of from 0 to 50° C., wherein the alkaline carbonate is present in an amount in excess of from 20 to 100% over the stoichiometrically equivalent amount to effect complete precipitation of the rare earth element in the aqueous solution, to form an

aqueous slurry containing precipitates of a carbonate of the rare earth element;

- (b) aging the aqueous slurry containing the precipitates of the carbonate of the rare earth element at a temperature of 50° C. or higher for at least 60 minutes;
- (c) admixing the aqueous slurry after step (b) with an additional amount of the aqueous solution of the inorganic salt of the rare earth element in an amount in the range of from one fifth to one-half of the amount of the inorganic salt of the rare earth element contained in the aqueous solution in step (a);
- (d) heating the aqueous slurry after step (c) at a temperature of 60° C. or higher for at least 60 minutes; and
- (e) subjecting the aqueous slurry after step (d) to solid-liquid separation to collect the precipitates of the carbonate of the rare earth element, followed by washing with water, drying and calcining the carbonate of the rare earth element to form rare earth oxide powder.

5,439,657

# MOLYBDENUM CATALYST SEPARATION

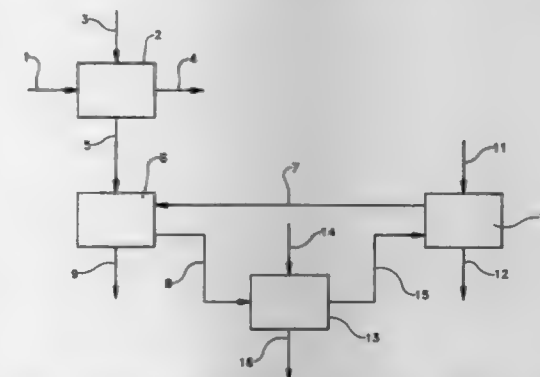
Tim T. Wong, Downingtown, and Lawrence M. Candela, Philadelphia, both of Pa., assignors to Arco Chemical Technology, L.P., Greenville, Del.

Filed May 16, 1994, Ser. No. 242,921

Int. Cl.<sup>6</sup> B01D 11/00; C01G 39/00

U.S. Cl. 423—54

6 Claims



1. The method of recovering molybdenum from a reaction mixture containing molybdenum and phenolic impurities resulting from a molybdenum catalyzed epoxidation of an olefin with an organic hydroperoxide which comprises adding aqueous caustic to the reaction mixture, separating an aqueous phase containing molybdenum, sodium and phenolic impurities, adding acid to the separated aqueous phase to acidify the separated aqueous phase, extracting molybdenum from the acidified aqueous phase by contacting with a water insoluble tertiary amine, contacting the molybdenum containing tertiary amine with aqueous base at pH of 8-9 to provide a molybdenum containing aqueous phase, separating tertiary amine containing phenolic impurities from the molybdenum containing aqueous phase, contacting the tertiary amine containing phenolic impurities with aqueous base at a pH of at least 11 to remove the phenolic impurities, and then separating the tertiary amine.

5,439,658

# REGENERABLE MAGNESIUM DRY SCRUBBING

Dennis W. Johnson, Barberton; Gerald T. Amrhein, Louisville; Robert B. Myers, Akron; Peter VanSmith, N. Canton, and William Downs, Alliance, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 116,306, Sep. 3, 1993. This application Jun. 21, 1994, Ser. No. 263,120

Int. Cl.<sup>6</sup> B01J 8/00; C01B 21/00

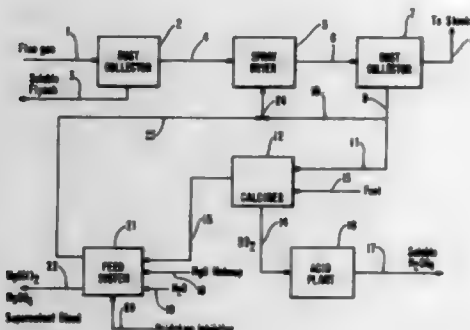
U.S. Cl. 423—243.07

6 Claims

1. A method of cleaning a flue gas containing flyash, sulfur

dioxide contaminants and other contaminants, the method comprising the steps of:

- positioning a first dust collector in a flue gas stream for receiving a flue gas and removing flyash therefrom;
- providing a slurry source having a slurry comprising water, an oxidation inhibitor, magnesium sulfite and magnesium hydroxide, the slurry source being connected to a spray dryer which is connected to the first dust collector downstream therefrom;
- spraying the flue gas in the spray dryer with the slurry for removing sulfur dioxide contaminants and for forming reaction products in the flue gas;
- collecting the reaction products from the flue gas with a



- second dust collector connected to the spray dryer downstream therefrom;
- providing a first portion of the reaction products to the slurry source;
- providing a remaining portion of the reaction products to a calciner;
- heating the remaining portion of the reaction products in the calciner at a temperature sufficient to decompose the remaining portion containing magnesium sulfite into sulfur dioxide and magnesium oxide, the calciner being heated at a temperature to decompose magnesium sulfite, one of the reaction products, and leave magnesium sulfate unaffected; and
- providing the magnesium oxide to the slurry source.

5,439,659

#### METHOD FOR TREATING EXHAUST GAS AND AN APPARATUS THEREFOR

Masanori Izumo, Settsu, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan

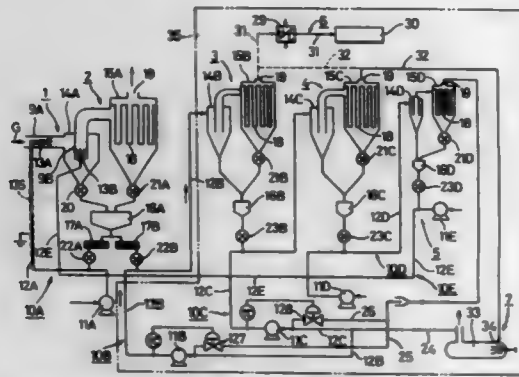
PCT No. PCT/JP92/01126, § 371 Date May 5, 1993, § 102(e) Date Sep. 17, 1993, PCT Pub. No. WO93/04766, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 3, 1992, Ser. No. 50,227

Claims priority, application Japan, Sep. 5, 1991, 3-226237 Int. Cl. B01D 53/34

U.S. Cl. 423-245.1

24 Claims



1. An apparatus for treating an exhaust gas containing parti-

cles that comprise organic compounds as a component and a noxious and malodorous gas, comprising:

- a powdery adsorbent;
- a means for mixing the powdery adsorbent with an exhaust gas so as to adhere particles of the exhaust gas to the powdery adsorbent and so as to have the powdery adsorbent adsorb a noxious and malodorous gas component of the exhaust gas and for separating the powdery adsorbent having the particles adhered thereto and the noxious and malodorous gas adsorbed thereby from the exhaust gas after the exhaust gas has been at least partially purified;
- a means for regenerating the powdery adsorbent that has been separated, said means for regenerating being connected with said means for mixing and separating, and said means for regenerating comprising a first heating means for heating the powdery adsorbent at a first temperature sufficient to have the noxious and malodorous gas desorbed from the powdery adsorbent and a second heating means for heating the powdery adsorbent treated by said first heating means at a second temperature sufficient to thermally decompose the particles, wherein the first temperature is substantially lower than the second temperature; and
- means connected between said means for mixing and separating and said means for regenerating for conveying the regenerated powdery adsorbent from said means for regenerating to said means for mixing and separating.

5,439,660

#### OXONITRIDES OF THE FORMULA $\text{LnTaON}_2$ WITH ENHANCED BRIGHTNESS AND A PROCESS FOR THEIR PRODUCTION AND USE

Martin Jansen; Hans-Peter Letschert, both of Bonn, and Dietrich Speer, Hanau, all of Germany, assignors to Cerdec Aktiengesellschaft Keramische Farben, Frankfurt, Germany Filed Mar. 16, 1994, Ser. No. 213,537

Claims priority, application Germany, May 26, 1993, 43 17 421.3

Int. Cl. C01F 17/00

U.S. Cl. 423-263

26 Claims

1. A process for producing an oxonitride with a perovskite structure of the formula  $\text{LnTaON}_2$ , where Ln represents a rare-earth element, wherein said oxonitride displays enhanced brightness, said process comprising mixing

- (a) a tantalum (V) compound selected from the group consisting of Ta (V) oxides, Ta(V) oxide hydrates, Ta(V) oxonitrides, and mixtures thereof,
- (b) a rare-earth metal compound selected from the group consisting of oxides, oxide hydrates, hydroxides, carbonates, nitrates, carboxylates of a C<sub>1</sub> to C<sub>4</sub> mono- or dicarboxylic acid, and mixtures thereof, and
- (c) at least one mineralizing agent selected from the group consisting of alkali metal or alkaline earth halides,  $\text{Na}_3\text{AlF}_6$ ,  $\text{Na}_2\text{SiF}_6$ ,  $\text{AlF}_3$ , ammonia salts of carbonic acid, a mono- or dicarboxylic acid with 1 to 4 C atoms, and mixtures thereof, in a quantity of 0.1 to 10 parts by weight per parts by weight of said Ta and Ln compounds, to form a reaction mixture, heating said reaction mixture to annealing temperatures in a reducing atmosphere to form an annealed reaction mixture, and optionally removing said mineralizing agent(s) from said annealed reaction mixture.

5,439,661

#### PROCESS FOR PRODUCING HYDROGEN CYANIDE

Takafumi Abe; Shuji Ebata; Kazuhiro Sugamura; Taiji Matsuzaki, and Hirofumi Higuchi, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan Filed Oct. 27, 1994, Ser. No. 330,202

Claims priority, application Japan, Dec. 6, 1993, 5-305222; Dec. 6, 1993, 5-305223

Int. Cl. C01C 3/02

U.S. Cl. 423-373

11 Claims

1. A process for producing hydrogen cyanide by a catalytic dehydrative reaction of formamide which process comprises employing as a catalyst at least one member selected from the group consisting of a manganese oxide modified with an alkali metal and a magnesium oxide modified with an alkali metal.

5,439,662

#### PROCESS FOR MAKING $\text{MgCl}_2\cdot\text{MgO}$ WITH NARROW GRANULOMETRIC DISTRIBUTION, CATALYTIC COMPONENTS CONTAINING THE SAME, PROCESS OF USING SUCH SUPPORTS TO POLYMERIZE OLEFINS, AND RESULTANT POLYOLEFINS

Roger Spitz, St. Symphorien d'Ozon; Maryse Patin, Villeurbanne, and Claude Brun, Idron, all of France, assignors to Elf Atochem S.A., France

Filed Jan. 21, 1993, Ser. No. 6,621

Claims priority, application France, Jan. 27, 1992, 92 00820

Int. Cl. C01F 1/00

U.S. Cl. 423-497

3 Claims

1. A process for the manufacture of  $\text{MgCl}_2\cdot\text{MgO}$  with a granulometric distribution, expressed as D90D10, lower than 9, comprising forming a suspension by suspending particles of  $\text{MgCl}_2\cdot x\text{HOH}$  wherein  $0.3 \leq x \leq 12$  in an alcohol to form an  $\text{MgCl}_2$ -supersaturated alcohol medium, maintaining said suspension at a temperature of 0° C. to 150° C. to swell said particles, at least partially eliminating the alcohol, and heat treating said particles between 300° to 600° to form  $\text{MgCl}_2\cdot\text{MgO}$  without destroying the granulometric rearrangement.

5,439,663

#### METHOD FOR PRODUCING CARO'S ACID

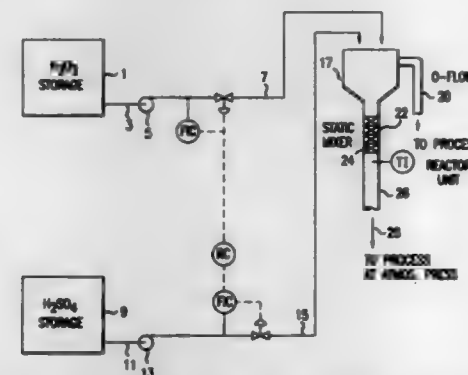
James L. Manganaro, Princeton; Martin E. Sacks, East Windsor, both of N.J., and James Carmichael, Buffalo, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 1, 1994, Ser. No. 283,348

Int. Cl. C01B 17/08

U.S. Cl. 423-521

12 Claims



1. A process for producing Caro's acid by reacting sulfuric acid having a concentration of at least about 85% by weight and hydrogen peroxide having a concentration of at least about 50% by weight, wherein the hydrogen peroxide is introduced through a first feed line and the sulfuric acid is introduced through a second feed line into a funneling zone open to the atmosphere, the first feed line and second feed line having air gaps between their ends and the funneling zone, continuing to introduce the hydrogen peroxide and sulfuric acid into the funneling zone to flow and mix within the funneling zone,

passing the resulting mixture by gravity flow into one end of a reaction zone that has been sized to permit a pressure drop therein which is at least 8 times the theoretical pressure drop for liquids flowing through such reaction zone and removing a mixture containing Caro's acid from an exit end of the reaction zone.

5,439,664

#### PROCESS FOR THERMAL CONVERSION OF HYDROGEN SULFIDE TO ELEMENTAL SULFUR

Michael Heisel, Pullach, and Freimut Marold, Ottobrunn, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

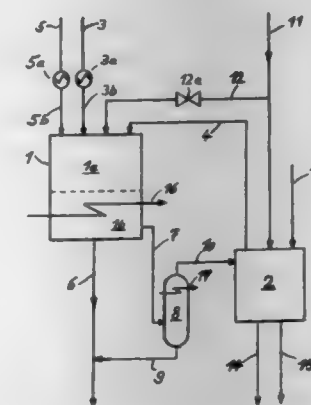
Filed Jun. 29, 1992, Ser. No. 905,567

Claims priority, application Germany, Jun. 27, 1991, 41 21 290.8

Int. Cl. C01B 17/04; B01D 53/48

U.S. Cl. 423-567.1

23 Claims



1. A process for the thermal conversion of hydrogen sulfide contained in a gaseous feedstream with sulfur dioxide to form elemental sulfur, comprising: introducing the gaseous feedstream containing hydrogen sulfide into a thermal reactor together with sulfur dioxide obtained from a waste gas purification facility arranged downstream of the reactor, reacting the hydrogen sulfide and sulfur dioxide thermally in said thermal reactor under non-catalytic conditions to produce a vapor phase sulfur stream and a gaseous stream partially depleted of sulfur compounds, condensing resultant vapor phase sulfur by cooling, and withdrawing resultant condensed sulfur as a product, discharging the gaseous stream partially depleted of sulfur compounds and containing residual  $\text{H}_2\text{S}$  from the thermal reactor, and feeding said gaseous stream into the downstream waste gas purification facility to obtain said sulfur dioxide, wherein the process is devoid of any step downstream of said thermal reactor of catalytically converting the residual  $\text{H}_2\text{S}$  in the gaseous stream to elemental sulfur.



5,439,665

**DETECTION AND TREATMENT OF INFECTIOUS AND INFLAMMATORY LESIONS**

Hans J. Hansen, Westfield, and Milton D. Goldenberg, Short Hills, both of N.J., assignors to Immunomedics, Morris Plains, N.J.

Continuation of Ser. No. 386,047, Jul. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 226,180, Jul. 29, 1988, Pat. No. 4,925,648. This application Oct. 17, 1991, Ser. No. 777,499

The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 51/00, 39/44

U.S. Cl. 424—1.49

14 Claims

1. A therapeutic anti-leukocyte antibody-agent conjugate for targeting loci of leukocyte accretion, comprising at least one immunoreactive substantially monospecific antibody or antibody fragment which specifically binds to at least one leukocyte cell type, conjugated to at least one therapeutic boron-containing addend or therapeutic radionuclide, wherein said conjugate further comprises at least a second substantially monospecific antibody or antibody fragment which specifically binds to at least one other, different leukocyte cell type.

10. A method of treatment of an inflammatory or infectious lesion, which comprises injecting a mammal parenterally with an effective amount for therapy of an anti-leukocyte conjugate for targeting foci of leukocyte accretion, comprising at least one immunoreactive substantially monospecific antibody or antibody fragment which specifically binds to at least one leukocyte cell type, conjugated to at least one therapeutic boron-containing addend or therapeutic radionuclide, and parenterally administering to the subject, at a time after administration of said antileukocyte conjugate sufficient to permit maximum selective uptake thereof by leukocytes at the site of said lesion, a second, unlabeled antibody or antibody fragment which specifically binds to said anti-leukocyte conjugate, in an amount sufficient to increase the therapeutic index of said therapy agent by at least about 10 percent.

5,439,666

**IODINATED NEUROPROBE FOR MAPPING MONOAMINE REUPTAKE SITES**

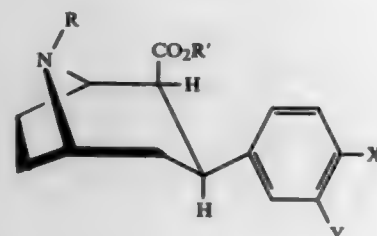
John L. Neumeyer, Wayland; Richard A. Milius, Boston, both of Mass., and Robert B. Innis, Hamden, Conn., assignors to Research Biochemicals Limited Partnership, Natick, Mass. Continuation of Ser. No. 841,617, Feb. 25, 1992, Pat. No. 5,310,912. This application Jan. 24, 1994, Ser. No. 185,689

Int. Cl.<sup>6</sup> A61K 51/00

U.S. Cl. 424—1.85

6 Claims

1. A kit for preparing a radiolabeled neuroprobe for mapping monoamine reuptake sites, the kit comprising:  
a precursor of the formula:



wherein

R=a monofluoroalkyl group;

R'=a C<sub>n</sub>H<sub>2n+1</sub> group where n=0-6;

X=I or Sn(R''<sub>1</sub>R''<sub>2</sub>R''<sub>3</sub>);

R''<sub>1</sub>=a C<sub>n</sub>H<sub>2n+1</sub> group where n=1-6, or an aryl group;

R''<sub>2</sub>=a C<sub>n</sub>H<sub>2n+1</sub> group where n=1-6, or an aryl group;

R''<sub>3</sub>=a C<sub>n</sub>H<sub>2n+1</sub> group where n=1-6, or an aryl group;

and

Y=H.

5,439,667

**METHOD FOR PRESERVING TISSUE FOR MICROSCOPIC EXAMINATION USING AN OSMOTICALLY CONTROLLED GLYOXAL SOLUTION**

Gerald W. Camlener, 26700 Hurlingham Rd., Beachwood, Ohio 44122

Continuation of Ser. No. 762,307, Sep. 20, 1991, abandoned. This application Dec. 2, 1993, Ser. No. 160,285

Int. Cl.<sup>6</sup> A01N 1/02

U.S. Cl. 435—40.5

11 Claims

1. A method of preserving multicellular tissue for microscopic examination without substantially cross-linking the tissue, which comprises:

contacting the tissue with an aqueous solution consisting essentially of (i) about 0.08% to about 36% glyoxal or glyoxal in the form of a bisulfite, hydrate or alcohol addition product and (ii) about 0.1% to about 14% of an osmotic controlling ionic or nonionic chemical or a combination of osmotic controlling ionic or nonionic chemicals, wherein the glyoxal is present in a concentration sufficient to prevent degradation of the tissue prior to microscopic examination without substantially cross-linking the tissue and the osmotic controlling chemical or combination of osmotic controlling chemicals is present in a concentration sufficient to osmotically stabilize the tissue for subsequent microscopic examination, and examining the tissue under a microscope.

5,439,668

**HETEROCYCLIC CHELATING AGENTS**

Torsten Almen, Malmö, Sweden; Arne Berg, Blommenholm, Norway; Harald Dugstad, Oslo, Norway; Jo Klaveness, Oslo, Norway; Klaus D. Krautwurst, Stabekk, Norway, and Pal Rongved, Hellvik, Norway, assignors to Nycomed Imaging AS, Oslo, Norway

Division of Ser. No. 690,975, Jul. 24, 1991. This application May 2, 1994, Ser. No. 235,882

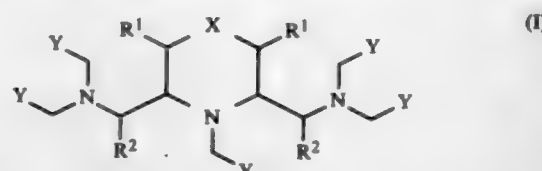
Claims priority, application United Kingdom, Jan. 13, 1989, 8900719

Int. Cl.<sup>6</sup> A61K 49/04; A61B 5/055

U.S. Cl. 424—9.361

16 Claims

1. A chelate complex of a compound of formula I



wherein X represents a bond, an oxygen or sulphur atom or a group of formula CHR<sup>1</sup> or NR<sup>3</sup>;

each R<sup>1</sup> which may be the same or different represents a hydrogen atom, a group of formula OR<sup>3</sup> or NR<sup>3</sup>R<sup>3</sup> or a C<sub>1</sub>-alkyl or (C<sub>1</sub>-alkoxy)-C<sub>1</sub>-alkyl group optionally substituted by a hydroxyl group or by a group of formula NR<sup>3</sup>R<sup>3</sup> or CONR<sup>3</sup>R<sup>3</sup>;

each R<sup>2</sup> which may be the same or different represents a hydrogen atom or a C<sub>1</sub>-alkyl or C<sub>1</sub>-alkoxy group optionally mono- or poly-substituted by hydroxyl or C<sub>1</sub>-alkoxy groups; each R<sup>3</sup> which may be the same or different represents a hydrogen atom, an optionally mono- or poly-hydroxylated C<sub>1</sub>-alkyl group or a group of formula CH<sub>2</sub>Y;

Y represents a group of formula COZ, CON(OH)R<sup>4</sup>, POZ<sub>2</sub> or SO<sub>2</sub>Z;

Z represents a group of formula OR<sup>4</sup>, NR<sup>4</sup>R<sup>4</sup>, or

5,439,670

**MEDICINAL AEROSOL FORMULATIONS**

Tarlochan S. Purewal, Leamington Spa, and David J. Greenleaf, Loughborough, both of England, assignors to Riker Laboratories, Inc., St. Paul, Minn.

Continuation of Ser. No. 649,140, Jan. 30, 1991, Pat. No. 5,225,183, which is a continuation of Ser. No. 442,119, Nov. 28, 1989, abandoned. This application Jul. 2, 1993, Ser. No. 86,820

The portion of the term of this patent subsequent to Jul. 6, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61L 9/04

U.S. Cl. 424—45

29 Claims

1. An aerosol formulation comprising: a medicament, a propellant comprising 1,1,1,2-tetrafluoroethane and less than 5% by weight of CHClF<sub>2</sub>, CH<sub>2</sub>F<sub>2</sub>, CF<sub>3</sub>CH<sub>3</sub>, or a mixture thereof, a surface active agent, and at least one other compound having a higher polarity than 1,1,1,2-tetrafluoroethane according to the Kauri-butanol value.

5,439,671

**PROCESS FOR THE PRODUCTION OF NEUTRAL-TASTING PASTES OF ALKYL ETHER SULFATES IN GLYCEROL**

Achim Ansmann, Erkrath; Willi Breitzke, Dueseldorf, and Karl-Heinz Gantke, Moenchengladbach, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dueseldorf, Germany

PCT No. PCT/EP92/02073, § 371 Date Mar. 18, 1994, § 102(e) Date Mar. 18, 1994, PCT Pub. No. WO93/06081, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 8, 1992, Ser. No. 211,073

Claims priority, application Germany, Sep. 19, 1991, 41 31 118.3

Int. Cl.<sup>6</sup> A61K 7/16

U.S. Cl. 424—56

9 Claims

1. A process for the production of a neutral-tasting paste of an alkyl ether sulfate in glycerol, comprising the steps of:

- forming an aqueous paste of at least one alkyl ether sulfate wherein the aqueous paste contains from about 25 to about 75% by weight of alkyl ether sulfate;
- adding glycerol to the aqueous paste from step A) in from about 1 to about 4 times the quantity by weight of the aqueous paste;
- distilling off substantially all of the water present in the mixture resulting from step B) to produce a substantially anhydrous paste; and
- passing steam heated to a temperature above 100° C. through said paste with intensive whirling of the paste and steam phases.

5,439,672

**COSMETIC COMPOSITION BASED ON AN AQUEOUS DISPERSION OF SMALL LIPID SPHERES**

Ariette Zabotto, Paris; Jacqueline Griat, Ablon; Rose-Marie Handjani, Paris; Guy G. Vanlerberghe, Villevaude, and Alian J. Ribier, Paris, all of France, assignors to L'Oréal, Paris, France

Continuation-in-part of Ser. No. 480,135, Feb. 14, 1990, which is a continuation of Ser. No. 167,995, Mar. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 279,517, Jul. 1, 1981, abandoned. This application Nov. 18, 1993, Ser. No. 155,591

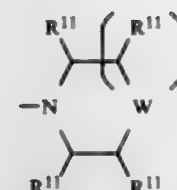
Claims priority, application France, Jul. 1, 1980, 80 14657

Int. Cl.<sup>6</sup> A61K 7/42

U.S. Cl. 424—59

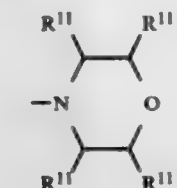
10 Claims

1. A composition suitable for use in cosmetics consisting essentially of an oil-in-water dispersion wherein the external water phase of said dispersion contains an oil dispersed therein, said oil-in-water dispersion being stabilized by spheres dispersed in said external water phase without causing destruction of said spheres, said spheres consisting essentially of organized molecular layers of a nonionic amphiphilic lipid material en-



where each R<sup>11</sup> which may be the same or different is a hydrogen atom, a hydroxyl group or an optionally hydroxylated C<sub>1</sub>-alkyl group,  
s is 0, 1 or 2, and  
W is a group CHR<sup>11</sup>, NR<sup>11</sup> or an oxygen atom; and  
each R<sup>4</sup> which may be the same or different represents a hydrogen atom or an optionally mono- or poly-hydroxylated C<sub>1</sub>-alkyl, (C<sub>1</sub>-alkoxy)-C<sub>1</sub>-alkyl or poly-(C<sub>1</sub>-alkoxy)-C<sub>1</sub>-alkyl group;

with the provisos that where s is 0 then in the resultant 5 membered heterocyclic ring W is a CHR<sup>11</sup> group, and that where X represents a bond or a group CHR<sup>1</sup> at least one group R<sup>1</sup> or R<sup>2</sup> represents other than a hydrogen atom or an unsubstituted C<sub>1</sub>-alkyl group, or a salt thereof, and with the proviso that when X represents a bond or a group of formula CHR<sup>1</sup> or NR<sup>3</sup>, at least one group Z represents a group of formula



5,439,669

**BIOLOGICAL IMAGING EMULSIONS CONTAINING ALKYL- OR ALKYLGLYCEROPHOSPHORYL CHOLINE SURFACTANTS AND METHODS OF USE**

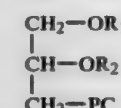
Robert J. Kaufman, and Thomas J. Richard, both of University City, Mo., assignors to HemaGen/PFC, St. Louis, Mo. Division of Ser. No. 791,420, Nov. 13, 1991, Pat. No. 5,304,325. This application Nov. 24, 1993, Ser. No. 157,676

Int. Cl.<sup>6</sup> A61B 5/055, 8/08; A61K 49/04, 31/685

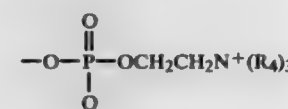
U.S. Cl. 424—9.37

14 Claims

1. A biological imaging agent comprising an amount of a physiologically acceptable emulsion of a fluorochemical, water and a surfactant having a general structure of



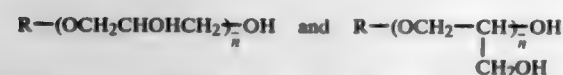
where R<sub>1</sub> and R<sub>2</sub> are a C<sub>14</sub>-C<sub>18</sub> saturated or unsaturated aliphatic group and PC is the phosphoryl choline group or salt thereof represented by the structure



where R<sub>4</sub> is hydrogen or lower alkyl from the group consisting of methyl, ethyl and propyl, said amount being clinically effective for imaging by modalities selected from the group consisting of nuclear magnetic resonance, X-ray and ultrasound.

capsulating an internal aqueous phase, said nonionic amphiphilic lipid material being selected from the group consisting of

(i) a straight or branched chain polyglycerol ether having the following formulae:



wherein  $\bar{n}$  has a statistical average value from 2 to 6 and R represents a straight or branched chain saturated aliphatic group containing from 16 to 20 carbon atoms or a hydrocarbon group of a lanolin alcohol, and

(ii) a polyoxyethylenated sterol;  
said oil contained in said external water phase being selected from the group consisting of (a) a fatty acid total ester of a polyol, (b) a fatty acid ester of a branched alcohol and having the formula R-COOR' wherein R represents the radical of a fatty acid containing 8 to 20 carbon atoms and R' represents a branched hydrocarbon chain containing 3 to 20 carbon atoms, and (c) jojoba oil.

5,439,673

## HAIR CARE COMPOSITION

Andrew M. Murray, Cheshire, United Kingdom, assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Mar. 1, 1993, Ser. No. 24,701

Claims priority, application United Kingdom, Mar. 2, 1992, 9204509

Int. Cl. A61K 7/075

U.S. Cl. 424-70.12

6 Claims

1. A conditioning shampoo composition comprising:  
(a) 0.00001 to 0.008% by weight of a perfluoropolyether material having the following formula:



wherein the ration of N to M is from 20 to 40 and N is selected such that the molecular weight of the polymer is from 100 to 100,000

- (b) 0.0001 to 0.4% by weight of the composition of a silicone conditioning agent being a non-volatile silicone selected from the group consisting of polyalkylsiloxanes, polyarylsiloxanes, polyalkylarylsiloxanes, silicone gums, silicone resins, aminofunctional silicones and quaternary silicones;  
(c) an anionic surfactant;  
(d) 75-95% by weight of water; and  
(e) a cationic polymer as a deposition aid.

5,439,674

## HAIR COSMETIC MATERIAL

Isao Noda, and Suguru Tsubaki, both of Kanagawa, Japan, assignors to OSI Specialties, Inc., Danbury, Conn.

Continuation of Ser. No. 929,376, Aug. 14, 1992, abandoned.

This application Jan. 14, 1994, Ser. No. 181,604

Int. Cl. A61K 7/075

U.S. Cl. 424-70.12

12 Claims

1. A hair set retaining cosmetic material comprising a reaction product prepared by:

- (1) reacting for at least three hours in a solvent at the reflux temperature of the solvent  
(A) 100 parts by weight of an amino group containing polysiloxane expressed by the following general formula:



wherein

A is selected from the group consisting of a hydroxyl

group, an alkoxy group, and an amino containing alkyl group;

R is selected from the group consisting of an alkyl group having 1 to 18 carbon atoms;

Q represents an amino group containing alkyl group;

m and n each represent a number of 0-3;

x represents a number 300-400; and

y represents a number of 1-30; with

(B) 20 to 5,000 parts by weight of an anionic group containing polymer selected from the group consisting of 1-ethenyl-2-pyrrolidinone, homopolymer; 1-ethenyl-2-pyrrolidinone, copolymer with acetic acid, ethenyl ester; ethene, methoxy-, copolymer with but-2-ene-1,4 diol acid mono ethyl or mono butyl ester; acetic acid, ethenyl ester, homopolymer carboxylated; 2-butenic acid, copolymer with acetic acid, ethenyl ester; 2-butenic acid, copolymer with acetic acid, alkyl 2-methyl-2-propenoate; diacetone acrylamide, copolymer with alkyl 2-propenoate or with alkyl 2-methyl-2-propenoate or with 2-propenoic acid or with 2-methyl-2-propenoic acid; and 1-(hydroxymethyl)-5,5-dimethyl hydantoin, homopolymer;

(2) concentrating the reaction product of step (1) to obtain a solid mixture; and

(3) neutralizing the reaction product of step (2) with an alkaline compound to a neutralization ratio of 60-150%.

5,439,675

## CYSTEAMINE PERMANENT WAVE COMPOSITION AND METHOD

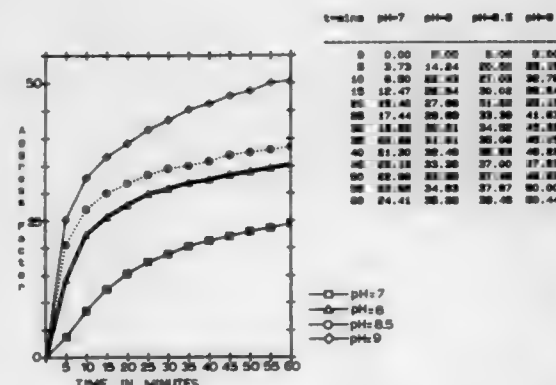
Arun Nandagiri, Libertyville; Richard A. Abbott, Westmont; Renee E. Nardone, Chicago, all of Ill., and Edward T. Borish, Mahwah, N.J., assignors to Helene Curtis, Inc., Chicago, Ill.  
Continuation of Ser. No. 111,305, Aug. 24, 1993, Pat. No. 5,362,487, which is a continuation-in-part of Ser. No. 819,113, Jan. 10, 1992, Pat. No. 5,260,054. This application Jun. 2, 1994, Ser. No. 253,105

The portion of the term of this patent subsequent to Nov. 9, 2010, has been disclaimed.

Int. Cl. A61K 7/09

U.S. Cl. 424-70.51

28 Claims



1. A permanent wave composition capable of breaking sulfur to sulfur bonds in human hair when in contact with said human hair so that said hair can be reconfigured in a predetermined configuration, comprising an aqueous solution of a cysteamine in an amount of at least about 7.8% by weight of the permanent wave composition and in an amount sufficient, at the pH of the composition, to provide cysteamine thiolate anions in solution in a concentration of at least about 0.2 Molar to about 0.6 Molar; and a second reducing agent in an amount of about 0.1% to about 18% by weight of the composition.

5,439,676

## CAMP DERIVATIVES AND USE THEREOF FOR PREVENTING OR RESTORING GRAYED HAIR TO ITS NATURAL COLOR

Keiji Kuruu, Odawara; Yoshiyuki Watanabe, Matsudo; Keiichi Sugiyama, Kanagawa, and Akira Kiyomiya, Matsudo, all of Japan, assignors to Lion Corporation, Tokyo, Japan  
Continuation of Ser. No. 631,478, Dec. 21, 1990, abandoned.

This application Jan. 25, 1994, Ser. No. 186,247

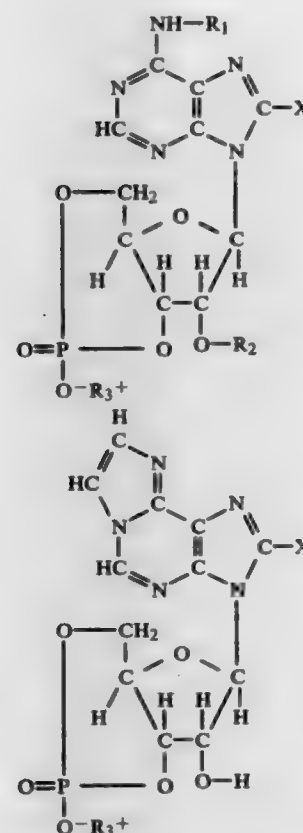
Claims priority, application Japan, Dec. 27, 1989, 1-339709

Int. Cl. A61K 7/06

U.S. Cl. 424-70.6

11 Claims

1. A method for preventing graying of hair and restoring grayed hair to its natural color by applying to a human scalp an effective amount of a composition consisting essentially of a salt of formula I or II set forth below and an inert carrier wherein the concentration of said salt ranges from about 0.001 to 5% by weight, based on the total weight of the composition:



wherein R<sub>1</sub> and R<sub>2</sub> each represent a hydrogen atom or an acyl group having 1 to 12 carbon atoms, X represents a hydrogen atom, an O-containing group, an S-containing group, an alkyl-amino group having 1 to 12 carbon atoms or a halogen atom, and R<sub>3</sub><sup>+</sup> represents an ammonium cation derived from 2-amino-2-methyl-1,3-propanediol, 2-amino-1-alkanol having 3 to 6 carbon atoms, monoalkylamine having 1 to 3 carbon atoms, lysine or histidine.

5,439,677

## COMPOSITIONS AND METHODS FOR TREATING HAIR USING A MIXTURE OF POLYSILOXANES

Arturo A. Villamarin, Grand Rapids, Mich., assignor to The Dial Corp., Phoenix, Ariz.

Filed Feb. 24, 1993, Ser. No. 22,828

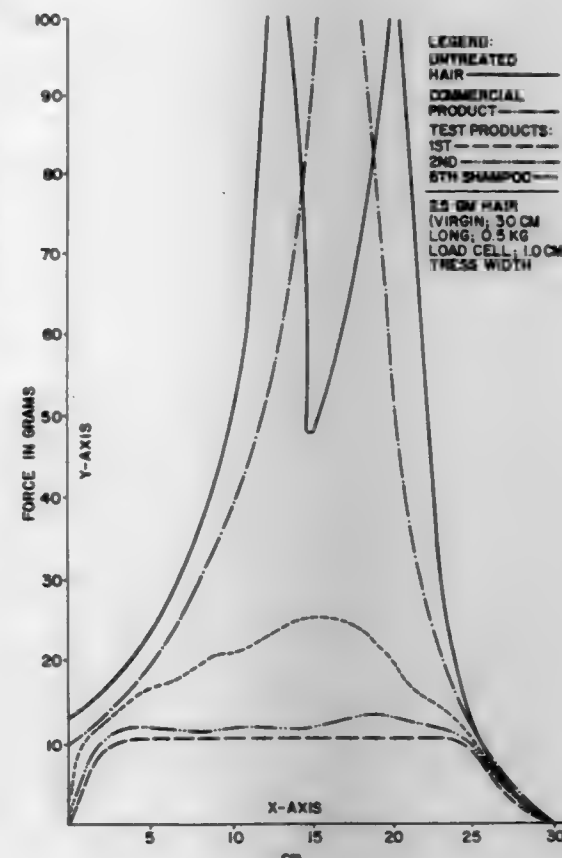
Int. Cl. A61K 7/035, 7/11

U.S. Cl. 424-70.12

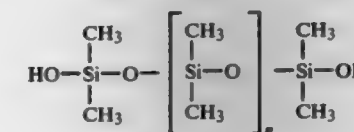
8 Claims

1. A method for semi-permanently conditioning hair by

applying thereto a composition comprising an aqueous oil-in-water emulsion of a mixture of

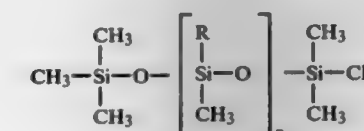


(1) a hydroxy-terminated dimethyl polysiloxane having the general formula



where n is not less than 500 and

(2) a methyl hydrogen polysiloxane having the general formula



where n is from about 185-235 and where R is selected from the group consisting of H and CH<sub>3</sub> and where the ratio of R=H to R=CH<sub>3</sub> is about 1:3, said composition being at an acid pH and wherein the ratio of polysiloxane (1) to polysiloxane (2) is about 1:1 to about 100:1 with the total concentration of said polysiloxanes being from about 0.5% to about 10% by weight of said composition, said polysiloxanes in said composition prior to application to said hair being in an unreacted state, said hair being dried after application of said composition resulting in cross-linking of said polysiloxanes on the hair.



5,439,678

**METHOD FOR INHIBITING MICROORGANISM GROWTH**

Walter J. Dobrogosz, Raleigh, N.C., and Sven E. Lindgren, Uppsala, Sweden, assignors to Biogala Biologics AB, Gothenburg, Sweden

Continuation of Ser. No. 708,800, May 30, 1991, abandoned, which is a continuation of Ser. No. 268,361, Sep. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 102,830, Sep. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 46,027, May 1, 1987, abandoned. This application Mar. 16, 1994, Ser. No. 214,014

Int. Cl.<sup>6</sup> A01N 63/00; C12N 1/20

U.S. Cl. 424—93.45

1 Claim

1. A method for providing a probiotic to the gastrointestinal tract of an animal, comprising selecting a *Lactobacillus reuteri* strain which produces  $\beta$ -hydroxypropionaldehyde as a detectable end-product under anaerobic conditions and in the presence of at least 20 mM glycerol or glyceraldehyde; and feeding the animal about  $10^8$  to  $10^{10}$  cells of the strain of *Lactobacillus reuteri*.

5,439,679

**PEPTIDE PLASMINOGEN ACTIVATORS**

Ernest-Guenter Afting, Eric-Paul Paques, both of Marburg, Germany; Nancy L. Haigwood, and Guy Mullenbach, both of Oakland, Calif., assignors to Chiron Corporation, Emeryville, Calif. and Behringwerke AG, Marburg-Lahn, Germany

Division of Ser. No. 812,879, Dec. 23, 1985, abandoned. This application Mar. 10, 1994, Ser. No. 208,202

Int. Cl.<sup>6</sup> C12N 9/48, 15/58; A61K 37/547

U.S. Cl. 424—94.64

13 Claims

1. A human tissue plasminogen activator capable of dissolving clots and having at least one improved property selected from the group consisting of improved plasminogenolytic specific activity, increased fibrin dependence, and decreased plasminogen inhibitor susceptibility, said human tissue plasminogen activator having a lysine at amino acid position 277 substituted with arginine.

5,439,680

**CELL-ASSOCIATED GLUCOSYLTRANSFERASE, AN ANTIBODY THERETO, AND A DENTAL CARIES PROPHYLACTIC COMPOSITION CONTAINING SAID ANTIBODY AS AN EFFECTIVE COMPONENT**

Toshio Horikoshi, Odawara; Junichiro Hiraoka, Yokohama; Isamu Fujita, Ikeda; Tohru Tokoro, Gifu; Yoshikatsu Kodama, Gifu, and Hideaki Yokoyama, Kakamigahara, all of Japan, assignors to Kanebo Ltd., Tokyo and Ghen Corporation, Gifu, both of Japan

Continuation of Ser. No. 48,941, Apr. 20, 1993, abandoned, which is a continuation of Ser. No. 866,206, Apr. 9, 1992, abandoned, which is a division of Ser. No. 807,746, Dec. 17, 1991, Pat. No. 5,281,524, which is a continuation of Ser. No. 298,546, Jan. 18, 1989, abandoned. This application Dec. 2, 1994, Ser. No. 353,257

Claims priority, application Japan, Jan. 22, 1988, 63-010853  
Int. Cl.<sup>6</sup> A61K 39/395, 39/40; C07K 16/02, 16/12

U.S. Cl. 424—157.1

16 Claims

9. A method of preventing adherence of *Streptococcus mutans* cells on tooth surfaces comprising topically applying an effective amount of an egg yolk antibody to the mouth of a person requiring the same, said egg yolk antibody being obtained by the steps of:

- cultivating cells of *Streptococcus mutans* serotype c, e or f in a nutrient-containing culture medium to obtain a culture containing cultured cells;
- removing the supernatant from the culture to recover the cultured cells;
- extracting a glucosyltransferase from the cultured cells using a urea or guanidine-HCl solution and purifying the

glucosyltransferase, said glucosyltransferase having the following physicochemical characteristics:

- capable of catalyzing the synthesis of water-insoluble glucan from sucrose;
  - having an optimum pH between glucan 6.7 and 7.0 for catalyzing the synthesis of water-insoluble glucan from sucrose;
  - losing its activity by heat treatment at 80° C. for 5 minutes;
  - having a molecular weight of 150 to 165 kilodaltons as determined by SDS-polyacrylamide gel electrophoresis; and
  - antigenic in animals and capable of raising an antibody specifically binding to the glucosyltransferase;
- (D) immunizing hens with the purified glucosyltransferase; and
- (E) separating the egg yolk antibody, which specifically binds to the glucosyltransferase, from the eggs of the immunized hens.

5,439,681

**PARACHLOROMETAXYLENOL ANTIMICROBIAL FORMULATION**

Mohammad A. Khan, Sandy, and Minh Q. Hoang, Taylorsville, both of Utah, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 675,362, Mar. 25, 1991. This application Jun. 7, 1993, Ser. No. 72,658  
Int. Cl.<sup>6</sup> A01N 25/02, 25/30; A61K 9/08

U.S. Cl. 424—400

1 Claim

1. An antimicrobial composition comprising:

- parachlorometaxylene in an amount from 1.5 to about 3.5 weight percent of the total composition;
- poly(oxypropylene) poly(oxyethylene) in an amount from 1.0 to 6.0 weight percent of the total composition;
- an ammonium salt of sulfated nonylphenoxypoly(ethyleneoxy) ethanol in an amount from 2.0 to 12.0 weight percent of the total composition;
- ammonium lauryl sulfosuccinate in an amount from about 2.0 to about 12.0 weight percent of the total composition;
- lanolin in an amount from about 5.0 to about 15.0 weight percent of the total composition;
- cellulose, 2-hydroxyethyl ether in an amount from about 0.1 to about 1.0 weight percent of the total composition;
- an acid to adjust the pH in the range of from about 4 to about 6; and
- the balance water.

5,439,682

**COMBINED PERSONAL CLEANSING AND MOISTURIZING COMPOSITIONS**

Susan C. Wivell, Madison, and George E. Deckner, Trumbull, both of Conn., assignors to Richardson-Vicks Inc., Shelton, Conn.

Continuation of Ser. No. 797,519, Nov. 22, 1991, abandoned. This application Mar. 22, 1993, Ser. No. 35,517  
Int. Cl.<sup>6</sup> A61K 6/00

U.S. Cl. 724—401

17 Claims

1. A personal cleansing and moisturizing composition comprising:

- from about 1% to about 10% of at least one anionic surfactant,
- from about 0.4% to about 15% of a long chain C16-22 suspending agent selected from the group consisting of ethylene glycol long chain esters, alkanolamides of long chain fatty acids, long chain esters of long chain fatty acids, glyceryl long chain esters, lone chain esters of long chain alkanolamides, and mixtures thereof,
- from about 0.1% to about 10% of a dispersed, insoluble, oil phase,
- from about 1% to about 10% of at least one additional

surfactant selected from the group consisting of nonionic surfactants, zwitterionic surfactants, amphoteric surfactants, and mixtures thereof, and

(e) the remainder water.

5,439,683

**PADDY RICE TREATMENT**

Leonard E. Hodakowski, Raleigh, N.C., assignor to Rhone-Poulenc Inc., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 959,020, Oct. 9, 1992, abandoned. This application Sep. 20, 1993, Ser. No. 122,987

Int. Cl.<sup>6</sup> A01N 25/00, 25/02, 25/04

U.S. Cl. 424—408

20 Claims

1. A method for the treatment of growing paddy rice in a water containing paddy comprising positioning in the water, at least one 10 to 1500 ml cold water soluble polymeric sealed envelope enclosing therein a plant protecting composition in the form of a viscous or sticky fluid or a viscous or sticky gel having a specific gravity less than 1 g/cm<sup>3</sup> that will spread or rapidly form a uniform film along the surface of the water surrounding the envelope and will coat rice plants in response to changes in water level in the rice paddy wherein the wall of the envelope has a thickness of 10 micrometers to 1 millimeter wherein the fluid or gel comprises between 10 and 95% solvent between 0.1 to 60% of active ingredient and between 0.5 and 30% surfactant and wherein the active ingredient has solvent/solubility in water greater than 5.

5,439,684

**SHAPED, SWOLLEN DEMINERALIZED BONE AND ITS USE IN BONE REPAIR**

Annamarie B. Prewett, Little Silver, N.J.; Roger C. Stikeleather, Doylestown, Pa.; Simon Bogdansky, Marlboro, and Robert K. O'Leary, Spring Lake, both of N.J., assignors to Osteotech, Inc., Shrewsbury, N.J.

Division of Ser. No. 809,580, Dec. 17, 1991, Pat. No. 5,298,254, which is a continuation-in-part of Ser. No. 573,458, Aug. 27, 1990, Pat. No. 5,290,558, which is a continuation-in-part of Ser. No. 410,596, Sep. 21, 1989, Pat. No. 5,073,373. This application Jan. 21, 1994, Ser. No. 184,306

Int. Cl.<sup>6</sup> A61B 17/56; A61K 35/32

U.S. Cl. 424—422

26 Claims



1. A kit for swelling, disinfecting and/or plasticizing demineralized bone, said kit comprising

- a first sealed vessel comprising the bone immersed in a swelling medium,
- a second sealed vessel comprising disinfecting and/or plasticizing medium, and
- means for accessing the interior of said first vessel for (1) draining off said swelling medium and (2) placing said first sealed vessel in open communication with said second sealed vessel containing said disinfecting and/or plasticizing medium,

wherein said swelling medium is selected from a member of the group consisting of liquid polyhydroxy compound, liquid polyhydroxy compound ester, liquid solution of solid polyhydroxy compound, liquid solution of solid polyhydroxy compound ester and mixtures thereof, and the polyhydroxy compound is selected from the group consisting of acyclic polyhydric alcohols, non-reducing sugars, sugar alcohols, sugar acids, monosaccharides, disaccharides, water-soluble or water dispersible oligosaccha-

rides, polysaccharides, polyalkylene glycols and mixtures thereof.

5,439,685

**PHARMACEUTICAL COMPOSITION FOR THE PREVENTION OF SEXUALLY TRANSMITTED DISEASES**

Jacques J. Augros, Villiers Le Bel, France, assignor to S S P L Safe Sex Products Licensing Societe Anonyme, Paris, France

Continuation of Ser. No. 377,938, Jul. 11, 1989, abandoned. This application Dec. 22, 1992, Ser. No. 995,522

Claims priority, application France, Jul. 11, 1988, 88 09418  
Int. Cl.<sup>6</sup> A61K 9/107; A61L 15/44

U.S. Cl. 424—430

11 Claims

1. A pharmaceutical composition for preventing the transmission of sexually transmitted diseases, comprising in combination, a vaginal tampon containing an active agent being selected from the group consisting of cholic acid and salts of cholic acid; and dimethylpolysiloxane in the form of an emulsion and being present in an amount effective to form a substantially uniform film coating on the vaginal mucosa and to inhibit penetration of said active agent across the vaginal mucosa; wherein said vaginal tampon comprises an open cell foam.

5,439,686

**METHODS FOR IN VIVO DELIVERY OF SUBSTANTIALLY WATER INSOLUBLE PHARMACOLOGICALLY ACTIVE AGENTS AND COMPOSITIONS USEFUL THEREFOR**

Neil P. Desai; Patrick Soon-Shiong; Paul A. Sandford, all of Los Angeles; Mark W. Grinstaff, Pasadena, all of Calif., and Kenneth S. Suslick, Champaign, Ill., assignors to VivoRx Pharmaceuticals, Inc., Santa Monica, Calif.

Filed Feb. 22, 1993, Ser. No. 23,698

Int. Cl.<sup>6</sup> A61K 9/48

U.S. Cl. 424—451

17 Claims

1. A composition for in vivo delivery of a substantially water insoluble pharmacologically active agent, wherein said agent is a solid or liquid substantially completely contained within a polymeric shell, wherein the largest cross-sectional dimension of said shell is no greater than about 10 microns, wherein said polymeric shell comprises a biocompatible polymer which is substantially crosslinked by way of disulfide bonds, and wherein said polymeric shell containing pharmacologically active agent therein is suspended in a biocompatible aqueous liquid.

5,439,687

**DOSAGE FORMS HAVING ZERO-ORDER DIHYDROPYRIDINE CALCIUM ANTAGONIST RELEASE**

Sabine Compassi, Stansstad, Switzerland, assignor to Siegfried Pharma AG, Zofingen, Switzerland

Filed Feb. 8, 1993, Ser. No. 14,836

Claims priority, application Switzerland, Feb. 17, 1992, 00464/92

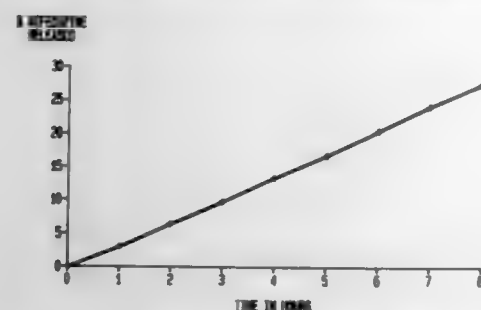
Int. Cl.<sup>6</sup> A61K 9/22, 9/36, 9/52

U.S. Cl. 424—468

19 Claims

1. A pharmaceutical dosage form having prolonged release of zero order of an active ingredient upon once-daily oral administration, containing as active ingredient a therapeutically effective amount of a crystalline, dihydropyridine calcium antagonist having a solubility in water of from 0.0001 to 0.01%, a homogeneous matrix consisting of 5-60% by weight of the calcium antagonist, an hydroxypropylmethylcellulose of the 2208 USP XXII Class having a molecular weight in the range of about 20,000-250,000 in an amount sufficient to prolong the zero order release of the calcium antagonist and maintain a constant therapeutically effective plasma level over a

period of 24 hours, said amount being from 2-50% by weight, and optionally 2-25% by weight of pharmaceutically acceptable excipients controlling release, said excipients being solid polyethylene glycols, polyvinylpyrrolidones, vinylpyrrolidone/vinylacetate copolymers, pharmaceutically accept-



able derivatives of vegetable fats in solid, tablet/table form having a melting point of above 60° C. or a combination thereof and optionally other pharmaceutically acceptable excipients making up the weight of the dosage form to 100%, said other pharmaceutically acceptable excipients being fillers, lubricants flow regulating agents or a combination thereof.

5,439,688

#### PROCESS FOR PREPARING A PHARMACEUTICAL COMPOSITION

Piero Orsolini, Martigny, and Frédéric Heimgartner, Villeneuve, both of Switzerland, assignors to Debio Recherche Pharmaceutique S.A., Martigny, Switzerland  
Continuation-in-part of Ser. No. 555,973, Jul. 20, 1990, Pat. No. 5,134,122. This application Nov. 12, 1991, Ser. No. 790,033  
Claims priority, application Switzerland, Nov. 14, 1990, 03616/90

The portion of the term of this patent subsequent to Jul. 6, 2010, has been disclaimed.

Int. Cl. A61K 9/14, 37/24, 9/48

U.S. Cl. 424-489

24 Claims

1. A process for preparing a pharmaceutical composition designed for the sustained and the controlled release of a drug, including a biodegradable polymer selected from the group consisting of poly-1,4-butylene succinate, poly-2,3-butylene succinate, poly-1,4-butylene fumarate and poly-2,3-butylene fumarate, and incorporating as the active substance the pamoate, tannate, stearate or palmitate salt of a natural or of a synthetic peptide, characterized in that:

- a) the biodegradable polymer and the active substance selected are dry blended, both as microparticles having an average size smaller than about 500 microns;
- b) the powdered mixture is compressed progressively and heated progressively to about 90° C.;
- c) the pre-compressed and pre-heated mixture is subjected to an extrusion at a temperature comprised between about 90° and 100° C., and the extruded product is cooled; and when required;
- d) the product resulting from the extrusion is comminuted at a decreased temperature, and finally the microparticles obtained are selected and collected.

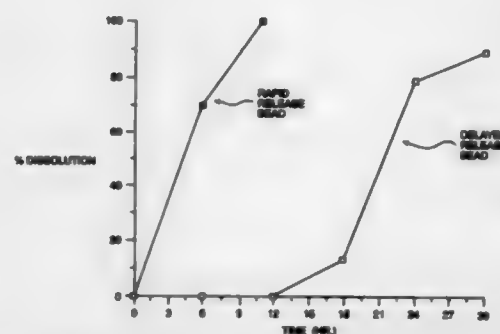
5,439,689

#### DILTIAZEM FORMULATION

Dennis L. Hendrickson, Overland Park, Kans.; Dan C. Dimmitt, Belton; Mark S. Williams, Kansas City, both of Mo.; Paul F. Skultety, Leawood, Kans., and Michael J. Baltezer, Lees Summit, Mo., assignors to Carderm Capital L.P., Switzerland  
Continuation of Ser. No. 58,534, May 6, 1993, Pat. No. 5,286,497, which is a continuation of Ser. No. 872,572, Apr. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 702,567, May 20, 1991, abandoned. This application Dec. 8, 1993, Ser. No. 164,062  
Int. Cl. A61K 9/16

U.S. Cl. 424-490

22 Claims



1. A method of treating cardiovascular disorders with a diltiazem formulation suitable for a once-a-day oral administration comprising:

administering an effective amount of a diltiazem formulation having A) a rapid release component and B) a delayed release component;

A) wherein said rapid release component comprises:

- 1) a diltiazem core containing an effective amount of diltiazem or a pharmaceutically acceptable salt thereof, optionally in association with pharmaceutically acceptable excipients; and

2) a sufficient quantity of a first suitable polymeric coating material which substantially envelops said diltiazem core so that said diltiazem exhibits the following in-vitro dissolution profile when measured in a type 2 dissolution apparatus (paddle) according to U.S. Pharmacopeia XXII at 37° C. in 0.1N HCl at 100 rpm:

- a) from 0-40% of total diltiazem is released after 3 hours of measurement in said apparatus; and
- b) from 30-100% of total diltiazem is released after 6 hours of measurement in said apparatus; and

B) wherein said delayed release component comprises:

- 1) a diltiazem core containing an effective amount of diltiazem or a pharmaceutically acceptable salt thereof, optionally in association with pharmaceutically acceptable excipients; and

2) a sufficient quantity of a second polymeric coating material which substantially envelops said diltiazem core so that said diltiazem exhibits the following in-vitro dissolution profile when measured in a type 2 dissolution apparatus (paddle) according to U.S. Pharmacopeia XXII, at 37° C. in 0.1N HCl at 100 rpm:

- a) from 0-45% of total diltiazem is released after 12 hours of measurement in said apparatus;
- b) from 0-75% of total diltiazem is released after 18 hours of measurement in said apparatus; and
- c) not less than 40% of total diltiazem is released after 24 hours of measurement in said apparatus;

wherein said diltiazem formulation exhibits the following in-vitro dissolution pattern when measured in a type 2 dissolution apparatus (paddle), according to U.S. Pharmacopeia XXII, in 0.1N HCl at 100 rpm:

- a) from 20-45% of total diltiazem is released after 6 hours of measurement in said apparatus;

- b) from 25-50% of total diltiazem is released after 12 hours measurement in said apparatus;
- c) from 35-70% of total diltiazem is released after 18 hours measurement in said apparatus;
- d) not less than 70% of total diltiazem is released after 24 hours of measurement in said apparatus; and,
- e) not less than 85% of total diltiazem is released after 30 hours of measurement in said apparatus.

5,439,690

#### NON-HAZARDOUS PEST CONTROL

Arthur M. Knight, Stuart, Fla., assignor to Ecosmart, Inc., Atlanta, Ga.

Filed May 21, 1993, Ser. No. 65,594

Int. Cl. A01N 59/00, 59/06, 25/12

U.S. Cl. 424-687

6 Claims

1. A pesticide for controlling insects, consisting essentially of a crystalline powder having 30%-35% by weight calcium carbonate, 60%-65% by weight alkali metal bicarbonate, a scenting agent, and an absorbent material, the crystalline powder having a size of about 0.1 micron, whereby the crystalline powder pierces the exoskeleton of the insects and penetrates therein.

5,439,693

Patent Not Issued For This Number

5,439,691

#### PROCESS FOR REDUCING CARCINOGENS IN FOODS

Richard M. Basel, 10760 W.C.R. 18, Fostoria, Ohio 44830  
Division of Ser. No. 865,225, Apr. 8, 1992, Pat. No. 5,331,886.  
This application Feb. 17, 1994, Ser. No. 197,316

Int. Cl. A23L 1/00

U.S. Cl. 426-314

17 Claims

FOOD ZONE	FRACTIONATING MEDIUM	SMOKE PRODUCING ZONE
(Low boiling point smoke compounds which pass through the fractionating medium and contact the food)	(High boiling point smoke compounds are prevented from contacting the food because they are retained by the fractionating medium)	(High and low boiling point smoke compounds are produced)

1. A process for preparing food comprising the steps of:
  - a) providing a food zone, a smoke producing zone and a fractionating medium which physically separates the smoke producing zone from the food zone,
  - b) locating the food in the food zone,
  - c) producing smoke compounds in the smoke producing zone,
  - d) separating the smoke compounds produced in the smoke producing zone on the basis of boiling point by means of the fractionating medium, and
  - e) allowing lower boiling point smoke compounds to pass through the fractionating medium and contact the food in the food zone.

5,439,692

#### PROCESS FOR INFUSING RAISINS WITH HUMECTANT

Miguel Guzman, Santa Cruz, and George Sousa, Jr., San Jose, both of Calif., assignors to Kellogg Company, Battle Creek, Mich.

Continuation of Ser. No. 53,731, Apr. 27, 1993, abandoned. This application Sep. 21, 1994, Ser. No. 309,785

Int. Cl. A23L 1/212; A23B 4/10

U.S. Cl. 426-321

25 Claims

1. A method for improving softness retention characteristics of raisins which comprises the steps of

- (1) providing raisins with a moisture content of from about 18 to about 26%;

- (2) applying to the surface of said raisins pure edible polyalcohol humectant at a temperature of from about 150° F. to 190° F. in an amount of from about 18 to about 28 percent based on the weight of the raisins;
- (3) infusing the raisins with the humectant by reducing the pressure above the raisins and maintaining said raisins under conditions at reduced pressure for a period of from about 5 to about 8 hours to enable the raisins to absorb said humectant to an amount of from about 10% to about 19% by weight;
- (4) tumbling said raisins;
- (5) separating the raisins from any unused humectant; and
- (6) thereafter drying the raisins to a moisture content of from about 7% to about 20%.

5,439,694

#### POULTRY PREPARATION PROCESS AND APPARATUS

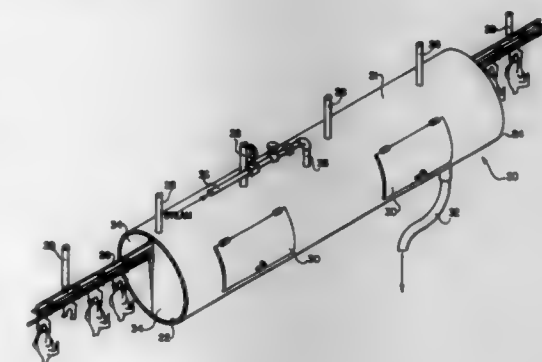
William F. Morris, Jr., Raleigh, N.C., assignor to Morris & Associates, Inc., Raleigh, N.C.

Filed Jul. 11, 1994, Ser. No. 272,539

Int. Cl. A23B 4/00; A23L 1/00

U.S. Cl. 426-511

4 Claims



1. A method of preparing poultry including the steps of
  - a) suspending slaughtered and eviscerated poultry carcasses from an overhead, track-type conveyor line;
  - b) moving said carcasses along said conveyor line and through flexible rubber doors placed at openings to an enclosed chamber;
  - c) moving said carcasses into said chamber through one of said doors and retaining said carcasses in said chamber for a predetermined length of time;
  - d) injecting live steam of at least atmospheric pressure into



said chamber so as to contact all exposed surface areas of said carcasses with said live steam for said predetermined length of time; and  
 e) moving said carcasses out of said chamber through another of said doors and into cold water for chilling and moisture absorption.

5,439,695

# ISOTHERMAL PREPARATION OF CHOCOLATE PRODUCTS

Malcolm R. Mackey, Cambridge, United Kingdom, assignor to Nestec S.A., Vevey, Switzerland  
 Continuation of Ser. No. 96,703, Jul. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 84,559, Jun. 29, 1993, abandoned. This application Jul. 28, 1994, Ser. No. 281,866  
 Claims priority, application United Kingdom, Sep. 29, 1992, 9220477

Int. Cl.<sup>6</sup> A23G 7/00

U.S. Cl. 426—516

24 Claims

1. A process for forming chocolate products comprising feeding solid set chocolate into an extruder having a zone of convergence and an extrusion die outlet and passing the chocolate under pressure and at a temperature below its pour point temperature through the extruder to and through the zone of convergence and the outlet to deform, plasticize and extrude a plasticized chocolate extrudate from the outlet so that the chocolate deformed, plasticized and extruded has a temperature below the pour point temperature of the set chocolate and so that, at a temperature which approximates the temperature of the extrudate upon issuance from the outlet, the extrudate maintains plasticity for from 5 minutes up to 4 hours prior to hardening.

5,439,696

# HIGH RATIO BAKING COMPOSITION

Gerald O. Rabe, Minnetonka, and Thomas A. Meyers, Parkers Prairie, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Aug. 25, 1993, Ser. No. 111,998

Int. Cl.<sup>6</sup> A21D 6/00, 10/04

U.S. Cl. 426—555

23 Claims

1. A high ratio baking composition comprising:  
 (a) about 20 to 45% by weight of a chlorine free heat treated soft flour;  
 (b) about 0.25 to 3% by weight of a non-flour fiber;  
 (c) about 0.25 to 6% by weight of a protein; and  
 (d) about 25 to 55% by weight sugar  
 wherein the density of a baked product resulting from the high ratio baking composition is less than about 5.6 to 6.3 g/in<sup>3</sup> and the weight ratio of the sugar to the heat treated soft flour is at least about 1:1.

5,439,697

# LOW-FAT SPREADABLE COMPOSITIONS

Juan M. Gonzalez-Sanz, St. Louis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Sep. 9, 1993, Ser. No. 119,345

Int. Cl.<sup>6</sup> A23L 1/0522; A23G 3/00

U.S. Cl. 426—572

13 Claims

1. A low-fat ready-to-spread composition comprising:  
 (a) a sweetener in an amount of from about 30 wt % to about 90 wt % relative to the total weight of the composition;  
 (b) a shortening in an amount of from about 1 wt % to about 9 wt % relative to the total weight of the composition;  
 (c) a starch in an amount of from about 0.75 wt % to about 10 wt % relative to the total weight of the composition, said starch having a hydrophilic starch component and a modified hydrophobic starch component;  
 (d) a hydrocolloid in an amount of from about 0.05 wt % to about 1.5 wt % relative to the total weight of the composition;  
 (e) an emulsifier in an amount of from about 0.25 wt % to

about 3 wt % relative to the total weight of the composition; and  
 (f) water in an amount of from about 9 wt % to about 27 wt % relative to the total weight of the composition.

5,439,698

# PROCESS FOR MANUFACTURING GASIFIED CANDY

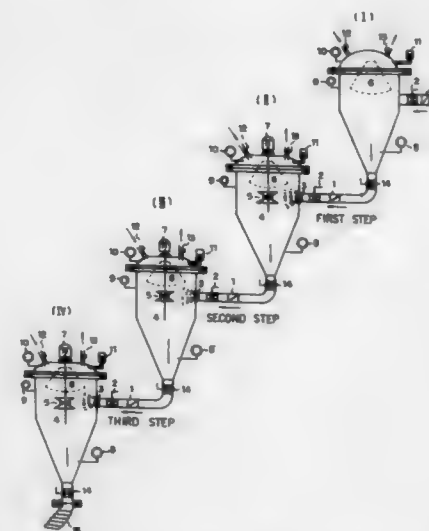
Sung Ae Ahn, 1-303, Jangmi 3rd Apartment Sincheon-Dong Songpa-Ku, Seoul, Rep. of Korea, and Young Deug Lee, Seoul, Rep. of Korea, assignors to Sung Ae Ahn, Seoul, Rep. of Korea  
 Filed Jan. 5, 1994, Ser. No. 177,623

Claims priority, application Rep. of Korea, Apr. 27, 1993, 93-7110

Int. Cl.<sup>6</sup> A23G 3/00

U.S. Cl. 426—572

5 Claims



1. A process for obtaining gasified candy comprising the steps of:

- providing four pressure vessels including a first pressure vessel having an interior structure comprising a gas inlet, a gas outlet, agitation guide plate, candy melt inlet, and candy melt outlet, and second, third, and fourth pressure vessels, each of said vessels having an interior structure comprising a nozzle plate mounted in a melt inlet and an agitation propeller, in addition to the structure of the first pressure vessel;
- introducing the candy melt and a gas into the first pressure vessel;
- spraying the candy melt from the first pressure vessel into the second pressure vessel in which the gas is pre-introduced using the pressure difference between the first and second pressure vessels through the nozzle plate mounted in the inlet of the second pressure vessel;
- dispersing again the candy melt sprayed into the second pressure vessel using the agitation propeller installed in the interior of said second pressure vessel thereby creating maximum contact of the candy melt with the gas;
- repeating steps c) and d) wherein the third pressure vessel is substituted for the second pressure vessel and the second pressure vessel is substituted for the first pressure vessel; and
- repeating steps c) and d) wherein the fourth pressure vessel is substituted for the second pressure vessel and the third pressure vessel is substituted for the first pressure vessel.

5,439,699

# METHOD FOR PREPARING COLORLESS CLEAR BEER

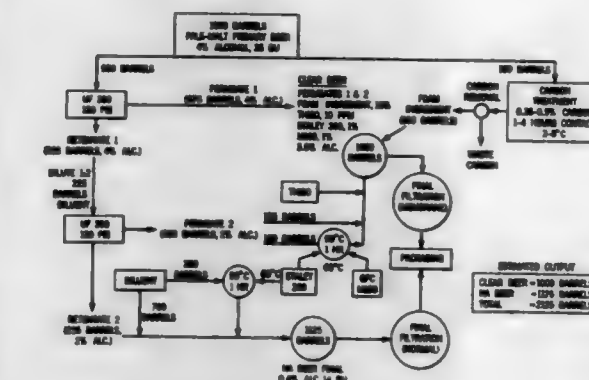
Matthew L. Tripp, Nashotah; Sydney Rader, Fredonia, both of Wis., and David S. Ryder, Libertyville, Ill., assignors to Miller Brewing Company, Milwaukee, Wis.

Filed Mar. 11, 1993, Ser. No. 29,740

Int. Cl.<sup>6</sup> C12C 12/04; C12G 3/08; C12H 3/00

U.S. Cl. 426—592

8 Claims



1. A method of preparing a colorless, clear beer comprises:

- subjecting a feed beer having about 3 to about 7% w/w alcohol, about 20 to about 50 bitter units and a color reading of about 4° to about 5° American Society Of Brewing Chemists standard method to ultrafiltration at a pressure of about 30 psi to about 190 psi using a membrane having a nominal 300 molecular weight cutoff range to obtain a retentate and a permeate;
- isolating the permeate which contains about the same level of alcohol as said feed beer and having less than 2 bitter units and a color of less than 0.1° American Society Of Brewing Chemists standard method;
- adding to the permeate an effective amount of a bittering agent to obtain the desired bitter flavor;
- adding an effective amount of high and intermediate dextrans in the permeate to add body and dryness; and
- adding an effective amount of a beer foaming component to the permeate to produce a colorless, clear beer.

5,439,700

# NON-HYDROGENATED COATING FAT

Frederick W. Cain, Voorburg; Adrian D. Hughes, The Hague, and Hendrikus Slager, Bussum, all of Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed Sep. 9, 1992, Ser. No. 942,562

Claims priority, application European Pat. Off., Sep. 10, 1991, 91202299

Int. Cl.<sup>6</sup> A23D 9/00

U.S. Cl. 426—607

7 Claims

1. A non-hydrogenated non-temper, lauric fat composition, said composition comprising

- a lauric fat, displaying the following characteristics:  
 (a) a solid fat content (NMR, stabilized) of: 35 < N<sub>30</sub> < 48;  
 (b) an oleic acid content of 1-10 wt. %;  
 (c) a content of C<sub>8</sub>-C<sub>14</sub> saturated fatty acids of 70-95 wt. %  
 (d) an elaidic acid content of less than 1.5 wt. % and
- a fraction of a natural fat, which fraction contains at least 50 wt. % of trisaturated glycerides (S<sub>3</sub>), wherein S is C<sub>16</sub>-C<sub>24</sub>,  
 wherein the amount of the lauric fat (1) is 85-99 wt. % and the amount of fraction (2) is 1-15 wt. %.

5,439,701

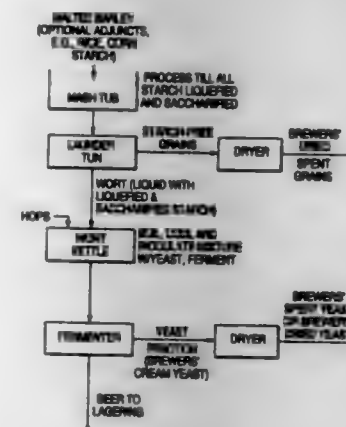
# FIBER-CONTAINING FOOD PRODUCT AND PROCESS FOR PRODUCING IT FROM A PORTION OF BY-PRODUCT OF ALCOHOL PRODUCTION PROCESS

Joseph A. Zimlich, III, Louisville, Ky., assignor to Brown-Forman Corporation, Louisville, Ky.  
 Continuation-in-part of Ser. No. 964,088, Oct. 21, 1992, Pat. No. 5,316,782. This application Apr. 15, 1994, Ser. No. 228,366

Int. Cl.<sup>6</sup> A23K 1/06; A23L 1/105, 1/186

U.S. Cl. 426—624

24 Claims



1. A process of treating a composition comprising a brewers' cream yeast, a brewers' dried yeast resuspended in water or a mixture thereof, consisting essentially of the steps of:

- adjusting pH of the brewers' cream yeast, the brewers' dried yeast resuspended in water or the mixture thereof to between about 7 to about 11;
- maintaining the pH-adjusted brewers' cream yeast, the brewers' dried yeast resuspended in water or the mixture thereof at a temperature of between about 130° F. to about 210° F. for about 4 to about 14 hours and concentrating the cooked, pH-adjusted brewers' cream yeast, the brewers' dried yeast resuspended in water or the mixture thereof to obtain a viscous product; and
- drying the viscous product of said step (b) to obtain a substantially free-flowing solid product.

5,439,702

# METHOD OF MIXING MEAT WITH DRIED FIBROUS COLLAGEN

James W. L. French, Dorchester, England, assignor to Stork Fibron B.V., Oss, Netherlands

Continuation of Ser. No. 35,490, Mar. 22, 1993, abandoned, which is a continuation of Ser. No. 752,567, Sep. 6, 1991, abandoned. This application Feb. 28, 1994, Ser. No. 203,604  
 Claims priority, application United Kingdom, Mar. 8, 1989, 89052922

Int. Cl.<sup>6</sup> A23L 1/31, 1/317

U.S. Cl. 426—641

27 Claims

1. A method of improving meat products which comprises mixing a de-boned or separated meat (D or S meat) with dried fibrous collagen having a water content of not more than about 10% in order to distribute the dried fibrous collagen substantially homogeneously throughout the D or S meat and forming the mixture into discrete portions or a continuous extrudate, said dried fibrous collagen providing improved texture and consistency in said products.

5,439,703

## PRESSURE PROCESSING METHOD FOR FOOD MATERIALS

Takeshi Kanda, Nishinomiya; Kazanobu Fujinuma, Tsukuba; Toshikatsu Naol, Kobe; Yoshihiko Inoue, Kobe; Yoshihiko Sakashita, Kobe, and Yoshihisa Sawada, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Division of Ser. No. 785,873, Nov. 1, 1991, Pat. No. 5,228,394.

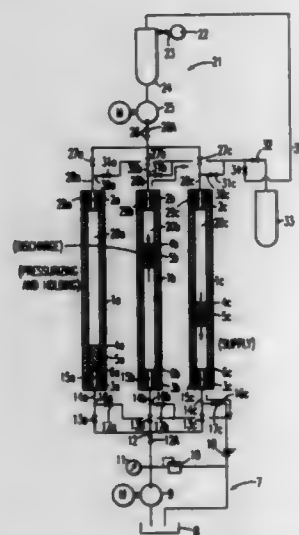
This application May 25, 1993, Ser. No. 66,237

Claims priority, application Japan, Nov. 2, 1990, 2-298060; Nov. 22, 1990, 2-320034; Jan. 23, 1991, 3-6534

Int. Cl.<sup>6</sup> A23L 3/00, 3/015; A23C 3/00

U.S. Cl. 426—665

4 Claims



1. A pressure processing method for flowable food materials, employing at least a first and second pressure container, each pressure container liquid tightly housing therein a free piston which is slidable axially in the container, wherein each of said free pistons partitions each container into a first pressure chamber for receiving a pressure medium and a second pressure processing chamber for receiving flowable food material to be pressure processed by being subjected to pressure greater than atmospheric pressure, each of said free pistons being configured to prevent mixture and contact between the pressure medium and the flowable food material when the pressure medium and the flowable food material are in the first and second chambers, respectively, and each of said free pistons being freely movable to equilibrium positions having equal fluid pressures in each of their respective chambers, comprising the steps of:

pressure processing flowable food material that has already been supplied to the second chamber of the first container by applying fluid pressure to the first chamber of the first container, such that the fluid pressure in the first chamber pressurizes the second chamber of the first container to a pressure greater than atmospheric pressure, and holding said flowable food material in the second chamber of the first container under said pressure for a time sufficient to pressure process the flowable food material; simultaneously with said pressure processing step, supplying additional flowable food material to be pressure processed to the second chamber of the second container; and terminating said pressure processing step in said first container and initiating a pressure processing step in said second container by fluidically communicating said first chamber of said second container with said first chamber of said first container so that the fluid pressure in said first chamber of said first container is applied to said first chamber of said second container.

5,439,704

## COMBINED COIL AND BLANK POWDER COATING

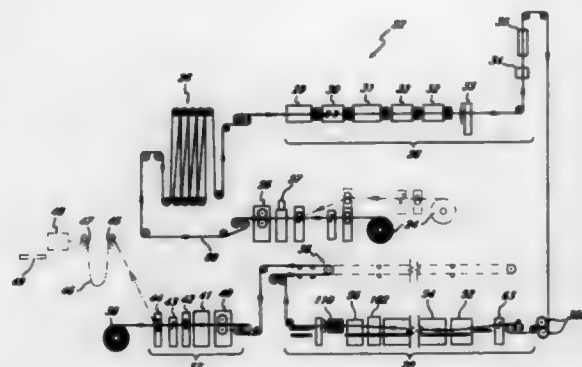
Subbiah Sankaran, Riverside, and Axel W. Missing, Moreno Valley, both of Calif., assignors to Hunter Engineering Company, Inc., Riverside, Calif.

Filed Oct. 27, 1993, Ser. No. 143,864

Int. Cl.<sup>6</sup> B05D 3/02, 7/26

U.S. Cl. 427—195

6 Claims



1. A method of coating metal in strip and then in blank form, comprising:  
supplying a continuous strip of metal through an entrance shear to an entrance end of a powder coating booth;  
suspending said continuous strip through said powder coating booth and through an oven;  
coating both sides of said strip using powder coating spray guns within said coating booth;  
melting and curing the powder on both sides of said strip within said oven;  
halting the progression of said strip;  
shearing said strip at said entrance shears and allowing a first end of said sheared strip to travel through said coating booth and said oven to a joiner;  
displacing a conveyor from a location outside of said coating booth to a location between an upper bank and a lower bank of powder coating spray guns within said coating chamber;  
introducing a blank to a location between said entrance shear and said entrance end of the coating booth;  
propelling said blank onto said coating booth conveyor;  
coating said blank using said upper bank of powder coating spray guns; and  
propelling said blank on an oven conveyor through said oven to melt and cure the powder on said blank.

5,439,705

## ENCAPSULATED ELECTROLUMINESCENT PHOSPHOR AND METHOD FOR MAKING SAME

Kenton D. Budd, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Continuation of Ser. No. 912,786, Jul. 13, 1992, which is a division of Ser. No. 514,440, Apr. 25, 1990, Pat. No. 5,156,885.

This application Jul. 14, 1994, Ser. No. 274,961

The portion of the term of this patent subsequent to Oct. 20, 2009, has been disclaimed.

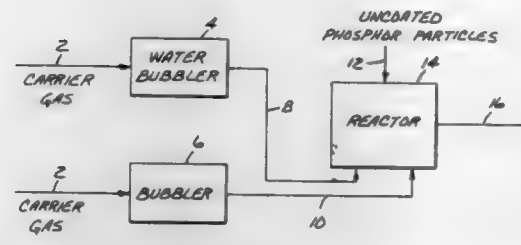
Int. Cl.<sup>6</sup> B05D 7/00

U.S. Cl. 427—212

14 Claims

1. A process for encapsulating phosphor particles in substantially transparent oxide coatings comprising:  
a) providing an agitated bed of zinc sulfide-based electroluminescent phosphor particles;  
b) heating said bed;  
c) exposing said bed to one or more vapor phase metal oxide precursors such that said precursors chemically react

substantially via hydrolysis to form hermetic, substantially transparent oxide coatings on the surfaces of said particles,



thereby yielding essentially encapsulated phosphor particles; and  
d) cooling said encapsulated particles.

5,439,706

## METHOD FOR MANUFACTURING INORGANIC MEMBRANES BY ORGANOMETALLIC CHEMICAL VAPOR DEPOSITION

Robin E. Richards, Chalfont; Robert L. Iampietro, Emmaus, and Paul N. Dyer, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 816,195, Jan. 2, 1992, Pat. No. 5,360,635. This application Mar. 17, 1994, Ser. No. 214,920

The portion of the term of this patent subsequent to Nov. 1, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B05D 5/00

U.S. Cl. 427—244

11 Claims

1. A method for manufacturing an inorganic membrane comprising a layer of an oxide ion conducting multicomponent metallic oxide which has been deposited onto a porous substrate, the method consisting essentially of:  
(a) individually heating organometallic complexes capable of forming an oxide ion conducting multicomponent metallic oxide comprising at least two different metal to a temperature sufficient to vaporize the organometallic complexes, each organometallic complex comprising organic functionality and a metallic component corresponding to a metal in the multicomponent metallic oxide;  
(b) introducing the vaporous organometallic complexes and an oxidizing agent into a reactor containing a porous substrate to form a mixture of the vaporous organometallic complexes and the oxidizing agent; and  
(c) depositing a layer of the oxide ion conducting multicomponent metallic oxide onto the porous substrate by reacting the mixture of organometallic complexes and oxidizing agent at a temperature of about 400° C. to 800° C. and pressure ranging from 1 to 760 torr to form the inorganic membrane.

5,439,707

## COATING FORMULATION AND METHOD OF PRODUCTION THEREOF FOR POST PRINT WAXABLE LINERBOARD

Leo M. Nelli, Walkkill; Eitan Avni; Lori Slovik, both of Monroe, and Kevin Ellis, Washingtonville, all of N.Y., assignors to International Paper Company Tuxedo Park, N.Y.

Filed May 5, 1994, Ser. No. 238,402

Int. Cl.<sup>6</sup> B05D 1/36, 5/00

U.S. Cl. 427—258

10 Claims

5. A process for flexographically printing multi-color graphics onto a linerboard substrate having a basis weight of greater than 150 g/m<sup>2</sup> comprising the steps of:

a) coating onto said linerboard substrate a highly absorbent formulation comprising 10–30% by weight precipitated amorphous silicate; 10–40% titanium dioxide; up to 80% by weight calcium carbonate; up to 80% by weight clay; and a latex binder to form a coated linerboard; and  
b) flexographically printing in succession a plurality of inks onto said coated linerboard to form a multi-color printed

substrate, wherein said inks are rapidly absorbed onto said coated linerboard to facilitate print uniformity and quality.

5,439,708

## SLIDE HOPPER-TYPE METHOD FOR COATING MOVING WEB HAVING REDUCED STREAKING

Tadahiro Tsujimoto; Takashi Ito; Nobuo Takeuchi, and Misao Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

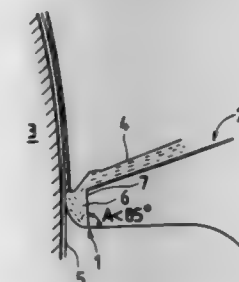
Filed May 28, 1992, Ser. No. 889,429

Claims priority, application Japan, Jun. 3, 1991, 3-157431

Int. Cl.<sup>6</sup> B05D 3/00

U.S. Cl. 427—294

6 Claims



1. A method for applying a coating solution onto a web, said method comprising the steps of:  
continuously conveying said web;  
providing a solution applying device, said device including a solution injector comprising a leading end portion having first and second ends, a first surface extending from said first end of said leading end portion, and a second surface extending from said second end of said leading end portion, said leading end portion being opposed to said web, and having a lower end portion having an angle of not more than 85° formed between said leading end portion and said second surface of said solution injector, a space below said second surface being open;  
flowing a coating solution along said first surface of said solution injector to form a bead between said leading end portion and said web, while said space below said second surface remains free of coating solution; and  
controlling applying conditions and pressure of said solution on both sides of said bead between said web and said leading end portion of said solution injector such that a first end portion of said bead coincides with said second end of said leading end portion of said solution injector.

5,439,709

## FATTY ACID METHYL ESTERS IN LUBRICANTS FOR CARD SPINNING

Wolfgang Becker, Moenchengladbach; Raymond Mathis, Dueseldorf; Ulrich Eicken, Korschenbroich; Karin Robrahn, Mettmann, and Silvia Stapper-Druyen, Moenchengladbach, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dueseldorf, Germany

PCT No. PCT/EP92/01121, § 371 Date Jan. 26, 1994, § 102(e) Date Jan. 26, 1994, PCT Pub. No. WO92/21809, PCT Pub. Date May 20, 1992

PCT Filed May 20, 1992, Ser. No. 142,451

Claims priority, application Germany, May 29, 1991, 41 17 670.7; Jan. 25, 1992, 42 01 978.8

Int. Cl.<sup>6</sup> B05D 5/00; D06M 13/184

U.S. Cl. 427—389.9

15 Claims

1. The process of lubricating textile fibers in the production of carded yarns, comprising contacting said textile fibers with a lubricant composition consisting essentially of a smoothing agent consisting of from 60 to 90% by weight of a C<sub>8</sub>–C<sub>22</sub> fatty acid methyl ester in admixture with 0.05 to 10% by weight of a viscosity-enhancing homopolymer or copolymer of an ester



of acrylic acid or methacrylic acid having a limiting viscosity below  $400 \text{ ml g}^{-1}$  as measured in tetrahydrofuran at  $20^\circ \text{C}$ , based on the weight of said lubricant composition.

5,439,710

# METHOD OF PRODUCING MULTILAYER COATINGS, MORE PARTICULARLY FOR LACQUERING OF MOTOR VEHICLES, HAVING GOOD ADHESION BETWEEN LAYERS

Bettina Vogt, Düsseldorf; Hans-Peter Patzschke, Wuppertal; Werner Lenhard, Wuppertal, and Dietrich Saatweber, Wuppertal, all of Germany, assignors to Herberts G.m.b.H., Wuppertal, Germany

Continuation of Ser. No. 959,891, Oct. 13, 1992, abandoned. This application Dec. 21, 1993, Ser. No. 171,323

Claims priority, application Germany, Oct. 17, 1991, 41 34 289.5

Int. Cl.<sup>6</sup> B05D 1/36; B32B 9/04; C25D 13/00

U.S. Cl. 427—407.1

16 Claims

1. A method of manufacturing a multilayer coating by applying a number of coating layers based on organic resins in succession to a substrate for coating, characterized in that at least three layers are applied on top of each other, each of said layers including resins having polar groups, the polarity of the polar groups of the resins within each said layer being the same and each said layer containing polar groups of opposite polarity to a next said layer, resulting in a layer structure having resin layers of alternating polarity.

5,439,711

# METHOD FOR CO-REACTIVE EXTRUSION COATING OF PIPE USING THERMOSETTING MATERIAL

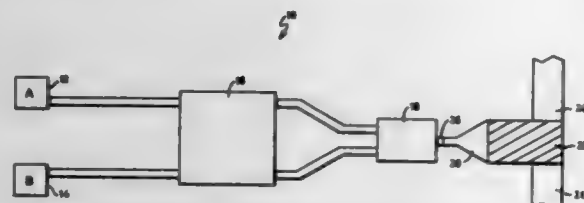
Cang Va, Columbia, Md., and Matthew T. Pickett, Bognor Regis, England, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jun. 23, 1994, Ser. No. 264,829

Int. Cl.<sup>6</sup> B05D 1/18

U.S. Cl. 427—430.1

13 Claims



1. A method for coating a pipe, comprising the steps of: introducing two thermoset components A and B each separately into a proportioning pump operative to meter said components in a ratio said components, when combined, operative to form a material selected from the group consisting of epoxy, polyurethane, and silicone; providing a metering pump in conjunction with said proportioning pump to ensure that after metering said thermoset components A and B are sufficiently intermixed to initiate a thermosetting reaction;

extruding onto a continuously rotating pipe said intermixed reacting components through a slot die having a body comprised of at least two blocks defining therebetween inner passageway surfaces comprised of low-stick material operative to permit said reacting thermosetting components, when gelled and thermoset, to be removed therefrom, said blocks being releasably attached to each other whereby said slot die can be dismantled and thermoset material can be removed from within said inner passageway surfaces, and said extruded intermixed reacting components having a coating coverage rate for coating said continuously rotating pipe; and advancing said slot die longitudinally along the length of said pipe while said pipe is rotated, whereby a ribbon of

thermosetting material is helically coated around said pipe and is operative to protect said pipe against corrosion.

5,439,712

# METHOD FOR MAKING A COMPOSITE ALUMINUM ARTICLE

Takeshi Hattori, Nishi; Kazuhiko Inoguti, Nagoya; Yukio Ohyama, Nishi; Yutaka Nakagishi, Ueno, and Masaaki Sakaguchi, Osaka, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Okuno Chemical Industries Co., Ltd., Osaka, both of Japan

Continuation of Ser. No. 922,469, Jul. 30, 1992. This application Mar. 1, 1994, Ser. No. 203,406

Claims priority, application Japan, Aug. 19, 1991, 206706

Int. Cl.<sup>6</sup> B05D 1/18

U.S. Cl. 427—437

16 Claims

1. A method for making a composite aluminum article, comprising the steps of:

electrochemically or chemically adsorbing fine particles of polytetrafluoroethylene to a surface of a hard anodic oxide film of a material chosen from the group consisting of aluminum and an aluminum alloy, said oxide film being disposed on an article;

drying said treated article; and

subsequently rubbing together said article and an opposite member which is to slide along said article, so as to form a lubricating film of said polytetrafluoroethylene, wherein said adsorbing step includes providing positive electrical charges to said fine particles of polytetrafluoroethylene, dispersing said fine particles of polytetrafluoroethylene uniformly in an aqueous solution, immersing said article having said hard anodic oxide film in said aqueous solution and electrolysis is carried out in said aqueous solution, whereby said fine particles of said polytetrafluoroethylene are adsorbed onto the surface of said hard anodic oxide film, wherein said particles of polytetrafluoroethylene have an average particle diameter of  $0.1 \mu\text{m}$  to  $0.5 \mu\text{m}$ .

5,439,713

# STEEL WIRE COATED WITH FE-ZN-AL ALLOYS AND METHOD FOR PRODUCING THE SAME

Yukio Yamaoka, and Tetsuro Noma, both of Amagasaki, Japan, assignors to Shinko Kosen Kogyo Kabushiki Kaisha, Hyogo, Japan

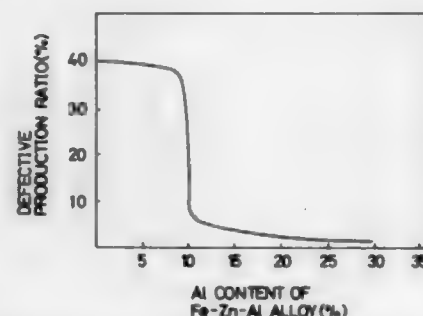
Filed May 2, 1994, Ser. No. 236,435

Claims priority, application Japan, Oct. 8, 1993, 5-253365

Int. Cl.<sup>6</sup> C23C 2/06

U.S. Cl. 427—433

4 Claims



1. A method for producing a steel wire for spring, comprising the steps of:

immersing a steel wire in a zinc molten bath to plate the steel wire with zinc;

immersing the zinc-plated steel wire in a zinc-aluminum molten bath containing 2 to 5 weight percent aluminum to form a ternary alloy of iron, zinc, and aluminum on a surface of the steel wire, said aluminum being present in said ternary alloy at a concentration greater than 10 weight percent; and

removing an unsolidified zinc-aluminum layer deposited on the outer surfaces of the zinc-plated steel wire while being taken out of the zinc-aluminum molten bath to expose the ternary alloy on an outermost surface of the steel wire.

5,439,714

# METHOD FOR THERMAL SPRAYING OF AN INNER SURFACE

Kazuhiko Mori, Okazaki; Kenji Shimoda, Nishikamo, and Hiroshi Harada, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

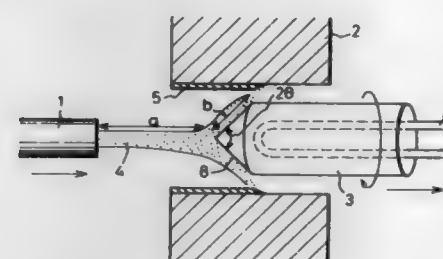
Filed Jul. 13, 1993, Ser. No. 90,313

Claims priority, application Japan, Aug. 3, 1992, 4-206648; Oct. 8, 1992, 4-270162

Int. Cl.<sup>6</sup> B05D 1/08

U.S. Cl. 427—446

7 Claims



1. A method of coating an inner surface of a member with a coating material by use of a thermal spray, comprising the steps of:

positioning a thermal spray gun relative to the member to be coated;

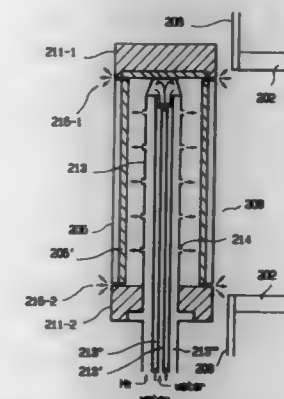
positioning a thermal spray material bending member within the member to be coated;

heating the material in the thermal spray gun to form a thermal spray;

jetting the thermal spray of the heated material from the thermal spray gun;

deflecting the thermal spray onto the inner surface of the member so as to coat the inner surface by positioning the thermal spray material bending member having an inclined guide plate such that the inclined guide plate is not connected to the thermal spray gun and intercepts and deflects the thermal spray;

regulating a spacing of the inclined guide plate from the thermal spray gun during said jetting and deflecting steps such that the material is completely melted immediately before it contacts the inner surface of the member; and moving the thermal spray gun in synchronism with the bending member while maintaining the distance therebetween.



wave glow discharge in film-forming raw material gas to generate plasma causing the formation of said functional deposited film on each of said cylindrical substrates while rotating said cylindrical substrate, the improvement which comprises maintaining each of the cylindrical substrates at a desired temperature by using a thermally conductive gas, wherein said thermally conductive gas is cooled with a cooling liquid medium, and is directed toward the inner circumferential wall of said substrate holder having said substrate positioned thereon in the interior space of said substrate holder, passing the cooled thermally conductive gas through (a) a joint allowance between the upper auxiliary substrate and the cylindrical substrate holder and (b) a joint allowance between the lower auxiliary substrate and the cylindrical substrate holder into the film-forming chamber.

5,439,716

# MULTIPLE PANE INSULATING GLASS UNIT WITH INSULATIVE SPACER

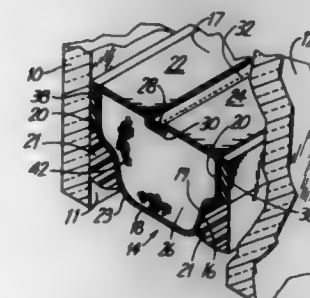
James E. Larsen, Andover, Minn., assignor to Cardinal IG Company, Minneapolis, Minn.

Filed Mar. 19, 1992, Ser. No. 853,785

Int. Cl.<sup>6</sup> E06B 3/24

U.S. Cl. 428—34

22 Claims



1. An insulating glass unit comprising a pair of generally parallel, spaced-apart glass panes, and a spacer peripherally

5,439,715

# PROCESS AND APPARATUS FOR THE FORMATION OF A FUNCTIONAL DEPOSITED FILM ON A CYLINDRICAL SUBSTRATE

Ryuji Okamura, Shiga; Hirokazu Otsoshi, and Tetsuya Takel, both of Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 635,975, Dec. 31, 1990, abandoned, which is a continuation of Ser. No. 526,536, May 21, 1990, Pat. No. 5,030,476, which is a continuation of Ser. No. 382,218, Jul. 20, 1989, abandoned. This application Dec. 14, 1993, Ser. No. 165,868

Claims priority, application Japan, Jul. 22, 1988, 63-181564; Jun. 16, 1989, 1-152228

Int. Cl.<sup>6</sup> B05D 3/06; C23C 16/50

U.S. Cl. 427—575

3 Claims

1. A microwave plasma chemical vapor deposition process for the formation of a functional deposited film on a plurality of cylindrical substrates each having auxiliary substrates by means of a microwave plasma chemical vapor deposition to be

joining the glass panes to each other about the perimeter of the glass unit, the panes and spacer defining between them a gas-containing interpane space, the spacer comprising an elongated spacer length formed of stainless steel having a wall thickness not greater than about 0.005 inches, having a hollow interior and opposed, generally flat side walls, and a sealant sealing the side walls to opposed pane surfaces, the spacer having a bent corner section filled with a crush-resistant particulate composition conforming to the interior configuration of the corner section to transmit compressive forces from one side wall of the spacer to the other and to thereby contribute compressive strength to the spacer.

5,439,717

# SHRUNKEN BAG MADE FROM BIAXIALLY STRETCHED, VLDPE FILM

Stanley Lustig, Park Forest; Nancy M. Mack, Chicago; Jeffrey M. Schuetz, Woodridge, and Stephen J. Vicik, Darien, all of Ill., assignors to Viskase Corporation, Chicago, Ill. Division of Ser. No. 779,676, Oct. 21, 1991, Pat. No. 5,256,428, which is a division of Ser. No. 501,986, Mar. 28, 1990, Pat. No. 5,059,481, which is a continuation of Ser. No. 384,589, Jul. 25, 1989, Pat. No. 4,976,898, which is a division of Ser. No. 42,087, Apr. 24, 1987, Pat. No. 4,863,769, which is a continuation of Ser. No. 745,236, Jun. 17, 1985, abandoned. This application Oct. 25, 1993, Ser. No. 142,744

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.<sup>6</sup> B32B 27/08; B65D 85/72

U.S. Cl. 428—34.9

20 Claims

1. A bag comprising: a shrunken thermoplastic flexible film wherein said shrunken film comprises a biaxially stretched very low density polyethylene (VLDPE) which is a linear copolymer of ethylene and at least one alpha-olefin selected from the group of butene-1, pentene-1, hexene-1, 4-methyl pentene-1, heptene-1 and octene-1, copolymer having a density of from about 0.86 g/cm<sup>3</sup> to about 0.91 g/cm<sup>3</sup> and a 1% secant modulus below about 140,000 kPa, said biaxially stretched film having a shrinkage value of from about 30 percent to about 50 percent at a temperature of 90° C. in at least one of the machine and transverse directions prior to shrinkage of said film.

5,439,718

# MULTILAYER CONTAINER OF POLYCARBONATE AND AMORPHOUS POLYAMIDE OF IMPROVED BARRIER AND STRESS CRACK RESISTANT PROPERTIES

Thomas M. Klerks, Bergen op Zoom, Netherlands; Robert S. Thayer, Pittsfield, Mass.; G. Fred Willard, Parkersburg, W. Va.; Thomas P. Dunton, Lebanon Springs, N.Y., and John H. C. Young, Jisp, Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Filed Jul. 21, 1993, Ser. No. 95,324

Int. Cl.<sup>6</sup> B65D 23/00

U.S. Cl. 428—35.7

4 Claims

1. A multilayer container having improved stress craze/crack resistance and improved rewashing consisting of four layers adjacent to each other comprising (1) an outer layer, (2) an intermediate layer comprising a two layer composite, and (3) an inner layer where the outer layer (1) consists essentially of a polycarbonate-organopolysiloxane random block copolymer having at least 10 organopolysiloxane units per organopolysiloxane block and said inner layer (3) being a C<sub>8</sub>-C<sub>13</sub> aliphatic lactam modified amorphous polyamide having a glass transition temperature of at least 130° C. and wherein said outer layer (1) and said inner layer (3) having disposed therebetween a two layer composite wherein the layer adjacent to the outer layer (1) is an amorphous polyamide having a glass transition temperature of at least 130° C. and the layer of said two layer composite adjacent to the inner layer (3) is a branched polycarbonate having an intrinsic viscosity of at least

0.40 deciliters per gram as measured in methylene chloride at 25° C.

5,439,719

# PROCESS FOR PREPARING A HIGH-MOLECULAR-WEIGHT POLYESTER

Thomas Grosse-Puppenthal, Haltern, and Walter K. Homann, Duellen, both of Germany, assignors to GAF-Huels Chemie GmbH, Marl, Germany

Filed Aug. 24, 1994, Ser. No. 294,922

Claims priority, application Germany, Sep. 21, 1993, 43 31 999.8

Int. Cl.<sup>6</sup> B32B 23/08, 1/08

U.S. Cl. 428—35.8

21 Claims

1. A process for preparing a polyester, comprising: i) reacting an organic dicarboxylic acid with a mixture of alkanediols and alkenediols with substantial exclusion of oxygen and in the presence of a catalyst until a solution viscosity number in the range of from 5 to 150 cm<sup>3</sup>/g is reached; and ii) subjecting said polyester to ionizing radiation.

5,439,720

# ULTRASONICALLY WELDED PLASTIC RIBBON AND APPARATUS AND PROCESS FOR FORMING SAME

Hrishikesh Choudhury, Gurnee, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

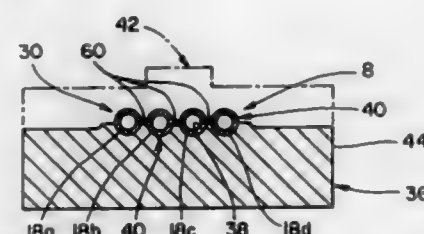
Continuation of Ser. No. 783,307, Oct. 28, 1991, abandoned.

This application Nov. 19, 1993, Ser. No. 156,530

Int. Cl.<sup>6</sup> B29D 23/00

U.S. Cl. 428—36.9 CRN

7 Claims



1. A ribbon of plastic tubing comprising: a plurality of individual, parallel extending plastic tubes, each plastic tube having a predetermined hollow passageway, a predetermined wall thickness, and an outer circumferential surface positioned adjacent in a non-contacting side-by-side relationship at least one other of the plastic tubes; and at least one integral weld bond formed from a portion of the predetermined wall thickness and radially extending from the outer surface of each of the plurality of plastic tubes, each weld bond integrally coupling the respective plastic tube to the integral weld bond of one other adjacent plastic tube without change in the hollow passageway of each tube.

5,439,721

# LABEL FOR PACKAGED PRODUCTS

John L. Pedrolli, Germantown; Larry Feldmann; Henry P. Littleton, both of Memphis; Richard L. Walton, Bartlett; James W. Littleton, Bartlett, and Kelly E. Haley, Bartlett, all of Tenn., assignors to ELR, Inc., Wilmington, Del.

Filed Jul. 7, 1993, Ser. No. 88,449

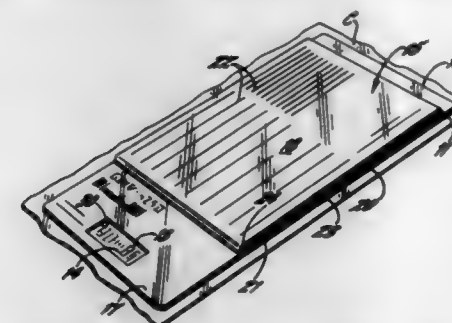
Int. Cl.<sup>6</sup> B42D 15/00; G09F 3/00

U.S. Cl. 428—40

6 Claims

1. A label for use in labeling products, about which information is desired to be imparted to users, comprising a bottom layer of imprintable material of a length and width substantially corresponding to the length and width of said label, said bottom layer having an adhesive coating on

at least a portion of the bottom surface thereof to secure the label to a product and having a portion of the upper surface imprinted with suitable indicia concerning the product to be labeled and at least one portion of the upper surface thereof being unprinted, and an upper layer of clear plastic film substantially coextensive with and adhesively laminated to said bottom layer at opposite end portions thereof while being unsecured to said bottom layer in the medial portion thereof to define



with the medial portion of said bottom layer a pocket removably receiving and containing an informational booklet about the product to be labeled, said upper layer having a die cut window in one end portion thereof with said upper layer surrounding said window and overlying the unprinted portion of said bottom layer and to expose the unprinted portion of said imprintable bottom layer for the imprinting of suitable additional product information at the time of label application.

5,439,722

# SUBSTRATE COMPOSED OF AT LEAST ONE CYCLOOLEFIN COPOLYMER FOR RECORDING MEDIA AND PROCESS FOR PRODUCING IT

Michael-Joachim Brekner, Frankfurt am Main, and Thomas Weller, Mainz, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 8, 1993, Ser. No. 131,945

Claims priority, application Germany, Oct. 8, 1992, 42 33 851.4

Int. Cl.<sup>6</sup> B32B 3/00

U.S. Cl. 428—65.1

20 Claims

1. A substrate comprising at least one cycloolefin copolymer for recording media, wherein the cycloolefin copolymer has a molar-mass distribution  $M_w/M_n < 2$  and a molecular weight of less than/equal to 30,000 g/mol and has a glass transition temperature of from 100° C. to 220° C.

5,439,723

# SUBSTRATE FOR PRODUCING SEMICONDUCTOR WAFER

Motoharu Miyashita; Norio Hayafuji, and Yutaka Mihashi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 977,154, Nov. 16, 1992, Pat. No. 5,279,077.

This application Nov. 12, 1993, Ser. No. 150,879

Claims priority, application Japan, Mar. 12, 1992, 4-089416

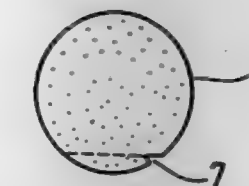
Int. Cl.<sup>6</sup> B32B 3/02

U.S. Cl. 428—66.7

8 Claims

1. A compound semiconductor wafer comprising a semiconductor monocrystalline disc having opposed substantially planar first and second surfaces and including a notch in the wafer edge, the notch having a side surface substantially per-

pendicular to the first and second surfaces and aligned with a cleavage plane that intersects the edge of the wafer disc twice, the



notch extends through the disc thickness, and the cleavage plane provides an orientation flat to said wafer disc.

5,439,724

# LID WITH A PRESSURE RELEASE HOLE AND A REMOVABLE SEAL, FOR VACUUM SEALING OF GLASSES AND OTHER GLASS CONTAINERS USED TO PACK FOODSTUFF

Arnaldo Rojek, Sao Paulo, Brazil, assignor to Metalgrafica Rojek Ltda., Cajamar - SP, Brazil

Division of Ser. No. 888,175, May 26, 1992, Pat. No. 5,275,679.

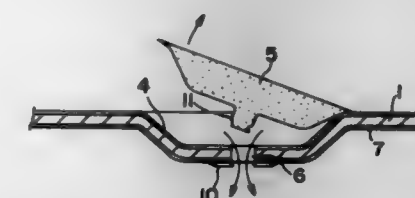
This application Jan. 4, 1994, Ser. No. 177,029

Claims priority, application Brazil, Sep. 10, 1991, 9103896

Int. Cl.<sup>6</sup> B32B 3/02

U.S. Cl. 428—66.3

12 Claims



1. A lid for sealing a container, the lid adhering to the container by a vacuum formed within the container, the lid comprising:

- a substantially circular panel having a flanged perimeter and a concave depression on an upper side of the circular panel;
- a sanitary coating disposed on a lower side of the circular panel;
- a pressure release hole extending through the concave depression of the circular panel;
- a first adhesive material applied to a lower side of the circular panel by fusion to the sanitary coating to form a thin film over the release hole; and
- a second adhesive material disposed in the concave depression on the upper side of the circular panel to form a removable seal, the second adhesive material having the same properties as the first adhesive material.

5,439,725

# FLOOR MAT FOR AN OVERLAND VEHICLE

John K. Roberts, Sheboygan, Wis., assignor to Masland of Wisconsin, Inc., Sheboygan, Wis.

Filed Apr. 20, 1993, Ser. No. 49,848

Int. Cl.<sup>6</sup> B32B 3/02, 7/02; B62D 25/20

U.S. Cl. 428—95

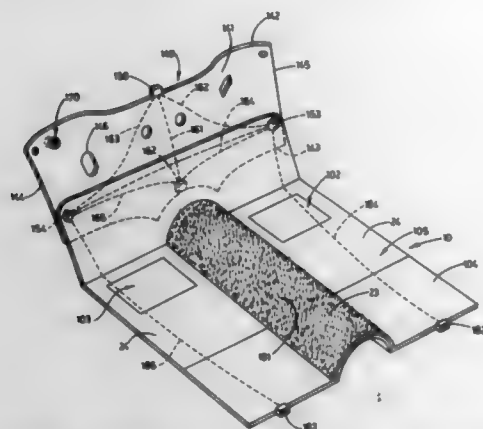
15 Claims

1. A floor covering for an overland vehicle having a passenger compartment and a predetermined floor area having a tunnel area, the floor covering comprising:

- a first sheet formed from a polymeric based compound having a predetermined filler content, wherein the first sheet is defined by a predetermined thickness dimension, an exposed top surface, and a bottom surface; and
- a second sheet formed from a polymeric based compound having a filler content which is greater than the filler



content of the first sheet, wherein the second sheet is defined by a top surface, a bottom surface, and a predetermined thickness dimension which is greater than the thickness dimension of the first sheet, and wherein the bottom surface of the first sheet is made integral with the top



surface of the second sheet to form a unitary floor covering which is capable of resting on the floor area; and a tunnel region which is capable of covering the tunnel area of the vehicle, the tunnel region of the floor covering having a carpet fixedly attached thereon.

5,439,726

#### BITUMINOUS ROOFING MEMBRANE INCLUDING A LIGHTWEIGHT GRID AND OVER-UNDER CONSTRUCTION

D. Mark Woiceshyn, St. Catharines, Canada, assignor to Bay Mills Limited, Ontario, Canada  
Division of Ser. No. 77,404, Jun. 16, 1993, Pat. No. 5,314,556, which is a continuation of Ser. No. 860,196, Mar. 26, 1992, abandoned, which is a continuation of Ser. No. 520,770, May 8, 1990, abandoned. This application Apr. 21, 1994, Ser. No. 230,813

Int. Cl.<sup>6</sup> B32B 11/00

U.S. Cl. 428—109

6 Claims



1. A reinforced bituminous roofing membrane comprising:  
a first layer consisting essentially of a lightweight, open grid of adhesively bound non-woven fabric in which yarns in the cross-machine direction are held between pairs of yarns in the machine direction, each such pair of yarns having one yarn that is essentially above the other and each such pair of yarns being coated and bound next to the other by adhesive which accumulates between the yarns of each pair;  
a second layer consisting essentially of a high strength reinforcing fabric;  
a third layer consisting essentially of a porous fiberglass mat; and  
a bituminous material that saturates and contains the first, second and third layers, said three layers being completely embedded within the bituminous material and the bituminous material on one side of the membrane bonding through the layers to the bituminous material on the other side of the membrane.

5,439,727

#### SURFACE ANTI-SCUFF DEVICE AND SYSTEM

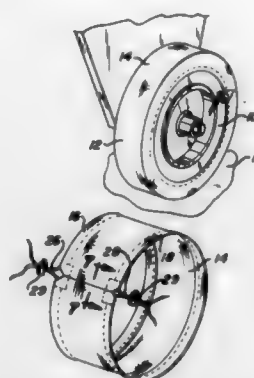
Brian G. Riggs, 3016 E. Locust St., Fort Collins, Colo. 80524, and Fernando Ramirez, 3500 Galway Dr., LaPorte, Colo. 80535

Filed Feb. 22, 1994, Ser. No. 199,782

Int. Cl.<sup>6</sup> B60B 7/02; B60C 27/18, 19/00; B60R 27/00

U.S. Cl. 428—128

9 Claims



1. A surface anti-scuff device for use on a vehicle tire during movement over a supporting surface comprising in combination:

an anti-scuff member in the form of a strip of material for extending around the circumference of and fastened tightly to a vehicle tire and against the tire tread and for being in contact with said supporting surface, said anti-scuff member being made of a pliable, durable, strip of non-scuff material, whereby when the tire and member are moved over a supporting surface said member will remain in place on the tire and the tire and member to substantially prevent scuffing said supporting surface, said strip of material being wider than the width of the tire tread and overlaying the tread and a portion of each side of sidewall, said strip of material being fastened at opposite ends to form a closed loop having approximately the same circumference as the circumference of the tire, said strip of material having first and second folded edge portions on opposite side edges with first and second draw lines extending through said first and second folded edge portions, respectively, said strip of material having at each end and each corner a corner flap portion folded over and secured to provide a double thickness beveled edge portion with each folded edge portion terminating inwardly of the fastened ends to enable the end portion of the associated draw line to pull straight through the associated folded edge portion, said draw line drawing, said strip of material tightly to the circumference of the tire on both sides of the tire tread, and opposite end portions of each of said first and second draw lines being connected together to hold said first and second draw lines taut.

5,439,728

#### INK JET HEAD HAVING NOZZLE PLATE EMPLOYING SHEET ADHESIVE MATERIAL HAVING SMALL HOLES FOR USE IN INK JET PRINTERS

Masayuki Morozumi, and Akira Takizawa, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan  
Filed Aug. 20, 1992, Ser. No. 932,541

Claims priority, application Japan, Aug. 21, 1991, 3-209346; Aug. 21, 1991, 3-209347; Jul. 8, 1992, 4-206025

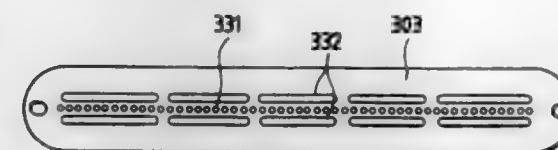
Int. Cl.<sup>6</sup> B41J 2/045; B32B 3/24

U.S. Cl. 428—136

5 Claims

1. An ink jet head, comprising at least a sheet-shaped adhesive member having a longitudinal axis, a nozzle member, and a chamber member, the sheet-shaped adhesive member being interposed between the nozzle member and the chamber member for bonding

the nozzle member and the chamber member into an integrated member, the nozzle member having nozzle holes, the chamber member having ink communication holes, and the sheet-shaped adhesive member having ink escape holes and deformation preventive holes formed adjacent to said ink escape holes,



each of the ink escape holes being aligned with one of the nozzle holes of the nozzle member and with one of the ink communication holes of the chamber member, such that in the integrated member, ink may escape from the chamber member to the nozzle member via the ink escape holes.

5,439,729

#### TRANSFER METALLIZING FILM AND SHEET

Kenichi Kawakami, Abiko; Katsuhiko Tsuchiya, Kusatsu, and Hideo Marubashi, Funabashi, all of Japan, assignors to Toray Industries, Inc., Japan

PCT No. PCT/JP91/01762, § 371 Date Jul. 14, 1993, § 102(e)

Date Jul. 14, 1993, PCT Pub. No. WO93/12941, PCT Pub.

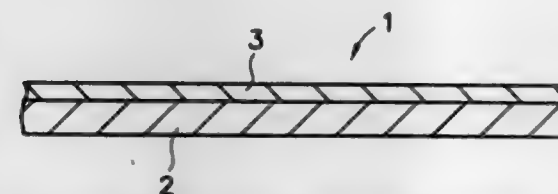
Date Jul. 8, 1993

PCT Filed Dec. 25, 1991, Ser. No. 87,796

Int. Cl.<sup>6</sup> B32B 15/08

U.S. Cl. 428—141

4 Claims



3. A transfer metallizing film comprising a destaticized polypropylene resin film said transfer metallizing film having an amount of static electricity not larger than 5 kV and having a transfer surface for releasable lamination thereto of a metal transfer layer, said transfer surface having a surface roughness value not larger than 0.1  $\mu\text{m}$  and an atomic construction ratio of the number of oxygen atoms to the number of carbon atoms within 10 nm from the surface of 0.0~0.03, and said transfer metallizing film having another surface opposite said transfer surface, said another surface having an atomic construction ratio of the number of oxygen atoms to the number of carbon atoms within 10 nm from the surface of 0.1~0.5.

5,439,730

#### FLOWABLE LOOSE PACKING DUNNAGE

Peter C. Kelly, Neenah; Daniel L. Hoefler, Kaukauna; Russell L. Johnson, Weyauwega; Barry S. Hammerberg, Appleton; R. Bradley Stillahn, Oshkosh, all of Wis., and Katherine L. Kalz, Watervliet, Mich., assignors to Productive Solutions, Inc., Neenah, Wis.

Filed Sep. 11, 1992, Ser. No. 943,944

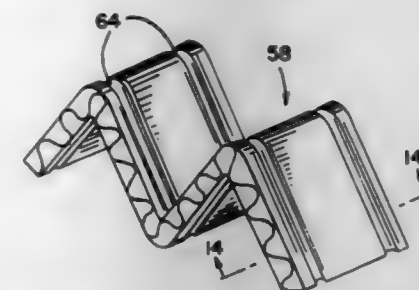
Int. Cl.<sup>6</sup> B32B 3/00; B65D 81/02

U.S. Cl. 428—156

27 Claims

1. Flowable loose packing dunnage comprising multiple particles, said particles including a particle being made of a single sheet of paperboard formed into a non-planar shape

which includes an integral reinforcing structure which helps maintain the shape of the particle, said reinforcing structure



including either or both of a strut or an elongated region of narrowed thickness of the paperboard.

5,439,731

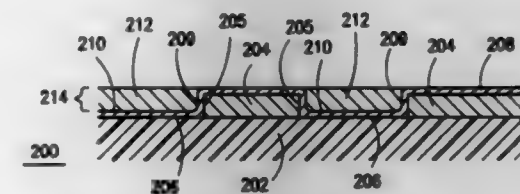
#### INTERCONNECT STRUCTURES CONTAINING BLOCKED SEGMENTS TO MINIMIZE STRESS MIGRATION AND ELECTROMIGRATION DAMAGE

Che-Yu Li; Peter Borgesen, and Matt A. Korhonen, all of Ithaca, assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.  
Filed Mar. 11, 1994, Ser. No. 208,598

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—209

11 Claims



1. A metal interconnect structure comprising:  
an insulating substrate;  
a first plurality of spaced, electrically conductive metal segments formed on said substrate, each having a pair of vertical sides and being separated by a plurality of corresponding gaps between adjacent ones of said first plurality of segments;  
a refractory metal back-up layer conformally formed over said first plurality of electrically conductive metal segments and said plurality of gaps, wherein said back-up layer includes a plurality of vertical portions adjacent each said vertical side of said first plurality of segments, and a plurality of troughs are formed above said backup layer and said gaps between adjacent ones of said vertical portions; and,  
a second plurality of electrically conductive metal segments formed in said troughs between and contacting said vertical portions;  
wherein, said first and second plurality of electrically conductive segments and said plurality of vertical portions of said refractory metal back-up layer form a metal interconnect, and wherein each segment in said first and second plurality of segments has a length which minimizes stress migration and electromigration damage by limiting the amount of vacancies for voids and atoms for hillocks, and each said vertical portion of said refractory metal back-up layer has a width which enables said vertical portion to block atomic transport between adjacent ones of said first and second plurality of electrically conductive segments, while at the same time minimizing electrical resistance through each said vertical portion.

5,439,732

## CERAMIC MULTI-LAYER WIRING BOARD

Takashi Nagasaka, Anjo; Yuji Ontani, Okazaki, and Mitsuhiro Saitou, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

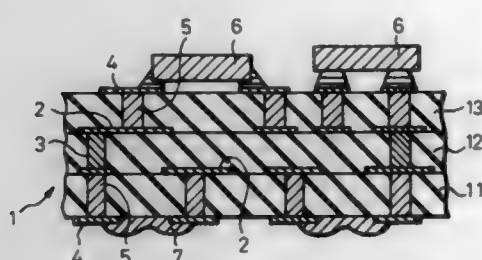
Filed Jan. 21, 1994, Ser. No. 184,104

Claims priority, application Japan, Jan. 22, 1993, 5-009175

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—210

12 Claims



1. A ceramic multi-layer wiring board comprising:  
 at least one ceramic layer including at least one inner conductor arranged in or on said at least one ceramic layer, said at least one inner conductor being made of a silver-based material having a melting point higher than a first temperature at which said at least one ceramic layer is fired;  
 a top ceramic layer formed on a first outermost layer of said at least one ceramic layer, said top ceramic layer having a hole;  
 a surface wiring conductor of a copper-based material formed on said top ceramic layer; and  
 a hole-filling conductor filled in said hole in said top ceramic layer and electrically connecting said surface wiring conductor and said at least one inner conductor, said hole-filling conductor [is] being made of a silver alloy which does not form eutectic crystals with said copper-based material of said surface wiring conductor at a second temperature at which said surface wiring conductor is fired.

5,439,733

## INSERT INTENDED FOR USE IN THE CLOTHING INDUSTRY

Christian Paire, Roisel, France, assignor to Lainiere de Picardie, Peronne, France

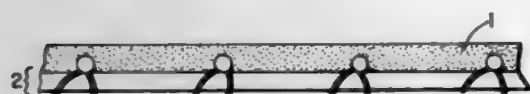
Continuation-in-part of Ser. No. 541,961, Jun. 22, 1990, abandoned. This application Feb. 4, 1993, Ser. No. 13,317

Claims priority, application France, Jun. 26, 1989, 89 08461

Int. Cl.<sup>6</sup> B32B 5/00

U.S. Cl. 428—219

9 Claims



1. An insert for use in the clothing industry, said insert comprising a microporous polymer foam layer and a textile substrate, wherein:  
 said microporous foam layer permeates said textile substrate and said textile substrate mechanically reinforces said microporous foam layer, said foam layer penetrating at least about 5% and up to about 30% into said substrate; said textile substrate is an open-textured knit or weave, and has a grammage ranging from 10 to 80 g/m<sup>2</sup>; and  
 said insert has a resistance to water vapor of about 60·10<sup>-3</sup> to 80·10<sup>-3</sup> millibars per m<sup>2</sup>/w and a resistance to liquid water of 1000 mm of water, whereby said insert is permeable to water vapor and impermeable to liquid water.

5,439,734

## NONWOVEN FABRICS HAVING DURABLE WETTABILITY

Dennis S. Everhart, Alpharetta, Ga., and Randy E. Meirowitz, Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

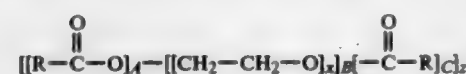
Filed Oct. 13, 1993, Ser. No. 135,823

Int. Cl.<sup>6</sup> A47L 13/16; A61F 13/36; A61L 15/42; D04H 3/16; H01M 2/16

U.S. Cl. 428—224

9 Claims

1. A nonwoven fabric having durable wettability comprising fibers formed from polyolefin blended with at least one di-fatty acid ester hydrophilic additive of the formula:



wherein x is an integer from 1 to 15, R is selected from the group consisting of alkanes with up to 18 carbon atoms and alkenes with up to 18 carbon atoms, A, B, and C are integers at least equal to one arranged in any order, z is an integer at least equal to one, and wherein said fibers have been formed by providing said at least one hydrophilic additive to said polyolefin prior to fiberization.

5,439,735

## METHOD FOR USING SCRAP RUBBER; SCRAP SYNTHETIC AND TEXTILE MATERIAL TO CREATE PARTICLE BOARD PRODUCTS WITH DESIRABLE THERMAL AND ACOUSTICAL INSULATION VALUES

Danny G. Jamison, 11841 Antietam Rd., Woodbridge, Va. 22192

Filed Feb. 4, 1992, Ser. No. 830,840

Int. Cl.<sup>6</sup> B29C 43/00; B32B 7/00

U.S. Cl. 428—255

10 Claims

6. A rigid sheet material comprising a mixture of scrap rubber of various sizes and geometrical configurations, with or without synthetic and/or textile scrap material and a cure mix of rubber maker's sulfur, zinc stearate, and carbon black, said cure mix filling interstices between and adhering to the scrap rubber ingredients.

5,439,736

## GAS PLASMA POLYMERIZED PERMSELECTIVE MEMBRANE

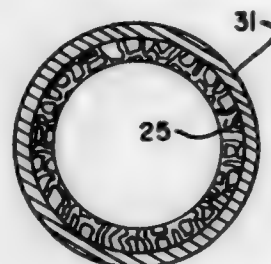
Hiroshi Nomura, Shorewood, Minn., assignor to NeoMecs Incorporated, St. Louis Park, Minn.

Filed Jan. 21, 1994, Ser. No. 184,643

Int. Cl.<sup>6</sup> B32B 27/32; B01D 53/22

U.S. Cl. 428—308.4

26 Claims



12. A membrane comprising: a porous substrate having a contiguous coating of a plasma polymerized comprising a polysiloxane deposited thereon from a gas plasma comprising a fully alkylated disiloxane and added oxygen, wherein the plasma polymerized has been deposited at a rate that is increased due to presence of the added oxygen in the gaseous blend, thereby generating a permselective composite membrane.

5,439,737

## TWO-PHASE FUSIBLE INTERLINING MADE OF A SEMI-INTERPENETRATING NETWORK OF THERMOPLASTIC RESINS

Mohamed F. Trabelsi, Péronne, France, assignor to Lainiere de Picardie, Peronne, France

Filed Mar. 19, 1993, Ser. No. 33,843

Claims priority, application France, Apr. 10, 1992, 92 03734

Int. Cl.<sup>6</sup> B32B 7/12; C08F 20/00

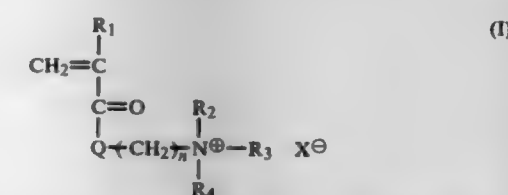
U.S. Cl. 428—317.7

11 Claims

1. Fusible interlining comprising a textile substrate used in combination with a single adhesive layer, intended to be bonded to a drapery, wherein the adhesive layer has a two-phase structure comprising:

- (i) at least one adhesive system in the form of a thermoplastic powder of dense granules of a polymeric resin selected from the group consisting of a polyamide, a polyester and mixtures thereof, said polymeric resin lacking functional groups capable of entering a cross-linking reaction, and whose main function is to ensure the adhesion of the fusible interlining to the drapery at the time of the bonding;  
 (ii) at least one crosslinkable system comprising at least one crosslinkable polymeric resin containing carboxylic, hydroxyl or amide groups which enable them to undergo an irreversible crosslinking reaction and at least one hardener, in the form of a homogeneous matrix whose main function is to coat the granules of thermoplastic powder of the bonding system, the hardener being an alkylated melamine.

where said ink-receiving layer contains a water-soluble polymer obtained by copolymerizing 10–50 parts by weight of at least one monomer selected from the quaternary salt monomers represented by the following formulas (I), (II) and (III), 1–30 parts by weight of at least one monomer selected from the monomers represented by the following formulas (IV), (V), (VI) and (VII), and 20–80 parts by weight of at least one monomer selected from acrylamide, methacrylamide, N,N-dimethylacrylamide, N-isopropylacrylamide, diacetone acrylamide, N-methylolacrylamide, 2-hydroxyethyl (meth)acrylate and N-vinylpyrrolidone as a water-soluble monomer, the recording medium being obtained by coating on the support a coating liquid containing 100 parts by weight of said water-soluble polymer and 0.1–30 parts by weight of a crosslinking agent for curing the water-soluble polymer and drying the coat:



wherein R<sub>1</sub> represents a hydrogen atom or a methyl group, Q represents oxygen or an NH group, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> each represents a methyl group or an ethyl group and may be the same or different, X represents a halogen ion, a sulfonate ion, an alkyl-sulfonate ion, an acetate ion or an alkylcarboxylate ion, and n represents an integer of or 3;

## MAGNETIC TAPE FOR USE IN CASSETTE FOR DIGITAL AUDIO TAPE RECORDER AND BIAXIALLY ORIENTED POLYESTER BASE FILM THEREFOR

Takao Chujo; Hisashi Hamano; Masanori Nishiyama; Yasuhiro Saeki; Tatsuya Ogawa, all of Sagami-hara, and Kouhei Endou, Anpachi, all of Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 213,638, Mar. 16, 1994. This application Jul. 14, 1994, Ser. No. 274,755

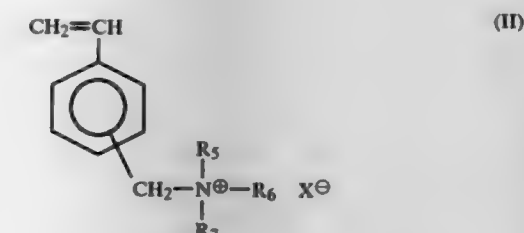
Claims priority, application Japan, Mar. 16, 1993, 5-055585; May 28, 1993, 5-126982; May 28, 1993, 5-126983; May 28, 1993, 5-126984; Jun. 15, 1993, 5-143635; Jun. 23, 1993, 5-152124

Int. Cl.<sup>6</sup> B32B 7/12

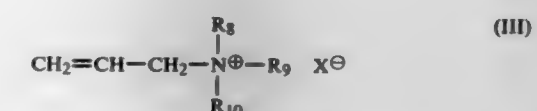
U.S. Cl. 428—332

6 Claims

1. A magnetic tape for use in a cassette for a digital audio tape recorder, which comprises a biaxially oriented polyester base film having the following properties:  
 a) a stress, when extended in the longitudinal direction by 5%, of at least 12 kg/mm<sup>2</sup>,  
 b) a residual extension in the longitudinal direction of 0.2% or less and in the transverse direction 0.3% or less,  
 c) a heat shrinkage in the longitudinal direction, after a heat treatment under no load at 105° C., for 30 minutes, of 1.5% or less,  
 d) at least one surface having a surface roughness Ra of 25 nm or less, and  
 e) a thickness in the range of from 3 to 12 μm, and a magnetic layer formed on one surface thereof.



wherein R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> each represents a methyl group or an ethyl group and may be the same or different and X is as defined above;



wherein R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> each represents a methyl group, an ethyl group or an allyl group and may be the same or different and X is as defined above;

5,439,739

## INK JET RECORDING MEDIUM

Akira Furukawa, and Makoto Kato, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Jun. 1, 1994, Ser. No. 251,842

Claims priority, application Japan, Jun. 3, 1993, 5-133151; Jun. 3, 1993, 5-133152

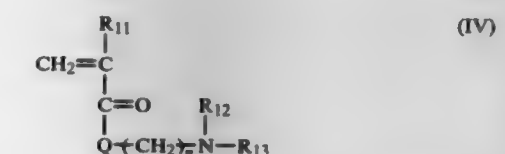
Int. Cl.<sup>6</sup> B41M 5/00

U.S. Cl. 428—341

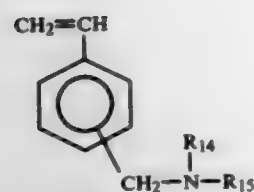
4 Claims

1. An ink jet recording medium comprising a support and at least one ink-receiving layer on which a recorded image is formed using an aqueous ink containing a water-soluble dye

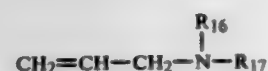
wherein R<sub>11</sub> represents a hydrogen atom or a methyl group, R<sub>12</sub> and R<sub>13</sub> each represents a methyl group or an ethyl group and may be the same or different, Q represents an oxygen atom or an NH group, and n represents an integer of 2 or 3;



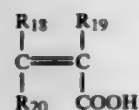




wherein  $\text{R}_{14}$  and  $\text{R}_{15}$  each represents a hydrogen atom, a methyl group or an ethyl group and may be the same or different;



wherein  $\text{R}_{16}$  and  $\text{R}_{17}$  each represents a hydrogen atom, a methyl group, an ethyl group or an allyl group and may be the same or different;



wherein  $\text{R}_{18}$  and  $\text{R}_{19}$  each represents a hydrogen atom or a methyl group and may be the same or different and  $\text{R}_{20}$  represents a hydrogen atom or a carboxylic acid group.

5,439,740

**COMPOSITE FIBERS HAVING A DIAMOND SURFACE**  
Roy Gat, Cleveland, Ohio, assignor to Case Western Reserve University, Cleveland, Ohio  
Division of Ser. No. 950,067, Sep. 23, 1992, Pat. No. 5,358,741.  
This application Jul. 14, 1994, Ser. No. 274,775  
Int. Cl.<sup>6</sup> D02G 3/00

U.S. Cl. 428—372

16 Claims



1. A fiber composite comprising a continuous diamond coating directly deposited on an individual inorganic fiber substrate wherein said diamond coating surrounds substantially all of said fiber substrate.

5,439,741

**HETEROFILAMENT COMPOSITE YARN**

John D. Gibbon, Charlotte, N.C., and Stephan F. Sherriff, Rock Hill, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Aug. 3, 1994, Ser. No. 285,460  
Int. Cl.<sup>6</sup> D02G 3/00

U.S. Cl. 428—377

1 Claim

1. A wire reinforced bundle comprising a plurality of multifilament composite yarn twisted around a metallic wire, wherein said multifilament composite yarn comprises thermally bonded sheath-core heterofilaments comprising a core component composed of a synthetic polymeric material having a given melting point temperature and a sheath polymeric component surrounding said core component consisting essentially of poly(butylene terephthalate) polymer having a melting point temperature lower than said given melting point temperature of said synthetic polymeric material; wherein said sheath-core heterofilaments are thermally bonded together to form a multifilament composite yarn.

(V)

5,439,742

**ELECTRICAL INSULATING VINYL HALIDE RESIN COMPOSITIONS**

Paulette Baker, Chagrin Falls, Ohio, and Richard F. Grossman, Shelton, Conn., assignors to Synthetic Products Company, Shaker Heights, Ohio

Filed Oct. 30, 1992, Ser. No. 969,036  
Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—389

12 Claims

1. An electrical insulating vinyl halide resin composition comprising a vinyl halide resin, a metal compound stabilizer selected from a group consisting of antimony, barium, cadmium, calcium, zinc and mixtures thereof for said resin and a polymeric polyvalent metal aromatic polycarboxylate polymeric calcium terephthalate as an electrical insulating agent in an effective electrically insulating amount.

(VI)

5,439,743

Patent Not Issued For This Number

5,439,744

**COMPOSITE BODIES AND METHODS FOR MAKING SAME**

Terry D. Claar, Newark; Vilupanur A. Ravi, Bear, and Phillip J. Roach, Newark, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

PCT No. PCT/US91/04762, § 371 Date Feb. 25, 1993, § 102(e)  
Date Feb. 25, 1993

PCT Filed Jun. 25, 1991, Ser. No. 979,853

Int. Cl.<sup>6</sup> C04B 35/65, 35/58

U.S. Cl. 428—408

23 Claims



1. A method for forming a self-supporting body comprising: providing at least one vapor-phase parent metal; providing a substrate material which is substantially non-reactive with said vapor-phase parent metal; coating said substrate material with a solid oxidant-containing material; contacting said at least one vapor-phase parent metal with at least a portion of said solid oxidant-containing material; and permitting said at least one vapor-phase parent metal and said solid oxidant-containing material to form a reaction product on at least a portion of said solid oxidant-containing material.

5,439,745

**POLYVINYL ALCOHOL PRODUCT AND MULTI-LAYER PRODUCT CONTAINING THE SAME**

Hiroyuki Ohba, Niihari; Kazuhiko Hirose, Abiko; Hideaki Tanaka, Niihari, and Nobuyuki Hisazumi, Tsuchiura, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 792,856, Nov. 19, 1991, Pat. No. 5,317,052.  
This application Mar. 2, 1994, Ser. No. 204,500

Claims priority, application Japan, Nov. 30, 1990, 2-338796;  
Oct. 11, 1991, 3-263962; Oct. 11, 1991, 3-263963

Int. Cl.<sup>6</sup> B32B 27/36

U.S. Cl. 428—412

5 Claims

1. A multi-layer product having at least one layer of a poly-

vinyl alcohol product obtained by heat-treating a melt-molded polyvinyl alcohol product composed of a polyvinyl alcohol composition containing 0.01 to 3.0 mmol of a metal compound based on 1 g of polyvinyl alcohol, said metal compound being selected from the group consisting of metal halides and metal nitrates where the metal element is selected from alkali metals, alkaline earth metals, and divalent to quadrivalent heavy metals.

5,439,746

**EPOXY RESIN-BASIN COMPOSITE MATERIAL**

Shuichi Suzuki, Yokohama, Japan, assignor to Kabushiki Kaisha

Toshiba, Kawasaki, Japan

Continuation of Ser. No. 871,726, Apr. 21, 1992, abandoned.

This application Mar. 18, 1994, Ser. No. 215,972

Claims priority, application Japan, Sep. 9, 1991, 3-227905;  
Sep. 9, 1991, 3-227911; Sep. 13, 1991, 3-234683

Int. Cl.<sup>6</sup> B32B 17/10; C08F 2/46

U.S. Cl. 428—415

16 Claims

1. An epoxy resin-based composite material formed by coating or impregnating a reinforcement sheet with an epoxy resin composition, followed by curing the epoxy resin composition, said epoxy resin composition comprising:

- a compound having at least one epoxy group;
- a curing agent for the compound having at least one epoxy group, said curing agent being selected from the group consisting of a phenolic compound, an amine compound, an imide compound, an amide compound, a barbituric acid compound, a cyanuric acid compound, a thiophenolic compound and a carboxylic compound;
- a silicon compound having or generating a hydroxyl group bonded to a silicon atom;
- an organometallic compound; and
- a powdery material which increases the mechanical strength of said composite material.

5,439,747

**ANODIZED ALUMINUM HAVING PROTECTIVE COATING**

Shelley D. Sturdevant; Edward T. Ryan, both of Cheswick, and Bruce A. Connelly, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 34,936, Mar. 19, 1993, abandoned. This application Nov. 22, 1993, Ser. No. 156,350

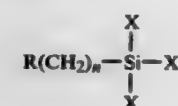
Int. Cl.<sup>6</sup> B32B 15/08, 15/20

U.S. Cl. 428—447

16 Claims

1. Anodized aluminum having a clear coating in which the coating comprises:

- the thermosetting reaction product of a crosslinking agent and a film-forming resin component consisting of a member selected from the group consisting of polyester polymers, thermosetting acrylic polymers, and mixtures thereof; and
- silane having the structure:



where R represents an epoxy terminated group, n is 1 to 10, and X represents a readily hydrolyzable group selected from the group consisting of: Cl,  $\text{OCH}_3$ ,  $\text{OC}_2\text{H}_5$ , and  $\text{OC}_2\text{H}_4\text{OCH}_3$ .

5,439,748

**WATER-SOLUBLE OR WATER-DISPERSIBLE PRESSURE-SENSITIVE ADHESIVE TAPE**

Koichi Nakamura; Naoki Matsuo; Toshiharu Konishi; Kenji Sano, and Hiroshi Wada, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Division of Ser. No. 943,477, Sep. 11, 1992, abandoned. This application Dec. 13, 1993, Ser. No. 165,494

Claims priority, application Japan, Sep. 12, 1991, 3-263066

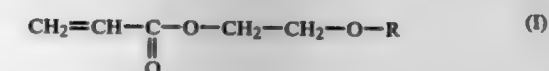
Int. Cl.<sup>6</sup> B32B 27/10, 27/08

U.S. Cl. 428—511

10 Claims

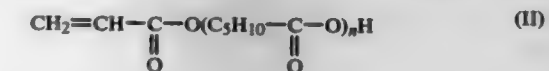
1. A pressure-sensitive adhesive tape comprising a tape-like substrate having provided on at least one side thereof a water-soluble or water-dispersible pressure-sensitive adhesive composition comprising a copolymer comprising:

- (a) 20 to 99% by weight of an alkoxyethyl acrylate represented by formula (I):



wherein R represents an alkyl group having from 1 to 4 carbon atoms,

- (b) 1 to 30% by weight of a styrenesulfonic acid salt comprising an alkali metal salt, and
- (c) 10 to 40% by weight of a monomer mixture of acrylic acid-caprolactone adducts represented by formula (II):



wherein n represents a number between 1 and 5, a homopolymer of said mixed acrylic acid-caprolactone adduct having a glass transition temperature of not more than  $-10^\circ\text{C}$ .

5,439,749

**COMPOSITE WOOD STRUCTURE**

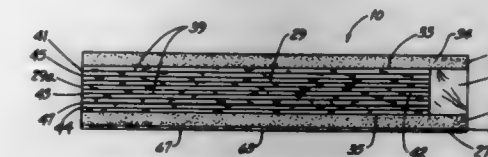
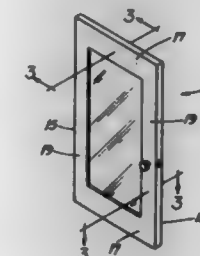
Thomas A. Klasell, Rice Lake, and Leland R. Miller, Oconomowoc, both of Wis., assignors to Andersen Corporation, Bayport, Minn.

Filed Aug. 18, 1994, Ser. No. 292,390

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—537.1

16 Claims



1. In a composite wood structure useful in making doors and windows, the structure including (a) first and second spaced layers, and (b) a core interposed between the layers, such structure having a thickness, the improvement wherein: the structure is substantially fiber-free and includes a sheet

vapor barrier between the layers and coextensive with the layers;  
the vapor barrier is bonded and substantially free of biomass particles;  
the vapor barrier comprises less than about 20% of the thickness of the structure; and  
the vapor barrier limits migration of moisture to less than about 6 grams per square meter of barrier area per hour, whereby the wood structure is made resistant to warpage due to moisture migration.

5,439,750

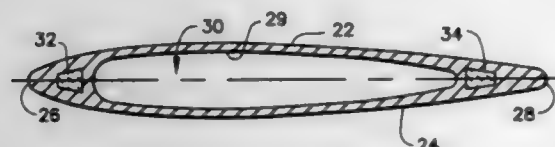
**TITANIUM METAL MATRIX COMPOSITE INSERTS FOR STIFFENING TURBINE ENGINE COMPONENTS**  
Richard Ravenhall, Cincinnati; Charles R. Wojciechowski; Stephen C. Mitchell, both of West Chester, all of Ohio; Gary D. Mercer, Ballston Lake, N.Y.; Thomas J. Kelly, Cincinnati, Ohio; Melvin A. Schobert, Cincinnati, Ohio, and Harvey M. MacLin, Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 15, 1993, Ser. No. 76,670

Int. Cl.<sup>6</sup> B32B 15/02

U.S. Cl. 428—614

20 Claims



1. A structural element that is adapted to be embedded in a cast metal article, comprising:  
a metal matrix composite structural core, said matrix composite structural core including a metal matrix containing a non-metallic material having a degrading temperature below the melting temperature of said cast metal article; and  
a metal sheath attached to and encasing said metal matrix composite structural core.

5,439,751

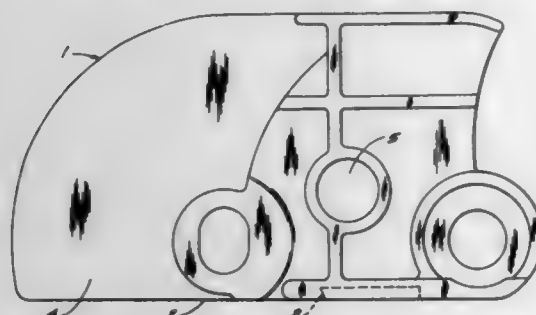
**ORE PELLET COOLER SIDE PLATE**  
Dennis J. Fesler, Des Peres, Mo., assignor to Carondelet Foundry Company, Pevely, Mo.

Filed Dec. 30, 1993, Ser. No. 175,996

Int. Cl.<sup>6</sup> B32B 15/18; B65G 17/06

U.S. Cl. 428—614

13 Claims



1. An improved cast grate cooler side plate having a bottom surface containing a metal alloy insert embedded therein wherein said insert is formed from an alloy selected from the group consisting of:

A. an alloy consisting essentially of, by weight,

Carbon	about 1.5–3%
Chromium	about 23–30%

-continued

Manganese	<2.5%
Silicon	<2.5%
Nickel	up to about 3%
Molybdenum	up to about 3%
Iron	essentially the balance

B. an alloy consisting essentially of, by weight,

Carbon	about 2.5–3.6%
Chromium	about 1.4–3.5%
Manganese	about 0.4–0.7%
Silicon	about 0.4–0.7%
Nickel	about 4.0–4.75%
Iron	essentially the balance

and

C. an alloy consisting essentially of, by weight,

Carbon	about 0.25–1.6%
Chromium	about 3–12%
Manganese	<1.5%
Silicon	<1.5%
Molybdenum	<2%
Vanadium	<1.5%
Iron	essentially the balance

5,439,752

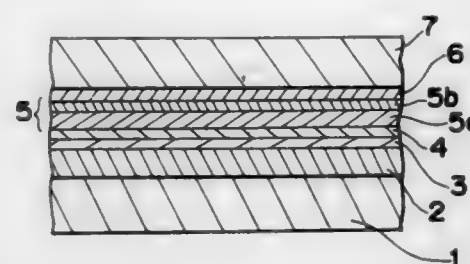
**OPTICAL RECORDING MEDIUM AND REFLECTING FILM FOR USE THEREIN**

Kazumi Yoshioka, Yawata; Takeo Ohta, Nara; Masami Uchida, Hirakata, and Shigeaki Furukawa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Continuation of Ser. No. 757,464, Sep. 10, 1991, abandoned. This application May 25, 1993, Ser. No. 66,921

Claims priority, application Japan, Sep. 11, 1990, 2-242110  
Int. Cl.<sup>6</sup> G11B 7/24

U.S. Cl. 428—623

3 Claims



1. A reflecting film of a phase change rewritable disc, said reflecting film located over a recording film and a substrate of said phase change rewritable disc, said recording film interposed between said reflecting thin film and said substrate, said reflecting film consisting essentially of a first reflecting layer consisting essentially of gold and a second reflecting layer consisting essentially of aluminum, wherein the second reflecting layer is positioned between the recording film and the first reflecting layer.

5,439,753

**ELECTRON EMISSIVE FILM**

Stephen P. Rogers, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1994, Ser. No. 317,061

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—688

22 Claims

1. A method for making an electron emissive film comprising the steps of:

providing a substrate;  
providing a plasma reactor having a reaction chamber, the reaction chamber having a temperature and a pressure, wherein the temperature and the pressure are adjustably controlled to a desired temperature and a desired pressure; placing the substrate in the reaction chamber;

 $H_e \leq 1 \text{ Oe}$ ;  $\lambda \leq 2 \times 10^{-6}$ ;

Bs of more than 15 kG; and  
a heat resistance of 500° C. or more.

5,439,755

**MAGNETIC RECORDING MEDIUM COMPRISING A MAGNETIC RECORDING LAYER, AN INTERMEDIATE LAYER, A METALLIC THERMAL RECORDING LAYER AND A PROTECTIVE LAYER**

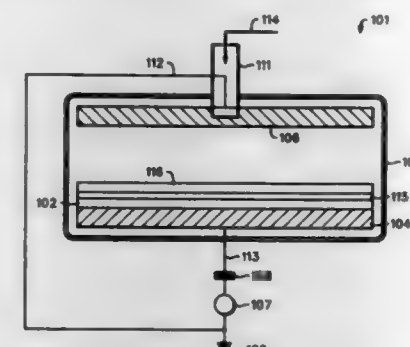
Minoru Fujita; Kenji Sugaya, and Yoshihiko Nakahara, all of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 9,415, Jan. 27, 1993, abandoned, which is a continuation of Ser. No. 821,127, Jan. 14, 1992, abandoned, which is a continuation of Ser. No. 365,198, Jun. 12, 1989, abandoned. This application Mar. 1, 1994, Ser. No. 205,136  
Claims priority, application Japan, Jun. 17, 1988, 63-148352  
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> G11B 5/00

U.S. Cl. 428—694 BP

12 Claims



flowing gases that include a hydrocarbon gas into the reaction chamber;  
igniting a plasma in the plasma reactor;  
forming a tetrahedral shaped compound in the plasma reactor; and  
depositing an electron emissive film on the substrate.

5,439,754

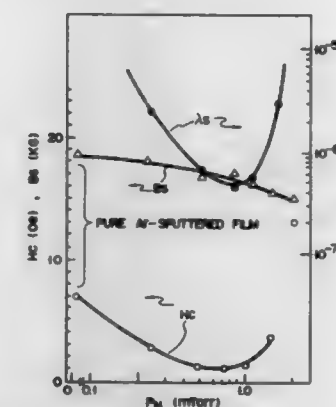
**FERROMAGNETIC FILM, METHOD OF MANUFACTURING THE SAME, AND MAGNETIC HEAD**  
Hitoshi Iwasaki, Yokohama, and Reiko Akashi, Sagami, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 726,198, Jul. 5, 1991, abandoned. This application Mar. 27, 1992, Ser. No. 860,221  
Claims priority, application Japan, Jul. 5, 1990, 2-176319; Mar. 29, 1991, 3-066383; Sep. 12, 1991, 3-232853

Int. Cl.<sup>6</sup> H01F 10/16

U.S. Cl. 428—692

6 Claims



1. A ferromagnetic film consisting of:  
an alloy represented by the formula



wherein T represents at least one type of an atom selected from the group consisting of Al, B, Si, Ga, and Ge,  
x, y, and z represent at % and satisfy  $66 < x < 94$ ,  $5 < y \leq 24$ ,  $1 < z < 10$ , and  $x + y + z = 100$ , and  
a and b represent at % and satisfy  $85 < a < 99$ ,  $1 < b < 15$ , and  $a + b = 100$ ,

said film being crystalline, and having a crystal structure at least partially consisting of an fcc phase; and  
wherein said film exhibits the following properties:

5,439,756

**ELECTRICAL ENERGY STORAGE DEVICE AND METHOD OF CHARGING AND DISCHARGING SAME**  
Anaba A. Anani, Lauderhill; Frank P. Malaspina, Plantation, and Gerald W. Blanton, Lighthouse Point, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1994, Ser. No. 203,096

Int. Cl.<sup>6</sup> H01M 12/00

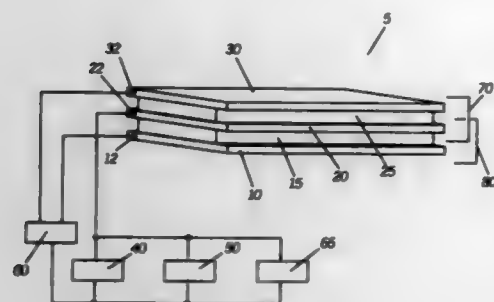
U.S. Cl. 429—9

20 Claims

1. An energy storage device, comprising:  
first, second, and third electrodes;  
a first electrolyte, disposed between and in contact with the first and second electrodes; and



the first electrode, the first electrolyte, and the second electrode comprising a battery;  
a second electrolyte, disposed between and in contact with the second and third electrodes; and



the second electrode, the second electrolyte, and the third electrode comprises a capacitor.

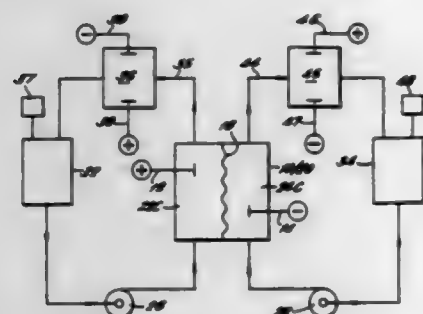
5,439,757

# **ELECTROCHEMICAL ENERGY STORAGE AND/OR POWER DELIVERY CELL WITH PH CONTROL** Ralph Zito, Chapel Hill, N.C., assignor to National Power PLC, London, England

Continuation-in-part of Ser. No. 961,111, Oct. 14, 1992, abandoned. This application Sep. 29, 1993, Ser. No. 128,126  
Int. Cl.<sup>6</sup> H01M 2/38

U.S. Cl. 429—51

6 Claims



1. An electrochemical apparatus for energy storage and/or power delivery comprising:

- (a) means for maintaining and circulating electrolyte flows in a fully liquid system in which the active constituents are fully soluble in a single cell or in an array of repeating cell structures, each cell with a chamber (+<sup>ve</sup> chamber) containing an inert +<sup>ve</sup> electrode and a chamber (-<sup>ve</sup> chamber) containing an inert -<sup>ve</sup> electrode, said chambers being separated one from another by an ion exchange membrane, the electrolyte circulating in the -<sup>ve</sup> chamber of each cell during power delivery containing a sulfide, and the electrolyte circulating in the +<sup>ve</sup> chamber during power delivery containing a liquid oxidizing agent,
- (b) means for restoring or replenishing the electrolytes in said +<sup>ve</sup> chamber and -<sup>ve</sup> chamber by circulating the electrolyte from each chamber to storage means comprising a volume of electrolyte greater than the cell volume for extended delivery of power over a longer discharge cycle than the cell volume alone would permit, and
- (c) a pH compensation cell to compensate for pH changes and/or changes in the concentration of hydroxyl ions in the -<sup>ve</sup> chamber, the pH compensation cell having a -<sup>ve</sup> electrode which is adapted to reduce the availability of polysulfides at the surface thereof, thereby promoting the electrolysis of water,
- (d) means for passing the -<sup>ve</sup> electrolyte through the pH compensation cell, and
- (e) means for driving an electric current through the -<sup>ve</sup>

electrolyte in the pH compensation cell, thereby generating OH<sup>-</sup> ions by the decomposition of water.

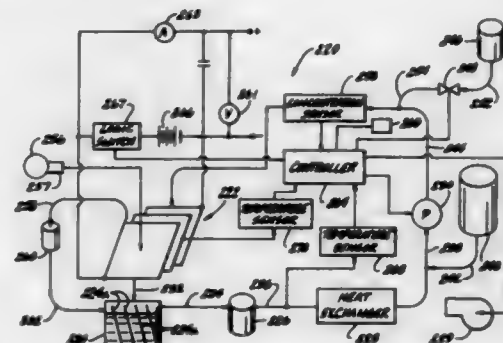
5,439,758

# **ELECTROCHEMICAL POWER GENERATING SYSTEM** Gordon R. Stone, O'Fallon, Ill.; Richard L. McGee, Chesterfield, Mo., and Douglas J. Amick, Ann Arbor, Mich., assignors to Voltek, Inc., Belleville, Ill.

Continuation-in-part of Ser. No. 955,583, Oct. 2, 1992. This application Jun. 23, 1993, Ser. No. 81,662  
Int. Cl.<sup>6</sup> H01M 8/24

U.S. Cl. 429—63

34 Claims



1. An electrochemical power generating system having a base unit and a replaceable fuel unit, said base unit comprising a first housing, an electrolyte pump in the first housing, and a controller for controlling operation of the pump, said fuel unit comprising:

- a second housing releasably connectable to the first housing;
  - a row of metal-air cells in the second housing electrically inter-connected together, each cell including a casing, a metal anode within the casing and having a reaction face, an air cathode having an outer face and an inner face with the inner face opposing the reaction face, a spacer between the inner face of the cathode and the reaction face of the anode for preventing the anode from contacting the cathode, an electrolyte intake port and an electrolyte discharge port in the casing for passage of electrolyte through the casing and between the anode and cathode;
  - a manifold having an intake port and a plurality of discharge ports in fluid communication with the electrolyte intake ports of the cells so that electrolyte flowing through the manifold is directed through the intake ports of the cells;
  - an electrolyte reservoir, said electrolyte reservoir and intake port of the manifold being operatively connectable with the electrolyte pump for fluid communication therewith so that the pump is able to pump electrolyte from the reservoir to the manifold; and
  - at least one fluid line for operatively connecting the discharge ports of the cells with the reservoir so that electrolyte discharged from the cells flows to the reservoir;
- said replaceable fuel unit being releasably attachable to the base unit so that the fuel unit can be quickly attached to and detached from the base unit.

5,439,759

# **COVER FOR BATTERY CABLE TERMINAL** Samuel A. Lippert, Canton, and Mark G. Hill, Novi, both of Mich., assignors to Yazaki Corporation, Tokyo, Japan

Filed Nov. 4, 1994, Ser. No. 334,116

Int. Cl.<sup>6</sup> H01M 2/32

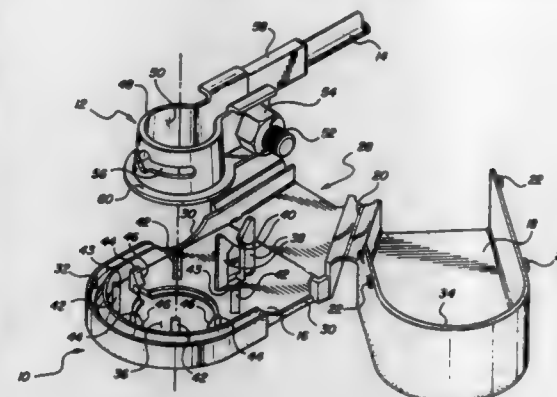
U.S. Cl. 429—65

24 Claims

1. A cover securable to a split-ring, flanged battery cable terminal having a bolt for adjusting the size of said split-ring, said cover comprising:

- a base having an aperture adapted to receive a battery post;
- a lid adapted to mate with said base;
- a hinge connecting said lid to said base, said hinge allowing

said lid to pivot about said base between an open position and a closed position;  
a pair of parallel, spaced apart resilient locking arms formed on the base to receive said terminal bolt therebetween;



a plurality of resilient tabs formed on said base and located around and adjacent the aperture in said base, said resilient tabs adapted to receive and releasably, lockingly engage said terminal flange; and  
means for securing said lid to said base over said terminal in the closed position.

5,439,760

# **HIGH RELIABILITY ELECTROCHEMICAL CELL AND ELECTRODE ASSEMBLY THEREFOR**

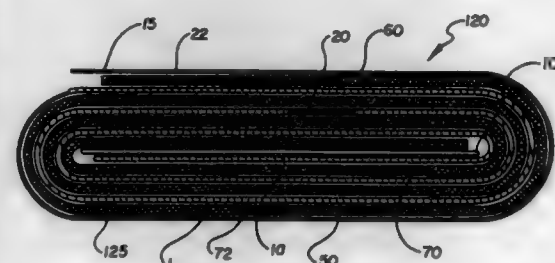
William G. Howard, Roseville, Minn.; Roger W. Keim, New Richmond, Wis.; Douglas J. Weiss, Plymouth, Minn.; Ann M. Crespi, Minneapolis, Minn.; Fred J. Berkowitz, Champlin, Minn., and Paul M. Skarstad, Plymouth, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 19, 1993, Ser. No. 155,410

Int. Cl.<sup>6</sup> H01M 6/16, 4/54

U.S. Cl. 429—94

71 Claims



1. An electrode assembly for an electrochemical cell comprising:

- (a) an anode including an elongated strip of alkali metal and a connector tab in electrical contact with the alkali metal on an edge thereof;
- (b) a cathode assembly including
  - (1) a cathode current collector having on an edge thereof a connector tab; and
  - (2) a cathode material bonded at a uniform density of reactive material to the current collector;
 the cathode assembly being shorter than the anode; the anode and the cathode assembly combined with a separator material therebetween in an elongated, unidirectional winding with two substantially straight sides, the winding having:
  - (a) at the innermost portion thereof a portion of the anode folded over the end of the cathode assembly such that it is disposed along both sides of the cathode assembly, the folded over portion establishing the length of the straight sides of the winding; and

(b) at the outermost portion thereof, the anode wrapped around the cathode assembly.

5,439,761

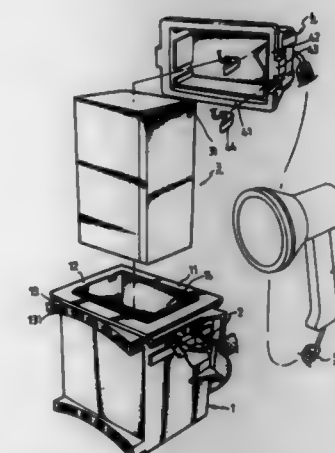
# **BATTERY BOX FOR A SEARCH LIGHT** Ming-Chou Hunag, No. 16, Lane 43, Hua Cheng Rd., Hsin Chuang, Taipei, Hsien, Taiwan

Filed Apr. 21, 1994, Ser. No. 230,835

Int. Cl.<sup>6</sup> H01M 2/10

U.S. Cl. 429—100

4 Claims



1. A battery box comprising:

- a box body in the shape of a rectangular container with an open top defining a storage space to hold a battery and having two opposite short sides and two opposite long sides;
- a top cover of rectangular shape to fit on said box body at the top, said top cover comprising two long side bottom edges each curved outwards to provide two ends elevated from the opposite long sides of the box body when the cover is attached to the box body at the top, two short side bottom edges each curved inwards to provide a middle part elevated from the opposite short sides of the box body when the cover is attached to the box body at the top, and two hooks respectively outwardly extended from said two opposite short side bottom edges; and
- two fasteners respectively mounted on the two opposite short sides of said box body to be releasably fastened to said two hooks to hold down said top cover causing said short and long side bottom edges of said top cover to be stressed and closely fitted over the short and long sides of said box body at the top.

5,439,762

# **HYDRATED AMORPHOUS SILICA BATTERY** Dan P. May, 808 Majorca, Coral Gables, Fla. 33134, and Jacob J. Swanko, II, 1561 Florida Mango Rd., #405, West Palm Beach, Fla. 33406

Filed Mar. 15, 1994, Ser. No. 212,870

Int. Cl.<sup>6</sup> H01M 4/02

U.S. Cl. 429—218

2 Claims

1. An electrochemical cell comprising a first and a second electrode, an electrolyte and a separator, wherein one of the electrodes comprises hydrated amorphous silica.

5,439,763

## OPTICAL MASK AND METHOD OF CORRECTING THE SAME

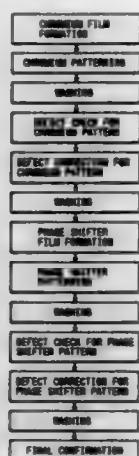
Akira Shimase; Junzou Azuma, both of Yokohama; Satoshi Haraichi, Tsukuba; Fumikazu Itoh, Fujisawa, and Yasuhiro Koizumi, Sayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 854,861, Mar. 19, 1992, Pat. No. 5,358,806. This application Feb. 26, 1993, Ser. No. 22,909 Claims priority, application Japan, Feb. 28, 1992, 4-042814 The portion of the term of this patent subsequent to Oct. 25, 2011, has been disclaimed.

Int. Cl. G03F 9/00

U.S. Cl. 430—5

24 Claims



1. An optical mask for a projection optical system comprising:
  - a light intercepting pattern formed on a transparent substrate;
  - a phase shifter for changing the phase of an exposure light, the phase shifter being provided at predetermined openings of the light intercepting pattern; and
  - an etching stopper film which transmits the exposure light, the etching stopper film being provided between said phase shifter and said light intercepting pattern.

5,439,764

## MASK HAVING MULTIPLE PATTERNS

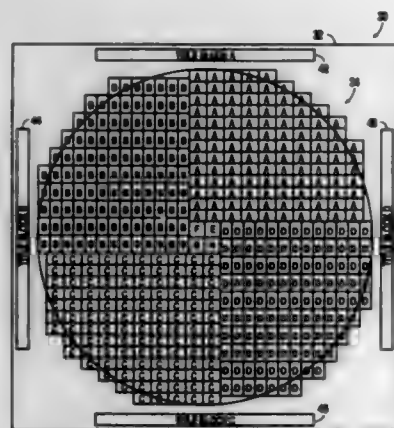
Martin J. Alter, Los Altos; Lawrence R. Sample; Hui F. Ip, both of San Jose; Marty E. Garnett, Los Gatos, and Helmuth R. Litfin, Cupertino, all of Calif., assignors to Micrel, Incorporated, San Jose, Calif.

Filed Jul. 1, 1993, Ser. No. 86,481

Int. Cl. G03F 9/00

U.S. Cl. 430—5

22 Claims



1. A mask structure for selectively exposing a photoresist

layer on a semiconductor wafer surface to radiation, said mask structure comprising:

- a first section containing an array of identical adjacent first mask patterns for selectively exposing a first section of said wafer to said radiation when said mask structure is in a first position relative to said wafer; and
- a second section containing an array of identical adjacent second mask patterns, said second mask patterns being different from said first mask patterns, for selectively exposing said first section of said wafer to said radiation when said mask structure is in a second position relative to said wafer, wherein each of said first mask patterns and each of said second mask patterns are for forming a pattern on a single integrated circuit.

5,439,765

## PHOTOMASK FOR SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Hiroshi Nozue, Tokyo, Japan, assignor to NEC Corporation, Japan

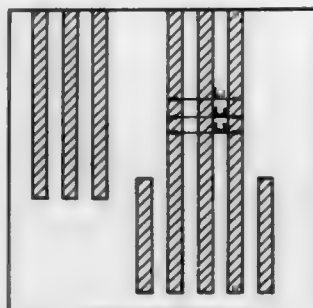
Division of Ser. No. 38,608, Mar. 29, 1993, abandoned. This application Aug. 17, 1994, Ser. No. 291,835

Claims priority, application Japan, Apr. 2, 1992, 4-080739

Int. Cl. G03F 9/00

U.S. Cl. 430—5

5 Claims



1. A method of making a photomask for a semiconductor integrated circuit device, in which a circuit pattern to be transferred onto a wafer of a semiconductor integrated circuit is formed by a light shielding substance on a glass substrate, said method comprising the steps of:

forming on said glass substrate a plurality of minute light shielding patterns, each of said plurality of patterns being a size which is smaller in at least one direction than a limit of a resolving power of an exposure device, said plurality of patterns being arranged at regular spaces on an entire surface of said glass substrate, said regular spaces being smaller than the limit of the resolving power of said exposure device, and said patterns being produced responsive basically to only one kind of data and said photomask being mass-produced in advance; and partially removing said minute light shielding patterns so that said circuit pattern which is to be transferred onto the wafer is formed by remainders of the plurality of said minute light shielding patterns.

5,439,766

## COMPOSITION FOR PHOTO IMAGING

Richard A. Day, Whitney Point, N.Y.; Donald H. Glatzel, New Milford, Pa.; John R. Mertz; Joel L. Roth, both of Endicott, N.Y.; David J. Russell, and Logan L. Simpson, both of Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 793,889, Nov. 18, 1991, Ser. No. 632,032, Dec. 21, 1990, abandoned, and Ser. No. 632,066, Dec. 21, 1990, abandoned, said Ser. No. 632,032, and Ser. No. 632,066, each is a continuation of Ser. No. 318,536, Mar. 3, 1989, Pat. No. 5,026,624, which is a continuation-in-part of Ser. No. 292,175, Dec. 30, 1988, Pat. No. 4,940,651. This application Nov. 13, 1992, Ser. No. 976,115

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl. G03C 1/725

U.S. Cl. 430—18

22 Claims

1. A circuit board comprising:
  - A. a cured epoxy glass substrate;
  - B. a patterned cationically polymerized epoxy resin coating disposed on said substrate, comprising an epoxy based resin system having solids comprising:
    - i. between about 10% and about 90% by weight of a polyol resin;
    - ii. between about 10% and about 90% by weight of a brominated epoxy resin;
 wherein said substrate is essentially free of free chemical species having a relative basicity greater than the basicity of the epoxide oxygen in said epoxy resin.

5,439,767

## PHASE SHIFT MASK AND ITS INSPECTION METHOD

Hiroshi Yamashita, and Tadao Yasuzato, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

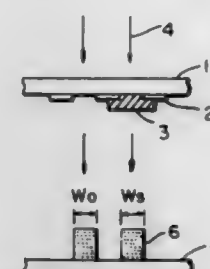
Filed Feb. 17, 1994, Ser. No. 197,851

Claims priority, application Japan, Feb. 17, 1993, 5-027060

Int. Cl. G03C 5/00

U.S. Cl. 430—30

10 Claims



1. A method of inspecting a transmittance error of a phase shifter on a phase shift mask, comprising the steps of:
  - providing a periodic repetitious pattern on the phase shift mask and arranging the phase shifter on every other transparent portion of the periodic repetitious pattern;
  - providing a substrate having a photoresist film formed thereon;
  - exposing a first portion of the photoresist film to projected light of the periodic repetitious pattern in a second focusing condition, one of the first and second focusing condition is a defocus condition;
  - developing the photoresist film to obtain a first width of a photoresist pattern formed by the exposure with the transparent portion and a second width of a photoresist pattern formed by the exposure with the phase shifter in both of said first portion and said second portion; and
  - determining existence of the transmittance error by finding a condition that the second width is smaller than the first width.

5,439,768

## ELECTROSTATIC INFORMATION RECORDING MEDIUM AND ELECTROSTATIC INFORMATION RECORDING AND REPRODUCING METHOD

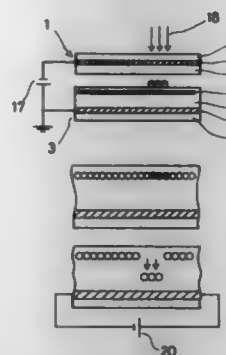
Makoto Matsuo; Minoru Utsumi; Masayuki Iijima; Yukio Taniguchi; Hiroyuki Obata, and Seiji Take, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 353,084, May 17, 1989, abandoned. This application Nov. 20, 1990, Ser. No. 616,445 Claims priority, application Japan, May 17, 1988, 63-121592; May 20, 1988, 63-123603; May 24, 1988, 63-127551; Mar. 8, 1990, 2-57351

Int. Cl. G03G 15/00

U.S. Cl. 430—56

23 Claims



1. A photosensitive device for use in an electrostatic information recording apparatus having an electrostatic information recording medium with an electric charge retaining layer that has an electrode on the backside thereof disposed face-to-face with a portion of the photosensitive device in order that information exposure is performed with voltage applied to record an electrostatic latent image corresponding to information exposure on the electrostatic information recording medium, said photosensitive device comprising a photosensitive member which includes:
  - a support member;
  - an electrode provided on said support member;
  - a photoconductive layer laminated on said electrode; and
  - an electric charge injection preventive layer means for inhibiting charges from being injected between said electrode and said photoconductive layer when the photosensitive device is not exposed to light even when a voltage is applied.

5,439,769

## DEVELOPING METHOD AND SYSTEM

Masanao Kunugi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

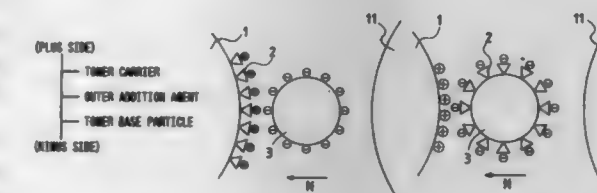
Filed Dec. 14, 1993, Ser. No. 166,017

Claims priority, application Japan, Dec. 16, 1992, 4-336384; Oct. 21, 1993, 5-263893

Int. Cl. G03G 13/08

U.S. Cl. 430—102

50 Claims



1. A developing method of the type in which toner constituted by toner base particles and a surface additive is transferred to a latent image carrier by using a toner carrier member to make an electrostatic latent image on said latent image carrier visible, wherein the improvement comprises using a



respective triboelectric series of said toner carrier member, said toner base particle and said surface additive having a predetermined relationship in an order defined from a plus or minus side, so that fogging is substantially reduced.

5,439,770

# TONER FOR DEVELOPING ELECTROSTATIC IMAGE, IMAGE FORMING APPARATUS AND PROCESS CARTRIDGE

Masaaki Taya, Kawasaki; Takaaki Kohtaki, Yokohama; Makoto Unno, Tokyo, and Tadashi Doujo, Ebina, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1994, Ser. No. 228,269

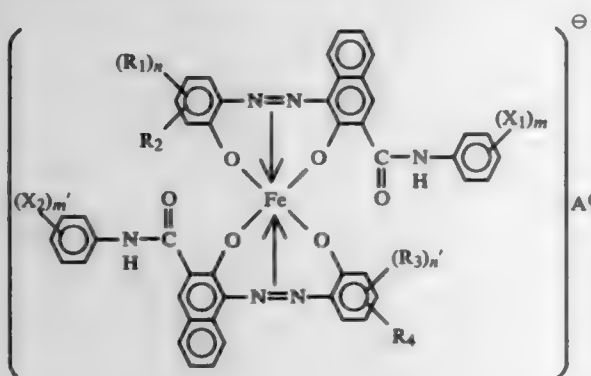
Claims priority, application Japan, Apr. 20, 1993, 5-093181

Int. Cl.<sup>6</sup> G03G 9/09, 9/097

U.S. Cl. 430—106

24 Claims

1. A toner for developing an electrostatic image, comprising: at least a binder resin and a charge control agent; the binder resin having an acid value of 5–50; the charge control agent comprising an iron complex represented by the following formula:



wherein  $X_1$  and  $X_2$  independently denote hydrogen atom, lower alkyl group, lower alkoxy group, nitro group or halogen atom;  $m$  and  $m'$  denote an integer of 1–3;  $R_1$  and  $R_3$  independently denote hydrogen atom,  $C_{1-13}$  alkyl or alkenyl, sulfonamide, mesyl, sulfonic acid group, carboxy ester group, hydroxy,  $C_{1-13}$  alkoxy, acetamino, benzoylamino or halogen atom;  $n$  and  $n'$  denote an integer of 1–3;  $R_2$  and  $R_4$  denote hydrogen atom or nitro group; and  $A^+$  denotes hydrogen ion, sodium ion, potassium ion or ammonium ion;

the toner having a weight-average particle size ( $D_4$ ) of 4–9  $\mu\text{m}$  and including toner particles having a particle size of 5  $\mu\text{m}$  or smaller at 3–90% by number, toner particles having a particle size of 6.35–10.08  $\mu\text{m}$  at 1–80% by number and toner particles having a particle size of 12.7  $\mu\text{m}$  or larger at a percentage by volume of at most 2.0%, wherein the toner particles having a particle size of 5.0  $\mu\text{m}$  or smaller are contained at  $N\%$  by number and at  $V\%$  by volume satisfying a relationship:

$$N/V = -0.05N + k,$$

wherein  $k$  is a positive number in the range of 3.0–7.5.

5,439,771

# CARRIER FOR USE IN ELECTROPHOTOGRAPHY, TWO COMPONENT-TYPE DEVELOPER AND IMAGE FORMING METHOD

Yoshinobu Baba, Yokohama; Yasuko Amano, Ebina, and Hitoshi Itabashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1993, Ser. No. 103,034

Claims priority, application Japan, Jul. 28, 1992, 4-201403; Oct. 15, 1992, 4-277235

Int. Cl.<sup>6</sup> G03G 9/107

U.S. Cl. 430—106.6

39 Claims

1. A carrier for use in electrophotography, comprising carrier particles having an average particle size of 5–100  $\mu\text{m}$ , wherein said carrier comprises a soft magnetic material having a bulk density of at most 3.0  $\text{g}/\text{cm}^3$ , and magnetic properties including: a magnetization of 30–150  $\text{emu}/\text{cm}^3$  under a magnetic field strength of 1000 oersted, a coercive force  $H_c$  of at most 42 oersted and relationships (1) and (2):

$$|\sigma_{1000} - \sigma_{300}| / \sigma_{1000} \leq 0.40 \quad (1)$$

wherein  $\sigma_{1000}$  and  $\sigma_{300}$  denote magnetizations ( $\text{emu}/\text{cm}^3$ ) under magnetic field strengths of 100 oersted (Oe) and 300 oersted (Oe); respectively, and

$$0.15 (\text{emu}/\text{cm}^3 \cdot \text{Oe}) \leq |\sigma_{100} - \sigma_r| / 100 (\text{Oe}) \quad (2)$$

wherein  $\sigma_{100}$  and  $\sigma_r$  denote magnetizations ( $\text{emu}/\text{cm}^3$ ) under magnetic field strengths of 100 (Oe) and zero (Oe), respectively.

5,439,772

# MAGNETIC TONER AND PROCESS FOR PRODUCING THE SAME

Selichi Takagi; Toyofumi Inoue, and Ikutaro Nagatsuka, all of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1994, Ser. No. 216,338

Claims priority, application Japan, Mar. 26, 1993, 5-090566; Feb. 17, 1994, 6-041810

Int. Cl.<sup>6</sup> G03G 7/083

U.S. Cl. 430—106.6

20 Claims

1. A magnetic toner comprising a binder resin, a magnetic substance, and polyolefin fine particles, wherein the content of the magnetic substance is from 20 to 80% by weight, the polyolefin fine particles have a mean dispersed particle diameter of from 0.01 to 0.5  $\mu\text{m}$ , the content of the polyolefin fine particles is from 2 to 20% by weight, and the toner particles have a residual magnetization ( $\sigma_r$ ) of from 4 to 7.0  $\text{emu}/\text{g}$ .

5,439,773

# ELECTRICALLY-CONDUCTIVE TONER, PROCESS FOR PREPARATION OF SAME, AND PROCESS FOR FORMATION OF IMAGE USING SAME

Izuru Matsui; Tsutomu Kubo; Kazuya Furuta, and Koichi Takashima, all of Minami-Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1993, Ser. No. 159,594

Claims priority, application Japan, Dec. 4, 1992, 4-350172

Int. Cl.<sup>6</sup> G03G 9/08, 13/16

U.S. Cl. 430—110

15 Claims

1. An electrically-conductive toner comprising toner mother grains and a lubricant which is at least one selected from the group consisting of an aliphatic acid, an aliphatic acid metal salt, an aliphatic alcohol, an aliphatic amide, an aliphatic bisamide, and an aliphatic acid ester, said lubricant being in the form of finely divided grains having such a diameter that at least 99% by number of said finely divided grains have a diameter of 3  $\mu\text{m}$  or less.

5,439,774

# POSITIVE-TYPE PHOTOSENSITIVE ELECTRODEPOSITION COATING COMPOSITION CONTAINING RESIN HAVING IONIC GROUP AND MODIFIED QUINONEDIAZIDESULFONE UNIT

Naozumi Iwasawa, Hiratsuka, and Junichi Higashi, Amagasaki, both of Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 44,190, Apr. 8, 1993, abandoned. This application Sep. 28, 1994, Ser. No. 314,438

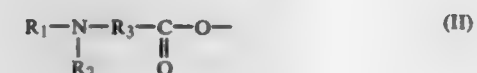
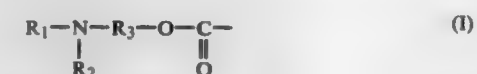
Claims priority, application Japan, Apr. 10, 1992, 4-116770

Int. Cl.<sup>6</sup> G03F 7/023

U.S. Cl. 430—190

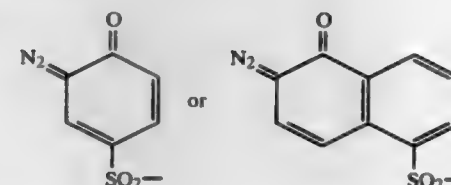
15 Claims

1. A positive-type photosensitive electrodeposition coating composition comprising a water-soluble or water-dispersible resin having an ionic group and containing at least one modified quinonediazidesulfone unit represented by the following formula (I) or (II)



wherein

$R_1$  represents



$R_2$  represents a hydrogen atom, an alkyl group, a cycloalkyl group or an alkyl ether group, and

$R_3$  represents at least one member selected from the group consisting of an alkylene group, a cycloalkylene group, an alkylene ether group, a phenylene group, a phenylene group substituted with an alkyl group having 1 to 20 carbon atoms, an alkylene group containing in its chain a phenylene group, an alkylene group containing in its chain a phenylene group substituted with an alkyl group having 1 to 20 carbon atoms, a cycloalkylene group containing in its chain a phenylene group, a cycloalkylene group containing in its chain a phenylene group substituted with an alkyl group having 1 to 20 carbon atoms, an alkylene ether group containing in its chain a phenylene group, and an alkylene ether group containing in its chain a phenylene group substituted with an alkyl group having 1 to 20 carbon atoms,

said modified quinonediazidesulfone unit being connected to the resin by a carboxylic acid ester linkage.

5,439,775

# IMAGE FORMATION PROCESS

Yohnosuke Takahashi; Hideyuki Nakamura; Fumiaki Shinozaki, and Shinji Tsuno, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 235,917, May 2, 1994, abandoned, which is a continuation of Ser. No. 964,052, Oct. 21, 1992. This application Dec. 14, 1994, Ser. No. 358,600

Claims priority, application Japan, Oct. 21, 1991, 3-272652; Dec. 17, 1991, 3-333336

Int. Cl.<sup>6</sup> G03C 3/00

U.S. Cl. 430—254

5 Claims

1. An image formation process with a light-sensitive element comprising on a support a light-sensitive layer which is adhesive when not exposed to actinic light but becomes non-adhe-

sive after being exposed to actinic light and a toner element comprising on a support a toner layer ( $a'$ ) containing a binder and a coloring material having a hue ( $a$ ) which comprises the steps of:

- imagewise exposing said light-sensitive layer to actinic light to form a latent image therein;
- bringing said light-sensitive layer in which a latent image has been imagewise formed into face-to-face contact with said toner layer ( $a'$ ) having a hue ( $a$ ); and
- separating said toner element and said light-sensitive element from each other to transfer the portion of the toner layer corresponding to the unexposed portion of the light-sensitive layer to the light-sensitive layer and leave the portion of the toner layer corresponding to the exposed portion of the light-sensitive layer on the support for said toner element, characterized in that said light-sensitive element includes between said light-sensitive layer and said support a layer comprising a light-insensitive polymer having a softening temperature of 80° C. or lower as determined by the Vicat process, and further characterized in that in step (C), no separation occurs between the light-sensitive layer and the layer comprising a light-sensitive polymer or between the support for the light-sensitive element and the layer comprising a light-insensitive polymer.

5,439,776

# ISOTHIOURONIUM SALTS AS PHOTOGRAPHIC NUCLEATING AGENTS

John F. Pilot, Carteret; Syeda Hussain, and Shirley Madamba, both of Middletown, all of N.J., assignors to Sun Chemical Corporation, Fort Lee, N.J.

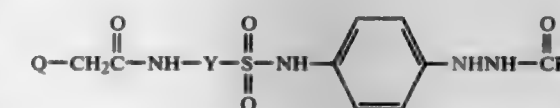
Filed Nov. 15, 1994, Ser. No. 339,857

Int. Cl.<sup>6</sup> G03C 1/06

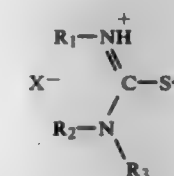
U.S. Cl. 430—264

13 Claims

1. A silver halide lithographic film element having high contrast and dot quality developable in rapid access developers without requiring the use of boosters or alkanol amines, said element having coated thereon a silver halide emulsion and containing at least one layer incorporating a hydrazine nucleating agent having the structure



wherein  $R$  is hydrogen,  $C_{1-10}$  alkyl, carbamoyl, alkoxy or aryloxy carbonyl;  $Y$  is divalent aryl, and  $Q$  is an isothiuronium salt moiety having the structure



wherein  $R_1$ ,  $R_2$  and  $R_3$ , alike or different, are selected from the group consisting of hydrogen, phenyl or phenyl hydrazide, cycloalkyl or cycloalkenyl,  $C_{1-12}$  alkyl or alkenyl, pyrrolidine, piperidine and aryl carbonylhydrazide; and  $X$  is an inorganic or organic anion.

5,439,777

# RECORDING AND REPRODUCING APPARATUS AND METHOD FOR APPLYING A PULSE VOLTAGE AND AN ELECTROMAGNETIC WAVE

Haruki Kawada, Yokohama; Hiroshi Matsuda, Isehara; Kiyoshi Takimoto, Kawasaki, and Hiroyasu Nose, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

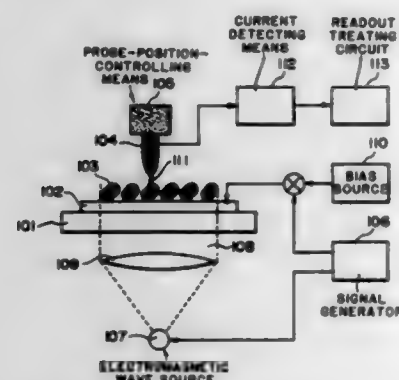
Continuation of Ser. No. 416,380, Oct. 3, 1989, abandoned. This application Feb. 18, 1993, Ser. No. 19,344

Claims priority, application Japan, Oct. 4, 1988, 63-251455; Dec. 1, 1988, 63-302223

Int. Cl.<sup>6</sup> G01N 23/00; G11B 7/00

U.S. Cl. 430—270

17 Claims



15. A recording-reproducing-erasing method, comprising the steps of:

- providing on an electrode a material that changes its intramolecular electron distribution upon a combined application of electromagnetic wave irradiation and an electric field, said material being effected by isomerizing of molecular structure due to electromagnetic wave irradiation generating an intramolecular or intermolecular redox pair, and by proton transfer within the redox pair due to electric field application;
- bringing an electrically conductive probe having a pointed tip close to said material;
- selectively projecting a first electromagnetic wave onto said material;
- selectively applying a first voltage between said electrode and said conductive probe for applying an electric field to said material when said first electromagnetic wave is projected onto the material, to change the intramolecular electron distribution, thereby to write information;
- selectively applying a second voltage between said electrode and said conductive probe when said first electromagnetic wave is not projected on said material, to detect a tunnel current flowing through said material, thereby to read out information; and
- projecting a second electromagnetic wave onto a written portion of said material to impart heat energy to said material for raising a vibration energy of molecules constituting said material, thereby to erase said written information.

5,439,778

# REFLECTANCE CONTROL METHOD AND OPTICAL RECORDING MEDIUM HAVING CONTROLLED REFLECTANCE

Fumio Matsui, and Kumi Kawano, both of Tsurugashima, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 12, 1994, Ser. No. 242,007

Claims priority, application Japan, May 17, 1993, 5-114371

Int. Cl.<sup>6</sup> G03C 7/26, 7/24

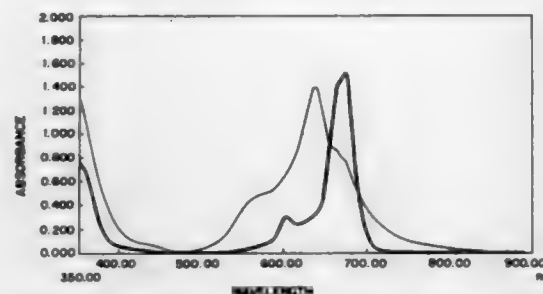
U.S. Cl. 430—270

7 Claims

1. A method of controlling a reflectance of an optical recording medium provided with a light transmission substrate on which a recording film containing a dye material is formed, comprising the steps of:

preparing a solution containing only a non-aggregated por-

tion of a dye material and a solution containing only an aggregated portion of a dye material; mixing both the solutions with a predetermined mixing ratio to prepare a mixture solution; and



coating the mixture solution on a surface of a light transmission substrate to form a recording film of an optical recording medium having a predetermined reflectance.

5,439,779

# AQUEOUS SOLDERMASK

Richard A. Day, Whitney Point, N.Y.; Donald H. Glatzel, New Milford, Pa.; David J. Russell, Apalachin, N.Y.; Jeffrey D. Gelorme, Painville, Conn., and John R. Mertz, Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 20,661, Feb. 22, 1993, abandoned. This application Jun. 13, 1994, Ser. No. 259,355

Int. Cl.<sup>6</sup> G03C 1/725

U.S. Cl. 430—280

4 Claims

1. A cationically polymerizable composition for forming a soldermask comprising:

- a. an aqueously dispersed photosensitive cationically polymerizable epoxy based resin system comprising: from about 10% to about 90% an aqueous dispersion of a polyepoxy novolak resin having a molecular weight of between about 200 and 10,000, a weight per epoxide of from about 200 to about 400, and essentially free of organic solvents; and from an effective amount to about 90%, by weight, of an aqueous dispersion of a glycidyl ether of brominated Bisphenol A having a molecular weight of from about 200 to about 10,000 a weight per epoxide of from about 200 to 500;
- b. from about 0.1 to about 15 parts by weight of a cationic photoinitiator capable of initiating polymerization in said epoxidized resin system upon exposure to actinic radiation; and,
- c. surfactant; wherein the composition is essentially free of organic solvents, and the composition when cured, is a solder mask that can withstand solder temperatures of 260° C.

5,439,780

# ENERGY SENSITIVE MATERIALS AND METHODS FOR THEIR USE

Ajeet M. Joshi, Somerset, and Timothy W. Weidman, Maplewood, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Apr. 29, 1992, Ser. No. 875,851

Int. Cl.<sup>6</sup> G03C 5/00

U.S. Cl. 430—296

24 Claims

1. A process for fabricating an article comprising the steps of forming a layer of radiation sensitive material on a substrate, exposing said material to said radiation to form a pattern and developing said pattern characterized in that said material comprises a silicon polymer represented by the base unit:



where  $0.2 < x < 1.5$ ,  $0.2 < y < 1.5$  and R is an organic substituent resulting in said material being insoluble.

5,439,781

# DEVICE FABRICATION ENTAILING SYNCHROTRON RADIATION

Alastair A. MacDowell, Baiting Hollow, N.Y., and Donald L. White, Morris Plains, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed May 10, 1993, Ser. No. 59,924

Int. Cl.<sup>6</sup> G03C 5/16; G21K 5/00

U.S. Cl. 430—311

17 Claims

1. Process for fabrication of a device comprising at least one element having a dimension  $\leq 0.25 \mu\text{m}$ , such process comprising construction of a plurality of successive levels, construction of each level comprising lithographic delineation, in accordance with which a subject mask pattern is illuminated to produce a corresponding pattern image on the device being fabricated, ultimately to result in removal of or addition of material in the pattern image regions, in which illumination used in fabrication of at least one level is radiation in the x-ray spectrum, and in which such radiation is derived from synchrotron emission from an electron storage ring characterized in that

the illumination consists of radiation from the ring collected over an arc of at least 100 mrad by a condenser, in which the condenser comprises a multi-faceted collector lens containing at least 4 facets, and in which collected radiation is processed subsequent to the collector lens by optics including processing optics.

5,439,782

# METHODS FOR MAKING MICROSTRUCTURES

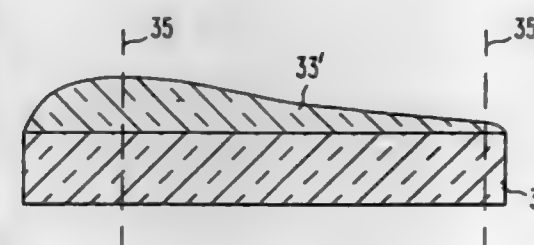
William H. Haemmerle, Florham Park; William M. MacDonald, Lebanon; Casimir R. Nijander, Lawrenceville; Joseph Shmulovich, Murray Hill; Wesley P. Townsend, Princeton, and Yiu-Huen Wong, Summit, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 13, 1993, Ser. No. 165,203

Int. Cl.<sup>6</sup> G02B 6/12

U.S. Cl. 430—321

12 Claims



1. A method comprising the steps of: defining on a glass substrate a polymer layer having a substantially uniform thickness and which tapers in width from a first end to a second end, the first end of the polymer layer being wider than the second end of the polymer layer; making said polymer layer to taper in thickness from the first end thereof to the second end thereof such that the first end of the polymer layer is thicker than the second end thereof; said making step comprising the step of heating the polymer layer of uniform thickness sufficiently to soften it and to cause its mass to be redistributed; the polymer layer being of a material that does not wet the substrate material, whereby, during the heating step, the polymer layer does not flow substantially on areas of the

substrate surface not previously covered by said polymer layer; hardening said polymer layer to form a second polymer structure that has a tapered width and a tapered thickness; and placing the second polymer structure and substrate in an RIE reactor and reactively etching them, said reactive ion etching resulting in a substantial replication of the configuration of the second polymer structure in an upper surface of said glass substrate.

5,439,783

# COMPOSITION FOR TREATING COPPER OR COPPER ALLOYS

Daisaku Akiyama, and Yoshiro Maki, both of Amagasaki, Japan, assignors to MEC Co., Ltd., Amagasaki, Japan

Filed Mar. 25, 1994, Ser. No. 217,638

Claims priority, application Japan, Apr. 5, 1993, 5-100121

Int. Cl.<sup>6</sup> G03C 11/06

U.S. Cl. 430—331

7 Claims

1. A composition for the treatment of surfaces of copper and copper alloys which comprises, (a) a cupric complex of an azole compound, (b) an organic acid having a boiling point or a decomposition point of 230° C. or lower, (c) a difficultly volatile complexing agent, (d) a complexing agent having a complexing power which is weaker than the complexing power of the azole compound, and (e) water.

5,439,784

# METHOD AND APPARATUS FOR PHOTOGRAPHIC PROCESSING SOLUTION REPLENISHMENT

Andrew D. Grimsey, Luton; David M. Henson, Wealdstone; Peter D. Marsden, Middlesex, and Peter J. Twist, Bucks, all of Great Britain, assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/EP91/00735, § 371 Date Oct. 19, 1992, § 102(e) Date Oct. 19, 1992, PCT Pub. No. WO91/16666, PCT Pub. Date Oct. 31, 1991

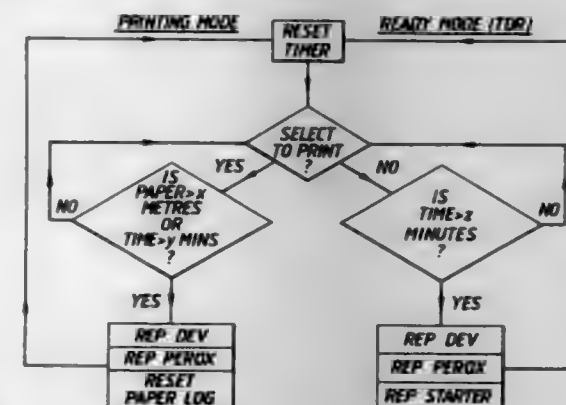
PCT Filed Apr. 16, 1991, Ser. No. 946,455

Claims priority, application United Kingdom, Apr. 18, 1990, 9008750

Int. Cl.<sup>6</sup> G03C 7/00, 7/407, 7/44

U.S. Cl. 430—399

5 Claims



1. A method of processing color photographic silver halide material comprising the steps of: contacting exposed color photographic silver halide material with a processing solution comprising a color developing agent and an oxidizing agent and replenishing said processing solution with replenisher solutions including a color developing agent replenisher, an oxidizing agent replenisher and a halide-containing seasoning replenisher (starter solution), wherein said replenishing is conducted without removing said oxidizing agent from said processing solution in which either said three solutions are added at a regular time interval while no processing is taking place (idling time), said three replen-



isher solutions are only added prior to restarting of processing after a period of idling, or color developing agent replenisher is added at a regular time interval while idling and the other two of the said three replenisher solutions are added only prior to restarting processing.

5,439,785

# PHOTOGRAPHIC ELEMENTS COMPRISING ANTISTATIC LAYERS OF VANADIUM PENTOXIDE, EPOXY-SILANE, AND SULFOPOLYMER

David R. Boston, Woodbury; William L. Kausch, Cottage Grove, both of Minn.; Elio Martino, Carcare, Italy; Eric D. Morrison, West St. Paul, Minn., and Alberto Valsecchi, Vado Ligure, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 49,941, Apr. 20, 1993, abandoned. This application Jul. 19, 1994, Ser. No. 277,097

Int. Cl.<sup>6</sup> G03C 1/85, 1/89

U.S. Cl. 430—530

34 Claims

1. A light-sensitive photographic element comprising a polymeric film base, at least one silver halide emulsion layer, and an antistatic layer comprising a colloidal vanadium oxide, an adhesion promoting compound, and a sulfopolymer adhered to at least one side of said polymeric film base, wherein the weight ratio of vanadium oxide to sulfopolymer is no greater than 1:20.

5,439,786

# PHOTOGRAPHIC EMULSIONS AND MATERIALS WITH REDUCED PRESSURE SENSITIVITY

Guenther H. Klinger, and Albert B. Levit, both of Binghamton, N.Y., assignors to International Paper Company, Purchase, N.Y.

Continuation of Ser. No. 880,128, May 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 790,776, Nov. 12, 1991, abandoned. This application Jul. 6, 1993, Ser. No. 88,603

Int. Cl.<sup>6</sup> G03C 1/035, 1/08

U.S. Cl. 430—567

3 Claims

1. Negative-working, silver halide emulsion comprising monodispersed, non-twinned, non-tabular silver halide crystals, having no more than about 1 mole percent silver iodide, a core and a shell, said crystals having a chemically sensitized surface;

said core having a silver halide composition consisting essentially of silver bromide and being non-converted; and said shell consisting essentially of silver chlorobromide doped with a group VIII metal, provided that:

the shell contains between 0.5 and 50 mole percent silver chloride; and

the core represents from about 5 to about 50% of the total crystal volume;

whereby said emulsion has substantially reduced black or white pressure sensitivity compared with homogeneous silver bromide or silver chlorobromide emulsions.

5,439,787

# SILVER HALIDE PHOTOGRAPHIC EMULSION AND PHOTOGRAPHIC MATERIAL CONTAINING THE SAME

Junichi Yamanouchi; Yoichi Hosoya, and Shigeharu Urabe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Jul. 7, 1994, Ser. No. 271,662

Claims priority, application Japan, Jul. 7, 1993, 5-191814

Int. Cl.<sup>6</sup> G03C 1/005

U.S. Cl. 430—567

9 Claims

1. A silver halide photographic emulsion comprising tabular grains prepared in the presence of at least one member of polymers comprising at least one repeating unit derived from at least one member of monomers represented by the following formula (I)



wherein R<sup>1</sup> represents a hydrogen atom or a lower alkyl group; R<sup>2</sup> represents a monovalent substituent group; R<sup>3</sup> represents an alkylene group having 3 to 10 carbon atoms; L represents a bivalent bonding group; and n represents the mean number of a repeating unit represented by —R<sup>3</sup>—O— and is a number of at least 4, but not more than 200.

5,439,788

# METHOD OF MANUFACTURING SILVER HALIDE EMULSION

Hiroshi Takehara, Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 28, 1994, Ser. No. 233,946

Claims priority, application Japan, Apr. 30, 1993, 5-124612

Int. Cl.<sup>6</sup> G03C 1/025, 1/015

U.S. Cl. 430—569

17 Claims

1. A method of manufacturing a light-sensitive silver halide emulsion with an average grain size of 0.04 μm or more and 0.2 μm or less, wherein an average silver chloride content of the silver halide emulsion is 3 mol % or less, which comprises adding a sensitizing dye to said emulsion at a temperature of 25° C. or more and 50° C. or less, and subsequently performing chemical ripening at a temperature higher than the addition temperature of the sensitizing dye.

5,439,789

# METHINE COMPOUND AND SILVER HALIDE PHOTOGRAPHIC MATERIAL COMPRISING THE SAME

Takashi Kato, and Kiyohito Takada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1994, Ser. No. 240,462

Claims priority, application Japan, May 11, 1993, 5-132457

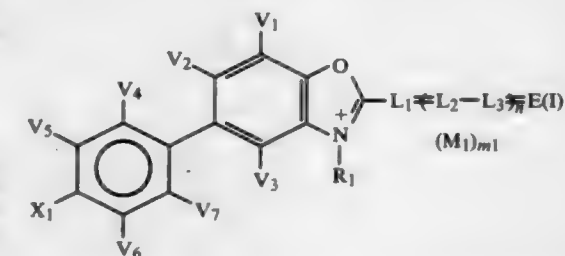
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.<sup>6</sup> G03C 1/18

U.S. Cl. 430—585

10 Claims

1. A silver halide photographic material comprising a support having thereon at least one light-sensitive silver halide emulsion layer, which comprises at least one methine compound represented by the following formula (II):



wherein R<sub>2</sub> and R<sub>3</sub> each represent a sulfoalkyl group having from 2 to 5 carbon atoms; Z<sub>1</sub> represents a benzoxazole nucleus; V<sub>8</sub>, V<sub>9</sub>, V<sub>10</sub>, V<sub>11</sub>, V<sub>12</sub>, V<sub>13</sub> and V<sub>14</sub> each represent a hydrogen atom; X<sub>2</sub> represents a chlorine atom or a bromine atom; L<sub>4</sub>, L<sub>5</sub> and L<sub>6</sub> are the same or different and each represents a methine group; M<sub>2</sub> represents an ion for neutralizing charge; and m<sub>2</sub> represents a number of 0 or more necessary for neutralizing the molecular charge.

5,439,790

# PHthalimide BLOCKED POST-PROCESSING STABILIZERS FOR PHOTOTHERMOGRAPHY

Ramaiah Muthyala, Mendota Heights; Raymond J. Kenney, Woodbury; Frank J. Manganiello, St. Paul; Kumars Sakizadeh, Woodbury, and Sharon M. Simpson, Lake Elmo, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 24, 1994, Ser. No. 265,317

The portion of the term of this patent subsequent to Apr. 5, 2011, has been disclaimed.

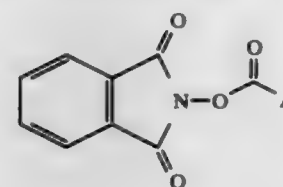
Int. Cl.<sup>6</sup> G03C 1/498

U.S. Cl. 430—619

22 Claims

1. A photothermographic element comprising a support bearing at least one photosensitive, image-forming photothermographic-emulsion layer comprising:

- (a) a photosensitive silver halide;
- (b) a non-photosensitive, reducible silver source;
- (c) a reducing agent for said non-photosensitive, reducible silver source;
- (d) a binder; and
- (e) a compound capable of releasing a post-processing stabilizer having a nucleus of the formula:



wherein:

A represents any monovalent group for which the corresponding compound AH functions as a post-processing stabilizer.

5,439,791

# MODIFIED GELATIN TYPES AND HYDROPHILIC ELEMENTS CONTAINING THEM

Piet Kok, Gent; Jean-Marie Dewanckele, Drongen; Johan Loccuffer, Zwijnaarde; Eddy Michiels, Duffel, and Frank Michiels, Arendonk, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsels, Belgium

Filed Feb. 10, 1994, Ser. No. 194,513

Claims priority, application European Pat. Off., Mar. 8, 1993, 93200655

Int. Cl.<sup>6</sup> G03C 1/30

U.S. Cl. 430—622

14 Claims

1. Modified gelatin according to general formula (I):



wherein

Gel is a gelatin polypeptide, —CO— is a carbonyl group from part of the free carboxyl groups originally present in an aspartic acid or glutamic acid moiety in said gelatin polypeptide,

X is a group selected from the group consisting of:

—SO<sub>2</sub>M, and —SM,

M is hydrogen or a cation,

R<sup>1</sup> and R<sup>2</sup>, when present, each independently represent hydrogen, alkyl, aryl, cycloalkyl,

L represents a divalent linking group selected from the group consisting of:

(i) an aliphatic alkylene chain comprising n carbon atoms, wherein

n is at least 2 when X represents —SO<sub>2</sub>M or —SM,

said aliphatic alkylene chain can be further substituted by alkyl, aryl, cycloalkyl,

one or more pairs of said substituents on said alkylene chain can combine together to form a ring,

said alkylene chain can be interrupted by one or more heteroatoms;

(ii) a cycloalkylene group;

(iii) a arylene group; and

(iiii) a aromatic heterocyclic group.

5,439,792

# CYSTEINE THIOL-PROTECTED PEPTIDES FOR USE IN IMMUNOASSAYS

James Blake; Carol-Ann Cole, both of Seattle; Patrick F. Coleman, Edmonds; Nobuo Monji, Seattle, and John P. Montana, Montlake Terrace, all of Wash., assignors to Genetic Systems Corporation, Redmond, Wash.

Continuation of Ser. No. 532,429, Jun. 4, 1990, abandoned, which is a continuation-in-part of Ser. No. 360,513, Jun. 2, 1989, abandoned. This application Oct. 21, 1993, Ser. No. 140,696

Int. Cl.<sup>6</sup> C12Q 1/00

U.S. Cl. 435—5

10 Claims

1. A method for preparing a peptide coated solid phase for immunological detection and/or quantitation of antibody to a cyclic viral protein epitope, comprising:

(a) synthesizing the peptide which comprises an amino acid sequence of 10 to 50 amino acids and having two Cys residues which are separated from each other by at least about three but fewer than twenty non-Cys amino acid residues;

(b) protecting thiol groups of the cysteine encoded within the peptide sequence by chemically reversible means resistant to highly acidic cleavage to form a protected peptide composition;

(c) immobilizing the protected peptide composition on a solid phase;

(d) removing the chemically reversible protection means from the immobilized peptide composition; and

(e) incubating the immobilized peptide composition under conditions conducive to the formation of disulfide bonds between the Cys residues.

5,439,793

# METHOD FOR PRODUCING A POLYNUCLEOTIDE HAVING AN INTRAMOLECULARLY BASE-PAIRED STRUCTURE

Samuel Rose, and Linda M. Western, both of Mountain View, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 19, 1990, Ser. No. 555,968

Int. Cl.<sup>6</sup> C12Q 1/68; C12P 19/34

U.S. Cl. 435—6

49 Claims

1. A method of forming a single stranded polynucleotide having two segments that are non-contiguous and hybridizable with each other, said method comprising the steps of:

(a) forming a partially single stranded duplex by hybridizing

(1) a first polynucleotide sequence of about 30 to 5000 nucleotides in length and having one of a hydroxyl or phosphate group at its 3'-end with (2) a second polynucleotide sequence of at least 10 consecutive nucleotides in length that hybridizes with said first polynucleotide sequence and having the other of a hydroxyl or phosphate group at its 5'-end, wherein said partially single stranded duplex is comprised of a non-hybridized single stranded portion of at least one of said first and second polynucleotide sequences containing one of said ends and 10 to 25 nucleotides in length, and

(b) ligating said ends within said duplex with an excess of T4 deoxyribonucleic acid ligase, thereby forming a single stranded polynucleotide having two segments that are non-contiguous and hybridizable with each other.

5,439,794

**MIXED LIGAND COMPLEXES AND USES THEREOF AS BINDING AGENTS TO DNA**

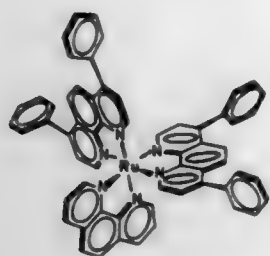
Jacqueline K. Barton, New York, N.Y., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Division of Ser. No. 268,247, Nov. 7, 1988, Pat. No. 5,112,974, which is a continuation-in-part of Ser. No. 905,295, Sep. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 693,023, Jan. 18, 1985, Pat. No. 4,721,669. This application Feb. 28, 1992, Ser. No. 843,315

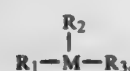
Int. Cl.<sup>6</sup> C07H 21/04, 21/00, 21/02

U.S. Cl. 435—6

34 Claims

Ru(DIP)<sub>2</sub>(phen)<sup>2+</sup>

1. A method for labeling DNA with a complex which is determinable spectroscopically or photoactively when bound to the DNA which comprises contacting the DNA with a coordination complex or salt thereof which is spectroscopically or photoactively determinable when bound to DNA having the formula



wherein M is Ru, Rh, Co, Fe, Cr, Cu, Zn, Cd, or Pb and each of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> is ethylenediamine or a substituted derivative thereof, bipyridine or a substituted derivative thereof, phenanthroline or a substituted derivative thereof, diazafluorene-9-one or a substituted derivative thereof, phenanthrenequinonediimine or a substituted derivative thereof; wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are bound to M by coordination bonds and wherein R<sub>1</sub> and R<sub>2</sub> are the same and both are different from R<sub>3</sub>; under conditions such that the complex binds to the DNA and thereby labels the DNA with the complex.

5,439,795

**MONOCLONAL ANTIBODIES THAT SPECIFICALLY BIND SOMATOTROPIN BINDING PROTEINS BUT NOT TO CORRESPONDING SOMATOTROPIN RECEPTORS AND METHODS OF USE IN IMMUNOASSAYS**

William R. Baumbach, Hopewell; Bosco S. Wang, Cranbury; Homayoun Sadeghi, Robbinsville; John S. Logan, Robbinsville, and Ian C. Hart, Pennington, all of N.J., assignors to American Cyanamid Company, Wayne, N.J.

Filed Jan. 31, 1990, Ser. No. 473,086

Int. Cl.<sup>6</sup> G01N 33/53; C12N 5/20; C07K 16/18

U.S. Cl. 435—7.1

11 Claims

1. An monoclonal antibody which binds to the somatotropin binding protein in an animal species, but which does not bind to the corresponding somatotropin receptor in said species, wherein said monoclonal antibody binds to a unique carboxyl terminal segment of said somatotropin binding protein which is absent in said somatotropin receptor.

5,439,796

**SPECIFIC MONOCLONAL ANTIBODIES AGAINST A DEFINED EPITOPE OF PROGESTERONE RECEPTOR AND METHODS FOR THEIR USE**

Abdulmageed M. Traish, Belmont, and Herbert H. Wotiz, Milton, both of Mass., assignors to Trustees of Boston University, Boston, Mass.

Continuation of Ser. No. 762,246, Sep. 19, 1991, Pat. No. 5,283,190, which is a continuation of Ser. No. 494,356, Mar. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 388,091, Jul. 31, 1989, abandoned. This application Jul. 23, 1993, Ser. No. 77,902

Int. Cl.<sup>6</sup> C12Q 1/00; G01N 33/53; A61K 35/14; C07K 3/00

U.S. Cl. 435—7.1

4 Claims

1. An in-vitro method for ascertaining the functional integrity of human progesterone receptor protein in a cellular sample, said method comprising the steps of: providing at least one monoclonal antibody specific for a single epitope in the native (8S) and transformed (4S) forms of human progesterone receptor protein, said epitope located within amino acid residues 533–547 of human progesterone receptor protein; mixing said monoclonal antibody with a cellular sample whereby said monoclonal antibody binds specifically to such 8S and 4S forms of human progesterone receptor protein as are present in said cellular sample; and determining the presence of bound monoclonal antibody within said cellular sample, the presence of said bound monoclonal antibody serving as a measure for ascertaining the functional integrity of the human progesterone receptor protein within the cellular sample.

5,439,797

**DETECTION OF ANALYTES USING FLUORESCENT ENERGY TRANSFER**

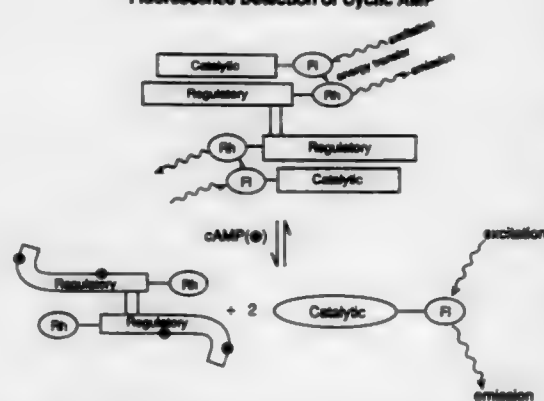
Roger Y. Tsien, La Jolla; Susan S. Taylor, Del Mar; Stephen R. Adams, Poway, and Ying Ji, San Diego, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 547,990, Jul. 2, 1990, abandoned. This application Aug. 30, 1993, Ser. No. 114,103

Int. Cl.<sup>6</sup> G01N 33/533

U.S. Cl. 435—7.21

60 Claims

**Fluorescence Detection of Cyclic AMP**

15. A method of determining the concentration of adenosine 3', 5'-cyclic monophosphate in a sample comprising:

(a) forming the complex represented by the formula (S<sub>1</sub>.A)<sub>n</sub>1 and (S<sub>2</sub>.D)<sub>n</sub>2, wherein S<sub>1</sub> is the regulatory subunit of adenosine 3', 5'-cyclic monophosphate dependent protein kinase and S<sub>2</sub> is the catalytic subunit of adenosine 3', 5'-cyclic monophosphate dependent protein kinase, and wherein D and A are different fluorochromes the emission wavelength of D overlapping the excitation wavelength of A, and D and A in said complex are in sufficiently close proximity to allow radiationless transfer of energy be-

tween the fluorochromes, and wherein n1 and n2 represent the stoichiometry of said subunits in said complex;

(b) contacting the complex with the sample;

(c) exposing said sample to radiative energy near the excitation wavelength of D; and

(d) measuring the fluorescence emitted at the emission wavelength of at least one of D and A is.

5,439,798

**MALEIMIDE ADDUCT CONJUGATES OF PROCANAMIDE AND NAPA**

Gerald F. Sigler; Charles F. Walter, both of Carmel; Charles E. Durant, Indianapolis; Todd Glancy, Fairmount, all of Ind.; Frank E. Klein, Elkton, Md., and Allan R. Dorn, Carmel, Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

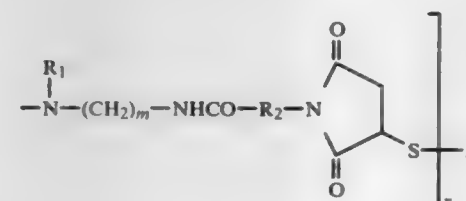
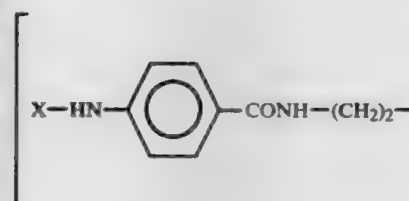
Filed Dec. 17, 1993, Ser. No. 169,851

Int. Cl.<sup>6</sup> G01N 33/542; C07K 16/44; C12N 9/96; C07D 207/448

U.S. Cl. 435—7.7

18 Claims

2. A compound of the formula:



wherein:

X=hydrogen or acetyl;

R<sub>1</sub>=an alkyl group having 1 to 3 carbon atoms;

m=an integer from 2 to 10;

R<sub>2</sub>=an alkyl, cycloalkyl or aryl group having 2 to 10 carbon atoms;

Z=an immunogenic poly(amino acid), an enzyme donor polypeptide or a label selected from the group consisting of an enzyme, a substance having fluorescent properties and a radioactive substance; and

n=1 to p where p=MW of Z/1000.

15. A method for determining procainamide in a sample comprising:

(a) contacting said sample with

(i) an enzyme donor polypeptide conjugate according to the compound of claim 2, wherein X is hydrogen and Z is an enzyme donor polypeptide of β-galactosidase;

(ii) an enzyme acceptor polypeptide wherein said enzyme acceptor polypeptide is characterized by forming with said enzyme donor polypeptide conjugate an active enzyme complex having β-galactosidase activity in the absence of an antibody to procainamide;

(iii) an antibody specific for procainamide, wherein said enzyme donor conjugate is capable of competitively binding to said antibody, thereby inhibiting the formation of active enzyme complex; and

(iv) a substrate capable of reacting with said active enzyme complex, such that the rate of conversion of said substrate by said active enzyme complex can be monitored, and

(b) measuring the rate of conversion of said substrate by said active enzyme complex as a measure of the amount of procainamide in said sample.

5,439,799

**AGENT AND PROCESS FOR TREATING BODY FLUIDS IN THE DETERMINATION OF NEOPTERIN**

Wilfried Rautenberg, Reinheim, and Arnulf Heubner, Mainz, both of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Germany

Filed May 7, 1993, Ser. No. 57,796

Claims priority, application Germany, May 9, 1992, 42 15 275.5

Int. Cl.<sup>6</sup> G01N 33/545

U.S. Cl. 435—7.93

17 Claims

10. A competitive immunoassay for detecting neopterin in body fluids, comprising:

incubating a sample of body fluid comprising neopterin with an antibody specific for neopterin and neopterin conjugated to a detectable label in the presence of an effective amount of oxidizing agent, wherein said oxidizing agent is potassium or sodium hexacyanoferrate(III), which reduces the amount of interferences by body fluid components;

detecting the amount of binding between the antibody and the neopterin conjugated to a detectable label; and correlating said amount of binding with the amount of neopterin in said body fluid.

5,439,800

**OFFSHORE PETROLEUM EXPLORATION SYSTEM**

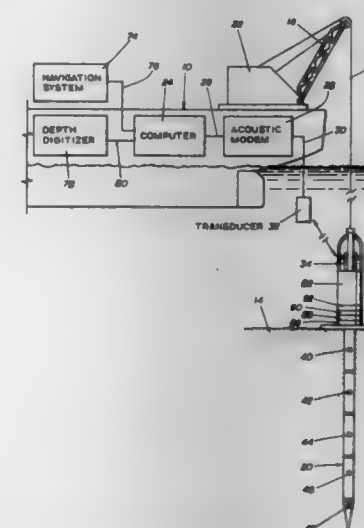
Keith F. M. Thompson, 878 Augusta, Houston, Tex. 77057

Continuation of Ser. No. 2,720, Jan. 11, 1993, abandoned. This application Jun. 17, 1994, Ser. No. 261,763

Int. Cl.<sup>6</sup> G01N 33/24; G01V 3/00

U.S. Cl. 435—9

9 Claims



1. A system for petroleum exploration in a body of seawater having a floor with sediments, said system including in combination

a vessel in a body of seawater, said vessel including measurement means, and

probe means embedded in the floor of said body of seawater whereby seepage of petroleum within sediments of said floor is detected from negative electrical potential which characterizes the sulfide zone in said sediments at an abnormally shallow depth due to the occurrence of petroleum seepage and is transmitted to said measurement means, wherein said measurement means includes a transducer, an acoustic modem connected to said transducer, a computer connected to said acoustic modem, a navigation system connected to said computer, and a depth digitizer connected to said computer.



5,439,801

**TEST COMPOSITION FOR THE RAPID DETECTION OF HELICOBACTER PYLORI IN GASTRIC BIOPSY TISSUE**  
Frank W. Jackson, Mechanicsburg, Pa., assignor to Chek-Med Systems, Inc., Camp Hill, Pa.

Filed Feb. 14, 1994, Ser. No. 195,954

Int. Cl.<sup>6</sup> G12Q 1/58; G01N 33/48

U.S. Cl. 435—12

10 Claims

1. In a test composition for the diagnosis of gastric disease by detecting the presence of urease associated with *H. pylori* in a biopsy specimen; said composition containing urea and a dye indicator whereby if *H. pylori* is present in the biopsy specimen the associated urease hydrolyzes the urea to produce ammonia which raises the pH and changes the color of the dye indicator indicating gastric disease;

the improvement which comprises:

said dye indicator comprising at least two dyes in combination which together change color from an initial color to at least one different color indicating the presence of *H. pylori*;

said color change indicating the presence of *H. pylori* initially occurring at an acid pH; and

said color indicating the presence of *H. pylori* being distinctive from the color of the biopsy specimen.

5,439,802

**METHOD FOR DETERMINING THE FUNCTIONAL ACTIVITY OF FREE PROTEIN S OR PROTEIN C IN A PLASMA SAMPLE**

Steffen Rosén, Kallered, Sweden, assignor to Chromogenix AB, Molndal, Sweden

PCT No. PCT/SE90/00478, § 371 Date Jan. 14, 1992, § 102(e)

Date Jan. 14, 1992, PCT Pub. No. WO91/01382, PCT Pub. Date Feb. 7, 1991

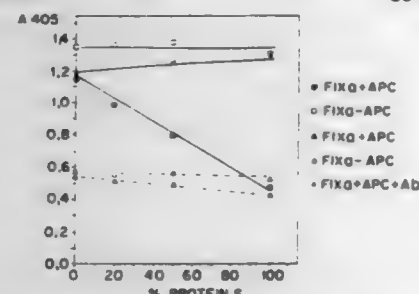
PCT Filed Jul. 4, 1990, Ser. No. 793,342

Claims priority, application Sweden, Jul. 14, 1989, 8902532

Int. Cl.<sup>6</sup> C12Q 1/56; G01N 33/86, 33/00; A61K 37/00

U.S. Cl. 435—13

16 Claims



1. A method for determining in a human plasma sample containing 0.02 to 50 percent plasma by volume the functional activity of free Protein S or Protein C, said method comprising:

(i) adding to said plasma sample a snake venom enzyme which activates protein C or activated Protein C when Protein S is to be determined, or a snake venom enzyme which activates protein C and Protein S when Protein C is to be determined;

(ii) adding (a) coagulation enzyme FIX<sub>g</sub> in an amount of  $1 \times 10^{-15}$  to  $1 \times 10^{-6}$  mol/l, (b) at least one further coagulation reagent selected from the group consisting of cofactor FV<sub>g</sub> in an amount of  $1 \times 10^{-12}$  to  $1 \times 10^{-9}$  mol/l and phospholipids in an amount of  $1 \times 10^{-6}$  to  $3 \times 10^{-4}$  mol/l, (c) calcium ions in an amount of  $10^{-4}$  to  $5 \times 10^{-2}$  mol/l and (d) a buffer to maintain a pH of 6.5 to 9.5 and having an ion strength of 0 to 0.6, to form a mixture and incubating said mixture to form thrombin from prothrombin;

(iii) measuring the quantity of thrombin formed; and

(iv) determining the content of functionally active Protein S or functionally active Protein C in the original plasma sample on the basis of the measured quantity of thrombin by comparing the measured quantity with a standard; the content of Protein S or Protein C being inversely related to the quantity of thrombin formed.

5,439,803

**ISOTOPE AND ASSAY FOR GLYCOLYSIS AND THE PENTOSE PHOSPHATE PATHWAY**

Brian D. Ross, Ann Arbor, Mich., and Peter B. Kingsley, Memphis, Tenn., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 106,172, Aug. 13, 1993, abandoned. This application Sep. 20, 1993, Ser. No. 124,514

Int. Cl.<sup>6</sup> C12P 19/02; C12Q 1/54, 1/48

U.S. Cl. 435—14

9 Claims



1. A method of assaying for the presence of labeled lactate produced by an enzyme system wherein lactate is derived from glucose, and wherein the label is derived from an isotopically substituted glucose, the method comprising the steps of:

- providing an isotopically substituted glucose comprising D-(1,6-<sup>13</sup>C<sub>2</sub>,6-<sup>2</sup>H<sub>2</sub>)glucose;
- administering the substituted glucose to the system;
- providing means for detecting labeled lactate; and
- detecting the presence of labeled lactate derived from the substituted glucose.

5,439,804

Patent Not Issued For This Number

5,439,805

Patent Not Issued For This Number

5,439,806

**CARBOXYLATE PROTECTIVE GROUPS, A PROCESS FOR THEIR PREPARATION, THEIR COUPLING TO A FUNCTIONAL GROUP, AND THEIR USE**

Horst Kunz, Mainz; Gnter Braum, Wiesbaden, and Peter Braum, Mainz, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 957,004, Oct. 6, 1992, abandoned. This application Apr. 12, 1994, Ser. No. 226,367

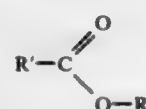
Claims priority, application Germany, Oct. 7, 1991, 41 33 139.7; Apr. 25, 1992, 42 13 706.3

Int. Cl.<sup>6</sup> C07K 5/06, 5/10; C12P 21/06, 13/04

U.S. Cl. 435—68.1

3 Claims

1. A process for the enzymatic hydrolysis of a compound of the formula I,



in which

R is an unbranched or branched organic radical which is polar and hydrophilic and which contains, as polar members between aliphatic or araliphatic hydrocarbon bridges, ether oxygens, amine nitrogen groups or a mixture of ether and amine groups which can be incorporated into a cyclic structure, where the total length does not exceed 20 members and where, in the case of polyethylene glycol of

the formula  $(CH_2-CH_2-O)_n$ , n indicates the number of the members and is defined as any integer, and the group  $R'-C=O$  is a protected or unprotected amino acid, a peptide, or a glycopeptide, wherein said process comprises reacting the compound of the formula I with a lipase dissolved in water or in a water-containing solution.

5,439,807

**METHODS FOR THE PREPARATION OF ENDOTOXIN-BINDING PROTEINS**

Lynn S. Grinna, Middleburg, Va., assignor to Xoma Corporation, Berkeley, Calif.

Continuation-in-part of Ser. No. 885,501, May 19, 1992, abandoned. This application May 19, 1993, Ser. No. 72,063

Int. Cl.<sup>6</sup> C07K 1/22; C12N 15/12

U.S. Cl. 435—69.1

6 Claims

1. In a method for the production of a recombinant endotoxin-binding protein comprising bactericidal/permeability increasing protein or an endotoxin-binding NH<sub>2</sub>-terminal fragment of bactericidal/permeability increasing protein, wherein genetically transformed host cells are cultured in a medium suitable for cell growth and maintenance and wherein the endotoxin-binding protein is secreted into said medium, the improvement comprising the following steps in sequence:

incorporating a particulate cation exchange material into said host cell containing culture medium;

culturing said host cells with said cation exchange particulate material to allow endotoxin-binding proteins secreted by said host cells to reversibly bind to said cation exchange material;

separating said cation exchange material having endotoxin-binding protein bound thereto from said host cell containing culture medium; and

isolating said endotoxin-binding protein from said cation exchange material.

5,439,808

**METHOD FOR THE HIGH LEVEL EXPRESSION, PURIFICATION AND REFOLDING OF THE OUTER MEMBRANE GROUP B PORIN PROTEINS FROM NEISSERIA MENINGITIDIS**

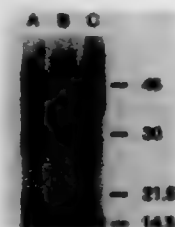
Milan S. Blake, New York, N.Y.; Joseph Y. Tai, Fort Washington, Pa.; Huilin L. Qi, New York, N.Y.; Shu-Mei Liang, Bethesda; Lucjan J. J. Hronowski, Laurel, both of Md., and Jeffrey K. Pullen, Columbia, Md., assignors to North American Vaccine, Inc., Beltsville, Md. and The Rockefeller University, New York, N.Y.

Filed Jul. 23, 1993, Ser. No. 96,182

Int. Cl.<sup>6</sup> C12N 15/31, 15/62, 15/67, 15/70

U.S. Cl. 435—69.1

19 Claims



1. A method for the high level expression of the outer membrane meningococcal group B porin protein or fusion protein thereof in an *E. coli* host cell having a deleted ompA gene ( $\Delta$ ompA), comprising:

(a) transforming the *E. coli*  $\Delta$ ompA host cell with a vector comprising a selectable marker and a gene coding for a protein selected from the group consisting of:

- a mature porin protein, and
- a fusion protein which is a mature porin protein fused

to amino acids 1 to 22 of the T7 gene  $\phi$ 10 capsid protein;

wherein said gene is operably linked to the T7 promoter;

(b) growing the transformed host cell in a culture medium containing a selection agent, and

(c) inducing expression of said protein; wherein the protein so expressed comprises more than about 2% of the total protein expressed in the host cell.

5,439,809

**NON-INFECTIOUS HIV PARTICLES LACKING LONG TERMINAL REPEATS**

Joel Haynes, Middleton, Wis.; Michel H. Klein, Willowdale; Benjamin Rovinski, Thornhill, and Shi X. Cao, Etobicoke, all of Canada, assignors to Connaught Laboratories Limited, Willowdale, Canada

Filed Jun. 15, 1992, Ser. No. 839,751

Claims priority, application United Kingdom, Oct. 13, 1989, 8923123

Int. Cl.<sup>6</sup> A61K 39/21; C12N 15/49; C07K 14/155

U.S. Cl. 435—69.3

13 Claims

1. A genetically-engineered, non-infectious, non-replicating and immunogenic HIV retrovirus-like particle, produced by: incorporating into an expression vector a DNA molecule comprising the HIV genome devoid of long terminal repeats, introducing the expression vector into mammalian cells, and expressing said DNA molecule in said mammalian cells to produce said HIV retrovirus-like particle.

5,439,810

**MANIPULATION OF GENE COPY NUMBER IN BORDETELLA**

Sheena Loosmore, Aurora; Gavin Zealey, Thornhill; Reza Yacoub, Mississauga, and Michel Klein, Willowdale, all of Canada, assignors to Connaught Laboratories Limited, Willowdale, Canada

Filed Jul. 9, 1992, Ser. No. 911,291

Claims priority, application United Kingdom, Jul. 16, 1991, 9115332

Int. Cl.<sup>6</sup> A61K 35/14, 39/10; C12N 1/21, 15/09

U.S. Cl. 435—69.3

20 Claims

1. A genetically-modified Bordetella strain from which the FHA gene is absent from the genome of the strain and which contains an additional TOX gene in the genome of the strain.

5,439,811

**METHOD FOR PREPARING AMINOACYL- AND MISAMINOACYL-TRNA**

Nobuhiko Yamashita, Takatsuki; Junichi Tohyama, Ohtsu; Chiwa Kataoka, Kyoto, and Kazunobu Miura, Nagaokakyo, all of Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Filed Mar. 14, 1994, Ser. No. 212,708

Claims priority, application Japan, Mar. 18, 1993, 5-058549

Int. Cl.<sup>6</sup> C12P 19/34; C07H 21/02

U.S. Cl. 435—91.53

2 Claims

1. A method for preparing L-tyrosyl-tRNA<sup>Tyr</sup> or L-phenylalanyl-tRNA<sup>Tyr</sup>, wherein tRNA<sup>Tyr</sup> represents tyrosine-specific tRNA, comprising:

reacting tRNA<sup>Tyr</sup> with a large excess of L-tyrosine or L-phenylalanine in an aqueous solvent containing an organic solvent in the presence of an aminoacyl-tRNA hydrolase derived from *Fusarium culmorum* or *Artemia salina*, said large excess of L-tyrosine or L-phenylalanine being sufficient to suppress the hydrolytic activity of said aminoacyl-tRNA hydrolase so that said L-tyrosyl-tRNA<sup>Tyr</sup> or L-phenylalanyl-tRNA<sup>Tyr</sup> is synthesized; and separating the resultant L-tyrosyl-tRNA<sup>Tyr</sup> or L-phenylalanyl-tRNA<sup>Tyr</sup> from the reaction mixture by a chromatographic technique.

5,439,812

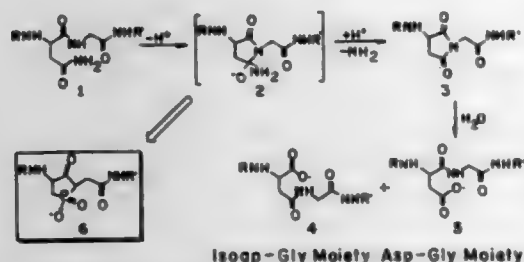
## ANTIBODIES CATALYZING DEAMIDATION OF PROTEINS

Stephen J. Benkovic, Scott D. Taylor, and Richard A. Gibbs, all of State College, Pa., assignors to The Pennsylvania Research Corporation, University Park, Pa.

Filed Apr. 8, 1992, Ser. No. 865,216  
Int. Cl.<sup>6</sup> C12N 9/00, 9/82; C12P 13/14

U.S. Cl. 435—109

18 Claims



1. An antibody or fragment thereof having catalytic activity which catalyzes the deamidation reaction of the asparagine residue of an asparaginyl-glycyl dipeptide moiety.

5,439,813

## PRODUCTION OF GLYOXYLIC ACID WITH GLYCOLATE OXIDASE AND CATALASE IMMOBILIZED ON OXIRANE ACRYLIC BEADS

David L. Anton, Robert DiCosimo, and John E. Gavan, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 755,926, Sep. 6, 1991, abandoned. This application Jun. 3, 1994, Ser. No. 253,812

The portion of the term of this patent subsequent to Jun. 15, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> C12P 7/40; C12N 9/04, 9/08

U.S. Cl. 435—136

15 Claims

1. A process for the production of glyoxylic acid comprising contacting, in aqueous solution at a temperature of 0° to 40° C. and at a pH of 7 to 10, glycolic acid with oxygen in the presence of (1) catalysts comprising glycolate oxidase and catalase immobilized on oxirane acrylic beads as insoluble supports, and (2) an amine buffer capable of forming a chemical adduct with glyoxylic acid wherein the initial concentration of glycolic acid is 200 mM to 2500 mM, where the initial mole ratio of amine to glycolic acid is within a range of 1.0 to 3.0 and thereafter recovering glyoxylic acid.

5,439,814

## DNA ENCODING INFECTIOUS RUBELLA VIRUS

Teryl K. Frey, Atlanta; Geraldina Dominguez, Tucker, and Chin-Yen Wang, Clarkston, all of Ga., assignors to Georgia State Research Foundation, Inc., Atlanta, Ga.

Continuation of Ser. No. 722,334, Jun. 28, 1991, abandoned. This application Jul. 19, 1993, Ser. No. 93,453

Int. Cl.<sup>6</sup> C12N 15/00, 7/00, 15/40, 15/63

U.S. Cl. 435—172.3

5 Claims

1. An isolated DNA molecule comprising a nucleotide sequence encoding an infectious rubella virus.

5,439,815

## RESTRICTOCIN-LIKE RIBOTOXIN ANALOGUES COMPRISING ONLY ONE CYSTEINE AVAILABLE FOR COVALENT LINKAGE TO A PARTNER

John E. Fitton, Buxton, and David Timms, Macclesfield, both of England, assignors to Imperial Chemical Industries plc, London, United Kingdom

Filed Jul. 13, 1992, Ser. No. 912,740

Claims priority, application United Kingdom, Jul. 24, 1991, 9115999; Jul. 24, 1991, 9116000; Jul. 24, 1991, 9116001; Jul. 24, 1991, 9116002; Jul. 24, 1991, 9116011; Apr. 6, 1992, 9207488; Apr. 16, 1992, 9208397

Int. Cl.<sup>6</sup> C12N 9/22, 15/55, 1/21, 5/10, 1/15

U.S. Cl. 435—199

6 Claims

1. A conserved protein analogue of a native ribotoxin in which both the protein analogue and the native ribotoxin can cleave only a single phosphodiester bond of 28S rRNA in a 60S ribosomal subunit from rat liver and in which the protein analogue contains only one cysteine available for covalent linkage to a partner said cysteine not being present in the native ribotoxin

wherein said peptide is selected from the group consisting of:

(a) a restrictocin analogue selected from the group consisting of:

i) a restrictocin analogue in which any one of the following residues in native restrictocin (SEQ ID NO:10) has been substituted by cysteine: Lys 13, Lys 20, Lys 28, Lys 60, Lys 63, Lys 69, Ser 82, Lys 88, Lys 106, Lys 110 or Lys 128;

ii) native restrictocin (SEQ ID NO:10) having additionally a C-terminus extension Cys 150-Gly 151 attached thereto; and

iii) native restrictocin (SEQ ID NO:10) having additionally an N-terminus extension Gly-Cys attached thereto;

(b) a mitogillin analogue selected from the group consisting of:

i) a mitogillin analogue in which any one of the following residues in native mitogillin (SEQ ID NO:47) has been substituted by cysteine: Lys 13, Lys 20, Lys 28, Lys 60, Lys 63, Lys 69, Ser 82, Lys 88, Lys 106, Lys 110 or Lys 128;

ii) native mitogillin (SEQ ID NO:47) having additionally a C-terminus extension Cys 150-Gly 151 attached thereto; and

iii) native mitogillin (SEQ ID NO:47) having additionally an N-terminus extension Gly-Cys attached thereto; and

(c) an alpha-sarcin analogue selected from the group consisting of:

i) an alpha-sarcin analogue in which any one of the following residues in native alpha-sarcin (SEQ ID NO:48) has been substituted by cysteine: Lys 14, Lys 21, Lys 29, Lys 61, Lys 64, Lys 70, Ser 83, Lys 89, Lys 107, Lys 111 or Lys 129;

ii) native alpha-sarcin (SEQ ID NO:48) having additionally a C-terminus extension Cys 151-Gly 152 attached thereto; and

iii) native alpha-sarcin (SEQ ID NO:48) having additionally an N-terminus extension Gly-Cys attached thereto.

5,439,816

## CARBOXYMETHYLCCELLULOSE ISOLATED FROM BACILLUS SP. PKM-5430 (FERM BP-4087)

Decorosa D. Lusterio; Franklin G. Suizo, both of Cagayan de Oro; Nellie M. Labunog; Marietta N. Valledor, both of Misamis Oriental, and Shinta Ueda, Cagayan de Oro, all of Philippines, assignors to Kao Corporation, Tokyo, Japan

PCT No. PCT/JP92/01615, § 371 Date Jun. 2, 1994, § 102(e) Date Jun. 2, 1994, PCT Pub. No. WO93/12224, PCT Pub. Date Jun. 24, 1994

PCT Filed Dec. 10, 1992, Ser. No. 244,370

Claims priority, application Japan, Dec. 10, 1991, 3-325978; Dec. 10, 1991, 3-325979

Int. Cl.<sup>6</sup> C12N 9/42, 1/20, 1/00

U.S. Cl. 435—209

1 Claim

1. Carboxymethylcellulose 5430 having the following physicochemical properties:

(1) Action:

The carboxymethylcellulose 5430 can hydrolyze carboxymethylcellulose;

(2) Substrate specificity:

The carboxymethylcellulose 5430 shows strong activity toward carboxymethylcellulose and lichenan, and also is active toward cellulose powder, phosphoric acid-swollen cellulose, cellobiose, p-nitrophenol-β-D-glucopyranoside and p-nitrophenyl-β-D-cellobioside;

(3) Active pH range and optimum pH:

The carboxymethylcellulose 5430 is active in a pH range of 4.2–12.5 and has two optimum pH values of about 7.7 and about 9.5;

(4) pH Stability:

Even when kept overnight at 5° C., the carboxymethylcellulose 5430 is scarcely deactivated over a pH range of 4.6–12.8;

(5) Active temperature range and optimum temperature:

The carboxymethylcellulose 5430 is active over a temperature range of 10°–78° C., and its optimum temperature is at about 55° C.;

(6) Thermal stability:

The carboxymethylcellulose 5430 is scarcely deactivated even after being heated for 10 minutes at 60° C., and still retains some activity even after being heated to 80° C.;

(7) Effects of surfactants:

The activity of the carboxymethylcellulose 5430 is not inhibited by sodium dodecyl sulfate (SDS), sodium linear alkylbenzenesulfonate (LAS), sodium alkyl sulfate (AS), sodium polyoxyethylene alkyl sulfate (ES), sodium α-olefin sulfonate (AOS), sodium α-sulfonated fatty acid ester (α-SFE), fatty acid salt (soap) and polyoxyethylene alkyl ether;

(8) Molecular weight:

The molecular weight of the carboxymethylcellulose 5430 is 26,000±1,000 as estimated by gel filtration on Bio-Gel A 0.5 m, wherein said carboxymethylcellulose 5430 is isolated from *Bacillus* sp. PKM-5430 (FERM BP-4087).

5,439,817

## METHOD OF PREPARATION OF PURIFIED ALKALINE PROTEASE

Jayarama K. Shetty, Elkhart; Chimanbhai P. Patel, Mishawaka, both of Ind., and Mary Ann Nicholson, Portage, Mich., assignors to Solvay Enzymes, Inc., Houston, Tex.

Division of Ser. No. 813,705, Dec. 27, 1991, Pat. No. 5,256,557. This application Jan. 21, 1993, Ser. No. 6,484

Int. Cl.<sup>6</sup> C12N 9/56, 9/54

U.S. Cl. 435—222

7 Claims

1. A process for the preparation of solid alkaline protease derived from *Bacillus licheniformis*, *Bacillus alcalophilus*, or mutants thereof:

(i) preparing an alkaline protease solution by removing cells and suspended solids from a fermentation mixture produced by fermentation of the alkaline protease-producing bacterium;

(ii) forming a concentrated solution by concentrating the

alkaline protease solution such that the alkaline protease is present in a concentration of at least about 37 g/l; and (iii) adding sodium chloride salt in an amount effective to precipitate the alkaline protease.

5,439,818

## DNA ENCODING HUMAN RECOMBINANT BASIC FIBROBLAST GROWTH FACTOR

John C. Fiddes, Palo Alto, and Judith A. Abraham, Sunnyvale, both of Calif., assignors to Scios Nova Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 775,521, Sep. 12, 1985, abandoned. This application Dec. 16, 1985, Ser. No. 809,163

Int. Cl.<sup>6</sup> C12N 5/10, 1/21, 15/16, 15/85

U.S. Cl. 435—240.2

17 Claims

1. A recombinant DNA sequence encoding human basic fibroblast growth factor.

5,439,819

## CHIMERIC PROTEIN TYROSINE KINASES

Dan Littman, and Hua Xu, both of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Aug. 27, 1993, Ser. No. 112,912

Int. Cl.<sup>6</sup> C12N 5/00, 9/12; C12P 21/06; C07H 19/00

U.S. Cl. 435—240.2

7 Claims

1. A DNA molecule comprising a nucleic acid sequence encoding a chimeric protein comprising a CD4 molecule lacking the CD4 cytoplasmic domain linked to an src protein tyrosine kinase.

5,439,820

## ANTI-THROMBIN POLYPEPTIDES

Paolo Sarmientos, Milan, Italy; Philippe De Taxis du Poet, Brussels, Belgium; Giampaolo Nitti, Monza, and Emanuela Scacheri, Legnano, both of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Division of Ser. No. 842,089, Feb. 26, 1992, Pat. No. 5,356,875.

This application Jun. 23, 1994, Ser. No. 264,485

Claims priority, application United Kingdom, Feb. 28, 1991, 9104260; Sep. 18, 1991, 9119954

Int. Cl.<sup>6</sup> C12N 5/00; C12P 21/06; A61K 37/02; C07H 19/00

U.S. Cl. 435—240.2

18 Claims

1. An expression vector comprising a DNA sequence encoding a polypeptide having the amino acid sequence of SEQ ID NO: 1, 2, 3, 50, 51, 52, 53, 54, 56, 57, 58 or 59.

5,439,821

## DNA ENCODING PEPTIDE HORMONE THAT INHIBITS DIGESTION IN INSECTS

Dov Borovsky, Vero Beach, and David A. Carlson, Gainesville, both of Fla., assignors to University of Florida Research Foundation, Gainesville, Fla. and The United States of America as represented by the United States Department of Agriculture, Washington, D.C.

Division of Ser. No. 989,290, Dec. 11, 1992, Pat. No. 5,358,934.

This application Jul. 7, 1994, Ser. No. 271,698

Int. Cl.<sup>6</sup> C12N 1/21, 15/16

U.S. Cl. 435—240.4

3 Claims

1. An isolated DNA molecule encoding a peptide having the following formula:



(SEQ ID NO:1)



5,439,822

## GENE EXPRESSION REGULATORY DNA

Ryoichi Katsumata, and Yutaka Takano, both of Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan  
Filed Aug. 28, 1992, Ser. No. 938,333

Claims priority, application Japan, Sep. 2, 1991, 3-221885

Int. Cl.<sup>6</sup> C12N 1/21, 15/11, 15/60, 15/77

U.S. Cl. 435—252.32

8 Claims

1. An isolated DNA which consists of a DNA from the isocitrate lyase gene of a coryneform bacterium, said DNA having at least a functional nucleotide sequence of nucleotide sequence 1 to 702 of SEQ ID NO:4, which regulates expression of a structural gene encoding a protein by repressing expression when carbon sources in a culture medium are sugars and inducing expression when carbon sources in a culture medium are non-sugars or a medium contains no sugar when functionally incorporated into a vector DNA together with said structural gene and introduced into a host coryneform bacterium.

5,439,823

## APPARATUS FOR FAST FERMENTATION TREATMENT

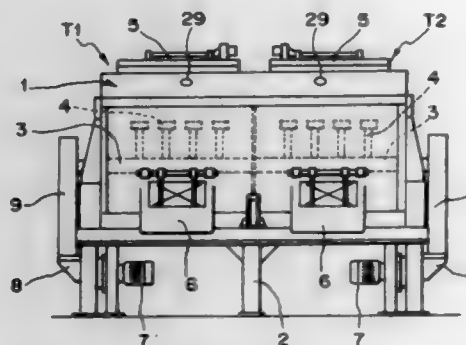
Takashi Sayama, Sakai, Japan, assignor to Martial Plant Corporation, Osaka, Japan  
Filed Feb. 25, 1994, Ser. No. 202,231

Claims priority, application Japan, Sep. 1, 1993, 5-217327

Int. Cl.<sup>6</sup> A01C 3/02; C12M 1/02, 1/06, 1/38

U.S. Cl. 435—290

4 Claims



1. An apparatus for fast fermentation treatment comprising:  
a main body having an inlet and an outlet for receiving organic material to be treated;  
a rotary shaft through which hot water circulates and which is rotatably provided in the main body with a paddle for stirring the organic material to be treated;  
a drive unit for driving the rotary shaft;  
an electric heater provided on an exterior surface of the main body;  
a temperature sensor for detecting temperature of the main body;  
a control section for controlling the electric heater so that the main body obtains a specified temperature based on a signal representing the temperature of the main body from the temperature sensor; and  
a blower for discharging gas from the main body to supply air through an opening in the main body.

5,439,824

INCREASED EXPRESSION OF  $\alpha$ -1-ANTITRYPSIN IN EXPRESSION VECTORS THROUGH THE INCLUSION OF INTRON II

Mark Brantly, Silver Spring, and Victor Laubach, Bethesda, both of Md., assignors to The United States of America, Washington, D.C.

Filed May 6, 1993, Ser. No. 60,925

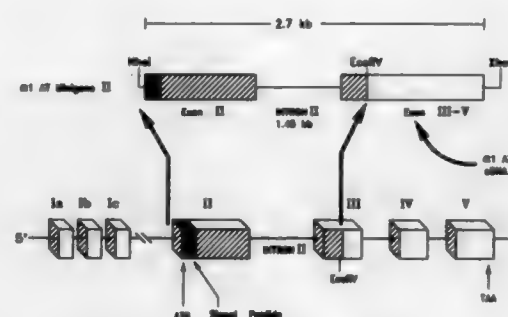
Int. Cl.<sup>6</sup> C12N 15/11, 15/12, 15/63; C12P 21/00

U.S. Cl. 435—320.1

8 Claims

1. An isolated DNA molecule encoding human  $\alpha$ -1-antitrypsin, said molecule comprising a set of introns and a set of exons,

wherein said set of exons consists of Exons II, III, IV and V of the human  $\alpha$ -1-antitrypsin gene, and said set of introns consists



of Intron II and zero to two additional introns of the human  $\alpha$ -1-antitrypsin gene.

5,439,825

## ANALYSIS OF HEMOGLOBIN VARIANTS BY CAPILLARY ZONE ELECTROPHORESIS

Fu-Tai A. Chen, Brea, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

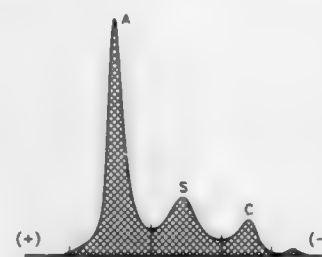
Division of Ser. No. 870,531, Apr. 17, 1992, Pat. No. 5,202,006.

This application Dec. 10, 1992, Ser. No. 988,576

Int. Cl.<sup>6</sup> G01N 33/00

U.S. Cl. 436—18

8 Claims



1. A buffer for the analysis of hemoglobin and the variants of hemoglobin by capillary zone electrophoresis comprising:

- (a) between about 175 mM and about 250 mM of a compound selected from the group consisting of:  
i) barbituric acid;  
ii) derivatives of barbituric acid;  
iii) combinations of barbituric acid and the derivatives of barbituric acid; and  
iv) combinations of the derivatives of barbituric acid,  
(b) at least one hemoglobin variant selected from the group consisting of hemoglobin A, hemoglobin F, hemoglobin S and hemoglobin C;

wherein the pH of said buffer is at least about 8.0.

5,439,826

## METHOD OF DISTINGUISHING AMONG STRIPS FOR DIFFERENT ASSAYS IN AN AUTOMATED INSTRUMENT

Michael Kontorovich, Colchester, Vt., assignor to Bio-Tek Instruments, Inc., Winooski, Vt. and Syva Company, Palo Alto, Calif.

Filed Dec. 2, 1988, Ser. No. 278,902

Int. Cl.<sup>6</sup> G01N 35/02

U.S. Cl. 436—50

18 Claims

1. A method for distinguishing among strips for different assays in testing by an automated instrument which performs said testing based on detection of one or more physical characteristics to which said automated instrument is sensitive, said method comprising the following steps:

selectively introducing, in a predetermined order, one of said physical characteristics into wells of the microstrip to which the automated instrument is sensitive, said auto-

mated instrument correlating said predetermined order to a particular assay; and  
detecting the presence or absence of said introduced characteristic in each of the wells, wherein the elements of said automated instrument which detect said introduced characteristic perform said testing.

5,439,827

## COMPOSITION FOR DETECTING PEROXIDE ACTIVE MATERIAL

Yuji Yagi, Tamaki Kagawa, Hiroshi Tamura, and Tetsuya Ota, all of Kyoto, Japan, assignors to Kyoto Daiichi Kagaku Co., Ltd., Kyoto, Japan

Filed Nov. 8, 1993, Ser. No. 148,321

Claims priority, application Japan, Nov. 9, 1992, 4-298514

Int. Cl.<sup>6</sup> G01N 33/72, 21/75

U.S. Cl. 436—66

7 Claims

1. A composition for detecting or quantitatively measuring a peroxide active material in a sample, comprising an organic hydroperoxide, a chromogen, a buffer for maintaining the pH range of 5 to 7, and an iron (III) complex of the formula:



(1)

wherein X is an alkylene group represented by the formula  $-(CH_2)_n-$  in which n is an integer of 0 to 5, and M is a monovalent cation selected from the group consisting of ammonium ion, monoalkylammonium ion, dialkylammonium ion, trialkylammonium ion, tetraalkylammonium ion, pyridinium ion, pyrrolidinium ion, anilinium ion and hydrazinium ion.

5,439,828

## FLUORESCENT AND CHROMOGENIC THREE-DIMENSIONAL IONOPHORES AS SELECTIVE REAGENTS FOR DETECTING IONS IN BIOLOGICAL FLUIDS

Divakaran Masilamani, Morristown; Mariann E. Lucas, Netcong, and George S. Hammond, Madison, all of N.J., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 80,721, Jul. 31, 1987, Pat. No. 5,162,525.

This application Jun. 26, 1991, Ser. No. 621,510

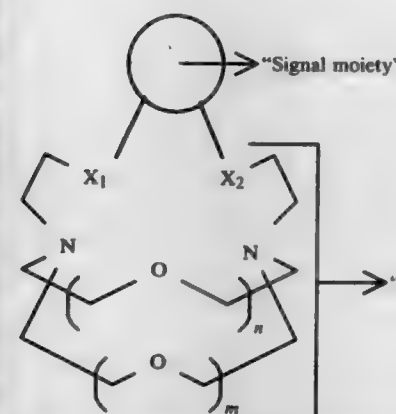
Int. Cl.<sup>6</sup> G01N 21/64

U.S. Cl. 436—74

20 Claims

1. A method for detecting ions in a sample, comprising the steps of:

- (a) contacting said sample with a reagent ionophore having an affinity for said ions for a time sufficient to allow binding of some or all ions that may be present; said reagent ionophore capable of demonstrating certain optical properties when in an unbound state, and also capable of demonstrating a change in said optical properties when in a bound state, wherein said reagent ionophore has the formula



wherein said signal moiety is selected from the group consist-

ing of unsubstituted and substituted coumarins, and wherein said ion-recognizing system is a three-dimensional cryptand, wherein X<sub>1</sub> and X<sub>2</sub> of said cryptand are the same or different and are selected from the group consisting of S, P, N, O, and Se; and wherein the repeating units m and n are the same or different and are each an integer of 0 to 12;

(b) measuring the optical properties of said reagent ionophore after contact with said sample; and

(c) determining the binding of ions to said reagent ionophore by comparing the optical properties of the reagent ionophore after contact with the sample to its optical properties when in an unbound state, using the change in optical properties as a function of binding of ion to the reagent ionophore.

5,439,829

## IMMOBILIZATION OF BIOLOGICALLY ACTIVE MOLECULES BY CHANGING THE OXIDATION STATE OF A CHELATED TRANSITION METAL ION

Leslie D. Anderson, Encinitas, Calif.; James A. Cook, Indianapolis, Ind.; Gary S. David, La Jolla, Calif.; Susan M. Hochschwender, Del Mar, Calif.; Mary S. Kasher, Indianapolis; Michele C. Smith, Indianapolis, both of Ind., and Willem P. C. Stemmer, Carlsbad, Calif., assignors to Eli Lilly and Company, Indianapolis, Ind. and Hybritech Incorporated, San Diego, Calif.

Continuation-in-part of Ser. No. 647,901, Jan. 30, 1991, abandoned. This application Jan. 24, 1992, Ser. No. 826,928

Int. Cl.<sup>6</sup> G01N 33/543, 33/549; C12N 11/00; C07K 17/00

U.S. Cl. 436—518

15 Claims

1. A method of immobilizing a biologically active molecule on a support, said method consisting of the steps of:

- (a) covalently bonding a chelating agent to a biologically active molecule, said chelating agent being capable of chelating transition metal ion selected from the group consisting of Co(II), Cr(II) and Ru(III);

(b) contacting the product of step (a) with a solid support containing said transition metal ion bound thereto whereby said chelating agent chelates said transition metal ion and the product of step (a) is attached to the support; and

(c) treating the product of step (b) with an oxidizing agent or a reducing agent to change the oxidation state of said transition metal ion to Co(III), Cr(III) or Ru(II), respectively, to provide a kinetically inert oxidation state whereby the biologically active molecule is immobilized on the support.

5,439,830

## METHOD OF PERFORMING AN IMMUNOASSAY USING PHOTOTHERMAL DEFLECTION SPECTROSCOPY

Hajime Sakashita, Setagaya; Hiroshi Kishioka, Yokkaichi; Shohhei Konishi, Setagaya; Tsuguo Swada, Arakawa, and Takahiko Kitamori, Matsudo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1993, Ser. No. 138,069

Claims priority, application Japan, Oct. 20, 1992, 4-281330

Int. Cl.<sup>6</sup> G01N 33/546

U.S. Cl. 436—534

3 Claims

1. An immunoassay method for determining the amount of a target substance in a test sample, comprising:

- (1) reacting the sample with a first immobilized antibody or antigen having a specific binding capacity for the target substance to form an immune complex wherein said immobilized antibody or antigen is linked to a carrier substance having a mean diameter of from 1 to 500  $\mu$ m selected from the group consisting of polystyrene, carboxylated polystyrene, polyvinyltoluene, styrene-divinylbenzene copolymer, styrene-butadiene copolymer, carboxyl-

- ated styrene butadiene copolymer, acrylic ester copolymer, methacrylic ester copolymer, glass and kaolin;
- (2) reacting said immune complex with a second antibody or antigen also having a specific binding capacity for said target substance to form an immunoconjugate wherein said second antibody or antigen is coupled to a marker compound having a photothermal conversion activity selected from the group consisting of azo dyes, phenothiadione dyes, acridine dyes, phthalocyanine dyes, squaric acid dyes, colloid gold, iron-oxine complex and phycocyanin, with the proviso that said carrier substance amplifies the photothermal conversion activity of said marker compound when irradiated with an excitation beam having a specified wavelength;
  - (3) irradiating the second reacted sample containing said immunoconjugate with said excitation beam having said specified wavelength; and
  - (4) measuring the amount of heat generated by said coupled marker compound by measuring deflection of a probe beam passing through said irradiated sample by photo-thermal deflection spectroscopy to determine the amount of said target substance in said test sample.

5,439,831

## LOW JUNCTION LEAKAGE MOSFETS

Udo Schwalke, Heldenstein, and Heinz Zeininger, Obermichelbach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

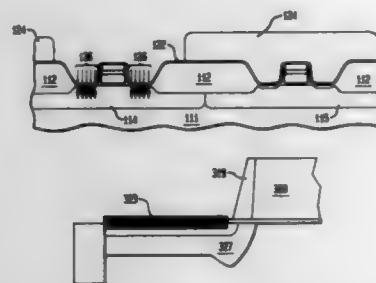
Filed Mar. 9, 1994, Ser. No. 208,548

The portion of the term of this patent subsequent to Dec. 7, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—24

8 Claims



1. In a method of making shallow junction metal oxide semiconductor field effect transistors, the improvement comprising

depositing a buffer layer over the substrate surface adjacent to the gate electrode;  
ion implanting a first dopant at a high dosage, low energy level into the buffer layer;  
ion implanting a second dopant at a low dosage, high energy level into the buffer layer; and  
diffusing said ions into said substrate.

5,439,832

## METHOD FOR FABRICATING SEMICONDUCTOR DEVICE

Shunji Nakamura, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 2, 1994, Ser. No. 190,463

Claims priority, application Japan, Jun. 4, 1993, 5-134972

Int. Cl.<sup>6</sup> H01L 21/265

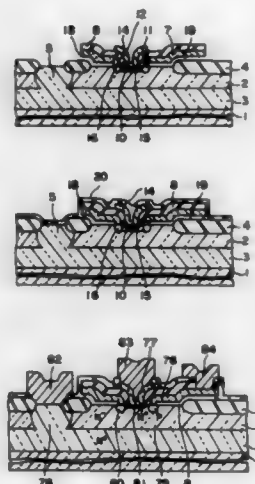
U.S. Cl. 437—31

27 Claims

1. A method for fabricating a semiconductor device, comprising the steps of:

depositing a first insulating film, a first conducting film, and a second insulating film in order on a substratum semiconductor layer containing first-conducting-type impurities; patterning the first insulating film, the first conducting film and the second insulating film to form an opening and

- expose the substratum semiconductor layer from the opening;  
forming a second conducting film for connecting electrically the first conducting film with the substratum semiconductor layer along an inner periphery of the opening;  
forming an insulating side wall for covering the second conducting film in the opening without completely closing the opening;



- forming a first electrode connecting with the substratum semiconductor layer by passing through a center of the opening;

patterning the first conducting film and the second insulating film and leaving them around the opening to form a second electrode comprising the first and second conducting films and to expose part of the first insulating film; and removing the first insulating film selectively by means of isotropic etching to form a space between the second electrode and the semiconductor film.

5,439,833

## METHOD OF MAKING TRULY COMPLEMENTARY AND SELF-ALIGNED BIPOLAR AND CMOS TRANSISTOR STRUCTURES WITH MINIMIZED BASE AND GATE RESISTANCES AND PARASITIC CAPACITANCE

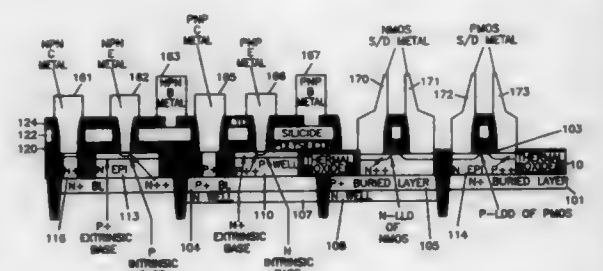
Francois Hebert, Sunnyvale; Datong Chen, Fremont, and Rashid Bashir, Santa Clara, all of Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Filed Mar. 15, 1994, Ser. No. 213,630

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—31

16 Claims



1. A method for forming an integrated circuit having complementary bipolar transistors with minimized extrinsic base resistance and CMOS devices with minimized gate resistances on a silicon substrate, wherein the substrate has been selectively formed so as to be P-type in the regions where PNP bipolar and NMOS are formed and to be N-type in the regions

- where NPN bipolar and PMOS devices are formed and has active regions and field oxide regions defined thereon, comprising the steps of:

depositing a polysilicon layer on top of the substrate;  
depositing a silicide layer on top of the polysilicon layer and selectively doping the silicide layer using a first photoresist mask;  
forming a low temperature deposited oxide layer (LTO) on top of the silicide layer;  
selectively etching the LTO, silicide, and polysilicon layers so as to define extrinsic base regions of the bipolar transistors and gate regions of the CMOS devices in regions where the LTO, silicide, and polysilicon layers were not etched away;  
oxidizing the substrate to form a thin oxide layer to cover any areas on the substrate that are no longer covered by oxide and to densify the LTO;  
selectively implanting a P-type impurity into NPN bases and PMOS sources and drains using the remaining LTO, silicide, and polysilicon to self-align the NPN bases and the PMOS sources and drains to those remaining LTO, silicide, and polysilicon layers and using a second photoresist mask to protect regions unintended to be implanted with P-type dopant;  
selectively implanting an N-type impurity into PNP bases and NMOS sources and drains using the remaining LTO, silicide, and polysilicon to self-align the PNP bases and the NMOS sources and drains to those remaining LTO, silicide, and polysilicon layers and using a third photoresist mask to protect regions unintended to be implanted with N-type dopant;  
depositing nitride and etching the nitride to form inside spacers on vertical surfaces of the remaining LTO, silicide, and polysilicon layers resulting from the selective etching step;  
etching away portions of the thin oxide layer where NPN collector and emitter areas and NMOS source and drain areas are to be formed and implanting the N-type impurity into those areas, such that the emitter areas are self-aligned by the inside spacers; and  
etching away portions of the thin oxide layer where PNP collector and emitter areas and PMOS source and drain areas are to be formed and implanting the P-type impurity into those areas, such that the emitter areas are self-aligned by the inside spacers.

5,439,834

## METHOD FOR FABRICATING A CMOS DEVICE WITH REDUCED NUMBER OF PHOTOLITHOGRAPHY STEPS

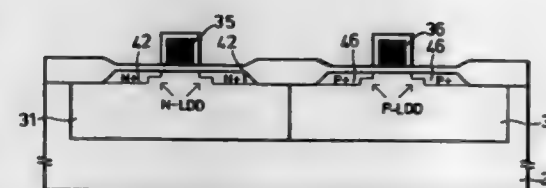
Heng-Tien Chen, Taipei, Taiwan, assignor to Winbond Electronics Corp., Hsinchu City, Taiwan

Filed Nov. 15, 1994, Ser. No. 340,264

Int. Cl.<sup>6</sup> H01L 21/8238

U.S. Cl. 437—34

2 Claims



1. A method for fabricating a CMOS device with NMOS and PMOS transistors, said method comprising the steps of: (A) preparing an intermediate semiconductor device, including the steps of: (A-1) implanting P-type and N-type impurity into a substrate to form NMOS and PMOS transistor wells; (A-2) depositing a silicon nitride layer over surfaces of said NMOS and PMOS transistor wells; (A-3) etching said silicon nitride layer in order to expose isolation re-

- gions around said NMOS and PMOS transistor wells; (A-4) growing field oxide layers on said isolation regions; (A-5) removing said silicon nitride layer; (A-6) growing a gate oxide layer which overlies said surfaces of said NMOS and PMOS transistor wells; (A-7) depositing a polysilicon layer on said gate oxide layer; and (A-8) etching said polysilicon layer to form gate electrodes for said NMOS and PMOS transistors;
- (B) forming sidewall spacers on each side of said gate electrodes;
  - (C) growing a first screening oxide layer on said surfaces of said NMOS and PMOS transistor wells;
  - (D) depositing a first silicon nitride layer on said surfaces of said NMOS and PMOS transistor wells;
  - (E) coating a first photoresist layer on said first silicon nitride layer;
  - (F) patterning said first photoresist layer above a first one of said NMOS and PMOS transistor wells by exposure and development;
  - (G) etching a portion of said first silicon nitride layer above said first one of said NMOS and PMOS transistor wells to expose ion implant regions for said first one of said NMOS and PMOS transistor wells;
  - (H) removing the remaining portion of said first photoresist layer;
  - (I) subjecting said first one of said NMOS and PMOS transistor wells to N<sup>+</sup> ion implantation if said first one of said NMOS and PMOS transistor wells is said NMOS transistor well, and to P<sup>+</sup> ion implantation if otherwise;
  - (J) etching said sidewall spacer at said gate electrode above said first one of said NMOS and PMOS transistor wells;
  - (K) growing a second screening oxide on said surfaces of said NMOS and PMOS transistor wells;
  - (L) subjecting said first one of said NMOS and PMOS transistor wells to N-LDD ion implantation if said first one of said NMOS and PMOS transistor wells is said NMOS transistor well, and to P-LDD ion implantation if otherwise; and
  - (M) removing the remaining portion of said first silicon nitride layer.

5,439,835

## PROCESS FOR DRAM INCORPORATING A HIGH-ENERGY, OBLIQUE P-TYPE IMPLANT FOR BOTH FIELD ISOLATION AND PUNCHTHROUGH

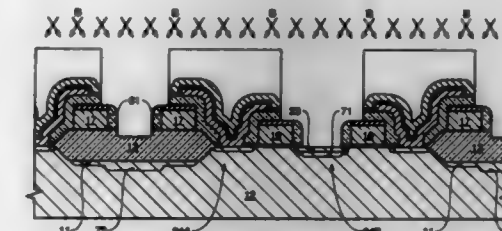
Fernando Gonzalez, Boise, Id., assignor to Micron Semiconductor, Inc., Boise, Id.

Continuation-in-part of Ser. No. 152,116, Nov. 12, 1993, Pat. No. 5,376,566. This application Oct. 14, 1994, Ser. No. 324,277

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—35

15 Claims



1. A process for fabricating a dynamic random access memory cell array on a P-type substrate, each cell of said array having a field-effect access transistor that is insulated from neighboring access transistors by a surrounding field isolation layer, each access transistor having a first source/drain region which functions as a bitline contact region, a second source/drain region which functions as a storage node, a channel region between said first and second source/drain regions, and a gate electrode having vertical sidewalls adjacent said first and second source/drain regions, said gate electrode being



dielectrically insulated from and overlying said channel region, said process comprising the following steps:

- depositing an offsetting dielectric layer which conformally coats said vertical sidewalls;
- performing a low-dosage N-type implant in N-channel source/drain regions;
- constructing cell capacitors superjacent the storage-node regions;
- forming spacers on the sidewalls of the gate electrodes;
- performing a high-energy oblique implant with a P-type impurity which penetrates the spacers and field oxide layers;
- performing a thermal drive-in step; and
- performing a high-dosage N-type source/drain implant in bitline contact regions.

5,439,836

# **METHOD FOR PRODUCING A SILICON TECHNOLOGY TRANSISTOR ON A NONCONDUCTOR**

Benoît Giffard, Grenoble, France, assignor to Commissariat à l'Energie Atomique, Paris, France

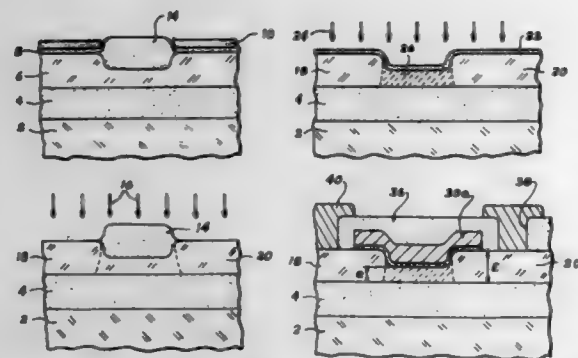
Filed Jul. 13, 1994, Ser. No. 274,452

Claims priority, application France, Jul. 22, 1993, 93 09021

Int. Cl.<sup>6</sup> H01L 21/86

U.S. Cl. 437—40

7 Claims



1. Method for producing an MIS transistor comprising a channel, a source and a drain on both sides of the channel and a gate on the channel and separated from the source and the drain, said method comprising the following stages:

- forming a thin film of silicon on a nonconductor,
- forming on the thin silicon film a mask including an opening at the location provided for the channel of the transistor,
- forming a local thick oxidation film by oxidizing the unmasked silicon so as to locally thin the silicon and to form a thinned silicon zone in said silicon film,
- removing the mask,
- effecting ion drain and source implantation in the silicon, the oxidation film being used as a self-aligning mask to mask this implantation,
- removing the oxidation film,
- forming a thin gate nonconductor overlapping the source and the drain, and
- forming the gate on the gate nonconductor.

5,439,837

# **METHOD OF FABRICATING A THIN-FILM TRANSISTOR HAVING AN OFFSET GATE STRUCTURE**

Akihiro Hata, Tenri, and Yasunori Shimada, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 19, 1994, Ser. No. 359,192

Claims priority, application Japan, Dec. 20, 1993, 5-320135

Int. Cl.<sup>6</sup> H01L 21/86

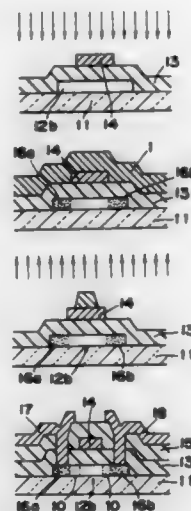
U.S. Cl. 437—41

6 Claims

1. A method of fabricating a transistor having an offset gate structure wherein offset regions are formed between a gate

electrode and a source region and between the gate electrode and a drain region, comprising the steps of:

- forming a semiconductor film, a gate insulation film and a gate electrode in that order on a top surface of a substrate either formed of an insulating material or having an insulation film on a surface thereof;
- doping impurity ions in said semiconductor film using said gate electrode as a mask and thereby forming a source region and a drain region in the semiconductor film;



forming a photoresist film on said gate electrode and gate insulation film; exposing said photoresist film to light from a back side of said substrate to form a photoresist pattern of a width smaller than that of said gate electrode; and etching both side surfaces of said gate electrode using said photoresist pattern as a mask and thereby forming an offset region of a specified width between said gate electrode and each of said source and drain regions.

5,439,838

# **METHOD OF THINNING FOR EEPROM TUNNELING OXIDE DEVICE**

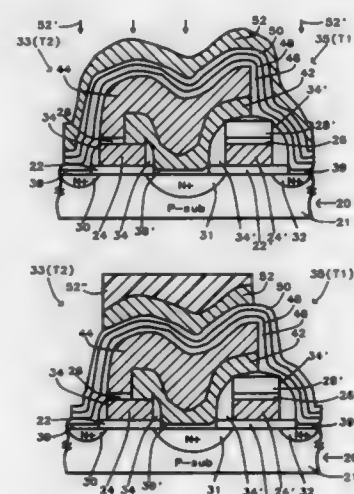
Ming-Tzong Yang, Hsin Chu, Taiwan, assignor to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Sep. 14, 1994, Ser. No. 305,559

Int. Cl.<sup>6</sup> H01L 21/266, 21/8247

U.S. Cl. 437—43

16 Claims



1. A method of forming an EEPROM memory cell on a semiconductor substrate comprising

forming a first dielectric layer on said substrate, forming a gate electrode of a select transistor and a first layer of a floating gate electrode of an EEPROM device on said dielectric layer, forming ion implanted regions including a central region in said substrate adjacent to said gate electrode and said first layer of said floating gate electrode, said ion implanted regions comprising source/drain regions formed proximate to at least the periphery of said gate electrode and said first layer of said floating gate electrode and the central region of said ion implanted regions being located between said gate electrode and said first layer of said floating gate electrode, forming a tunneling oxide layer above said central region using said electrodes to form the boundaries of said tunneling oxide layer, forming a second layer of said floating gate electrode in contact with said first layer of said floating gate electrode and in contact with the upper surface of said tunneling oxide layer, forming additional dielectric material over the upper surface of said floating gate, and forming a control gate electrode deposited upon the surface of said additional dielectric material.

5,439,839

# **SELF-ALIGNED SOURCE/RAIN MOS PROCESS**

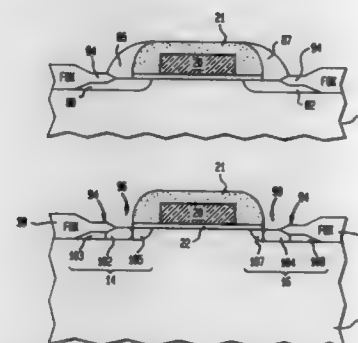
Wen-Yueh Jang, Hsin Chu, Taiwan, assignor to Winbond Electronics Corporation, Hsin Chu, Taiwan

Filed Jul. 13, 1994, Ser. No. 274,537

Int. Cl.<sup>6</sup> H01L 21/266, 21/8234

U.S. Cl. 437—44

3 Claims



1. A method for forming an MOS device comprising the steps of:

- providing a substrate region having a gate enclosed in a dielectric formed thereon and lightly doped source and drain regions on either side of the gate,
- forming spacers on opposite sides of the dielectric enclosed gate and over a portion of the lightly doped source and drain regions,
- forming a protective layer over portions of said lightly doped source and drain regions not covered by said dielectric or said spacers so that the entire lightly doped source and drain regions are covered,
- removing said spacers to form openings to expose a portion of said lightly doped source and drain regions,
- implanting through said openings heavily doped source and drain regions,
- forming interconnects to said heavily doped source and drain regions in said openings, and
- forming metallic contacts to said interconnects.

5,439,840

# **METHOD OF FORMING A NONVOLATILE RANDOM ACCESS MEMORY CAPACITOR CELL HAVING A METAL-OXIDE DIELECTRIC**

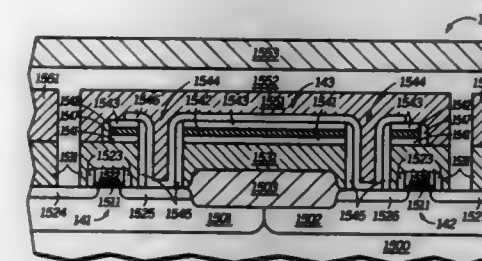
Robert E. Jones, Jr., and Papa D. Maniar, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 2, 1993, Ser. No. 100,793

Int. Cl.<sup>6</sup> H01L 21/70, 27/00

U.S. Cl. 437—52

11 Claims



1. A process for forming a nonvolatile random-access-memory cell comprising the steps of:

- forming a word line over a semiconductor substrate;
- forming a first doped region, a second doped region, a third doped region, and a fourth doped region within the substrate, wherein the first, second, third, and fourth doped regions are spaced apart from one another;
- forming an insulating layer over the word line and doped regions;
- forming a first electrode layer over the insulating layer;
- forming a metal-oxide dielectric layer over the first electrode layer;
- forming a second electrode layer over the metal-oxide dielectric layer;
- patterning the first electrode, metal-oxide dielectric, and second electrode layers to form a first ferroelectric capacitor, a second ferroelectric capacitor, and a drive line;
- forming a first opening and a second opening, wherein: the first opening extends through the first ferroelectric capacitor and the insulating layer; and the second opening extends through the second ferroelectric capacitor and the insulating layer;
- forming a first conductive member and a second conductive member, wherein: the first conductive member electrically connects the second electrode layer of the first ferroelectric capacitor to the first doped region via the first opening; and the second conductive member electrically connects the second electrode layer of the second ferroelectric capacitor to the second doped region via the second opening; and
- forming a first bit line and a second bit line, wherein: the first bit line is electrically connected to the third doped region; and the second bit line is electrically connected to the fourth doped region.

5,439,841

# **HIGH VALUE GATE LEAKAGE RESISTOR**

Martin J. Alter, Los Altos, Calif., assignor to Micrel, Inc., San Jose, Calif.

Filed Jan. 12, 1994, Ser. No. 180,579

Int. Cl.<sup>6</sup> H01L 21/70

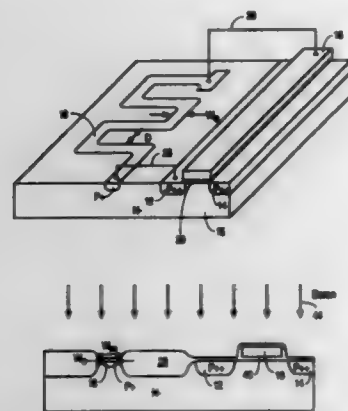
U.S. Cl. 437—60

7 Claims

1. A method of forming a resistor of a selected value comprising the steps of: depositing and selectively etching a masking layer over a portion of a substrate of a first conductivity type in which it is desired to form a diffused resistor of a second conductivity type; oxidizing a surface of said substrate to form oxide having a first thickness on either side of said masking layer, said

oxide forming a bird's beak having end portions, less than said first thickness, which encroach and merge under said masking layer and lift said masking layer at edges of said masking layer;

etching away said masking layer;  
implanting a dopant of said second conductivity type into a surface of said substrate of said first conductivity type, said oxide having said first thickness acting to block the implantation of said dopants into said surface of said sub-



strate, said oxide less than said first thickness under said masking layer acting to block said dopants to varying degrees, depending upon a thickness of said oxide, wherein a resistivity of said resistor is controlled by controlling encroachment of said bird's beak under said masking layer; and

connecting a first end of said resistor to a first terminal and connecting a second end of said resistor to a second terminal to achieve a selected resistance value across said first terminal and said second terminal.

5,439,842

#### LOW TEMPERATURE OXIDE LAYER OVER FIELD IMPLANT MASK

Mike F. Chang, Cupertino; David G. Grasso, San Jose, and Jun-Wei Chen, Saratoga, all of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Continuation-in-part of Ser. No. 949,283, Sep. 21, 1992, Pat. No. 5,328,866. This application May 2, 1994, Ser. No. 236,299  
Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 437-70

11 Claims

1. A method, comprising:  
thermally growing a base oxide layer over a surface of a semiconductor material;  
forming a nitride layer over said base oxide layer;  
forming a low temperature oxide layer over said nitride layer;  
forming a masking layer over said low temperature oxide layer;  
patterning said low temperature oxide layer and said masking layer such that a portion of said low temperature oxide layer and a portion of said masking layer form at least part of an implant mask;  
implanting dopant ions into a second region of said semiconductor material using said implant mask to mask a first region;  
removing said portion of said low temperature oxide layer and said portion of said masking layer such that said nitride layer is disposed over said first region of said semi-

conductor material but not over said second region of said semiconductor material; and



thermally growing a field oxide layer in said second region of said semiconductor material after said removing.

5,439,843

#### METHOD FOR PREPARING A SEMICONDUCTOR SUBSTRATE USING POROUS SILICON

Kiyofumi Sakaguchi; Takao Yonehara, both of Atsugi, and Mamoru Miyawaki, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

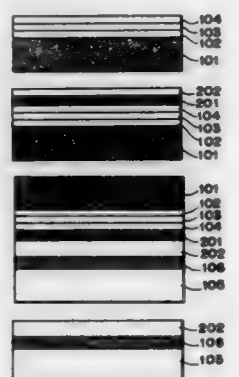
Continuation of Ser. No. 11,221, Jan. 29, 1993, abandoned. This application Sep. 6, 1994, Ser. No. 301,263

Claims priority, application Japan, Jan. 31, 1992, 4-040584; Jan. 31, 1992, 4-046303; Jan. 31, 1992, 4-046304; Jan. 31, 1992, 4-046305

Int. Cl.<sup>6</sup> H01L 21/20

U.S. Cl. 437-71

15 Claims



8. A method for preparing a semiconductor substrate which comprises:

- preparing a first Si substrate having a surface which comprises a porous layer;
- forming a monocrystal compound semiconductor layer on said porous layer;
- bonding the surface of said monocrystal compound semiconductor layer to a surface of a second substrate; and
- removing said porous layer from said bonded substrate by etching.

5,439,844

#### PROCESS FOR FORMING DEPOSITED FILM

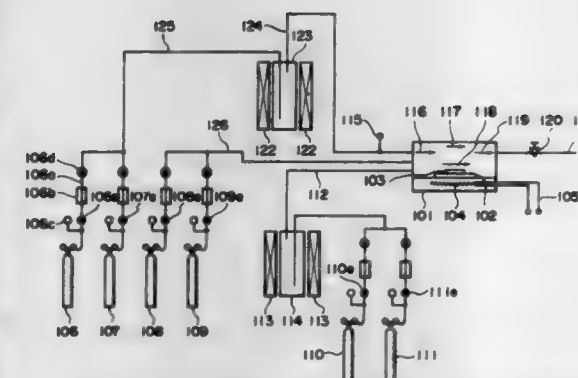
Akira Sakai, Nagahama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 728,310, Jul. 8, 1991, abandoned, which is a continuation of Ser. No. 579,244, Sep. 6, 1990, abandoned, which is a continuation of Ser. No. 38,218, Apr. 14, 1987, abandoned. This application May 12, 1993, Ser. No. 60,508  
Claims priority, application Japan, Apr. 14, 1986, 61-85506; Apr. 15, 1986, 61-86824

Int. Cl.<sup>6</sup> C30B 29/12

U.S. Cl. 437-83

10 Claims



1. A process for forming a silicon containing polycrystalline film on a substrate in a film forming space which comprises:

- arranging said substrate having an exposed surface which has a crystal orientability with a specific face direction in said film forming space;
- forming said silicon containing polycrystalline film on said exposed surface of said substrate by separately introducing into said film forming space an activated species (A) formed by decomposition of a compound (SX) containing silicon and halogen in a first activation space separate from said film forming space and an activated substance (B) formed in a second activation space separate from said film forming space from a chemical species (B) for film formation which is chemically mutually reactive with said activated species (A) to form a mixture and effect a chemical reaction therebetween to thereby effect the formation of the polycrystalline deposited film, said polycrystalline deposited film having a film growth surface; and
- exposing the film growth surface of the polycrystalline deposited film to a gaseous substance (E) capable of effecting an etching action thereon and thereby effecting crystal growth in a specific face direction wherein said gaseous substance (E) is irradiated with light energy to enhance its activity.

5,439,845

#### PROCESS FOR FABRICATING LAYERED SUPERLATTICE MATERIALS AND MAKING ELECTRONIC DEVICES INCLUDING SAME

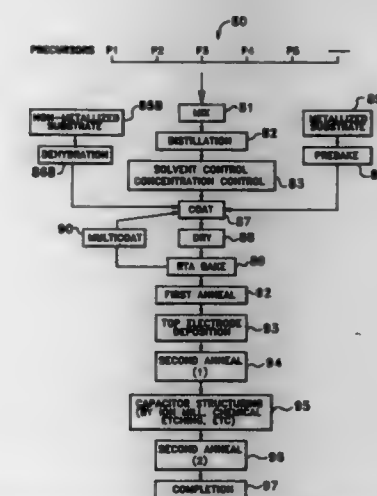
Hitoshi Watanabe, Tokyo, Japan; Carlos A. Paz De Araujo, Colorado Springs, Colo.; Hiroyuki Yoshimori, Kanagawa, Japan; Michael C. Scott, Colorado Springs, Colo.; Takashi Mihara, Saitama, Japan; Joseph D. Cuchiaro, and Larry D. McMillan, both of Colorado Springs, Colo., assignors to Olympus Optical Co., Ltd., Japan and Symetrix Corporation, Colorado Springs, Colo.

Division of Ser. No. 65,656, May 21, 1993, which is a continuation-in-part of Ser. No. 981,133, Nov. 24, 1992, and a continuation-in-part of Ser. No. 965,190, Oct. 23, 1992, which is a continuation-in-part of Ser. No. 807,439, Dec. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 660,428, Feb. 25, 1991, abandoned. This application Dec. 5, 1994, Ser. No. 350,313

Int. Cl.<sup>6</sup> H01L 29/15

U.S. Cl. 437-130

5 Claims



1. A method of fabricating a capacitor, said method comprising the steps of:

- providing a substrate having a first electrode, and a precursor containing a plurality of metals in effective amounts for forming a layered superlattice material upon thermal treatment of said precursor;
- applying said precursor to said substrate;
- rapid thermal processing said precursor on said substrate in an oxygen-containing environment to form a layered superlattice material containing said metals on said substrate;
- furnace annealing said substrate subsequent to said step of rapid processing; and
- forming a second electrode on said layered superlattice material after said step of furnace annealing to form a capacitor, and subsequently performing a second furnace anneal.

5,439,846

#### SELF-ALIGNED METHOD FOR FORMING CONTACT WITH ZERO OFFSET TO GATE

Loi Nguyen, Denton, and Robert L. Hodges, Euless, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Dec. 17, 1993, Ser. No. 169,587

Int. Cl.<sup>6</sup> H01L 21/44

U.S. Cl. 437-187

27 Claims

1. An integrated circuit fabrication method, comprising the steps of:

- providing a substrate which includes exposed surface portions of substantially monolithic semiconductor material separated by regions of field dielectric;





a mixed oxide of  $\text{Ln}_2\text{Al}_2\text{O}_7$  compound and silica or  $\text{LnAlO}_3$  compound and silica; and having an average grain size of not more than 30  $\mu\text{m}$ .

5,439,854

# TIC-BASE/SIC WHISKER COMPOSITE CERAMIC CUTTING TOOLS

Junichiro Suzuki; Shoji Sakakibara; Akiyasu Okuno, and Masakazu Watanabe, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

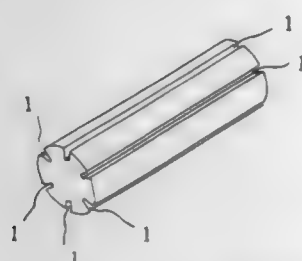
Continuation of Ser. No. 78,496, Jul. 28, 1987, abandoned. This application Oct. 4, 1993, Ser. No. 131,571

Claims priority, application Japan, Jul. 31, 1986, 61-178834; Aug. 15, 1986, 61-190483; Oct. 6, 1986, 61-236077; Oct. 6, 1986, 61-237593

Int. Cl.<sup>6</sup> C04B 35/56

U.S. Cl. 501—91

24 Claims



1. A ceramic cutting tool having high impact resistance and high resistance against wear in high speed cutting of difficult to cut materials formed of a polished sintered body consisting essentially of 40% by weight or more of TiC and 5 to 40% by weight of SiC whisker uniformly dispersed in said sintered body, said SiC whisker having a diameter of 0.2–1.5  $\mu\text{m}$  and a length of substantially 1–20  $\mu\text{m}$ .

said ceramic cutting tool having higher impact resistance and higher resistance against wear in high speed cutting of difficult to cut materials than ceramic cutting tools consisting essentially of 40% weight or more of TiC and 5 to 40% by weight of SiC whiskers of a length greater than 20  $\mu\text{m}$  dispersed in said ceramic cutting tools.

5,439,855

# SILICON NITRIDE CERAMICS CONTAINING A DISPERSED PENTAMOLYBDENUM TRISILICIDE PHASE

Allan B. Rosenthal, Wilmington, Del., assignor to Lanxide Technology Company, L.P., Newark, Del.

Continuation of Ser. No. 719,427, Jun. 24, 1991, abandoned.

This application Aug. 21, 1992, Ser. No. 933,956

Int. Cl.<sup>6</sup> C04B 35/58

U.S. Cl. 501—97

11 Claims

1. A sintered ceramic product consisting essentially of (a) from about 20 to about 98% silicon nitride, (b) from about 1 to about 80%  $\text{Mo}_5\text{Si}_3$ , and (c) from 0.02 to about 20% of at least one oxide, nitride or silicate of an element selected from IUPAC groups 2, 3, 4, 13 or the lanthanide series, all percentages being by weight based on the total weight of the product.

5,439,856

# HIGH THERMAL CONDUCTIVE SILICON NITRIDE SINTERED BODY AND METHOD OF PRODUCING THE SAME

Michiyasu Komatsu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 7, 1993, Ser. No. 117,287

Claims priority, application Japan, Sep. 8, 1992, 4-239769

Int. Cl.<sup>6</sup> C04B 35/58

U.S. Cl. 501—97

22 Claims

1. A high thermal conductive silicon nitride sintered body containing: 2.0–7.5% by weight of a rare earth element in

terms of an oxide thereof; and at most 0.3% by weight of Li, Na, K, Fe, Ca, Mg, Sr, Ba, Mn and B as impurity cationic elements in terms of total amount thereof, and having a thermal conductivity of at least 60 W/m-K.

5,439,857

# DIELECTRIC CERAMIC COMPOSITION

Sakiko Iwamoto, Nagaokakyo; Harunobu Sano, Kyoto; Yukio Hamaji, Nagaokakyo, and Kunisaburo Tomono, Ohtsu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jun. 30, 1994, Ser. No. 268,819

Claims priority, application Japan, Jun. 30, 1993, 5-188777; Jun. 30, 1993, 5-188778; Jun. 30, 1993, 5-188779

Int. Cl.<sup>6</sup> C04B 35/26

U.S. Cl. 501—136

13 Claims

1. A dielectric ceramic composition consisting essentially of: a main component of a four component system,  $\text{Pb}(\text{Mg}_x\text{Nb}_{1-x})\text{O}_3$ — $\text{PbTiO}_3$ — $\text{Pb}(\text{Ni}_y\text{Nb}_{1-y})\text{O}_3$ — $\text{Pb}(\text{Zn}_z\text{W}_{1-z})\text{O}_3$ , of which a part of Pb is replaced with at least one substituent selected from the group consisting of Ba, Ca and Sr, said main component consisting essentially of 4.0 to 93.0 mol % of  $\text{Pb}(\text{Mg}_x\text{Nb}_{1-x})\text{O}_3$ , 1.5 to 35.0 mol % of  $\text{PbTiO}_3$ , 1.5 to 51.0 mol % of  $\text{Pb}(\text{Ni}_y\text{Nb}_{1-y})\text{O}_3$ , and 1.0 to 34.0 mol % of  $\text{Pb}(\text{Zn}_z\text{W}_{1-z})\text{O}_3$ , the amount of said at least one substituent for Pb being 0.1 to 10 mol %; and

a secondary component selected from the group consisting of W, Zn and Mg, said secondary component being incorporated in said main component in an amount of 0.05 to 10.0 parts by weight per 100 parts by weight of said main component in terms of each oxide,  $\text{WO}_3$ ,  $\text{ZnO}$  or  $\text{MgO}$ .

5,439,858

# HYDRATED GRANULAR CARRIER PREPARED FROM POLYVINYL ALCOHOL AND ACTIVATED CHARCOAL FOR BIOLOGICAL TREATMENT APPARATUS

Kozo Konishi; Shoichi Chizaki, both of Ichihara; Shuzo Fujii, and Yoshiyuki Takashima, both of Tokyo, all of Japan, assignors to Denka Consultant and Engineering Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1993, Ser. No. 174,367

Claims priority, application Japan, Jun. 30, 1993, 5-186723

Int. Cl.<sup>6</sup> B01J 37/36; C12N 11/00, 11/02, 11/08

U.S. Cl. 502—7

1 Claim

1. A method for producing a hydrated granular carrier for a biological treatment apparatus, comprising the steps of:

adding water heated at 40 to 100 degrees Centigrade to polyvinyl alcohol having a degree of polymerization of 1000 to 2500 and a degree of saponification of 98 % or more in an amount of 50 to 150 parts by weight based on 100 parts by weight of said polyvinyl alcohol, said water added via spraying at a rate of 10 to 15 liters per minute while stirring said polyvinyl alcohol with a stirrer at a speed of about 500 to 1000 rpm, to thereby prepare hydrated granular gel particles; and

adding finely ground activated charcoal having a particle size of 200 mesh or less in an amount of 3 parts by weight or more together with water heated at 40 to 100 degrees Centigrade in an amount of 5 to 20 parts by weight to said hydrated granular gel particles while stirring said particles with a stirrer at a speed of about 500 to 1000 rpm.

5,439,859

# PROCESS AND CATALYST FOR DEHYDROGENATION OF ORGANIC COMPOUNDS

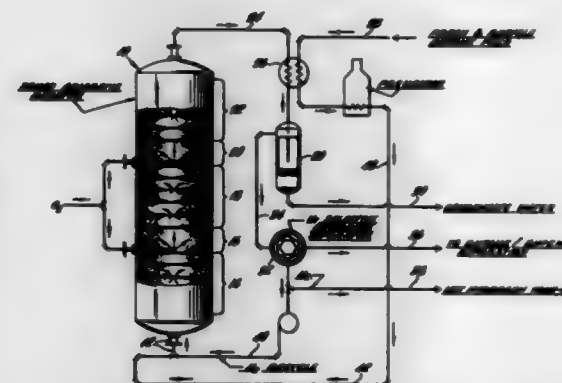
Vincent A. Durante, West Chester; Daniel E. Resasco, Media, both of Pa.; Darrell W. Walker, Visalia, Calif.; Gary L. Halter, Hamden, Conn., and Eugene L. Coggins, Malvern, Pa., assignors to Sun Company, Inc. (R&M), Philadelphia, Pa.

Filed Apr. 27, 1992, Ser. No. 874,499

Int. Cl.<sup>6</sup> B01J 29/064, 29/072

U.S. Cl. 502—66

30 Claims



1. A new composition of matter having catalytic activity for dehydrogenation of dehydrogenatable organic compounds which comprises reduced and sulfided nickel on siliceous supports which have been pretreated with chromium compounds and oxidized to provide surface-anchored chromyl species.

5,439,860

# CATALYST SYSTEM FOR COMBINED HYDROTREATING AND HYDROCRACKING AND A PROCESS FOR UPGRADING HYDROCARBONACEOUS FEEDSTOCKS

Mohammad M. Habib, Benicia; Philip L. Winslow, Hercules, and Richard O. Moore, Jr., San Rafael, all of Calif., assignors to Chevron Research and Technology Company, a Division of Chevron U.S.A. Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 869,666, Apr. 16, 1992, abandoned. This application Apr. 7, 1993, Ser. No. 44,359

Int. Cl.<sup>6</sup> B01J 29/05, 29/072, 29/068

U.S. Cl. 502—66

14 Claims

1. A dual function catalyst system for combined hydrotreating and hydrocracking process operations comprising two randomly intermixed distinctly different particulate catalysts, the first of which is a hydrodenitritification and/or hydrodesulfurization catalyst having substantially no cracking activity and the second of which is a hydrocracking catalyst, wherein the catalyst particles of both particulate catalysts are substantially the same size, having an effective diameter within a factor of about 4 of each other.

5,439,861

# CATALYZED VAPOR PHASE PROCESS FOR MAKING SYNTHESIS GAS

Alakananda Bhattacharyya, Wheaton; Mark S. Kleefisch, Naperville, and Carl A. Udovich, Joliet, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 745,902, Aug. 16, 1991, Pat. No. 5,246,899, and Ser. No. 993,419, Dec. 21, 1992, abandoned.

This application Apr. 16, 1993, Ser. No. 48,667

The portion of the term of this patent subsequent to Sep. 21, 2010, has been disclaimed.

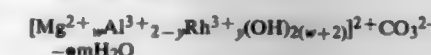
Int. Cl.<sup>6</sup> B01J 20/12, 21/16

U.S. Cl. 502—84

21 Claims

1. A catalyst composition suitable to prepare synthesis gas comprising hydrogen and carbon monoxide by partial oxidation of hydrocarbyl compounds using a source of oxygen

comprising molecular oxygen or carbon dioxide which composition comprising a mixture formed by heat treating to a temperature of at least about 500° C., a catalyst precursor composition having formula



where y is a number in a range from about 0.00001 to about 1.5; w is a number in a range from about 2 to about 20; and m is 0 or a positive number.

5,439,862

# OLIGOMERIZATION CATALYST AND PROCESS

Richard A. Kemp, 11510 Chariot, Stafford, Tex. 77477

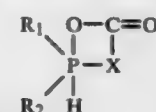
Filed Oct. 21, 1993, Ser. No. 140,643

Int. Cl.<sup>6</sup> B01J 31/00

U.S. Cl. 502—121

12 Claims

1. A catalyst suitable for oligomerization which is prepared by a process which comprises reacting a catalyst precursor ligand having a formula



wherein  $\text{R}_1$  and  $\text{R}_2$  each independently is an alkyl, alkoxy, aryl, or aryloxy group having from about 1 to about 20 carbon atoms, with the proviso that  $\text{R}_1$  and  $\text{R}_2$  are not both aryl, or  $\text{R}_1$  and  $\text{R}_2$  together form a divalent hydrocarbon moiety, and X is 1,2-arylene,  $\text{O}-\text{CH}_2$ ,  $\text{S}-\text{CH}_2$ , or  $\text{Se}-\text{CH}_2$ , with a deprotonation source, a transition metal compound wherein the transition metal is selected from the group consisting of nickel, chromium, cobalt, iron, copper, and mixtures thereof, and a catalyst activator, wherein the molar ratio of catalyst activator to transition metal compound is at least about 1:1.

5,439,863

# NEUTRAL METAL COMPLEX SALTS

Axel Bottcher, Wesel; Manfred Doring, Jena, and Jürgen Zehrfeld, Voerde, all of Germany, assignors to Rutgerswerke Aktiengesellschaft, Germany

Filed Sep. 9, 1993, Ser. No. 119,026

Claims priority, application Germany, Sep. 22, 1992, 42 31 622.7

Int. Cl.<sup>6</sup> C07F 15/00

U.S. Cl. 502—152

14 Claims

1. A process for the preparation of a neutral metal complex salt with additional coordinated ligands comprising reacting a complex-forming metal salt of the metal M as defined below with a chelating ligand and a Lewis base in water and the optional presence of a solubilizer and an inorganic auxiliary base which forms a soluble salt with the acid radical of the metal salt in stoichiometric amounts while inputting high energy to form the neutral complexes and recovering the product in fine crystalline form, the reaction being represented by the equation:



wherein M is a metal ion selected from the group consisting of cobalt, nickel, iron, zinc, manganese, copper, mercury, zirconium, tin, cadmium, titanium, vanadium, indium, silver, chromium and antimony, SR is an acid radical of an organic or inorganic acid, B is a Lewis base and L is a chelating ligand, wherein



$m-a=b-n>m(c-x)$   
 $x<c$  and  $n/m=p$ ,  $m-o<p$ , and  
 $a$ =an integer of 1-8,  
 $b$ =an integer of 1-3,  
 $c$ =an integer of 0-4,  
 $m$ =an integer of 1-3,  
 $n$ =an integer of 1-8,  
 $o$ =an integer of 0-8,  
 $X$ =an integer of 0-4,  
 $y$ =an integer of 8-15.

5,439,864

## SHAPED CARBONACEOUS COMPOSITION

Richard R. Rosin, Riverside, and Steven A. Bradley, Arlington Heights, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Dec. 27, 1993, Ser. No. 172,980

Int. Cl.<sup>6</sup> B01J 21/18, 20/20

U.S. Cl. 502-180

6 Claims

1. A shaped composition comprising a carbonaceous pyropolymer having recurring units containing at least carbon and hydrogen atoms and characterized in that said composition has a crush strength of at least 6 kg, has pores whose pore diameters are less than about 300 Å and the pore diameters are described by a bimodal distribution curve having maxima at average diameters of about 60 to 90 Å and about 120 to 160 Å.

5,439,865

## CATALYST FOR EXHAUST GAS PURIFICATION AND PROCESS FOR PRODUCTION THEREOF

Fumio Abe, Handa; Naomi Noda, Ichinomiya; Makoto Hori, and Toshimi Fukui, both of Kitakyushu, all of Japan, assignors to NGK Insulators, Ltd. and Krosaki Corporation, both of Japan

Filed May 12, 1993, Ser. No. 59,595

Claims priority, application Japan, Jul. 30, 1992, 4-203791

Int. Cl.<sup>6</sup> B01J 21/04, 23/40

U.S. Cl. 502-333

37 Claims

1. A catalyst for exhaust gas purification, comprising: a heat-resistant inorganic carrier; and a catalyst layer loaded on said carrier, said catalyst layer comprising a catalyst composition containing at least one noble metal selected from the group consisting of Pt, Pd and Rh, and active alumina, said catalyst composition maintaining a specific surface area of not less than 50 m<sup>2</sup>/g and a porosity of not less than 50% after the catalyst composition is held at 1,000° C. for 20 hours in air, wherein said catalyst composition has a pore radius distribution curve having a peak in a range of 50-1,000 Å.

15. A process for producing a catalyst for exhaust gas purification, comprising the steps of: hydrolyzing an aluminum salt or an aluminum alkoxide derivative to obtain an alumina precursor sol or gel; drying said sol or gel under a supercritical temperature and pressure to obtain an alumina porous material; firing the material at a temperature of not less than 500° C. to obtain active alumina; adding at least one noble metal selected from the group consisting of Pt, Pd and Rh to said active alumina to obtain a catalyst composition; and forming a catalyst layer containing said catalyst composition on a heat-resistant inorganic carrier, wherein said catalyst composition maintains a specific surface area of not less than 50 m<sup>2</sup>/g and a porosity of not less than 50% after the catalyst composition is held at 1,000° C. for 20 hours in air.

5,439,866

## SILVER-CONTAINING TOBERMORITE

Naokazu Sakoda, and Kouji Sugiyama, both of Osaka, Japan, assignors to Rengo Co., Ltd., Osaka, Japan

PCT No. PCT/JP93/00284, § 371 Date Nov. 1, 1993, § 102(e) Date Nov. 1, 1993, PCT Pub. No. WO93/17964, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 4, 1993, Ser. No. 108,574

Claims priority, application Japan, Mar. 6, 1992, 4-084795

Int. Cl.<sup>6</sup> B01J 20/04, 20/12

U.S. Cl. 502-407

1 Claim

1. A silver-containing tobermorite having a composition of



where  $0 \leq x \leq 1$ ,  $0.001 \leq y \leq 2$ ,  $0 \leq z \leq 0.1$ , M is a monovalent cation, prepared from a tobermorite having the composition  $\text{Ca}_5\text{M}_x(\text{Si}_{6-x}\text{Al}_x\text{O}_{18}\text{H}_2) \cdot 4\text{H}_2\text{O}$ , where  $0 \leq x \leq 1$ , M is a monovalent cation as defined above, by exchanging silver ion for the interlayer cation  $\text{Ca}^{2+}$ , or both  $\text{Ca}^{2+}$  and monovalent cation  $\text{M}^+$  of the tobermorite.

5,439,867

## FLUIDIZABLE SULFUR SORBENT AND FLUIDIZED SORPTION PROCESS

Gyanesh P. Khare, and Bryan W. Cass, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 4, 1994, Ser. No. 206,300

Int. Cl.<sup>6</sup> B01J 20/08, 20/10

U.S. Cl. 502-407

18 Claims

1. A method of making a zinc oxide based sorbent composition suitable for use in a fluidized bed, the steps comprising: mixing alumina, silica and zinc oxide to form a mixture; impregnating said mixture with an aqueous solution of a promoter metal-containing compound to form an impregnated mixture; agglomerating said impregnated mixture to form an agglomerate; and granulating said agglomerate so as to produce a granulated material suitable for use as a fluidizable material in said fluidized bed.

16. A fluidizable sorbent, comprising:

a particulate having a mean particle size in the range of from about 20 micrometers to about 500 micrometers and consisting essentially of alumina, silica, and zinc oxide.

5,439,868

## ABSORBENTS FOR REMOVING LOW-CONCENTRATION NITROGEN OXIDES

Shigenori Onitsuka, Ikoma; Masayoshi Ichiki, Osaka; Chikashi Inazumi, Kyoto; Takanobu Watanabe, Kyoto; Atsushi Fukuj, Ibaraki; Masaki Akiyama, Osaka; Yuki Saiyo, Suita, and Hidetsugu Kobayashi, Osaka, all of Japan, assignors to Hitachi Zosen Corporation, Osaka and The Pollution-Related Health Damage Compensation and Prevention Association, Tokyo, both of Japan

Continuation of Ser. No. 968,531, Oct. 29, 1992, abandoned.

This application Aug. 11, 1994, Ser. No. 288,763

Claims priority, application Japan, Oct. 31, 1991, 3-286276; Oct. 31, 1991, 3-286277; Jan. 23, 1992, 4-010312

Int. Cl.<sup>6</sup> B01J 20/04, 20/08, 20/28; C09K 3/00

U.S. Cl. 502-415

14 Claims

1. An adsorbent for removing low-concentration nitrogen oxides comprising a carrier comprising gamma-alumina or anatase-type titania, a ruthenium halide and at least one halide of an addition metal co-supported on the carrier, the addition metal being selected from the group consisting of copper, zinc, rubidium and cerium.

5,439,869

## THERMOREACTIVE RECORDING MATERIAL OF PARTICULAR STABILITY

Günter Klug, Monheim; Pieter Ooms, Krefeld, and Christian Rasp, Bergisch Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 28, 1993, Ser. No. 69,963

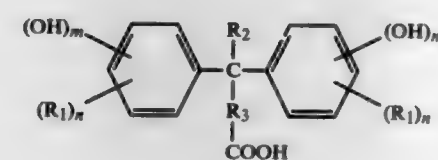
Claims priority, application Germany, Jun. 5, 1992, 42 18 561.0

Int. Cl.<sup>6</sup> B41M 5/26

U.S. Cl. 503-208

11 Claims

1. A thermoreactive recording material comprising a base material coated with a mixture containing, a) at least one modified bisphenol carboxylic acid of the formula (I)



(I)

in which

each  $R_1$ , independently of the others, represents  $C_1$ - to  $C_3$ -alkoxy,  $C_1$ - to  $C_6$ -alkyl,  $C_3$ - to  $C_6$ -cycloalkyl or phenyl,

$R_2$  represents hydrogen,  $C_1$ - to  $C_6$ -alkyl or phenyl,

$R_3$  represents  $C_1$ - to  $C_3$ -alkylene or a direct bond, each  $m$ , independently of the other, represents one or two, and

each  $n$ , independently of the other, represents zero, one or two

b) and at least one basic compound and c) 5 to 30% by weight of a color developer.

5,439,870

Patent Not Issued For This Number

5,439,871

## METHOD FOR DETECTING UNUSABLE DONOR IN A DYE DONOR WEB

Robert J. Matoushek, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 895,748, Jun. 9, 1992, abandoned. This

application Apr. 29, 1994, Ser. No. 236,783

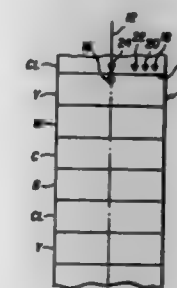
Int. Cl.<sup>6</sup> B41M 5/035, 5/38; G01N 21/00

U.S. Cl. 503-227

8 Claims

1. A method for detecting defects in a dye donor web having repeating series of at least two dye donor patch colors wherein light of a predetermined color is transmittable through at least one dye donor patch of each repeating series of patches, said method comprising the steps of:

providing a mark on one of the dye donor patches of a repeating series of patches which has at least one defect in the series, said mark being opaque to light of said predetermined color, said one of the dye donor patches being transmittable to light of said predetermined color; advancing the dye donor web along a path adjacent a source of light of said predetermined color such that two beams of light of said predetermined color impinge on the dye donor web, said beams being in substantial alignment on the web in a direction transverse to the path such that the mark aligns with one of said two light beams and not the other;



sampling the transmission or non-transmission of the two light beams through the dye donor web; and generating an error signal, indicative of the presence of a mark in the series of dye donor patches, upon detecting the simultaneous non-transmission of the one light beam and transmission of the other light beam.

5,439,872

## IMAGE-RECEIVING SHEET

Yoshikazu Ito; Masanori Akada; Masaki Kutsukake, all of Tokyo; Mineo Yamachi, Ichikawa; Masanori Saito, Tokyo; Atsushi Takano, Tokyo; Hidechiro Takeda, Tokyo, and Hitoshi Arita, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 116,276, Sep. 3, 1993, Pat. No. 5,352,652, which is a continuation of Ser. No. 44,613, Apr. 9, 1993, Pat. No. 5,270,285, which is a continuation of Ser. No.

876,415, Apr. 30, 1992, Pat. No. 5,260,258, which is a continuation of Ser. No. 487,184, Mar. 1, 1990, Pat. No.

5,130,292, which is a continuation of Ser. No. 301,989, Jan. 26, 1989, Pat. No. 4,923,847, which is a division of Ser. No. 82,225,

Aug. 6, 1987, Pat. No. 4,820,686, which is a division of Ser. No. 833,039, Feb. 26, 1986, Pat. No. 4,720,480. This application Jun.

23, 1994, Ser. No. 264,693

Claims priority, application Japan, Feb. 28, 1985, 60-39934; Feb. 28, 1985, 60-39935; Apr. 15, 1985, 60-79857

The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.

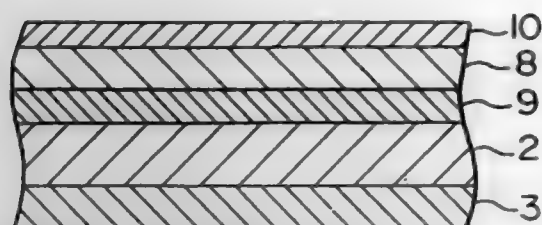
Int. Cl.<sup>6</sup> B41M 5/035, 5/38

U.S. Cl. 503-227

8 Claims

1. An image-receiving sheet comprising: a base sheet having first and second opposed surfaces;

a receptive layer formed on said first surface of said base sheet; and



an antistatic layer formed on at least one of (i) an outermost surface of said receptive layer and (ii) said second surface of said base sheet.

5,439,873

### METHOD FOR STIMULATING PLANT GROWTH USING GABA

Alan Kinnersley, Knoxville, Tenn., assignor to Plant Growth Development Corporation, Knoxville, Tenn.

Filed Feb. 23, 1994, Ser. No. 200,218

Int. Cl.<sup>6</sup> A01N 33/08, 37/44

U.S. Cl. 504—158

15 Claims

1. A process for increasing growth of a plant comprising treating the plant with  $\gamma$ -aminobutyric acid.

5,439,874

### HERBICIDAL SUBSTITUTED BICYCLO[3.1.0]HEXANES

Mark W. Drewes, Langenfeld; Rolf Kirsten, Monheim; Hans-Joachim Santel, Leverkusen; Klaus Lürssen, and Robert R. Schmidt, both of Bergisch Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 21, 1993, Ser. No. 95,078

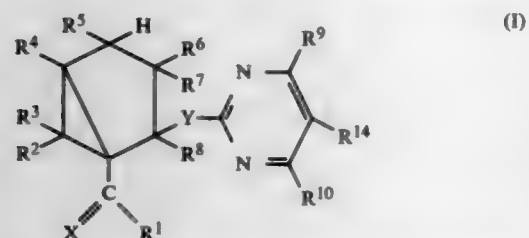
Claims priority, application Germany, Jul. 28, 1992, 42 24 925.7

Int. Cl.<sup>6</sup> C07D 239/34, 239/38, 239/42, 401/12, 413/12; A01N 43/54

U.S. Cl. 504—239

7 Claims

1. A substituted bicyclo[3.1.0]hexane of the formula (I)



in which

R<sup>1</sup> is hydrogen, hydroxyl, amino or a radical (optionally substituted by halogen or C<sub>1</sub>-C<sub>3</sub>-alkoxy) selected from the group consisting of C<sub>1</sub>-C<sub>3</sub>-alkyl, C<sub>1</sub>-C<sub>3</sub>-alkoxy, C<sub>3</sub>-C<sub>5</sub>-alkenyl, C<sub>3</sub>-C<sub>5</sub>-alkoxy, C<sub>3</sub>-C<sub>5</sub>-alkenylthio, C<sub>3</sub>-C<sub>5</sub>-alkoxy, phenylthio, pyridylthio, (nitro)quinolylthio, isoquinolylthio, C<sub>1</sub>-C<sub>3</sub>-alkylthio, phenylthio, pyrimidinylthio, C<sub>1</sub>-C<sub>3</sub>-alkylthio, (C<sub>1</sub>-C<sub>2</sub>-alkoxy-carbonyl)-C<sub>1</sub>-C<sub>3</sub>-alkyl-amino, phenyl-(C<sub>1</sub>-C<sub>3</sub>-alkylamino), benzylamino, phenethylamino, di-(C<sub>1</sub>-C<sub>4</sub>-alkyl) amino, (C<sub>1</sub>-C<sub>3</sub>-alkyl)-sulphonylamino, (C<sub>6</sub>-C<sub>10</sub>-aryl)-sulphonylamino and a hydrazino radical optionally be substituted by C<sub>1</sub>-C<sub>2</sub>-alkyl,

R<sup>2</sup> is hydrogen, halogen, C<sub>1</sub>-C<sub>3</sub>-alkyl, C<sub>1</sub>-C<sub>3</sub>-alkoxy, phenyl or (C<sub>1</sub>-C<sub>3</sub>-alkoxy)-carbonyl,

R<sup>3</sup> is hydrogen or C<sub>1</sub>-C<sub>3</sub>-alkyl or - if R<sup>2</sup> is hydrogen, alkyl or halogen - also may be halogen,

R<sup>4</sup> is hydrogen, halogen, C<sub>1</sub>-C<sub>3</sub>-alkyl or phenyl, R<sup>5</sup> is hydrogen, C<sub>1</sub>-C<sub>3</sub>-alkyl or phenyl,

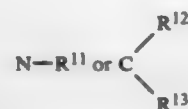
R<sup>6</sup> is hydrogen, hydroxyl, amino, halogen, cyano, C<sub>1</sub>-C<sub>3</sub>-alkyl, C<sub>1</sub>-C<sub>3</sub>-alkoxy, phenyl or (C<sub>1</sub>-C<sub>3</sub>-alkoxy)-carbonyl,

R<sup>7</sup> is hydrogen or C<sub>1</sub>-C<sub>3</sub>-alkyl or - if R<sup>6</sup> is hydrogen, alkyl or halogen, - also may be halogen,

R<sup>8</sup> is hydrogen, cyano, C<sub>1</sub>-C<sub>3</sub>-alkyl, phenyl or (C<sub>2</sub>-C<sub>6</sub>-alkoxycarbonyl)-methyl,

R<sup>9</sup> and R<sup>10</sup> each independently is hydrogen, halogen or a radical (optionally substituted by halogen or C<sub>1</sub>-C<sub>3</sub>-alkoxy), selected from the group consisting of C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>4</sub>-alkylthio, C<sub>1</sub>-C<sub>4</sub>-alkylamino, di-(C<sub>1</sub>-C<sub>4</sub>-alkyl)-amino, phenyl and phenoxy,

X is oxygen or sulphur or - if R<sup>1</sup> is hydrogen or alkyl - also may be:



where R<sup>11</sup> is hydrogen, hydroxyl, amino or a radical (optionally substituted by halogen) selected from the group consisting of C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>3</sub>-C<sub>6</sub>-alkenyl, C<sub>3</sub>-C<sub>6</sub>-alkynyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy, C<sub>3</sub>-C<sub>6</sub>-alkenylthio, C<sub>1</sub>-C<sub>4</sub>-alkoxy-carbonyl-C<sub>1</sub>-C<sub>2</sub>-alkoxy, C<sub>1</sub>-C<sub>6</sub>-alkylamino, di-(C<sub>1</sub>-C<sub>2</sub>-alkyl)-amino, C<sub>1</sub>-C<sub>6</sub>-alkylcarbamoyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy-carbamoyl and C<sub>1</sub>-C<sub>6</sub>-alkylsulphonylamino, or a radical (optionally substituted by at least one of nitro, amino, cyano, carboxyl, halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>2</sub>-halogenoalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>2</sub>-C<sub>2</sub>-halogenoalkoxy, C<sub>1</sub>-C<sub>4</sub>-alkylthio, C<sub>1</sub>-C<sub>2</sub>-halogenoalkylthio, C<sub>1</sub>-C<sub>4</sub>-alkoxy-carbonyl and di-(C<sub>1</sub>-C<sub>2</sub>-alkyl)-amino selected from the group consisting of phenyl, phenyl-C<sub>1</sub>-C<sub>4</sub>-alkyl, phenoxy, phenyl-C<sub>1</sub>-C<sub>4</sub>-alkoxy, phenylamino, phenyl-C<sub>1</sub>-C<sub>4</sub>-alkyl-amino, N-(C<sub>1</sub>-C<sub>4</sub>-alkyl)-N-phenylamino, pyridyl-amino, pyrimidinylamino, pyridylcarbamoyl, phenylcarbamoyl, furylcarbamoyl, thienylcarbamoyl and phenylsulphonylamino,

R<sup>12</sup> is hydrogen, cyano, carboxyl, C<sub>1</sub>-C<sub>6</sub>-alkoxycarbonyl, C<sub>1</sub>-C<sub>6</sub>-alkoxycarbonyl, C<sub>1</sub>-C<sub>6</sub>-alkylcarbamoyl or di-(C<sub>1</sub>-C<sub>4</sub>-alkoxy)-phosphoryl and

R<sup>13</sup> is formyl, cyano, carboxyl, hydroxymethyl, carbamoyl or a radical (optionally substituted by halogen, carboxyl or C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl) selected from the group consisting of C<sub>1</sub>-C<sub>6</sub>-alkoxycarbonyl, C<sub>5</sub>-C<sub>6</sub>-cycloalkyloxycarbonyl, C<sub>1</sub>-C<sub>6</sub>-alkylthio-carbonyl, C<sub>1</sub>-C<sub>6</sub>-alkylaminocarbonyl, C<sub>5</sub>-C<sub>6</sub>-cycloalkylamino-carbonyl, di-(C<sub>1</sub>-C<sub>2</sub>-alkyl)-aminocarbonyl, C<sub>1</sub>-C<sub>4</sub>-alkylaminocarbonyl-C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl, di-(C<sub>1</sub>-C<sub>2</sub>-alkyl)-amino-carbonyl-C<sub>1</sub>-C<sub>2</sub>-alkoxycarbonyl, phenylaminocarbonyl-C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl and N-methyl-N-phenylaminocarbonyl-C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl, or is a radical (optionally substituted by at least one of methyl and ethyl) selected from the group consisting of pyrrolidinylcarbonyl, piperidinylcarbonyl, morpholinylcarbonyl and piperazinylcarbonyl,

or is a radical (optionally substituted by at least one of nitro, amino, cyano, carboxyl, halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>2</sub>-halogenoalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>2</sub>-halogenoalkoxy, C<sub>1</sub>-C<sub>4</sub>-alkylthio, C<sub>1</sub>-C<sub>2</sub>-halogenoalkylthio, C<sub>1</sub>-C<sub>4</sub>-alkoxy-carbonyl and di-(C<sub>1</sub>-C<sub>2</sub>-alkyl)-amino) selected from the group consisting of phenoxy-carbonyl, phenyl-C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl, furylmethoxycarbonyl, thienylmethoxycarbonyl, phenylthiocarbonyl, phenyl-C<sub>1</sub>-C<sub>4</sub>-alkylthiocarbonyl, phenylaminocarbonyl, phenyl-C<sub>1</sub>-C<sub>4</sub>-alkylaminocarbonyl, N-(C<sub>1</sub>-C<sub>4</sub>-alkyl)-N-phenylaminocarbonyl, phenylhydrazinocarbonyl, C<sub>1</sub>-C<sub>4</sub>-alkylhydrazinocarbonyl and phthalimidoxycarbonyl, or R<sup>12</sup> together with R<sup>13</sup> is -CO-O-(CH<sub>2</sub>)<sub>n</sub>-, where

n is from 1 to 4,

R<sup>14</sup> is hydrogen, fluorine, chlorine, methyl or methoxy, and Y is oxygen, sulphur, imino (NH) or methylimino (NCH<sub>3</sub>), or a salt thereof.

5,439,875

### PROCESS FOR PREPARING JOSEPHSON JUNCTION DEVICE HAVING WEAK LINK OF ARTIFICIAL GRAIN BOUNDARY

So Tanaka; Hiroshi Inada, and Michitomo Iiyama, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

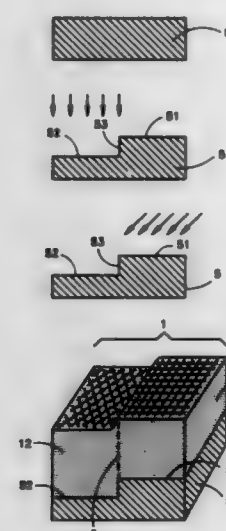
Division of Ser. No. 983,432, Dec. 2, 1992, abandoned. This application Nov. 7, 1994, Ser. No. 337,413

Claims priority, application Japan, Dec. 2, 1991, 3-343941; Dec. 6, 1991, 3-348969; Dec. 9, 1991, 3-350303; Nov. 12, 1992, 4-327399

Int. Cl.<sup>6</sup> B44C 1/22; C23F 1/00

U.S. Cl. 505—329

4 Claims



1. A method for manufacturing a Josephson junction device comprising the steps of:

wet-etching at least a portion of a principal surface of a single crystalline substrate so that the principal surface includes a first and a second region, of which at least a lattice distance of an exposed lattice of said first region is slightly different from a lattice distance of an exposed lattice of said second region, and,

forming an oxide superconductor thin film on the first and second regions of the principal surface so that the oxide superconductor thin film includes first and second portions respectively positioned on the first and the second regions of the substrate, said first and said second portions of said oxide superconductor thin film being constituted of single crystals of the oxide superconductor, wherein a lattice of said first portion is oriented at an angle of 45° to a lattice of the second portion, and so that the oxide superconductor thin film has a grain boundary between said first and second portions, which constitutes a weak link of the Josephson junction.

5,439,876

### METHOD OF MAKING ARTIFICIAL LAYERED HIGH T<sub>c</sub> SUPERCONDUCTORS

Volker Graf, Wollerau, and Carl A. Mueller, Hedingen, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 772,638, Oct. 8, 1991, abandoned, and Ser. No. 360,805, Jun. 2, 1989, abandoned. This application Aug. 16, 1993, Ser. No. 108,138

Claims priority, application European Pat. Off., Jun. 3, 1988, 88108908

Int. Cl.<sup>6</sup> C30B 19/10; C01F 11/00; C01G 1/00

U.S. Cl. 505—447

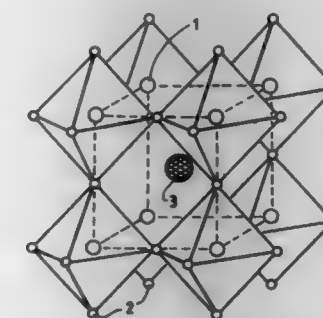
20 Claims

1. A method for making artificial, layered high T<sub>c</sub> supercon-

ductor compounds by monolayer epitaxy, comprising the following steps:

placing a monocrystalline substrate of a material from the group comprising strontium titanate SrTiO<sub>3</sub>, zirconium dioxide ZrO<sub>2</sub>, zinc telluride Zn<sub>1-x</sub>Se<sub>x</sub>, barium fluoride, BaF<sub>2</sub>, cadmium selenide Cd<sub>1-x</sub>Te<sub>x</sub>, and cadmium telluride Cd<sub>1-x</sub>Te<sub>x</sub>, wherein x < 1, in a chamber having a plurality of independent sources of materials for epitaxial deposition, exposing said substrate in a sequence to as many different ones of said sources of constituent materials as the superconductor compounds being made should contain,

said constituent materials being deposited one at a time, activating said sources in accordance with a pattern of activity, said pattern involving determining which particular constituent material is to be deposited at any one time; determining the amount and concentration of the particular



constituent material to be emitted from said activated source

determining the period of time the exposure of said substrate to the individual constituent materials should last for one monolayer/monomolecular layer of the particular constituent material to settle on the current substrate surface; determining the operating temperature at which the exposure is to be performed by monitoring, prior to said exposure, the operating temperature of the current substrate surface, monitoring, prior to said exposure the operating temperature of the source of the particular constituent material and from the reaction temperature required for the desired high T<sub>c</sub> superconductor material to form in accordance with a particular, desired crystal structure; repeating the preceding steps as often as corresponds to the number of monolayer/monomolecular layers the final superconductor compound should contain; cooling the resulting crystal to ambient temperature and removing it from said chamber.

5,439,877

### PROCESS FOR DEPOSITING HIGH TEMPERATURE SUPERCONDUCTING OXIDE THIN FILMS

Dean W. Face, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 894,983, Jun. 8, 1992, abandoned, which is a continuation of Ser. No. 624,435, Dec. 7, 1990, abandoned. This application Mar. 24, 1994, Ser. No. 217,036

Int. Cl.<sup>6</sup> C23C 14/34

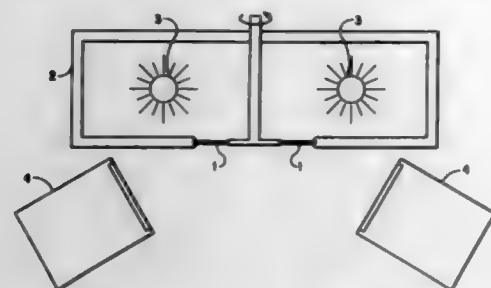
U.S. Cl. 505—475

16 Claims

1. A process for in-situ depositing a uniform crystalline thin film of a high temperature superconducting oxide onto a surface of a single crystal substrate having a front surface and a back surface comprising exposing said back surface to direct radiation from a radiant heat source to heat the substrate to a growth temperature of said superconducting oxide, and, while



maintaining the radiation, sputtering the thin film onto the front surface, wherein the area of said film simultaneously



deposited exceeds 6 cm<sup>2</sup> and the variation in  $T_c$  from the average  $T_c$  is plus or minus 2 K over the area of said film.

5,439,878

# **METHOD FOR PREPARING COPPER OXIDE SUPERCONDUCTOR CONTAINING CARBONATE RADICALS**

Kyoichi Kinoshita, Hoya, and Tomoaki Yamada, Higashimurayama, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan  
Division of Ser. No. 35,158, Mar. 22, 1993, Pat. No. 5,354,733.  
This application Jul. 7, 1994, Ser. No. 271,655

Claims priority, application Japan, Mar. 23, 1992, 4-64759; Mar. 24, 1992, 4-65766

Int. Cl.<sup>6</sup> H01B 1/06, 1/08

U.S. Cl. 505—491

6 Claims

1. A process for preparing a copper oxide superconductor containing carbonate radical, comprising the steps of:

weighting and mixing alkaline earth metal compounds, and a copper compound or metallic copper so that the molar ratio of said alkaline earth metal to said metallic copper is in the range from 1.1 to 2.25 to thereby obtain a mixture, said alkaline earth metal compounds including a barium compound selected from the group consisting of barium carbonate and a barium oxalate, and a strontium compound selected from the group consisting of strontium carbonate and strontium oxalate, and said copper compound selected from the group consisting of copper carbonate, copper nitrate, copper oxalate and copper oxide; pressing said mixture to form a pellet; and sintering said pellet in an oxygen atmosphere.

5,439,879

# **METHOD FOR JOINING SUPERCONDUCTOR SEGMENTS TO FORM A SUPERCONDUCTING ARTICLE**

Kamel Salama, and Venkatakrishnan Selvamani, both of Houston, Tex., assignors to University of Houston—University Park, Houston, Tex.

Continuation of Ser. No. 837,001, Feb. 14, 1992, abandoned.  
This application Jun. 30, 1993, Ser. No. 85,453

Int. Cl.<sup>6</sup> H01L 39/12

U.S. Cl. 505—500

36 Claims

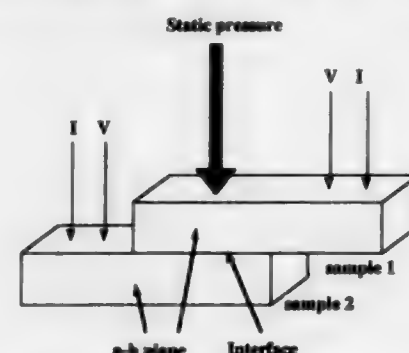
1. A method for joining a segment of a melt textured anisotropically superconducting 123 superconductor to an adjacent melt textured anisotropically superconducting segment of said 123 superconductor to form a coherent article, said superconductor having:

- a formula  $L_1M_2Cu_3O_{6+\delta}$ , wherein L is a rare earth metal, M is an alkali earth metal and  $\delta$  is a number from about 0.7 to about 1.0;
- unit cells with an a-axis, a b-axis, a c-axis, an ab plane, and an ac plane;
- a peritectic temperature; and
- a yield stress;

said segment and said adjacent segment having ab planes defined by the ab planes of aligned superconductor unit cells

therein, to form a larger dimensioned anisotropically superconducting article, comprising the steps of:

- contacting the segment with the adjacent segment such that the ab plane of the segment is within 5° of parallel alignment to the ab plane of the adjacent segment;
- heating the contacted segments to a relaxation temperature of from about 95° C. to about 160° C. below the peritectic temperature of the superconductor;
- further heating the contacted segments to an accelerated reaction temperature of from about 50° C. to about 90° C.



below the peritectic temperature, at a rate not in excess of 180° C. hr<sup>-1</sup>;

- maintaining the contacted segments at the accelerated reaction temperature and under a static pressure of from about 50% to about 90% of the yield stress of the superconductor measured at the accelerated reaction temperature for a sufficient period for reaction to join the segments into a coherent article; and
- cooling the coherent article to ambient temperature at a rate not exceeding 150° C. hr<sup>-1</sup>.

5,439,880

# **PREPARATION OF SUPERCONDUCTING OXIDES BY OXIDIZING A METALLIC ALLOY**

Gregory J. Yurek, Welleley Hills, and John B. Vander Sande, Newbury, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 794,962, Nov. 20, 1991, abandoned, which is a continuation of Ser. No. 61,233, Jun. 10, 1987, Pat. No. 5,204,318, which is a continuation-in-part of Ser. No. 31,407, Mar. 27, 1987, Pat. No. 4,826,808. This application May 3, 1993, Ser. No. 56,605

Int. Cl.<sup>6</sup> HA01 12/00; H01L 39/12

U.S. Cl. 505—492

14 Claims

1. A method of preparing a superconducting oxide comprising the steps of:

combining the metallic elements of said superconducting oxide to form an alloy having substantially stoichiometric proportions needed to form said superconducting oxide; and oxidizing said alloy to form said superconducting oxide, wherein said alloy is formed into a shape prior to said oxidation step, said shape comprising a wire, ribbon, sheet, rod, or ring.

5,439,881

# **GENE ENCODING NEMATODE-ACTIVE TOXIN PS63B CLONED FROM *BACILLUS THURINGIENSIS* ISOLATE**

Kenneth E. Narva, San Diego; George E. Schwab, La Jolla, and Jewel M. Payne, San Diego, all of Calif., assignors to Myco-gen Corporation, San Diego, Calif.

Division of Ser. No. 693,018, May 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 565,544, Jun. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 84,653, Aug. 12, 1987, Pat. No. 4,948,734. This application Apr. 19, 1993, Ser. No. 49,783

The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.

Int. Cl.<sup>6</sup> A01N 63/02; C12N 15/32

U.S. Cl. 514—2

2 Claims

2. A process for controlling nematodes which comprises containing said nematodes with a nematode-controlling effective amount of a toxin encoded by a gene obtained from the nematocidally-active *Bacillus thuringiensis* isolate designated B.t. PS63B, said gene found on a 4.4 kbp XbaI band by restriction fragment polymorphism analysis, and comprising an N-terminal amino acid sequence of:

QLQAQLIPYNVLA; SEQ ID NO. 9

and comprising an internal amino acid sequence of

VQRILDEKLSFQLIK; SEQ ID NO. 11,

said 4.4 kbp XbaI band hybridizing under standard Southern blot conditions to approximately 460 bp fragment which is generated by PCR using as primers SEQ ID NO. 17 and SEQ ID NO. 18; or a fragment thereof sufficient to encode a nematocidally-active toxin.

5,439,882

# **BLOOD SUBSTITUTE**

Mario Feola; Jan S. Simoni, both of Lubbock, and Peter C. Canizaro, deceased, late of Lubbock, all of Tex. by Hana Ilmer, legal representative, assignors to Texas Tech University Health Sciences Center, Lubbock, Tex.

Continuation-in-part of Ser. No. 654,764, Feb. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 459,071, Dec. 29, 1989, abandoned. This application May 14, 1993, Ser. No. 61,763

Int. Cl.<sup>6</sup> A61K 38/42, 35/14; C07K 14/805

U.S. Cl. 514—6

52 Claims



A. Pharmacia Standard, pH 9—pH 6  
B. Hemolysate  
C. Hemoglobin after purification (80 deg. C for 9 hrs, and 70 deg. C for 1 hr)  
D. Hemoglobin after conjugation with dithionite  
E. dATP 16  
F. dATP 16  
REF: Superficial Chemistry  
CA: Cationic Anion

REF shows both the purification of hemoglobin and the shift of hemoglobin from 6.0 to 5.1.

1. A method of treating a human in need of blood comprising intravenously administering to the human an effective amount of a blood substitute comprising substantially pyrogen-free, microbe-free, active hemoglobin reacted with o-ATP and o-adenosine to form a cross-linked hemoglobin.

5,439,883

# **ANTIHYPoxic FORMULATION**

Nikolai V. Karsanov, ulitsa Gotua, 16, kv. 96; Evgenia V. Selikhova, prospekt Tsaritsy Tamary, 18, kv. 104; Nodar N. Kipshidze, ulitsa Sumbatashvili-Jushina, 9, kv. 2, and Eteri I. Guchua, Digomsky massiv, 1 kvartal, korpus 11, kv. 5, all of Tbilisi, Georgia

Filed Apr. 18, 1994, Ser. No. 228,749

Int. Cl.<sup>6</sup> A61K 31/455, 31/52, 38/42, 31/70

U.S. Cl. 514—6

1 Claim

1. An antihypoxic formulation comprising cytochrome C, characterized in that it further includes nicotinamide adenine dinucleotide and inosine at the following mixture ratio (parts by weight):

cytochrome C 5-15  
nicotinamide adenine dinucleotide 0.5-5  
inosine (riboxin) 20-250.

5,439,884

# **METHOD OF CONTROLLING FERTILIZATION USING BOMBESIN OR ITS AGONIST**

Elliot R. Spindel, Lake Oswego; Srinivasa R. Nagalla, Portland; Srinivasan Vijayaraghavan, Beaverton, and Anthony Archibong, Portland, all of Oreg., assignors to Oregon Regional Primate Research Center, Beaverton, Oreg.

Filed Jul. 27, 1992, Ser. No. 919,731

Int. Cl.<sup>6</sup> A61K 38/10, 38/17

U.S. Cl. 514—12

16 Claims

1. A method of promoting fertilization by stimulating the acrosome reaction, said method comprising the step of contacting sperm either at the time of sperm capacitation or at the time of egg fertilization with an effective amount of bombesin or its agonist.

5,439,885

# **CRF ANALOGS**

Wayne D. Kornreich, San Diego, Calif.; Jean-Francois Hernandez, Noyarey, France; Jean E. F. Rivier, and Wylie W. Vale, Jr., both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 709,091, May 31, 1991, Pat. No. 5,235,036. This application Aug. 10, 1993, Ser. No. 104,862  
The portion of the term of this patent subsequent to Aug. 10, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> C07K 14/695; A61K 38/35

U.S. Cl. 514—12

14 Claims

1. A CRF agonist peptide having SEQ ID NO: 9 (Ser-Xaa<sub>2</sub>-Glu-Pro-Pro-Ile-Ser-Leu-Asp-Leu-Thr-Xaa<sub>12</sub>-His-Leu-Leu-Arg-Glu-Val-Leu-Xaa<sub>20</sub>-Xaa<sub>21</sub>-Xaa<sub>22</sub>-Xaa<sub>23</sub>-Xaa<sub>24</sub>-Xaa<sub>25</sub>-Gln-Leu-Ala-Gln-Gln-Ala-Xaa<sub>32</sub>-Ser-Asn-Arg-Xaa<sub>36</sub>-Leu-Xaa<sub>38</sub>-Xaa<sub>39</sub>-Ile-Xaa<sub>41</sub>) wherein Y is present at the N-terminus and is an acyl group having from 1 to 7 carbon atoms or is hydrogen and the C-terminus is amidated; and Xaa<sub>2</sub> is Glu; Xaa<sub>12</sub> is Phe or D-Phe; Xaa<sub>20</sub> is Ala or Glu; Xaa<sub>21</sub> is Met or Nle; Xaa<sub>22</sub> is Ala; Xaa<sub>23</sub> is Arg; Xaa<sub>24</sub> is Ala; Xaa<sub>25</sub> is Glu; Xaa<sub>32</sub> is His; Xaa<sub>36</sub> is Lys or Arg; Xaa<sub>38</sub> is Met or Nle; Xaa<sub>39</sub> is Ala or Glu; and Xaa<sub>41</sub> is Ile; provided however that at least one of Xaa<sub>20</sub> and Xaa<sub>39</sub> is Ala and that the N-terminus is optionally shortened by deletion of a sequence of from 1 to 5 residues; or a nontoxic addition salt thereof.

5,439,886

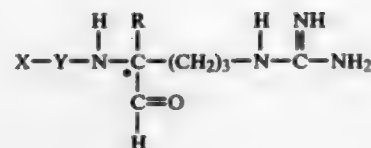
## MONOCLONAL ANTIBODY, POLYPEPTIDES AND PRODUCTION THEREOF

Shuichi Ikegami, Takatsuki; Masaru Koyama, Suita; Masayuki Miyake, Kyoto, and Masaharu Senoo, Okayama, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan  
Continuation of Ser. No. 865,552, Apr. 9, 1992, abandoned. This application Jan. 6, 1994, Ser. No. 254,493

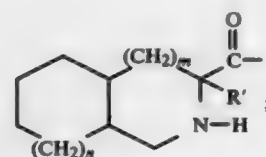
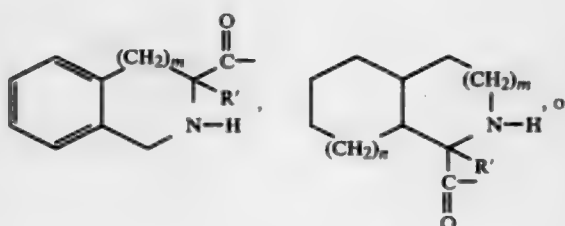
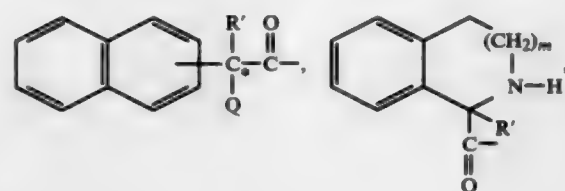
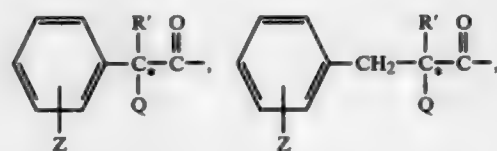
Claims priority, application Japan, Apr. 12, 1991, 3-079996; Apr. 17, 1991, 3-085396; Feb. 7, 1992, 4-022321

Int. Cl.<sup>6</sup> A61K 39/00; C07K 2/00, 4/00; C07H 19/00  
U.S. Cl. 514-12 3 Claims

1. A polypeptide having the amino acid sequence of amino acid residue numbers 138-191 of SEQ ID NO:1 or a portion thereof, wherein said polypeptide is capable of suppressing cell motility in vitro activity.



wherein  
X is



5,439,887  
PEPTIDE HAVING ANTIHYPERTENSIVE ACTIVITY  
FREE OF VASOCONSTRICTOR ACTIVITY  
Gilles Hamon, Le Raincy; Eve Mahe, and Dung Le-Nguyen, both of Montpellier, all of France, assignors to Roussel-Uclaf, France  
Filed Feb. 10, 1993, Ser. No. 16,023  
Claims priority, application France, Feb. 12, 1992, 92 01557  
Int. Cl.<sup>6</sup> C07K 7/00, 14/00; A61K 38/10, 38/16  
U.S. Cl. 514-13 7 Claims

wherein

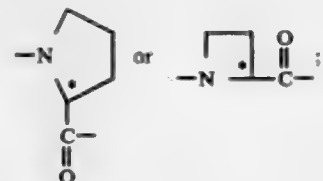
X<sub>3</sub> is hydrogen or cysteine residue,  
X<sub>4</sub> is a cysteine or alanine residue,  
X<sub>6</sub> is a residue selected from the group consisting of asparagine, phenylalanine, and glycine in the D series,  
X<sub>6</sub> is a residue selected from the group consisting of tryptophan, serine, lysine, aspartic acid, tyrosine, and threonine in the D series,  
X<sub>9</sub> and X<sub>17</sub> are a residue selected from the group consisting of glutamic acid, aspartic acid, lysine and leucine in the D series,  
X<sub>11</sub> is a cysteine or alanine residue,  
X<sub>14</sub> is a residue of tyrosine or phenylalanine in the D series,  
X<sub>21</sub> is hydrogen or a tryptophan or D-tryptophan residue, and the derivatives possessing, where appropriate, one or two disulfide bridges, with the proviso that X<sub>21</sub> cannot be a tryptophan residue when X<sub>1</sub>, X<sub>3</sub> and X<sub>11</sub> are a cysteine residue,  
X<sub>4</sub> is an asparagine residue, X<sub>6</sub> is a tryptophan residue, X<sub>9</sub> is a lysine residue, X<sub>14</sub> is a phenylalanine residue and X<sub>17</sub> is a leucine residue.

5,439,888

## ANTITHROMBOTIC AGENTS

Robert T. Shuman, Greenwood, and Gerald F. Smith, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.  
Filed Mar. 4, 1994, Ser. No. 206,578  
Int. Cl.<sup>6</sup> A61K 3/47; C07D 217/04  
U.S. Cl. 514-18 15 Claims

1. A compound having the formula



R is methyl or ethyl; and

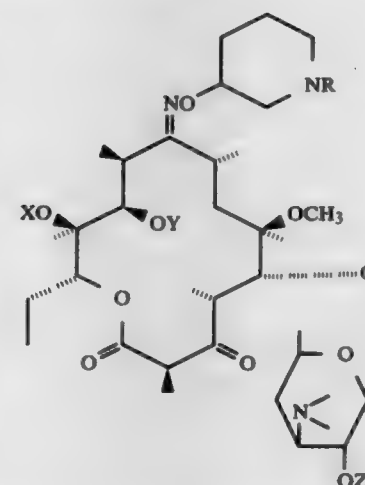
Z is hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, hydroxy, halo, or R<sub>2</sub>SO<sub>2</sub>NH—, where R<sub>2</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl;  
or a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable solvate of said compound of formula I or salt thereof.

5,439,889

## ERYTHROMYCIN DERIVATIVES

Constantin Agouridas, Nogent sur Marne; Yannick Benedetti, Rosny sous Bois; Jean-Francois Chantot, Greasy en France, and Alexis Denis, Paris, all of France, assignors to Roussel Uclaf, France  
Filed Mar. 7, 1994, Ser. No. 207,355  
Claims priority, application France, Mar. 9, 1993, 93 02674  
Int. Cl.<sup>6</sup> C07H 17/08; A61K 31/70  
U.S. Cl. 514-29 10 Claims

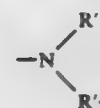
1. A compound selected from the group consisting of all possible stereoisomeric forms and mixtures thereof of a compound of the formula



wherein X and Y are hydrogen or together form



R is —(CH<sub>2</sub>)<sub>m</sub>—X<sub>4</sub>, m is an integer from 0 to 20, X<sub>4</sub> is selected from the group consisting of alkyl, alkenyl and alkynyl of up to 16 carbon atoms optionally substituted with a halogen, cycloalkyl of 3 to 8 carbon atoms, or



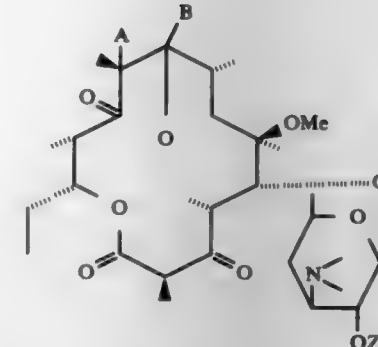
R'<sub>1</sub> and R'<sub>2</sub> are individually selected from the group consisting of hydrogen and alkyl of 1 to 12 carbon atoms, Z is hydrogen or acyl of an organic carboxylic acid of up to 18 carbon atoms and their non-toxic, pharmaceutically acid addition salts.

5,439,890

## ERYTHROMYCIN DERIVATIVES

Constantin Agouridas; Jean-Francois Chantot, both of Nogent sur Marne, and Nicole Tessot, Claye-Souilly, all of France, assignors to Roussel-Uclaf, France  
Filed Nov. 14, 1994, Ser. No. 340,026  
Claims priority, application France, Dec. 3, 1993, 93 14505  
Int. Cl.<sup>6</sup> A61K 31/70; C07H 17/08  
U.S. Cl. 514-29 12 Claims

1. A compound of the formula



wherein A and B are both hydrogen or A is hydrogen and B is —OH or A and B form a carbon-carbon double bond and Z is hydrogen or acyl of an organic carboxylic acid of 1 to 6 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

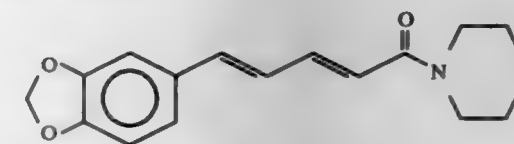
9. A method of treating bacterial infections in warm-blooded animals comprising administering to warm-blooded animals an antibacterially effective amount of a compound of claim 1.

5,439,891

## PROCESS FOR PREPARATION OF PHARMACEUTICAL COMPOSITION WITH ENHANCED ACTIVITY FOR TREATMENT OF TUBERCULOSIS AND LEPROSY

Randhir S. Kapil; Usha Zutshi; Kasturi L. Bedi; Gurbar Singh; Ramesh K. Johri; Santosh K. Dhar; Jawahar L. Kaul; Subhash C. Sharma; Gurcharan S. Pahwa; Naveen Kapoor; Ashok K. Tickoo; Manoj K. Tickoo; Uma Kaul; Surjeet Singh; Ram K. Zutshi, and Rajinder Singh, all of Regional Research Laboratory, Jammu 180001, India  
Filed Oct. 29, 1993, Ser. No. 142,973  
Int. Cl.<sup>6</sup> A01N 43/04, 43/30, 43/40; A61K 31/495  
U.S. Cl. 514-31 4 Claims

1. A composition for the treatment of tuberculosis and leprosy, having increased therapeutic efficacy, which comprises piperine of the formula



with known antituberculosis or antileprosy drugs or the mixture thereof.

5,439,892

## DEXTRIN SULFATES AS ANTI HIV-1 AGENTS AND COMPOSITION THEREOF

Donald S. Davies, Beaconsfield, United Kingdom, assignor to ML Laboratories, Liverpool, Great Britain  
PCT No. PCT/GB91/01628, § 371 Date Jun. 22, 1993, § 102(e)  
Date Jun. 22, 1993, PCT Pub. No. WO92/04904, PCT Pub. Date Apr. 2, 1992

PCT Filed Sep. 23, 1991, Ser. No. 30,227  
Claims priority, application United Kingdom, Sep. 25, 1990, 9020861

The portion of the term of this patent subsequent to Nov. 2, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 31/725, 47/36; C08B 31/06  
U.S. Cl. 514-58 13 Claims

1. An agent against HIV-1 and related viruses, the agent being or including dextrin sulphate containing at most two sulphate groups per glucose unit, and wherein the weight average molecular weight of the dextrin sulphate varies from 15,000 to 25,000.



5,439,893

## METHODS FOR THE TREATMENT AND PREVENTION OF DIARRHEA

Geoffrey N. Richards, and Carolyn E. Campbell, both of Missoula, Mont., assignors to University of Montana, Missoula, Mont.

Filed May 26, 1993, Ser. No. 66,843  
Int. Cl.<sup>6</sup> A61K 31/70; C08B 37/00

U.S. Cl. 514—53

16 Claims

1. A method for the treatment or prevention of diarrhea, said method comprising orally administering to a human, in an effective amount at least one sugar selected from the group consisting of a caramel having a high content of fructose oligosaccharides, sucrose thermal kestoses and fructoglucan polymers.

5,439,894

## DEXTRIN DERIVATIVES FOR THE TREATMENT OF ACIDIC CONDITIONS

Donald S. Davies, Buckinghamshire, Great Britain, assignor to M L Laboratories PLC, London, United Kingdom  
Division of Ser. No. 640,313, Jan. 29, 1991, Pat. No. 5,280,017.

This application Nov. 12, 1993, Ser. No. 150,717

Int. Cl.<sup>6</sup> A61K 31/73, 31/715

U.S. Cl. 514—58

10 Claims

1. A pharmaceutical composition comprising a dextrin derivative in which a proportion of the hydroxyl groups of dextrin are replaced by amine groups or residues, said amine groups or residues being present in an amount of at least 0.5 group per glucose unit, and at least one pharmaceutically acceptable carrier or diluent.

5,439,895

## 4-AMINOQUINAZOLINE DERIVATIVES

Sung J. Lee, Clarks Summit, Pa.; Yoshitaka Konishi, Mishima, Japan; Orest T. Macina, Clarks Summit, Pa.; Kigen Kondo, Mishima, Japan, and Dingwei T. Yu, Easton, Pa., assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

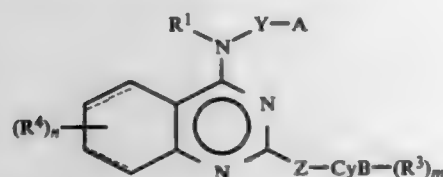
Continuation-in-part of Ser. No. 76,431, Jun. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 913,473, Jul. 15, 1992, abandoned. This application Nov. 19, 1993, Ser. No. 154,691

Int. Cl.<sup>6</sup> A61K 31/505; C07D 239/95

U.S. Cl. 514—63

19 Claims

1. A quinazoline derivative of the formula:



wherein R<sup>1</sup> is hydrogen or C1-4 alkyl;

Y is C1-6 alkylene;

A is —O—R<sup>0</sup> or —S(O)p—R<sup>0</sup>,

in which R<sup>0</sup> is C1-4 alkyl-hydroxy;

p is 0-2;

Z is single bond, methylene, ethylene, vinylene or ethynylene;

CyB is

(1) 7-membered, unsaturated or partially saturated, monocyclic hetero ring containing as hetero atoms, one, two or three nitrogen atoms,

(2) 6-membered, unsaturated or partially saturated, monocyclic hetero ring containing as hetero atoms, two or three nitrogen atoms,

(3) 6-membered, unsaturated or partially saturated, mono-

cyclic hetero ring containing as hetero atom, one nitrogen atom,

(4) 4- or 5-membered, unsaturated or partially saturated, monocyclic hetero ring containing as hetero atoms, one, two or three nitrogen atoms, or

(5) 4-7 membered, unsaturated or partially saturated, monocyclic hetero ring containing as hetero atoms, one or two oxygen atoms, or one or two sulfur atoms;

R<sup>3</sup> is hydrogen, C1-4 alkyl, C1-4 alkoxy, halogen or trifluoromethyl;

R<sup>4</sup> is (1) hydrogen, (2) C1-4 alkyl, (3) C1-4 alkoxy, (4) —COOR<sup>5</sup>, in which R<sup>5</sup> is hydrogen or C1-4 alkyl, (5) —NR<sup>6</sup>R<sup>7</sup>, in which R<sup>6</sup> is hydrogen, C1-4 alkyl or phenyl(C1-4 alkyl) and R<sup>7</sup> is hydrogen or C1-4 alkyl, (6) —NHCOR<sup>8</sup>, in which R<sup>8</sup> is C1-4 alkyl, (7) —NH—SO<sub>2</sub>R<sup>9</sup>, in which R<sup>9</sup> is as hereinbefore defined, (8) SO<sub>2</sub>NR<sup>10</sup>R<sup>11</sup>, in which R<sup>9</sup> and R<sup>10</sup> are as hereinbefore defined, (9) —OCOR<sup>11</sup>, in which R<sup>11</sup> is as hereinbefore defined, (10) halogen, (11) trifluoromethyl, (12) hydroxy, (13) nitro, (14) cyano, (15) —SO<sub>2</sub>N=CHNR<sup>12</sup>R<sup>13</sup> in which R<sup>12</sup> is hydrogen or C1-4 alkyl and R<sup>13</sup> is C1-4 alkyl, (16) —CONR<sup>14</sup>R<sup>15</sup> in which R<sup>14</sup> is hydrogen or C1-4 alkyl and R<sup>15</sup> is C1-4 alkyl or phenyl(C1-4 alkyl), (17) C1-4 alkylthio, (18) C1-4 alkylsulfinyl, (19) C1-4 alkylsulfonyl, (20) ethynyl, (21) hydroxymethyl, (22) tri(C1-4 alkyl)silyl ethynyl or (23) acetyl; and m and n independently are 1 or 2;

with the proviso that

(1) a CyB ring does not bond to Z through a nitrogen atom in the CyB ring when Z is vinylene or ethynylene; or pharmaceutically acceptable acid addition salts thereof, pharmaceutically acceptable salts thereof, or hydrates thereof.

5,439,896

## THERMOSETTING POWDERY COATING COMPOSITION

Haruki Ito, Chigasaki; Kenzou Maeda, Yokohama; Nobuyuki Miyazaki, Yokohama; Masao Unoki, Yokohama; Chiaki Sagawa, Tokyo, and Motoi Kamba, Yokohama, all of Japan, assignors to Nippon Oil and Fats Company, Limited and Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 901,121, Jun. 19, 1992, abandoned, which is a division of Ser. No. 607,610, Oct. 30, 1990, Pat. No. 5,147,934, which is a continuation of Ser. No. 224,054, Jul. 25, 1988, abandoned. This application Sep. 28, 1993, Ser. No. 128,313

Claims priority, application Japan, Jul. 31, 1987, 62-192816

Int. Cl.<sup>6</sup> C08L 27/12, 27/18, 27/20

U.S. Cl. 525—107

10 Claims

(1) A thermosetting powdery coating composition which comprises, in admixture:

(A) from 40 to 98 parts by weight of a fluorine-containing copolymer comprising fluoroolefin monomer compound selected from the group consisting of tetrafluoroethylene, chlorotrifluoroethylene, trifluoroethylene, hexafluoropropylene and pentafluoropropylene and having at least one crosslinkable reactive group selected from the group consisting of carboxyl, glycidyl, amide and isocyanate, said copolymer having a fluorine content of at least 10% by weight, an intrinsic viscosity which is determined at 30° C. in tetrahydrofuran of 0.05 to 2 dl/g, a glass transition temperature of 35° to 120° C., and a weight loss by heating at 105° C. for 3 hours which does not exceed 2%; and (B) from 60 to 2 parts by weight of a curing agent capable of forming crosslinks by reacting with the crosslinkable reactive groups in the fluorine-containing copolymer, said curing agent being selected from the group consisting of acid anhydrides of aliphatic dibasic acids, phthalic anhydride, trimellitic anhydride, pyromellitic anhydride, polyester resins having an acid value from 10 to 300 mg KOH/g, acrylic resins having an acid value from 10 to 300 mg KOH/g, dicyandiamide compounds, imidazole compounds, dibasic acid dihydrazides, amine

compounds, glycidyl-containing compounds, 1,4-bis(2'-hydroxyethoxy)benzene, bis(hydroxyethyl) terephthalate, copolymers of styrene and allyl alcohol, spiroglycol and tris(2-hydroxyethyl)isocyanurate, said composition having a weight loss by heating at 105° C. for 3 hours which does not exceed 5%.

5,439,897

## AZOXYCYANOBENZENE DERIVATIVES, COMPOSITIONS CONTAINING THEM AND THEIR USE AS FUNGICIDES

Werner E. J. Simon, Heilbronn, Germany, assignor to American Cyanamid Company, Wayne, N.J.

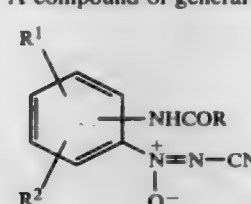
Filed Aug. 16, 1994, Ser. No. 291,270

Claims priority, application European Pat. Off., Aug. 18, 1993, 93113190

Int. Cl.<sup>6</sup> A01N 51/00; C07C 291/08

U.S. Cl. 514—149

1. A compound of general formula



in which

R represents an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl or heterocyclyl group; R<sup>1</sup> represents a halogen atom, nitro, cyano or optionally substituted alkyl, alkoxy, aryl or aryloxy group; and R<sup>2</sup> represents a hydrogen or halogen atom, nitro, cyano or optionally substituted alkyl or alkoxy group.

5,439,898

Patent Not Issued For This Number

5,439,899

## COSALANE AND RELATED COMPOUNDS HAVING ACTIVITY AGAINST AIDS AND AIDS-RELATED INFECTIONS

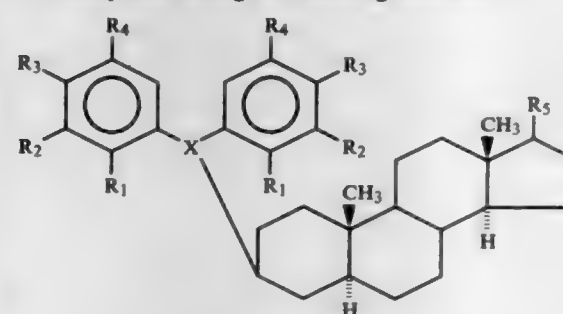
Mark Cushman, West Lafayette, Ind.; Rudiger D. Haugwitz, Bethesda, Md., and Wieslaw M. Golebiewski, West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind. and The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Mar. 10, 1993, Ser. No. 29,415

Int. Cl.<sup>6</sup> C07J 9/00

U.S. Cl. 514—169

1. A compound having the following structure:



wherein R<sub>1</sub> and R<sub>5</sub> independently are H; a halogen; hydroxy; amino; lower alkoxy; benzoyloxy; lower acyloxy; COOH or a salt thereof; SO<sub>3</sub>H or a salt thereof; PO<sub>3</sub>H<sub>2</sub> or a salt thereof; C<sub>8</sub>H<sub>17</sub> or a longer chain alkyl; aryl group; COOR where R is aryl or lower alkyl; SO<sub>3</sub>R where R is aryl or lower alkyl; PO<sub>3</sub>(R)<sub>2</sub> where R is aryl or lower alkyl; CONR'R'' where R' and R'' are each independently H, lower alkyl, aryl, or OH; SO<sub>2</sub>NR'R'' where R' and R'' are each independently H, lower

alkyl, or aryl; SR where R is lower alkyl or aryl; SCH<sub>2</sub>Ph; SCOR where R is lower alkyl or aryl; or NR'R'' where R' and R'' are each independently H, lower alkyl, or aryl; and X is an alkane or alkene radical having up to seven carbon atoms.

5,439,900

## METHODS AND COMPOSITIONS FOR PROVIDING ANALGESIA AND ENHANCED ANESTHESIA

Cuneyt Bukusoglu, 125 Old Mill Rd., Shrewsbury, Mass. 01545; Johann G. Thalhammer, 398 Central St., Framingham, Mass. 01701, and Neil R. Krieger, 23 Lila Rd., Jamaica Plain, Mass. 02130

Filed Feb. 25, 1993, Ser. No. 23,793

Int. Cl.<sup>6</sup> A61K 31/56

U.S. Cl. 514—170

28 Claims

1. A method for preparing an animal subject for surgery comprising:

(a) providing a composition including at least one steroid, an alcohol and a vehicle distinct from the alcohol, the amount of alcohol in relation to the steroid being effective to provide, in a suitable dose of the composition, an enhanced anesthetic effect in comparison to that of the steroid itself;

(b) selecting an effective amount of the composition sufficient to exert an anesthetic effect in an animal subject such that the magnitude of the anesthetic effect of the composition is greater than such an effect cumulatively achieved by all components of the composition acting separately; and

(c) administering the effective amount of the composition to the animal subject.

5,439,901

## CYPROTERONE THIOPIVALATE

Richard J. Schwen, Cincinnati; Mark R. Sine, Morrow, and Raphael Warren, Amberly Village, all of Ohio, assignors to The Procter &amp; Gamble Company, Cincinnati, Ohio

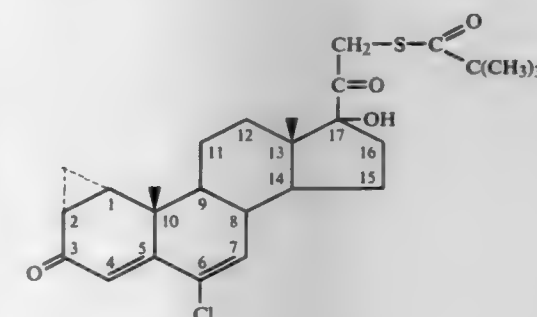
Filed Jul. 23, 1993, Ser. No. 96,081

Int. Cl.<sup>6</sup> A61K 31/56; C07J 7/00

U.S. Cl. 514—178

5 Claims

1. A compound having the structure:



5,439,902

14 $\alpha$ , 16 $\alpha$ -ETHANOAND 14 $\alpha$ ,  
16 $\alpha$ -ETHENO-ESTRADIENES

Henry Laurent, Peter Esperling, Walter Elger, and Rolf Krattemacher, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany  
PCT No. PCT/EP92/00945, § 371 Date Mar. 18, 1994, § 102(e)  
Date Mar. 18, 1994, PCT Pub. No. WO92/19641, PCT Pub. Date Nov. 12, 1992

PCT Filed Apr. 30, 1992, Ser. No. 140,053

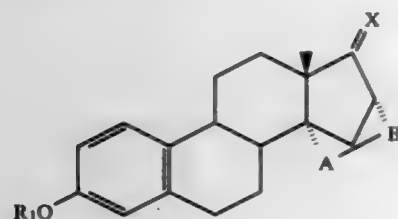
Claims priority, application Germany, Apr. 30, 1991, 41 14 635.2

Int. Cl.<sup>6</sup> C07J 53/00; A61K 31/565

U.S. Cl. 514-179

7 Claims

1. A 14 $\alpha$ ,16 $\alpha$ -Ethano- or 14 $\alpha$ ,16 $\alpha$ -etheno-estradiene of formula I,

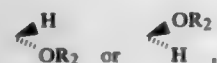


wherein

A-B is a C-C single bond or C-C double bond,

R<sub>1</sub> is a hydrogen atom, a methyl or acyl group with 1-12 carbon atoms and

X is oxygen or



wherein R<sub>2</sub> represents a hydrogen atom or an acyl-group with 1-12 carbon atoms.

5,439,903

ORGANOMETALLIC DIPHENYL HYDRANTOINS AND  
USES THEREOF

Sigmund E. Lasker, Roosevelt Island, N.Y. 10044

Continuation of Ser. No. 974,686, Nov. 12, 1992, Pat. No. 5,298,624, which is a continuation of Ser. No. 765,460, Sep. 25, 1991, abandoned, which is a continuation of Ser. No. 363,288, Jun. 2, 1989, abandoned, which is a continuation of Ser. No. 862,160, May 12, 1986, abandoned, which is a continuation of Ser. No. 570,800, Jan. 16, 1984, abandoned. This application Jan. 7, 1994, Ser. No. 178,768

Int. Cl.<sup>6</sup> C07D 233/58; A61K 31/445

U.S. Cl. 514-184

4 Claims

1. Silver diphenyl hydantoin ammonium complex.

5,439,904

2-SPIRO(2'-SPIROCYCLOALKYL)CYCLOPROPYL  
CEPHALOSPORIN SULFONES AS  
ANTIINFLAMMATORY AND ANTIGENERATIVE  
AGENTS

Samarendra N. Maiti; Charles Y. Flakpui; Andhe V. N. Reddy; David P. Czajkowski, and Ronald G. Micetich, all of Alberta, Canada, assignors to Synphar Laboratories, Inc., Alberta, Canada

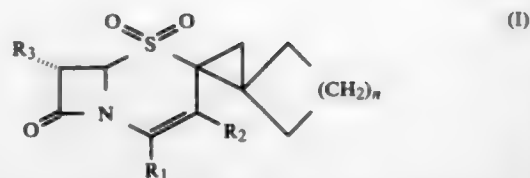
Filed Dec. 7, 1993, Ser. No. 162,478

Int. Cl.<sup>6</sup> C07D 501/59; A61K 31/545

U.S. Cl. 514-200

12 Claims

1. A 7 $\alpha$ -substituted 2-spiro(2'-spirocycloalkyl)cyclopropyl cephalosporin sulfone of the structural formula (I)



wherein R<sub>1</sub> is COOR<sub>4</sub>, COR<sub>4</sub>, C(R<sub>4</sub>)=N-OR<sub>4</sub> in which OR<sub>4</sub> is in the "syn" configuration or the "anti" configuration, CONR<sub>7</sub>R<sub>8</sub>;

R<sub>4</sub> is hydrogen; C<sub>1-6</sub> branched or straight chain alkyl; C<sub>2-6</sub> alkenyl; C<sub>1-6</sub> alkanoyl C<sub>1-6</sub> alkyl; C<sub>1-6</sub> alkanoyloxy C<sub>1-6</sub> alkyl; C<sub>1-6</sub> alkoxy C<sub>1-6</sub> alkyl; halogenated C<sub>1-6</sub> alkyl; -CH<sub>2</sub>-phenyl; -CH(phenyl); the phenyl groups being unsubstituted or substituted with at least one of C<sub>1-6</sub> alkyl, C<sub>1-6</sub> alkoxy, and nitro;

R<sub>5</sub> is hydrogen; C<sub>1-6</sub> straight or branched chain alkyl; C<sub>2-6</sub> alkenyl; C<sub>2-6</sub> alkynyl; C<sub>3-6</sub> cycloalkyl; C<sub>6-10</sub> aryl; aralkyl; thienyl; furyl; pyridyl; pyrimidinyl; imidazolyl; triazinyl; triazolyl; thiazolyl; thiadiazolyl; thienylmethyl; furylmethyl; pyridylmethyl triazolylmethyl; thiazolylmethyl; thiadiazolylmethyl;

R<sub>6</sub> is hydrogen or a C<sub>1-6</sub> straight or branched alkyl, which can be unsubstituted or substituted with -COOH, -COOC<sub>1-6</sub>alkyl,

R<sub>7</sub> and R<sub>8</sub> are the same or different, and are selected from hydrogen; C<sub>1-6</sub> alkyl; C<sub>3-6</sub>cycloalkyl; C<sub>6-10</sub> aryl; C<sub>7-12</sub> aralkyl; C<sub>1-6</sub> alkoxy; carbonyl C<sub>1-6</sub> alkyl;

or R<sub>7</sub> and R<sub>8</sub> in the formula CONR<sub>7</sub>R<sub>8</sub> may combine to form part of a heterocyclic ring containing 3-7 carbon atoms with the nitrogen atom to which they are bound, wherein the heterocyclic ring may contain one or more additional heteroatom selected from the group consisting of N, S and O, and wherein the ring is unsubstituted or substituted at a carbon atom or at a nitrogen atom with C<sub>1-6</sub>alkyl, -COOC<sub>1-6</sub>alkyl, -COOH, -CH<sub>2</sub>COOC<sub>1-6</sub>alkyl, -CH<sub>2</sub>COOH, hydroxy, cyano, carboxamide, hydroxyethyl, haloethyl, or diethoxyphosphinylethyl;

R<sub>2</sub> is hydrogen, chloro, bromo, fluoro, hydroxy, C<sub>1-6</sub> alkoxy, trifluoromethyl, C<sub>1-6</sub> alkyl, C<sub>2-6</sub> alkenyl, C<sub>2-6</sub> alkynyl, C<sub>3-6</sub> cycloalkyl, or -CH<sub>2</sub>X

wherein X is hydroxy, chloro, bromo, C<sub>1-6</sub> alkoxy, C<sub>1-6</sub> alkanoyloxy, -OCONH<sub>2</sub>, -OCONHC<sub>1-6</sub> alkyl, amino, -NHC<sub>1-6</sub>

alkyl, -N(C<sub>1-6</sub> alkyl)<sub>2</sub>; or R<sub>2</sub> is -CH<sub>2</sub>YR<sub>9</sub>, wherein Y is S or N, wherein when Y is sulfur, R<sub>9</sub> is hydrogen, a phenyl group or a 5 to 6 membered heterocyclic group containing 1 to 4 nitrogen atoms, with or without sulfur or oxygen and when Y is nitrogen, R<sub>9</sub> together with Y forms a nitrogen containing heterocyclic ring selected from triazolyl group, pyridinium group, N-methyl pyrrolidinium group, or N-methyl piperidinium group;

n is 0, 1, 2, 3 or 4;

R<sub>3</sub> is hydrogen or C<sub>1-6</sub> alkoxy;

or a pharmaceutically acceptable salt or ester thereof.

5,439,905

THIENODIAZEPINE COMPOUNDS AND THEIR USE  
Yoichi Naka, Iruma; Keiichi Hagi, Chikugo, and Masahiro Hosoya, Iruma, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

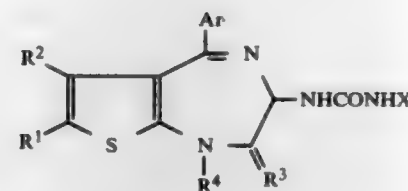
Filed May 27, 1993, Ser. No. 66,130

Int. Cl.<sup>6</sup> A61K 31/55; C07D 487/04, 495/00

U.S. Cl. 514-220

4 Claims

1. A thienodiazepine compound of the formula



wherein

R<sup>1</sup> and R<sup>2</sup> are the same or different and respectively represent hydrogen, halogen, alkyl having 1 to 20 carbon atoms or benzyl, or R<sup>1</sup> and R<sup>2</sup> combined together with the carbon atoms to which they are attached form a ring selected from the group consisting of cyclopentene, cyclopentadiene, cyclohexene, cyclohexadiene, benzene, cycloheptene, cycloheptadiene and cycloheptatriene,

R<sup>3</sup> and R<sup>4</sup> stand for a group wherein R<sup>3</sup> and R<sup>4</sup> combined together form a group of the formula =N=N=C(R<sup>5</sup>)— wherein R<sup>5</sup> stands for hydrogen, alkyl having 1 to 20 carbon atoms, alkenyl having 2 to 8 carbon atoms, benzyl or a group of the formula —(CH<sub>2</sub>)<sub>n</sub>COOR<sup>7</sup> wherein R<sup>7</sup> stands for hydrogen, alkyl having 1 to 20 carbon atoms, alkenyl having 2 to 8 carbon atoms or benzyl and n stands for an integer of 1 to 6;

Ar stands for (1) phenyl which is unsubstituted or is substituted by 1 to 3 substituents selected from the group consisting of halogen, alkyl having 1 to 20 carbon atoms, alkoxy having 1 to 20 carbon atoms, trifluoromethyl, nitro, amino, cyano and hydroxyl, or (2) pyridyl which is unsubstituted or is substituted by 1 to 3 substituents selected from the group consisting of halogen, alkyl having 1 to 20 carbon atoms, alkoxy having 1 to 20 carbon atoms, trifluoromethyl, nitro, amino, cyano and hydroxyl; and

X stands for (1) phenyl which is unsubstituted or is substituted by 1 to 3 substituents selected from the group consisting of halogen, alkyl having 1 to 20 carbon atoms, alkoxy having 1 to 20 carbon atoms, trifluoromethyl, nitro, amino, cyano and hydroxyl, or (2) pyridyl, quinolyl, indolyl, thienyl, furyl, benzofuranyl, 1H-benzimidazol-2-yl or 2-benzothiazolyl, each of which is unsubstituted or is substituted by 1 to 3 substituents selected from the group consisting of halogen, alkyl having 1 to 20 carbon atoms, alkoxy having 1 to 20 carbon atoms, trifluoromethyl, nitro, amino, cyano and hydroxyl; or a pharmaceutically acceptable salt thereof.

4. A method for preventing and treating pancreatic disorders, gastrointestinal ulcers, and dementia, which comprises administering to a patient in need of such treatment a pharmaceutically effective amount of a thienodiazepine compound or pharmaceutically acceptable salt thereof as defined in claim 1.

5,439,906

ANTIARRHYTHMIC BENZODIAZEPINES

Mark G. Bock, Hatfield; Robert M. DiPardo, Lansdale; Roger M. Freidinger, Lansdale; John J. Baldwin, Gwynedd Valley, and David C. Remy, North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

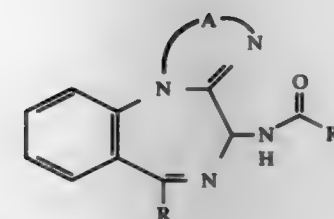
Filed Nov. 22, 1993, Ser. No. 155,672

Int. Cl.<sup>6</sup> A61K 31/55

U.S. Cl. 514-220

5 Claims

1. A method of treating arrhythmia which comprises the administration to a patient in need of such treatment of an effective amount of a compound of structural formula:



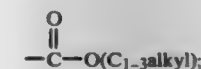
individual diastereomers, enantiomers and mixtures thereof or a pharmaceutically acceptable salt thereof, wherein

R is

- 1) phenyl, either unsubstituted or substituted with halo, such as chloro, bromo or fluoro, or C<sub>1-3</sub> alkyl,
- 2) C<sub>3-6</sub> cycloalkyl;

A is

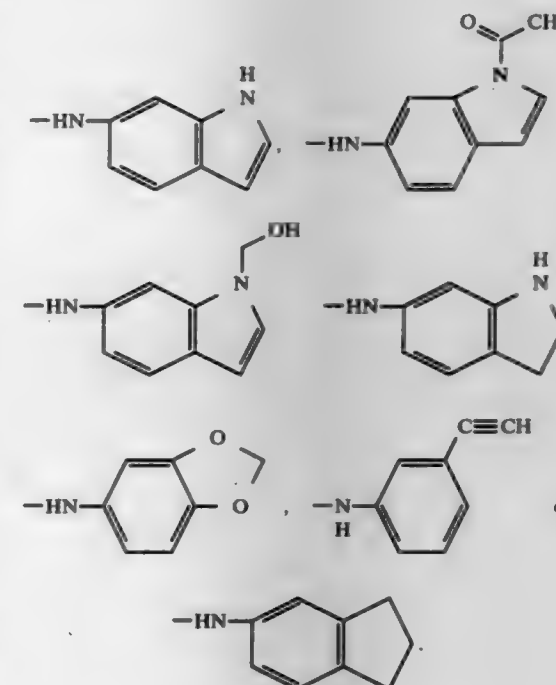
- 1) C<sub>2-3</sub> alkylene or alkenylene either unsubstituted or substituted with C<sub>1-3</sub> alkyl, hydroxy-C<sub>1-3</sub> alkyl or



and  
R<sup>1</sup> is



wherein R<sup>2</sup> is chloro, C<sub>1-3</sub> alkyl or —CF<sub>3</sub>;





5,439,907

## USE OF N9 MORPHOLINO DERIVATIVES OF 7,8-DISUBSTITUTED GUANINES

Robert Chen, Belle Mead, N.J.; Michael G. Goodman, Rancho Santa Fe, Calif., and Allen Reitz, La Jolla, Pa., assignors to The Scripps Research Institute, La Jolla, Calif.

Division of Ser. No. 250,484, May 27, 1994, Pat. No. 5,382,580.

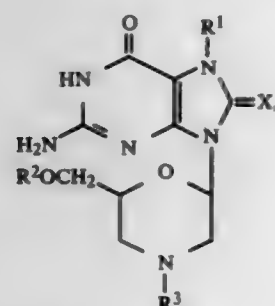
This application Jan. 17, 1995, Ser. No. 373,374

Int. Cl.<sup>6</sup> A61K 31/535

U.S. Cl. 514—234.2

20 Claims

1. A method of enhancing an immune response that comprises contacting leukocytes in an aqueous medium with an amount of a compound of formula I sufficient to enhance the immune response of those leukocytes:



wherein X is O or S;

R<sup>1</sup> is a hydrocarbyl or substituted hydrocarbyl moiety having a length of about one to about seven carbon atoms;

R<sup>2</sup> is hydrogen or C<sub>1</sub>–C<sub>8</sub> acyl;

R<sup>3</sup> is selected from the group consisting of hydrogen, C<sub>1</sub>–C<sub>5</sub> aliphatic hydrocarbyl, aralkyl, and substituted aralkyl groups; and

the pharmaceutically acceptable base addition salts thereof.

5,439,908

## DIAZINYL BUTYRIC ACID AMIDES AND ESTERS

Peter Maierbach, Rodersdorf, Switzerland; Manfred Boger, Weil am Rhein, Germany, and Thomas Pittner, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 30, 1992, Ser. No. 969,628

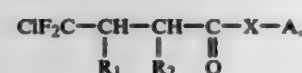
Claims priority, application Switzerland, Nov. 1, 1991, 3195/91

Int. Cl.<sup>6</sup> A61K 31/50, 31/505, 31/495; C07D 241/18, 239/32, 237/14, 237/18, 237/20

U.S. Cl. 514—247

13 Claims

1. A compound of formula



wherein

A is a substituted or unsubstituted, six member monocyclic heterocyclic radical containing two nitrogen atoms that is bonded by way of a carbon atom to X;

each of R<sub>1</sub> and R<sub>2</sub>, independently of the other, is hydrogen or C<sub>1</sub>–C<sub>8</sub>alkyl;

X is NR<sub>3</sub>, O or S; and

R<sub>3</sub> is hydrogen or C<sub>1</sub>–C<sub>4</sub>alkyl, in free form or in salt form.

5,439,909

## NEW SUBSTITUTED BENZODIOXINS

Gérald Guillaumet; Gérard Coudert, both of Orleans; Valérie Thiery, Cléry St André; Gérard Adam, Le Mesnil le Roi; Jean-Guy Bizot-Espiard, Paris; Bruno Pfeiffer, Eaubonne, and Pierre Renard, Versailles, all of France, assignors to Adir et Compagnie, Courbevoie, France

Continuation of Ser. No. 239,034, May 6, 1994. This application Jun. 14, 1994, Ser. No. 259,699

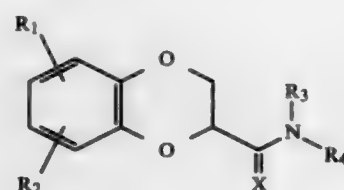
Claims priority, application France, May 7, 1993, 93 05467

Int. Cl.<sup>6</sup> A61K 31/495; C07D 401/14, 405/12

U.S. Cl. 514—253

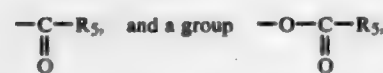
10 Claims

1. A compound selected from those of formula (I):



wherein:

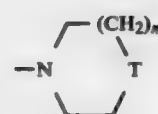
R<sub>1</sub> and R<sub>2</sub>, which are the same or different, are each selected, independently of the other, from hydroxy, alkoxy having 1 to 5 carbon atoms inclusive in straight or branched chain, and for R<sub>2</sub> also from H or C<sub>1</sub>–C<sub>4</sub> alkyl, and a group:



wherein R<sub>5</sub> is selected from alkyl having to 5 carbon atoms inclusive in straight or branched chain, optionally substituted aryl selected from phenyl and naphthyl, optionally substituted aralkyl selected from phenyl and naphthyl attached to an alkyl chain having 1 to 4 carbon atoms inclusive, optionally substituted heteroaryl selected from pyridyl, pyrrolyl, pyrazinyl, pyridazinyl, pyrimidinyl, quinolyl, quinazolinyl and indolyl, and optionally substituted heteroarylalkyl selected from the heteroaryl radicals defined above attached to an alkyl chain having 1 to 4 carbon atoms inclusive,

R<sub>3</sub> and R<sub>4</sub>, which are the same or different, are each selected, independently of the other, from hydrogen, alkyl having 1 to 5 carbon atoms inclusive in straight or branched chain and being optionally substituted, and aryl, aralkyl, heteroaryl and heteroarylalkyl radicals as defined for R<sub>5</sub> each of which may be optionally substituted,

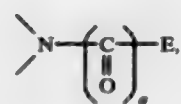
or R<sub>3</sub> and R<sub>4</sub>, together with the nitrogen atom to which they are attached, form a heterocycle of formula (I')



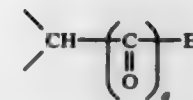
wherein

n is selected from 0, 1, 2 and 3,

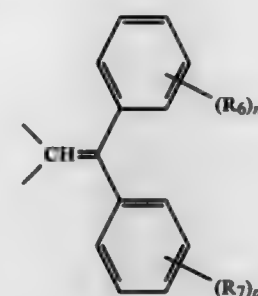
T is selected from oxygen, the group



the group



and the group



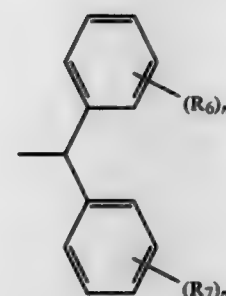
wherein:

m and p, which are the same or different, each independently represents the value 0, 1, 2, 3, 4, or 5,

R<sub>6</sub> and R<sub>7</sub>, which are the same or different, are each selected, independently of the other, from halogen, hydroxy, straight-chain or branched alkyl having 1 to 5 carbon atoms inclusive, alkoxy, haloalkyl, and polyhaloalkyl,

q is selected from 0 and 1,

E is selected from hydrogen, alkyl having from 1 to 5 carbon atoms inclusive in straight or branched chain, aryl, aralkyl, heteroaryl and heteroarylalkyl each of which being as defined hereinbefore for R<sub>5</sub> and being optionally substituted by one or more radicals R<sub>6</sub> as defined hereinbefore, and the group:



wherein R<sub>6</sub>, R<sub>7</sub>, m and p are as defined hereinbefore, with the proviso that, when X=O and R<sub>1</sub>=R<sub>2</sub>=H, T cannot represent CH<sub>2</sub> or quinazolinyl-2-ylamino,

and X is selected from O and S, it being understood that, unless indicated otherwise, the expression "optionally substituted" indicates an optional substitution by one or more radicals selected from hydroxy, nitro, cyano, alkyl, alkoxy, acyl, haloalkyl, polyhaloalkyl, amino, alkylamino and dialkylamino, the alkyl chains of the alkyl, alkoxy, acyl, haloalkyl, polyhaloalkyl, alkylamino and dialkylamino groups having 1 to 5 carbon atoms inclusive in straight or branched chain,

with the following proviso:

when X represents oxygen,

either R<sub>1</sub> and R<sub>2</sub> are each different from hydrogen,

or R<sub>1</sub> is different from hydrogen and R<sub>3</sub> and R<sub>4</sub>, together with the nitrogen atom to which they are attached, form a heterocycle as defined hereinbefore,

their possible stereoisomers, N-oxides, or their pharmaceutical-ly-acceptable addition salts with an acid or a base.

5,439,910

## FUNGICIDES

Paul J. de Fraigne, Wokingham; John M. Clough, Marlow; Paul A. Worthington, Maidenhead Court Park; Brian L. Pilkington, Maidenhead, and Ian R. Matthews, Wokingham, all of England, assignors to Zeneca Limited, London, England

PCT No. PCT/GB92/00681, § 371 Date Oct. 12, 1993, § 102(e) Date Oct. 12, 1993, PCT Pub. No. WO92/18487, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 14, 1992, Ser. No. 133,047

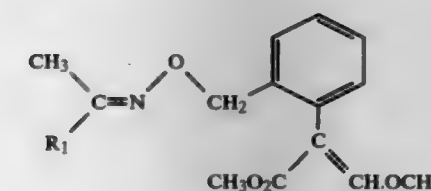
Claims priority, application United Kingdom, Apr. 15, 1991, 9108094; Sep. 27, 1991, 9120642; Jan. 31, 1992, 9202071

Int. Cl.<sup>6</sup> A61K 31/505, 31/44; C07D 239/02, 213/56

U.S. Cl. 514—256

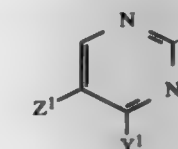
8 Claims

1. A compound of the formula (I):

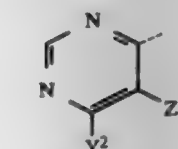


wherein R<sup>1</sup> is:

(i) pyrid-2-yl substituted by one or more groups selected from C<sub>1</sub>–C<sub>6</sub> alkoxy, C<sub>1</sub>–C<sub>6</sub> haloalkyl, C<sub>1</sub>–C<sub>6</sub> haloalkoxy, C<sub>1</sub>–C<sub>4</sub> alkoxy(C<sub>1</sub>–C<sub>6</sub>)alkyl or C<sub>1</sub>–C<sub>4</sub> alkoxy(C<sub>1</sub>–C<sub>6</sub>)alkoxy;



wherein Y<sup>1</sup> is C<sub>2</sub>–C<sub>6</sub> alkyl, C<sub>1</sub>–C<sub>6</sub> haloalkyl, C<sub>1</sub>–C<sub>6</sub> alkoxy, C<sub>1</sub>–C<sub>6</sub> alkylthio, C<sub>1</sub>–C<sub>6</sub> alkylsulphanyl, C<sub>1</sub>–C<sub>6</sub> haloalkoxy, C<sub>1</sub>–C<sub>6</sub> alkoxy(C<sub>1</sub>–C<sub>6</sub>)alkyl, C<sub>1</sub>–C<sub>6</sub> alkoxy(C<sub>1</sub>–C<sub>6</sub>)alkoxy, C<sub>1</sub>–C<sub>4</sub> alkoxy(C<sub>1</sub>–C<sub>6</sub>)alkoxy(C<sub>1</sub>–C<sub>6</sub>)alkoxy, di(C<sub>1</sub>–C<sub>4</sub> alkoxy)(C<sub>1</sub>–C<sub>6</sub>)alkoxy, C<sub>2</sub>–C<sub>6</sub> alkenyloxy or C<sub>2</sub>–C<sub>6</sub> alkynyloxy and Z<sup>1</sup> is hydrogen, fluorine, chlorine or C<sub>1</sub>–C<sub>6</sub> alkyl; or Y<sup>1</sup> is methyl and Z<sup>1</sup> is fluorine, chlorine or C<sub>1</sub>–C<sub>6</sub> alkyl; or,



wherein Y<sup>2</sup> is C<sub>2</sub>–C<sub>6</sub> alkyl, C<sub>1</sub>–C<sub>6</sub> haloalkyl, C<sub>2</sub>–C<sub>6</sub> alkoxy, C<sub>1</sub>–C<sub>6</sub> alkylthio, C<sub>1</sub>–C<sub>6</sub> alkylsulphanyl, C<sub>1</sub>–C<sub>6</sub> haloalkoxy or C<sub>2</sub>–C<sub>6</sub> alkynyloxy and Z<sup>2</sup> is hydrogen, fluorine, chlorine or C<sub>1</sub>–C<sub>4</sub> alkyl; or Y<sup>2</sup> is methyl or methoxy and Z<sup>2</sup> is fluorine, chlorine or C<sub>1</sub>–C<sub>4</sub> alkyl.

5,439,911

## AMINOPYRIMIDINE DERIVATIVES AND THEIR PRODUCTION AND USE

Toshikazu Ohtsuka, Koka; Moriyo Masui, Yokkaichi; Takami Takeda, Youkaichi; Michio Masuko, Koka, and Katsuki Ohba, Koka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Dec. 17, 1993, Ser. No. 168,217

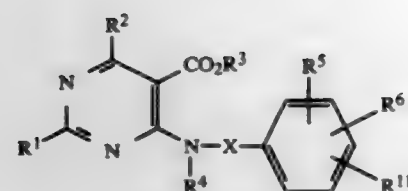
Claims priority, application Japan, Dec. 28, 1992, 4-348535; Feb. 1, 1993, 3-014980

Int. Cl.<sup>6</sup> C07D 239/42; A01N 43/54

U.S. Cl. 514—256

11 Claims

1. A compound of the formula (I);



wherein

R<sup>1</sup> is (1) a hydrogen atom, (2) a halogen atom, (3) C<sub>1-6</sub> alkyl, (4) C<sub>1-6</sub> alkylthio, (5) a heterocyclic group selected from the group consisting of pyridyl, pyrimidinyl, pyrazinyl, thiazolyl, benzothiazolyl, benzofuranyl, benzothienyl, oxazolyl, benzoxazolyl, isoxazolyl, pyrazolyl, imidazolyl and quinolyl, which is unsubstituted or substituted by a halogen atom, C<sub>1-4</sub> alkyl, halo-C<sub>1-4</sub> alkyl, or C<sub>1-4</sub> alkoxy, (6) phenyl which is unsubstituted or substituted by a halogen atom, C<sub>1-4</sub> alkyl, halo-C<sub>1-4</sub> alkyl or C<sub>1-4</sub> alkoxy;

R<sup>2</sup> is C<sub>1-6</sub> alkyl;

R<sup>3</sup> is (1) a hydrogen atom, (2) C<sub>1-6</sub> alkyl, (3) C<sub>2-6</sub> alkenyl, (4) C<sub>2-6</sub> alkynyl or (5) C<sub>6-10</sub> aryl-C<sub>1-4</sub> alkyl;

R<sup>4</sup> is (1) a hydrogen atom or (2) C<sub>1-6</sub> alkyl;

R<sup>5</sup>, R<sup>6</sup> and R<sup>11</sup> each is (1) a hydrogen atom, (2) a halogen atom, (3) C<sub>1-6</sub> alkoxy, (4) C<sub>1-6</sub> alkyl, (5) halo-C<sub>1-4</sub> alkyl, (6) C<sub>1-4</sub> alkoxy-C<sub>1-4</sub> alkyl, (7) hydroxy-C<sub>1-4</sub> alkyl, (8) C<sub>1-4</sub> alkylsulfonyloxy-C<sub>1-4</sub> alkyl, (9) tetrahydropyranyloxy-C<sub>1-4</sub> alkyl, (10) mono- or di-C<sub>1-4</sub> alkylamino-C<sub>1-4</sub> alkyl, (11) C<sub>1-4</sub> alkylthio-C<sub>1-4</sub> alkyl, (12) C<sub>1-4</sub> alkylsulfinyl-C<sub>1-4</sub> alkyl, (13) C<sub>1-4</sub> alkylsulfonyl-C<sub>1-4</sub> alkyl, (14) C<sub>2-6</sub> alkenyl, (15) C<sub>2-6</sub> alkynyl, (16) hydroxyl, (17) C<sub>1-6</sub> alkoxy, (18) C<sub>2-6</sub> alkenyloxy, (19) C<sub>2-6</sub> alkynyloxy, (20) halo-C<sub>1-6</sub> alkoxy, (21) C<sub>1-4</sub> alkoxy-C<sub>1-4</sub> alkoxy, (22) hydroxy-C<sub>1-4</sub> alkoxy, (23) C<sub>1-4</sub> alkylthio-C<sub>1-4</sub> alkoxy, (24) C<sub>1-4</sub> alkylsulfonyloxy-C<sub>1-4</sub> alkoxy, (25) C<sub>1-4</sub> alkylsulfinyl-C<sub>1-4</sub> alkoxy, (26) C<sub>1-4</sub> alkylsulfonyl-C<sub>1-4</sub> alkoxy, (27) mono- or di-C<sub>1-4</sub> alkylamino-C<sub>1-4</sub> alkoxy, (28) tetrahydropyranyloxy-C<sub>1-4</sub> alkoxy, (29) phenoxy, (30) 4-halophenoxy, (31) mono- or di-C<sub>1-6</sub>-alkylamino, (32) C<sub>1-6</sub> alkylthio, (33) C<sub>1-6</sub> alkylsulfinyl, (34) C<sub>1-6</sub> alkylsulfonyl or (35) nitro; and

X is (1) C<sub>1-6</sub> alkylene or (2) C<sub>1-6</sub> alkyleneoxy; or a salt thereof.

# 5,439,913 CONTRACEPTION METHOD USING COMPETITIVE PROGESTERONE ANTAGONISTS AND NOVEL COMPOUNDS USEFUL THEREIN

Krzysztof Chwalisz; Walter Elger; Karin Schmidt-Gollwitzer, and Eckhard Ottow, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany  
Filed Jul. 1, 1992, Ser. No. 907,514

Claims priority, application Germany, May 12, 1992, 42 16 003.0; May 12, 1992, 42 16 004.9

Int. Cl.<sup>6</sup> A61K 31/435; C07D 213/30

U.S. Cl. 514—277

17 Claims

1. A method of contraception in a female, which comprises administering to the female during the follicular phase of her menstrual cycle and optionally also in the luteal phase thereof an amount of a competitive progesterone antagonist, which is less than an ovulation-inhibiting dose and less than an abortion-inducing dose and which is effective to inhibit the formation of endometrial glands and epithelium growth.

## 5,439,914 SPIROCYCLES

David A. Claremon, Maple Glen; Gerald S. Ponticello, Lansdale, and Harold G. Selnick, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

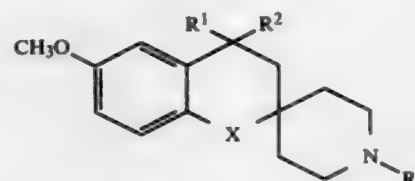
Filed Feb. 18, 1994, Ser. No. 198,940

Int. Cl.<sup>6</sup> A61K 31/445; C07D 491/107

U.S. Cl. 514—278

9 Claims

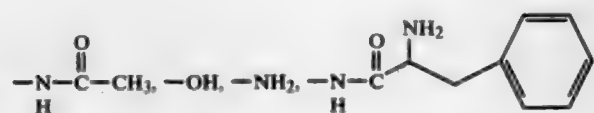
1. A compound of the structural formula:



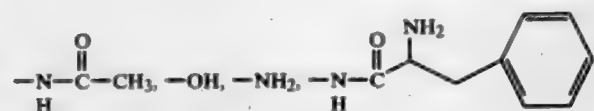
wherein:

X is CH<sub>2</sub>;

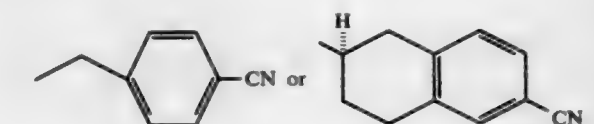
R<sup>1</sup> is H if R<sup>2</sup> is not H or if R<sup>2</sup> is H then R<sup>1</sup> is



R<sup>2</sup> is —H if R<sup>1</sup> is not H or if R<sup>1</sup> is H then R<sup>2</sup> is



(I) and R<sup>3</sup> is



or a pharmaceutically acceptable salt, hydrate or crystal form thereof.

## 5,439,912

### 2-PHENYLAMINO-4-CYANO-PYRIMIDINES

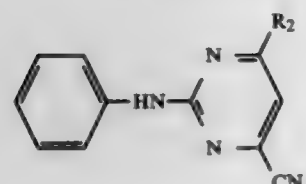
Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 949,273, Sep. 21, 1992, abandoned, which is a continuation of Ser. No. 699,544, May 14, 1991, abandoned. This application Jul. 29, 1994, Ser. No. 282,385  
Claims priority, application Switzerland, May 17, 1990, 1668/90

Int. Cl.<sup>6</sup> C07D 239/42; A01N 43/54

U.S. Cl. 514—275

1. A compound of formula I



wherein R<sub>2</sub> is C<sub>1-4</sub>alkyl; or an acid addition salt or metal salt complex thereof.

## 5,439,915

### PYRIDO[3,4-B]INDOLE CARBOXAMIDE DERIVATIVES AS SEROTON ERGIC AGENTS

Thomas J. Commons, Wayne; Christa M. LaClair, Newtown, both of Pa., and Susan Christman, Edison, N.J., assignors to American Home Products Corporation, Madison, N.J.

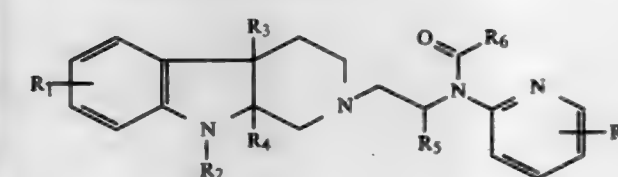
Filed Oct. 20, 1994, Ser. No. 326,636

Int. Cl.<sup>6</sup> A61K 31/44; C07D 471/04

U.S. Cl. 514—292

7 Claims

1. A compound of the formula:



where

R<sub>1</sub> and R<sub>7</sub> are independently hydrogen, fluorine, chlorine, bromine, iodine, trifluoromethyl, cyano, nitro, CO<sub>2</sub>H, C<sub>1-6</sub> alkyl, C<sub>2-10</sub> alkenyl, C<sub>1-6</sub> alkoxy, C<sub>3-8</sub> cycloalkyl, cycloalkylalkyl where the alkyl group is of 1 to 6 carbon atoms and the cycloalkyl group has 3 to 8 carbon atoms, C<sub>3-8</sub> cycloalkyloxy, C<sub>2-7</sub> alkylcarbonyl, C<sub>2-7</sub> alkylcarbonyloxy, C<sub>2-7</sub> alkoxycarbonyl, mono- or dialkylaminocarbonyl in which each alkyl group, independently, contains 1 to 6 carbon atoms, tetrazolyl, -OH, -(CH<sub>2</sub>)<sub>1-6</sub>OH, -SH, -NH<sub>2</sub> or -(CH<sub>2</sub>)<sub>1-6</sub>NR<sub>8</sub>R<sub>9</sub> where R<sub>8</sub> is hydrogen, C<sub>1-6</sub> alkyl, C<sub>2-7</sub> alkylcarbonyl, C<sub>2-7</sub> alkoxycarbonyl and R<sub>9</sub> is hydrogen or C<sub>1-6</sub> alkyl;

R<sub>2</sub> is hydrogen or C<sub>1-6</sub> alkyl;

R<sub>3</sub> and R<sub>4</sub> are hydrogen or taken together with the carbon atoms to which they are attached form a double bond;

R<sub>5</sub> is hydrogen or C<sub>1-6</sub> alkyl;

R<sub>6</sub> is C<sub>1-12</sub> alkyl, C<sub>3</sub> to C<sub>8</sub> cycloalkyl, cycloalkylalkyl where the alkyl group is of 1 to 6 carbon atoms and the cycloalkyl group has 3 to 8 carbon atoms, or C<sub>6</sub> to C<sub>12</sub> bicyclic or C<sub>9</sub> to C<sub>14</sub> tricyclic alkyl; or a pharmaceutically acceptable salt thereof.

## 5,439,916

### POLYCYCLIC QUINOLINE, NAPHTHYRIDINE AND PYRAZINOPYRIDINE DERIVATIVES

Ashit K. Ganguly, Montclair; Richard J. Friary, West Orange; John H. Schwerdt, Lake Hiawatha; Marvin I. Siegel, Woodbridge; Sidney R. Smith, Ridgewood, and Edmund J. Sybertz, South Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

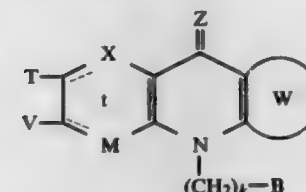
Division of Ser. No. 307,646, Feb. 7, 1989, Pat. No. 4,988,705, which is a division of Ser. No. 17,027, Feb. 17, 1987, Pat. No. 4,810,708, which is a continuation-in-part of Ser. No. 861,788, May 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 744,865, Jun. 13, 1985, abandoned. This application Aug. 31, 1990, Ser. No. 576,319

Int. Cl.<sup>6</sup> A61K 31/38, 31/395; C07D 471/04, 239/04

U.S. Cl. 514—293

11 Claims

1. A compound having the structural formula I



or a pharmaceutically acceptable salt or solvate thereof, wherein: in formula I:

the dotted lines (—) represent optional double bonds;

W is

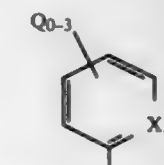


T and V may be the same or different and each represents H, OH, alkyl, alkoxy, phenyl or substituted phenyl; in addition, T may also be F, Cl, or Br;

X and M must be different and each represents —CH(R<sup>a</sup>)— or —NA— when the dotted line — attached thereto does not represent a double bond; or X and M each represents —CH— or —N— when the dotted line — attached thereto represents a double bond;

with the proviso that X and M together contain one carbon atom and one nitrogen atom;

or when M is N and the dotted lines — in ring t both represent double bonds, X and T together with the carbon atom of the ring t therebetween may also represent a group



wherein X is a carbon atom and Q<sub>0-3</sub> represents zero, 1, 2 or 3 Q substituents as defined below;

each A is independently selected from H, alkyl, —CH<sub>2</sub>CH<sub>2</sub>OH, COR<sup>b</sup>, COOR<sup>c</sup>, SO<sub>2</sub>R<sup>b</sup> or (CH<sub>2</sub>)<sub>3</sub>R<sup>c</sup>;

Z is O, S, N—R<sup>e</sup> or N(OR<sup>f</sup>);

B is alkyl, alkenyl (provided k is not zero), NH<sub>2</sub>, COOR<sup>e</sup>, O(CO)R<sup>e</sup>, or an aryl group selected from phenyl, naphthyl, indenyl, indanyl, phenanthridinyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, 1,2,4-triazinyl, furanyl, thienyl, benzofuranyl, indolyl, imidazolyl, pyrazolyl, triazolyl, or thiazolyl, any of which aryl groups may be substituted with up to three of any of the following substituents, Q: halogen, hydroxy, nitro, alkyl, CH<sub>2</sub>OH, trifluoromethyl, cyano, N(R<sup>g</sup>)<sub>2</sub>, cycloalkyl, alkoxy, alkenyloxy, alkynyloxy, S(O)<sub>2</sub>R<sup>e</sup>, NHSO<sub>2</sub>R<sup>e</sup>, NHSO<sub>2</sub>CF<sub>3</sub>, NHCOCF<sub>3</sub>, SO<sub>2</sub>NH<sub>2</sub>, SO<sub>2</sub>NHR<sup>e</sup>, SO<sub>2</sub>N(R<sup>g</sup>)<sub>2</sub>, COR<sup>h</sup>, —O—D—COR<sup>h</sup>, or NHCOR<sup>h</sup>;

R<sup>a</sup> is H, OH, alkyl, phenyl, substituted phenyl, phenylalkyl or substituted phenylalkyl;

R<sup>b</sup> is H, alkyl, phenyl, substituted phenyl, or N(R<sup>g</sup>)<sub>2</sub>;

R<sup>c</sup> represents carboxyl or N(R<sup>g</sup>)<sub>2</sub>;

R<sup>d</sup> represents H, alkyl, alkoxy, COR<sup>i</sup>, or NHR<sup>k</sup>;

each R<sup>e</sup> independently represents alkyl, phenyl, substituted phenyl, benzyl or substituted benzyl;

each R<sup>f</sup> independently represents H or alkyl;

R<sup>g</sup> represents OH, NH<sub>2</sub> or OR<sup>e</sup>;

each R<sup>h</sup> independently represents H or alkyl;

R<sup>i</sup> represents OH or alkoxy;

R<sup>k</sup> represents H or alkyl;

D represents alkylene;

k is 0, 1 or 2;

r is 0, 1 or 2; and

s is 1, 2, 3, 4 or 5;

in formula III:

the dotted line — represents one optional double bond or two optional non-cumulated double bonds;

of the groups a, b, c and d, one of a and b is O or S(C<sup>r</sup>), and each of the other three may be the same or different and each represents CH<sub>2</sub> or CH (if the dotted line — attached thereto represents a double bond); and

r is as defined above.



5,439,917

## ACTIVE COMPOUNDS

Carin Briving, Bildal; Stig Carlsson, Mölnlycke; Robert Carter, Mölnlycke; Marie Elebring, Mölnlycke; Thomas Kühler, Göteborg; Peter Nordberg, Göteborg; Ingemar Starke, Göteborg, and Arne Svensson, Mölndal, all of Sweden, assignors to Aktiebolaget Astra, Södertälje, Sweden

PCT No. PCT/SE92/00190, § 371 Date Sep. 27, 1993, § 102(e) Date Sep. 27, 1993, PCT Pub. No. WO92/17477, PCT Pub. Date Oct. 15, 1992

PCT Filed Mar. 25, 1992, Ser. No. 122,442

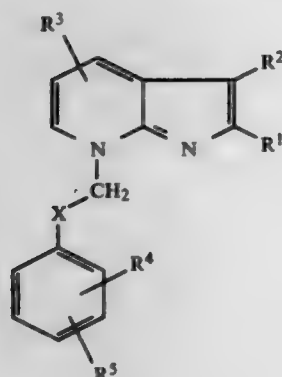
Claims priority, application Sweden, Mar. 27, 1991, 9100920

Int. Cl.<sup>6</sup> A61K 31/435; C07D 471/04

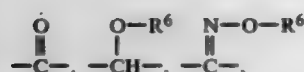
U.S. Cl. 514-300

33 Claims

1. A compound of the formula I



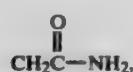
or a pharmaceutically acceptable salt thereof, wherein X represents



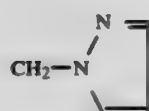
or -CH2-;

R<sup>1</sup> represents H, lower alkyl, CH<sub>2</sub>-O-R<sup>7</sup>, halogen, phenyl or phenyl substituted with (1-6c) alkyl, (1-6c) alkoxy, (1-6c) acyl, halogen, CF<sub>3</sub>, CN, NH<sub>2</sub>, NO<sub>2</sub>, or (1-6c) alkoxycarbonyl;

R<sup>2</sup> represents H, lower alkyl, CH<sub>2</sub>CN,



halogen, O-R<sup>8</sup>,



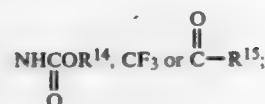
S-CN, CH<sub>2</sub>OH, CH<sub>2</sub>C=CH, CF<sub>3</sub>, CH<sub>2</sub>NC or NH<sub>2</sub>;

R<sup>3</sup> represents H, lower alkyl, CF<sub>3</sub>, O-R<sup>9</sup>, NH<sub>2</sub>, lower alkylamino, di-lower alkylamino, halogen, CN,



S-R<sup>10</sup>, or NHCOR<sup>10</sup>;

R<sup>4</sup> and R<sup>5</sup>, which are the same or different, represent H, lower alkyl, CN, halogen, O-R<sup>11</sup>, NO<sub>2</sub>, NH<sub>2</sub>, lower alkylamino, di-lower alkylamino, S-R<sup>12</sup>, NHCOR<sup>13</sup>,



R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>11</sup> and R<sup>13</sup> which are the same or different, represent H or lower alkyl;

R<sup>10</sup> represents lower alkyl or phenyl lower alkyl;

R<sup>12</sup> and R<sup>14</sup> which are the same or different represent lower alkyl;

R<sup>15</sup> represents H, lower alkyl, OH or lower alkoxy; provided that R<sup>1</sup> and R<sup>2</sup> are not simultaneously H.

5,439,918

## INHIBITORS OF FARNESYL-PROTEIN TRANSFERASE

S. Jane deSolms, Norristown, and Samuel L. Graham, Schwenksville, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

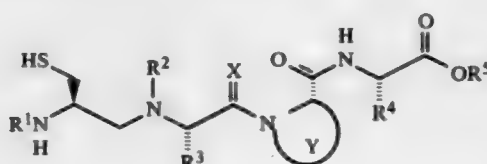
Filed Mar. 14, 1994, Ser. No. 212,489

Int. Cl.<sup>6</sup> C07D 217/12

U.S. Cl. 514-307

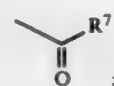
13 Claims

1. A compound of the formula I:

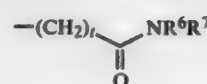


or a pharmaceutically acceptable salt or disulfide thereof; wherein:

R<sup>1</sup> and R<sup>2</sup> are independently selected from H, C<sub>1-4</sub> alkyl, C<sub>1-4</sub> aralkyl, -S(O)<sub>m</sub>-R<sup>6</sup> and



R<sup>3</sup> and R<sup>4</sup> are independently selected from: H; C<sub>1-8</sub> alkyl, alkenyl, alkynyl, or



unsubstituted or substituted with one or more of:

1) aryl or heterocycle, unsubstituted or substituted with:

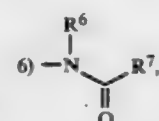
- C<sub>1-4</sub> alkyl,
- (CH<sub>2</sub>)<sub>m</sub>OR<sup>6</sup>,
- (CH<sub>2</sub>)<sub>m</sub>NR<sup>6</sup>R<sup>7</sup>, or
- halogen,

2) C<sub>3-6</sub> cycloalkyl,

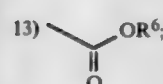
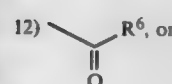
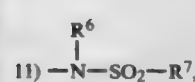
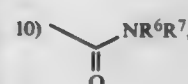
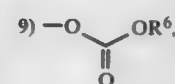
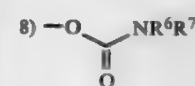
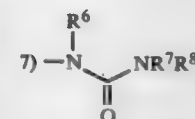
3) OR<sup>6</sup>,

4) SR<sup>6</sup>, S(O)T<sup>6</sup>, SO<sub>2</sub>R<sup>6</sup>,

5) -NR<sup>6</sup>R<sup>7</sup>,



-continued



R<sup>5</sup> is hydrogen;

R<sup>6</sup>, R<sup>7</sup> and R<sup>8</sup> are independently selected from: H; C<sub>1-4</sub> alkyl, C<sub>3-6</sub> cycloalkyl, heterocycle, aryl, unsubstituted or substituted with:

- C<sub>1-4</sub> alkoxy,
- aryl or heterocycle,
- halogen,
- HO,

e) -C(=O)-R<sup>9</sup>, or

f) -SO<sub>2</sub>R<sup>9</sup>,

wherein

R<sup>6</sup> and R<sup>7</sup> may be joined in a ring, and

R<sup>7</sup> and R<sup>8</sup> may be joined in a ring;

R<sup>9</sup> is C<sub>1-4</sub> alkyl or aralkyl;

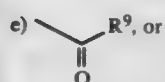
m is 0, 1 or 2;

t is 1 to 4;

X is O or H<sub>2</sub>; and

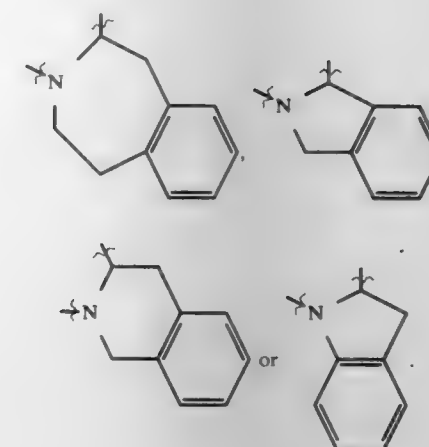
Y is substituted or unsubstituted nitrogen containing C<sub>4</sub>-C<sub>9</sub> mono or bicyclic ring system wherein the non-nitrogen containing ring may be an aromatic ring, a C<sub>5</sub>-C<sub>7</sub> saturated ring or a heterocycle and wherein the substituent is selected from C<sub>1-4</sub> alkyl, C<sub>3-6</sub> cycloalkyl, heterocycle, aryl, said substituent which is unsubstituted or substituted with:

- C<sub>1-4</sub> alkoxy,
- aryl or heterocycle,
- halogen,
- HO,



f) -SO<sub>2</sub>R<sup>9</sup>;

provided that Y is not



5,439,919

## ARYLGLYCINAMIDE DERIVATIVES AND PREPARATIVE PROCESSES THEREFOR

Hiroyuki Miyachi, Kazo; Mitsuru Segawa, Omiya; Emiko Tagami, Otone, and Hideo Okubo, Nogi, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1993, Ser. No. 93,854

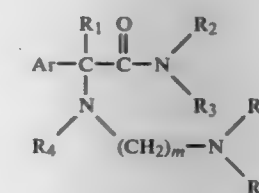
Claims priority, application Japan, Jul. 27, 1992, 4-219699; Jul. 14, 1993, 5-196882

Int. Cl.<sup>6</sup> C07C 233/00; C07D 211/30; A01N 43/40

U.S. Cl. 514-316

2 Claims

1. Arylglycinamide derivatives represented by a general formula (1)



(wherein Ar denotes a phenyl group which may have 1 to 3 substituents or naphthyl group which may have 1 to 3 substituents, R<sub>1</sub> and R<sub>4</sub> denote identically or differently hydrogen atoms or lower alkyl groups with 1 to 3 carbon atoms, R<sub>2</sub> denotes a lower alkyl group with 1 to 6 carbon atoms, cycloalkyl group with 3 to 6 carbon atoms, lower alkyl group with 1 to 4 carbon atoms which may have a phenyl group which may have 1 to 3 substituents, norbornyl group, adamantyl group or phenyl group which may have 1 to 3 substituents, R<sub>3</sub> denotes a hydrogen atom or lower alkyl group with 1 to 6 carbon atoms or it may form a ring constituting alkylene together with R<sub>2</sub>, R<sub>5</sub> denotes a lower alkyl group with 1 to 6 carbon atoms or cycloalkyl group with 5 or 6 carbon atoms, R<sub>6</sub> denotes a hydrogen atom or lower alkyl group with 1 to 6 carbon atoms or it may form a ring constituting alkylene together with R<sub>5</sub>, and m denotes 2 or 3), and their salts.

5,439,920

## 1,2,5,6-TETRAHYDROPYRIDINE DERIVATIVE, PROCESS FOR PREPARING IT AND ITS APPLICATIONS IN THERAPY

Philippe Laurent, Oullins, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

Filed Mar. 22, 1994, Ser. No. 215,782

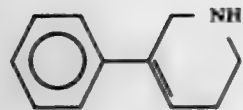
Claims priority, application France, Mar. 31, 1993, 93 03783

Int. Cl.<sup>6</sup> C07D 211/70; A61K 31/44

U.S. Cl. 514-317

3 Claims

1. A compound selected from the compound of formula:



and its addition salts with pharmaceutically acceptable acids.

5,439,921

## THERAPEUTIC USE OF PIPERIDINE-2,6-DIONES

Mitchell Dowsett, Rochester, England, assignor to British Technology Group Limited, London, England

PCT No. PCT/GB91/01099, § 371 Date Jan. 6, 1993, § 102(e) Date Jan. 6, 1993, PCT Pub. No. WO92/00738, PCT Pub. Date Jan. 23, 1992

PCT Filed Jul. 5, 1991, Ser. No. 960,405

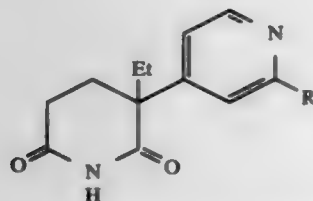
Claims priority, application United Kingdom, Jul. 6, 1991, 9014968

Int. Cl.<sup>6</sup> H61K 31/445

U.S. Cl. 514—318

3 Claims

1. A method of treating a patient suffering from prostatic cancer or benign prostatic hypertrophy comprising the step of administering to said patient an effective dosage of compound of formula (I)



wherein R represents a hydrogen atom or alkyl group having 1 to 4 carbon atoms or an acid addition salt thereof.

5,439,922

## PIPERIDYL-SUBSTITUTED INDOLES FOR TREATING ANXIETY

Jens K. Perregaard, Jaegerspris, Denmark, and Brenda Costall, Bradford, England, assignors to H. Lundbeck A/S, Copenhagen-Valby, Denmark

Filed Dec. 17, 1992, Ser. No. 999,482

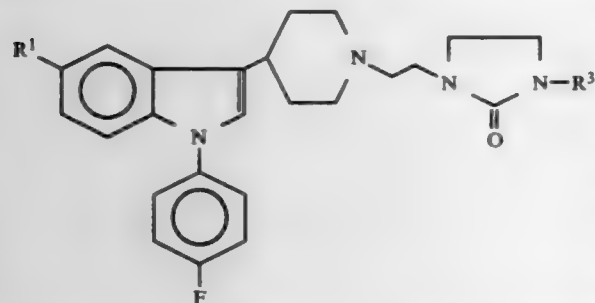
This is a continuation of PCT/DK91/00168, filed Jun. 21, 1991. Claims priority, application Denmark, Jun. 22, 1990, 1520/90

Int. Cl.<sup>6</sup> A61K 31/445; C07D 401/14, 403/14, 403/04

U.S. Cl. 514—323

1 Claim

1. A method for treating anxiety in mammals comprising administering in an effective amount, to said mammal, an 1-aryl-3-(4-piperidyl)indole derivative having the general formula:



wherein R<sup>1</sup> is hydrogen, fluorine, chlorine, bromine, methyl, methoxy or cyano; wherein R<sup>3</sup> is hydrogen or methyl; or a pharmaceutically acceptable acid addition salt thereof.

5,439,923  
METHOD OF INHIBITING SEBORRHEA AND ACNE  
George J. Cullinan, Trafalgar, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

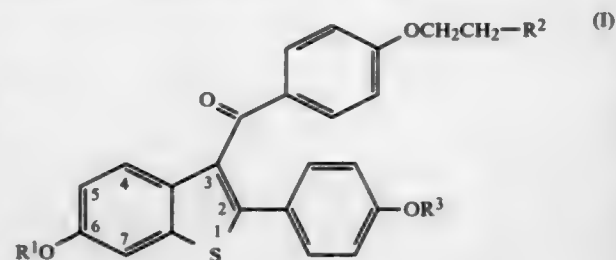
Filed Dec. 21, 1993, Ser. No. 170,970

Int. Cl.<sup>6</sup> A61K 31/445

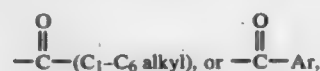
U.S. Cl. 514—324

5 Claims

1. A method of inhibiting acne or seborrhea comprising administering to a human in need of treatment an effective amount of a compound having the formula



wherein R<sup>1</sup> and R<sup>3</sup> are independently hydrogen, —CH<sub>3</sub>,



(I) wherein Ar is optionally substituted phenyl; R<sup>2</sup> is selected from the group consisting of pyrrolidino, hexamethylenemino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof.

5,439,924

## SYSTEMIC CONTROL OF PARASITES

Thomas A. Miller, Carrollton, Tex., assignor to Virbac, Inc., Fort Worth, Tex.

Continuation of Ser. No. 980,591, Nov. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 812,430, Dec. 23, 1991, abandoned. This application Mar. 17, 1994, Ser. No. 210,135

Int. Cl.<sup>6</sup> A61K 31/09, 31/44

U.S. Cl. 514—345

37 Claims

25. A method of systemically controlling ectoparasites and endoparasites in warm blooded animals which comprises administering a single dose in the range of about 10 to 200 mg/kg of 2-[1-methyl-2-(4-phenoxyphenoxy)ethoxy]pyridine (pyriproxifen) formulated to deliver an ovicidally effective amount to the animals blood stream for at least 25 days and 0.5 mcg/kg to 100 mg/kg of a parasite control compound selected from the group consisting of milbemycin, milbemycin derivatives, ivermectin, ivermectin derivatives, milbemycin oxime, milbemycin oxime derivatives, moxidectin, moxidectin derivatives, avermectin, and avermectin derivatives, or mixtures thereof, to a warm blooded animal such that ectoparasites feeding on the blood of the animal receive an ovicidally effective amount of pyriproxifen for at least 25 days.

5,439,925

## DI(AROMATIC) COMPOUNDS AND THEIR USE IN HUMAN AND VETERINARY MEDICINE AND IN COSMETICS

Jean-Michel Bernardon, Nice, and William R. Pilgrim, Valbonne, both of France, assignors to Centre International de Recherches Dermatologiques Galderma (Cird Galderma), Valbonne, France

Division of Ser. No. 859,522, Aug. 4, 1992, Pat. No. 5,387,594. This application Dec. 16, 1993, Ser. No. 167,145

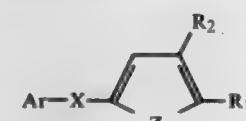
Claims priority, application Luxembourg, Oct. 12, 1990, 87821

Int. Cl.<sup>6</sup> A61K 31/165, 31/19, 31/235; C07C 69/76

U.S. Cl. 514—353

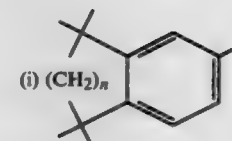
22 Claims

1. A di(aromatic) compound having the formula:

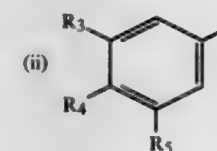


wherein

Ar represents



wherein n=1 or 2 or



wherein

R<sub>3</sub> and R<sub>5</sub> represent hydrogen, OH, alkoxy having 1–6 carbon atoms, α-branched alkyl having from 3–12 carbon atoms, α,α-branched alkyl having from 4–12 carbon atoms, cycloalkyl having from 3–12 carbon atoms, or mono- or polycyclic cycloalkyl having from 5–12 carbon atoms in which the carbon having the free valence is trisubstituted,

R<sub>4</sub> represents hydrogen, OH, alkoxy having 1–6 carbon atoms, α-branched alkyl having 3–12 carbon atoms, α,α-branched alkyl having 4–12 carbon atoms, cycloalkyl having 3–12 carbon atoms, mono- or polycyclic cycloalkyl having 5–12 carbon atoms in which the carbon having the free valence is trisubstituted, monohydroxyalkyl, polyhydroxyalkyl, fluorine, chlorine, SH, SR<sub>6</sub>, SOR<sub>6</sub>, SO<sub>2</sub>R<sub>6</sub>, alkenyl having 2–6 carbon atoms or alkenyloxy having 2 to 6 carbon atoms,

R<sub>6</sub> represents lower alkyl,

R<sub>1</sub> represents —COR<sub>7</sub>,

R<sub>7</sub> represents hydrogen, OH, —OR<sub>10</sub>, —N(r'r''), lower alkyl, monohydroxyalkyl, polyhydroxyalkyl or a sugar residue,

R<sub>10</sub> represents alkyl having 1–12 carbon atoms or alkenyl having 2–10 carbon atoms,

r' and r'' each independently, represent hydrogen, lower alkyl, aryl, aralkyl, an amino acid residue, a sugar residue, an amino sugar residue or a heterocycle, or r' and r'' taken together form a heterocycle,

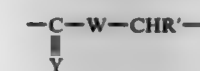
R<sub>2</sub> represents hydrogen, OH, lower alkyl, alkoxy having 1–6 carbon atoms, fluorine, chlorine CF<sub>3</sub>, COR<sub>7</sub> wherein R<sub>7</sub>

has the meaning given above, CH<sub>2</sub>OH or CH<sub>2</sub>OR<sub>6</sub> wherein R<sub>6</sub> has the meaning given above,

Z represents an oxygen atom, a sulphur atom, —CH=CR<sub>11</sub>—, —N=CH— or —N=CR<sub>6</sub>— wherein R<sub>6</sub> has the meaning given above,

R<sub>11</sub> represents hydrogen, OH, lower alkyl, alkoxy having 1–6 carbon atoms, fluorine, chlorine or CF<sub>3</sub>,

X is a divalent radical which can be read from left to right or vice versa and has the formula:



wherein

(I) R' represents hydrogen or —CH<sub>3</sub>,  
W represents an oxygen atom, a sulfur atom or —NR' wherein R' has the meaning given above,  
Y represents an oxygen atom or alternatively represents a sulfur atom when W represents —NR',  
with the proviso that at least one of R<sub>3</sub>, R<sub>4</sub> or R<sub>5</sub> is different from a hydrogen atom, and the salts of said compound of formula (I), and the optical isomers of said compound of formula (I).

5,439,926

## FUNGICIDAL COMPOSITIONS

Stefan Dutzmann, Hilden; Heinz-Wilhelm Dehne, Monheim; Karl-Heinz Kuck, Langenfeld; Wilhelm Brandes, Leichlingen, and Wolfgang Krämer, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 26, 1994, Ser. No. 249,511

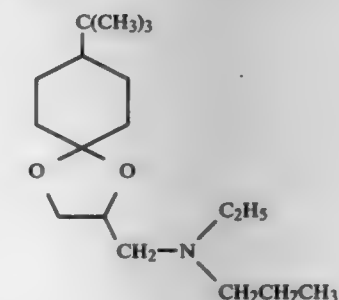
Claims priority, application Germany, Jun. 2, 1993, 43 18 285.2

Int. Cl.<sup>6</sup> A01N 43/12, 43/26, 43/64

U.S. Cl. 514—383

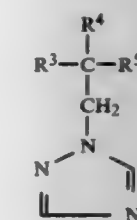
4 Claims

1. A fungicidal composition comprising a synergistic fungicidally effective amount of a combination of  
(A) 8-t-butyl-2-(N-ethyl-N-n-propylamino)-methyl-1,4-dioxaspiro[4.5]decane of the formula



and

(B) at least one azole derivative of the formula

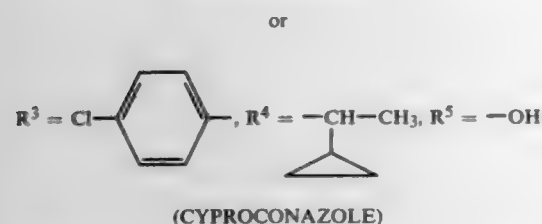
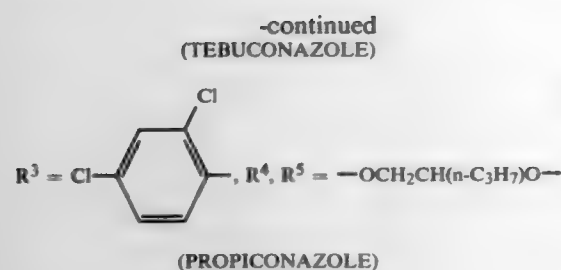


(III)

(III-1)

R<sup>3</sup> = Cl—C<sub>6</sub>H<sub>4</sub>—(CH<sub>2</sub>)<sub>2</sub>—, R<sup>4</sup> = —C(CH<sub>3</sub>)<sub>3</sub>, R<sup>5</sup> = OH,





wherein compounds (A) and (B) are present in a synergistic weight ratio of about 1:1 to 5:1.

5,439,927

# IMIDAZOYL- $\beta$ -OXO- $\beta$ -BENZENEPROPANETHIOMIDE DERIVATIVE, COMPOSITIONS AND METHOD OF USE THEREOF

Tetsuo Sekiya; Mikio Tsuboi, both of Kanagawa; Tetsuo Shim-puku, Tokyo; Tatsuo Nagano, Tokyo; Junko Hayashi, Tokyo, and Asami Seino, Kanagawa, all of Japan, assignors to Mit-subishi Kasei Corporation, Tokyo, Japan

Division of Ser. No. 996,404, Dec. 23, 1992, Pat. No. 5,332,833.

This application Apr. 22, 1994, Ser. No. 231,123

Claims priority, application Japan, Dec. 26, 1991, 3-345657 The portion of the term of this patent subsequent to Jul. 26, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C07D 233/96; A61K 31/165

U.S. Cl. 514-399

5 Claims

1. 4-(imidazolyl)-N-methyl- $\beta$ -oxo- $\alpha$ ,  $\alpha$ -trimethylenebenzenepropanethioamide, or the pharmaceutically acceptable acid addition salt thereof.

5,439,928

# AROMATASE INHIBITING 4(5)-IMIDAZOLES

Arto J. Karjalainen; Reino O. Pelkonen; Marja-Liisa Sodervall, all of Oulu; Matti A. Lahde; Risto A. S. Lammintausta, both of Turku; Arja L. Karjalainen, and Arja M. Kalapudas, both of Oulu, all of Finland, assignors to Orion-yhtymä Oy, Espoo, Finland

Continuation-in-part of Ser. No. 16,547, Feb. 11, 1993, abandoned, which is a continuation-in-part of Ser. No. 870,779, Apr. 21, 1992, abandoned, and Ser. No. 993,827, Dec. 18, 1992, abandoned, which is a continuation of Ser. No. 501,699, Mar. 30, 1990, abandoned, said Ser. No. 870,779, is a continuation of Ser. No. 761,550, Sep. 18, 1991, abandoned. This application May 19, 1993, Ser. No. 63,471

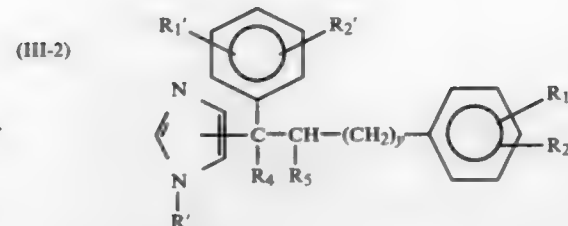
Int. Cl.<sup>6</sup> A61K 31/415; C07D 233/64

U.S. Cl. 514-400

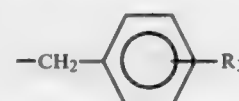
27 Claims

1. A compound which is a 4(5) substituted imidazole of the formula:

(III-2) (Ib)



or a non-toxic pharmaceutically acceptable acid addition salt thereof wherein R<sub>1</sub>, R<sub>2</sub>, R'<sub>1</sub> and R'<sub>2</sub>, which can be the same or different, are H, CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, C<sub>3</sub>H<sub>7</sub>, OCH<sub>3</sub>, OH, CH<sub>2</sub>OH, NO<sub>2</sub>, NH<sub>2</sub>, CN, CF<sub>3</sub>, CHF<sub>2</sub>, CH<sub>2</sub>F or halogen; R' is H or



where R<sub>3</sub> is H, CH<sub>3</sub> or halogen; R<sub>4</sub> is H or OH and R<sub>5</sub> is H or R<sub>4</sub> and R<sub>5</sub> together form a bond and y is 1 to 4.

5,439,929

# BICYCLIC CARBAMATES, PHARMACEUTICAL COMPOSITIONS AND USE

Matthew F. Brown, Pawcatuck, Conn., assignor to Pfizer Inc., New York, N.Y.

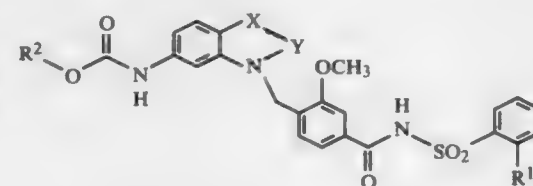
Filed Mar. 1, 1994, Ser. No. 204,037

Int. Cl.<sup>6</sup> A61K 31/40, 31/415; C07D 209/08, 231/56

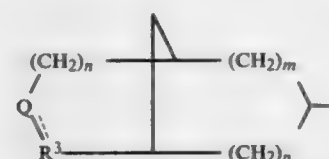
U.S. Cl. 514-403

13 Claims

1. A compound of the formula



and the pharmaceutically acceptable salts thereof, wherein the broken line represents an optional double bond; X is CH or CH<sub>2</sub> and Y is N, CH or CH<sub>2</sub>, with the proviso that when X and Y are both CH or when X is CH and Y is N, the broken line represents a double bond and with the proviso that when X is CH, then Y is CH and when X is CH<sub>2</sub>, then Y is N or CH<sub>2</sub>; R<sup>1</sup> is (C<sub>1</sub>-C<sub>6</sub>)alkyl, (C<sub>2</sub>-C<sub>6</sub>)alkenyl, (C<sub>2</sub>-C<sub>6</sub>)alkynyl, (C<sub>1</sub>-C<sub>6</sub>)alkoxy or (C<sub>2</sub>-C<sub>6</sub>)alkenyloxy and R<sup>2</sup> is a group of the formula



wherein the broken line represents an optional double bond; n is 0 or 1; m is 0, 1 or 2; p is 0, 1 or 2; Q is CH or CH<sub>2</sub> and R<sup>3</sup> is CH or CH<sub>2</sub>, wherein R<sup>2</sup> is in an exo or endo configuration or m mixture thereof, with the proviso that when Q and R<sup>3</sup> are both CH, the broken line represents a double bond.

5,439,930

# BIOLOGICALLY ACTIVE N-ACYLPROLYDIPETIDES HAVING ANTIAMNESTIC, ANTIHYPOXIC AND ANOREXIGENIC EFFECTS

Sergei B. Seredenin; Tatiana A. Voronina; Tatiana A. Guda-sheva; Rita U. Ostrovskaya; Grigori G. Rozantsev; Alexander P. Skoldinov; Sergei S. Trophimov, all of Moscow, Russian Federation; James A. Halikas, North Oaks, Minn., and Taisija L. Garibova, Moscow, Russian Federation, assignors to Russian-American Institute for New Drug Development, Bloomington, Minn.

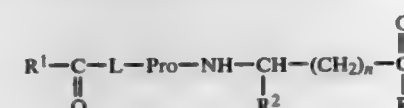
Continuation-in-part of Ser. No. 868,000, Apr. 14, 1992, abandoned. This application Oct. 14, 1992, Ser. No. 960,905

Int. Cl.<sup>6</sup> A61K 31/40; C07D 207/12

U.S. Cl. 514-423

25 Claims

12. A pharmaceutical composition containing as an active substance a pharmaceutically effective amount of an N-acyl-prolyldipeptide having the formula:



wherein:

- R<sup>1</sup> is CH<sub>2</sub>C<sub>6</sub>H<sub>5</sub>;
- R<sup>2</sup> is selected from the group consisting of H, CH<sub>3</sub>, CH(CH<sub>3</sub>)<sub>2</sub>, CH<sub>2</sub>CH(CH<sub>3</sub>)<sub>2</sub>, CH<sub>2</sub>C(O)OC<sub>2</sub>H<sub>5</sub>, (CH<sub>2</sub>)<sub>2</sub>C(O)OC<sub>2</sub>H<sub>5</sub>, and CH<sub>2</sub>C(O)NH<sub>2</sub>;
- R<sup>3</sup> is selected from the group consisting of OH, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, NH<sub>2</sub>, NHCH<sub>3</sub>, and N(CH<sub>3</sub>)<sub>2</sub>; and
- n=0-3.

5,439,932

# SUBSTITUTED AMINE DERIVATIVES HAVING ANTI-HYPERLIPIDEMIA ACTIVITY

Yoshimi Tsuchiya; Takashi Nomoto; Masahiro Hayashi; Yoshi-kazu Iwasawa; Hitoshi Masaki; Mitsuru Ohkubo; Yumiko Sakuma; Yasufumi Nagata; Toshihiko Satoh, and Toshio Kamel, all of Tokyo, Japan, assignors to Banyu Pharmaceuti-cal Co., Ltd., Tokyo, Japan

Division of Ser. No. 672,430, Mar. 20, 1991, abandoned. This application Mar. 4, 1993, Ser. No. 26,692

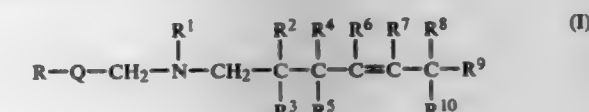
Claims priority, application Japan, Mar. 20, 1990, 2-71542; Apr. 3, 1990, 2-88624

Int. Cl.<sup>6</sup> A61K 31/38, 31/495; C07D 409/02, 409/14

U.S. Cl. 514-444

22 Claims

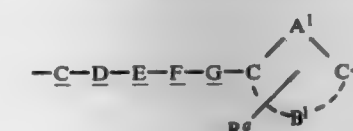
1. Substituted amine derivatives represented by the follow-ing general formula and the nontoxic salts thereof:



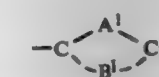
wherein,

R denotes a thienyl group;

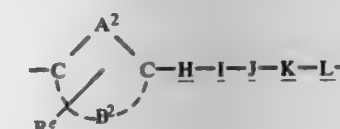
Q denotes (a) a group represented by the formula:



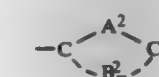
wherein the ring represented by the formula



is a thiophene or furan ring; and R<sup>a</sup> denotes a hydrogen atom, halogen atom, hydroxyl group, cyano group, lower alkyl group or lower alkoxy group; C, D, E, F, and G, may be the same or different, and, except as further defined below, each denotes an oxygen atom, sulfur atom, carbonyl group, group represented by the formula -CHR<sup>b</sup>, group represented by the formula -CR<sup>c</sup>, or group represented by the formula -NR<sup>d</sup> wherein R<sup>b</sup>, R<sup>c</sup> and R<sup>d</sup> are the same or different, and each denotes a hydrogen atom or lower alkyl group; provided that only each of pairs C and F, C and G or D and G can simultaneously denote oxygen atom(s), sulfur atom(s) or group(s) represented by the formula -NR<sup>d</sup>, and only one of C, D, E, F or G may denote a carbonyl group, and provided further that when the chain -C-D-E-F-G- contains one or two double bonds and one or more of oxygen atom(s), sulfur atom(s) or group(s) represented by the formula -NR<sup>d</sup>, the double bond(s) do not adjoin the oxygen atom(s), sulfur atom(s) or -NR<sup>d</sup> group(s); or Q denotes (b) a group represented by the formula:



wherein the ring represented by

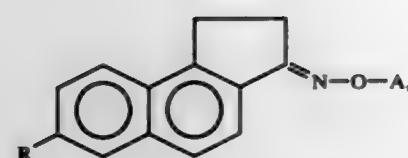


wherein Ar is optionally substituted phenyl;

R<sup>2</sup> is selected from the group consisting of pyrrolidine, hexamethyleneimino, and piperidino; or a pharmaceuti-cally acceptable salt of solvate thereof.







wherein

A represents a group of the formula  $\text{alk-NR}^1\text{R}^2$  wherein alk represents a  $\text{C}_{2-7}$  alkylene group optionally carrying a hydroxy substituent,

$\text{R}^1$  and  $\text{R}^2$  are independently hydrogen,  $\text{C}_{1-7}$  alkyl,  $\text{C}_{2-7}$  alkenyl,  $\text{C}_{2-7}$  alkynyl, mono( $\text{C}_{1-7}$ )alkylamino( $\text{C}_{1-7}$ )alkyl, di( $\text{C}_{1-7}$ )alkylamino( $\text{C}_{1-7}$ )alkyl or  $\text{C}_{3-8}$  cycloalkyl; or

$\text{R}^1$  and  $\text{R}^2$  together with the nitrogen atom to which they are attached form a 4 to 7 membered ring, optionally comprising an oxygen atom or a further nitrogen atom, which latter may carry a phenyl, benzyl, pyridyl, pyrimidinyl or  $\text{C}_{1-3}$  alkyl substituent which substituents may, in turn, bear a hydroxy or methoxy group or a halogen atom or a halophenyl group; or

$\text{R}^1$  and  $\text{R}^2$  together with the nitrogen atom to which they are attached form a phthalimido group; or

A represents pyrimidino, 2,3-epoxypropyl or a group of the formula  $-\text{C}(\text{O})\text{NHR}^3$ , wherein

$\text{R}^3$  stands for  $\text{C}_{1-7}$  alkyl,  $\text{C}_{2-7}$  alkenyl or  $\text{C}_{3-8}$  cycloalkyl; and R denotes hydrogen or  $\text{C}_{1-7}$  alkyl,

stereoisomers and optionally active isomers and the possible mixtures thereof, and further acid addition salts of these compounds.

5,439,941

# USE OF ALKYL CYCLOPENTANONE AND PHENYL ALKANOL DERIVATIVE-CONTAINING COMPOSITIONS FOR REPELLING BLOOD FEEDING ARTHROPODS AND APPARATUS FOR DETERMINING REPELLENCY AND ATTRACTANCY OF SEMIOCHEMICALS AGAINST AND FOR BLOOD FEEDING ARTHROPODS

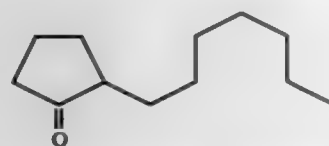
Jerry F. Butler, Gainesville, Fla.; Craig B. Warren, Rumson, N.J.; Anna B. Marin, Leonardo, N.J.; Braja D. Mookherjee, Holmdel, N.J., and Richard A. Wilson, Westfield, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla. Division of Ser. No. 157,419, Nov. 26, 1993, which is a division of Ser. No. 7,287, Jan. 21, 1993, Pat. No. 5,327,675, which is a continuation-in-part of Ser. No. 887,138, May 22, 1992, Pat. No. 5,228,233. This application Nov. 10, 1994, Ser. No. 339,177 Int. Cl.<sup>6</sup> A01N 25/34, 31/00, 31/06, 35/06

U.S. Cl. 514-690

1 Claim

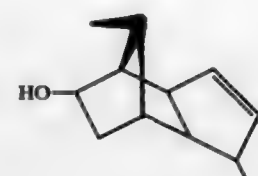
1. An insect repelling detergent tablet consisting of (A) a polymeric core containing a microporous polymer containing in the interstices thereof an effective insect repelling amount of a composition of matter consisting of an alkylcyclopentanone and phenyl alkanol derivative-containing composition of chemicals selected from the group consisting of:

(i) a mixture of compounds having the structure:



with a cycloalkanol derivative-containing composition of chemicals having the structures:

(i)



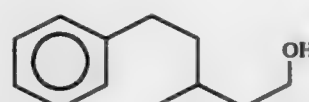
and



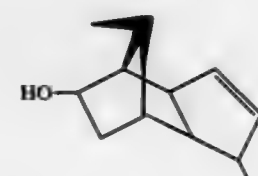
and



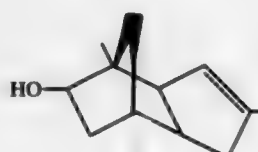
(ii) a mixture of the compounds having the structure:



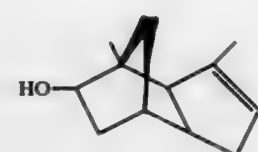
with a cycloalkanol derivative-containing composition of chemicals having the structures:



and



and



(B) coated on the polymeric core a detergent composition.

5,439,942

# METHOD OF TREATING CERTAIN TUMORS USING ILLUDIN ANALOGS

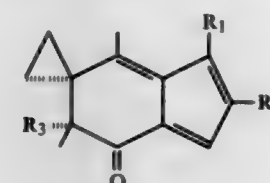
Michael J. Kelnar, San Diego; Trevor C. McMorris, La Jolla, and Raymond Taetle, San Diego, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 416,395, Oct. 3, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 606,511 Int. Cl.<sup>6</sup> A61K 31/12

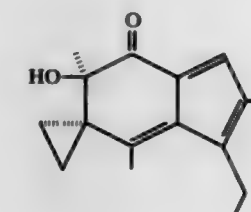
U.S. Cl. 514-691

3 Claims

1. A therapeutic method of inhibiting tumor cell growth in a human subject comprising the intravenous or intraperitoneal administration to a human subject in need of said therapy an amount of an illudin S or illudin M analog having the structure



wherein the amount is effective to inhibit tumor cell growth in said subject without excessive toxicity to the subject wherein  $\text{R}_1$  is hydrogen or the moiety:



$\text{R}_2$  is methyl; and

$\text{R}_3$  is OH;

wherein the tumor cell is selected from the group consisting of myeloid, T-cell leukemia, lung, ovarian and breast carcinoma.

5,439,943

# NON-STEROID AND NON-PROSTANOID INHIBITORS OF STEROID AND PROSTAGLANDIN TRANSFORMING ENZYMES

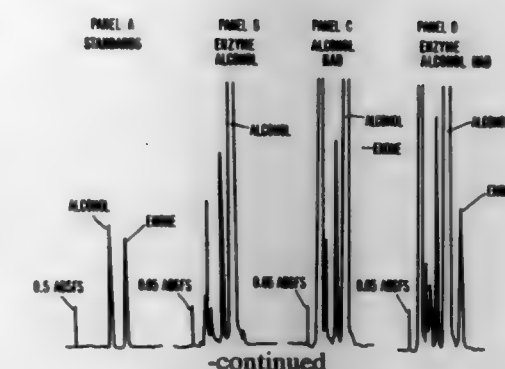
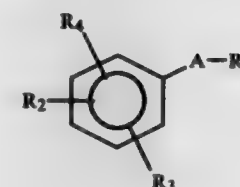
Trevor M. Penning, Aldan, Pa., and Joseph W. Ricigliano, Piscataway, N.J., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 114,737, Aug. 30, 1993, which is a division of Ser. No. 756,505, Sep. 9, 1991, Pat. No. 5,258,296, which is a continuation-in-part of Ser. No. 539,371, Jun. 18, 1990, Pat. No. 5,118,621, which is a continuation of Ser. No. 187,832, Apr. 29, 1988, abandoned. This application Nov. 9, 1994, Ser. No. 336,833 Int. Cl.<sup>6</sup> A01N 35/00; A61K 31/11

U.S. Cl. 514-705

18 Claims

1. A pharmaceutical composition comprising a compound of the formula:



-continued

(vi)

where

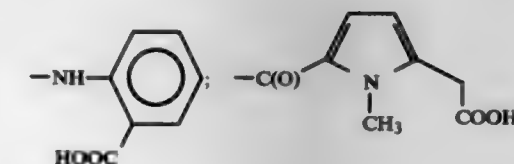
A is  $-\text{C}(\text{O})-$  or  $-\text{CH}(\text{OH})-$ ;

$\text{R}_1$  is selected from the groups consisting of  $\text{CH}=\text{CH}_2$ ,  $\text{CH}=\text{CH}-\text{OMe}$ ,  $\text{CH}=\text{CH}-\text{OEt}$ ,  $\text{C}=\text{CH}$ ,  $\text{C}=\text{C}-\text{OMe}$ , and  $\text{C}=\text{C}-\text{OEt}$ ;

$\text{R}_2$  is selected from the groups consisting of  $\text{NO}_2$ , Z,  $\text{CH}_2\text{Z}$ ,  $\text{CHZ}_2$ ,  $\text{CZ}_3$ ,  $\text{COOH}$ ,  $\text{NH}_2$  and OH;

$\text{R}_3$  and  $\text{R}_4$  are independently selected from the groups consisting of H,  $\text{NO}_2$ , Z,  $\text{CH}_2\text{Z}$ ,  $\text{CHZ}_2$ ,  $\text{CZ}_3$ ,  $\text{COOH}$ ,  $\text{NH}_2$  and OH;

$\text{R}_5$  is selected from the groups consisting of:



and



and Z is a halogen atom,

or its pharmaceutically acceptable salt, provided that, for compounds of formula (v), when  $\text{R}_2=\text{NO}_2$  and  $\text{R}_3$  and  $\text{R}_4=\text{H}$ , then  $\text{A}=-\text{CH}(\text{OH})-$  and  $\text{R}_1$  is other than  $\text{C}=\text{CH}$ .

5,439,944

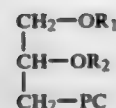
# RED BLOOD CELL SUBSTITUTE EMULSIONS CONTAINING ALKYL- OR ALKYLGLYCEROPHOSPHORYL CHOLINE SURFACTANTS AND METHODS OF USE

Robert J. Kaufman, and Thomas J. Richard, both of University City, Mo., assignors to HemaGen/PFC, St. Louis, Mo. Division of Ser. No. 791,420, Nov. 13, 1991, Pat. No. 5,304,325. This application Nov. 24, 1993, Ser. No. 157,893 Int. Cl.<sup>6</sup> A61K 9/107, 47/00

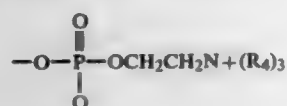
U.S. Cl. 514-306

20 Claims

1. A red blood cell substitute comprising an amount of a physiologically acceptable emulsion of a fluorocarbon, water and a surfactant having a general structure of



where  $R_1$  and  $R_2$  are a  $C_4$ - $C_8$  saturated or unsaturated aliphatic group and PC is the phosphoryl choline group or salt thereof represented by the structure



where  $R_4$  is hydrogen or lower alkyl from the group consisting of methyl, ethyl and propyl, said amount being therapeutically effective for oxygen carrying and transport in animals.

5,439,945

# FOAMS PRODUCED UNDER REDUCED PRESSURE AND METHOD OF PREPARING SUCH FOAMS

John R. Smies, W-1623 Smies Rd., Oostburg, Wis. 53070  
Filed Jan. 10, 1994, Ser. No. 179,091

Int. Cl.<sup>6</sup> C08J 9/00, 9/08

U.S. Cl. 521-50

11 Claims

1. A method for preparing an insulation foam wherein one or more polymeric foam forming materials are reacted under foam forming conditions and wherein cell voids are created in the foam during the reaction, the improvement comprising the steps of:

- causing the foam forming materials to react in an area to form cell voids;
- maintaining a negative pressure condition in the area during the time the reaction is occurring; and
- encasing the resultant polymeric foam in a gas impermeable material wherein the negative pressure in the cell voids is maintained.

5,439,946

# PROCESS FOR PREPARING INTRINSICALLY FOAMED THERMOPLASTIC POLYMER

Lubertus Klumperman, Born; Joseph P. H. Boyens, and Johannes H. Geesink, both of Schinnen, all of Netherlands, assignors to DSM N.V., Netherlands

PCT No. PCT/NL92/00040, § 371 Date Aug. 30, 1993, § 102(e) Date Nov. 1, 1993, PCT Pub. No. WO92/15638, PCT Pub. Date Sep. 17, 1992

PCT Filed Feb. 27, 1992, Ser. No. 108,628

Claims priority, application Netherlands, Feb. 28, 1991, 9100370; Feb. 28, 1991, 9100371

Int. Cl.<sup>6</sup> C08J 9/02

U.S. Cl. 521-77

15 Claims

1. A process for preparing an intrinsically foamed thermoplastic polymer which comprises:

- introducing an intrinsically foamable polymer composition into equipment suitable for foaming, wherein said polymer composition comprises (a) a copolymer comprising (a1) 15-50 moles of maleic acid and/or maleic anhydride, and (a2) a vinyl monomer, wherein the weight average molecular weight of said copolymer is 50,000 to 500,000, and bringing the polymer composition to a temperature high enough to release carbon dioxide from said copolymer, whereby an intrinsically foamed thermoplastic polymer is obtained.

5,439,947

# POLYMER FOAMS CONTAINING BLOCKING AGENTS

Philip L. Bartlett; Joseph A. Creazzo, both of Wilmington, and Howard S. Hammel, Bear, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 577,045, Aug. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 500,051, Mar. 23, 1990, abandoned. This application Nov. 9, 1992, Ser. No. 973,599

Int. Cl.<sup>6</sup> C08J 9/02; C08L 25/06, 75/04

U.S. Cl. 521-131

28 Claims

1. In a closed cell thermoplastic or thermoset polymer foam insulation characterized by a continuous polymeric phase and a discontinuous gaseous phase, the improvement comprising:

- (a) closed cells which comprise a discontinuous gaseous phase comprising at least one hydrogen-containing halo-carbon blowing agent;
- (b) an effective amount of a hydrogen bond forming blocking agent to reduce the permeation of air into the cells wherein said blocking agent comprises ether, ester, or ketone groups, and said ether is a member selected from the group consisting of sucrose polyether polyols, amino polyether polyols, polypropylene glycol polyether polyols, polyethylene glycol polyether polyols, glyme, diglyme, triglyme and tetraglyme; mono-, di- and tripropylene glycol methyl ethers and ether acetates; and mixtures thereof, wherein the blowing agent is a material selected from the group consisting of  $\text{CHClF}_2$ ,  $\text{CH}_2\text{F}_2$ ,  $\text{CHCl}_2\text{CF}_3$ ,  $\text{CHClFCClF}_2$ ,  $\text{CHClFCF}_3$ ,  $\text{CHF}_2\text{CF}_3$ ,  $\text{CHF}_2\text{CHF}_2$ ,  $\text{CH}_2\text{FCF}_3$  and mixtures thereof; and
- (c) said blowing agent optionally further comprises at least one additional blowing agent.

5,439,948

# PROCESS FOR CELLULAR POLYMERIC PRODUCTS

Rik De Vos, Rotselaar, and David Randall, Everberg, both of Belgium, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 977,988, Nov. 18, 1992, abandoned. This application Nov. 22, 1993, Ser. No. 156,194

Claims priority, application United Kingdom, Oct. 14, 1992, 9221592; Nov. 20, 1992, 9124635

Int. Cl.<sup>6</sup> C08G 18/10

U.S. Cl. 521-159

19 Claims

1. Process for the preparation of a cellular polymeric product which comprises reaction of a polyisocyanate composition with an isocyanate-reactive composition having a functionality of at least 2, in the presence of a blowing agent and in the presence of an inert, organic liquid which is substantially insoluble in the reaction mixture and which is present as the disperse phase of an emulsion or a microemulsion, wherein the amount of inert, organic liquid used in the reaction is in the range of 0.01 to 5 parts by weight based on the total weight of the reaction system, characterized in that the polyisocyanate composition comprises polymethylene polyphenylene polyisocyanate having a functionality of at least 2.5 and a urethane-modified, isocyanate-ended prepolymer, wherein the isocyanate functionality of the polyisocyanate composition is at least 2.3 and wherein the concentration of urethane linkages in the polyisocyanate composition is in the range from 1 millimole to 150 millimoles per 100 grams thereof.

5,439,949

# PROPYLENE COMPOSITIONS WITH IMPROVED RESISTANCE TO THERMOFORMING SAG

Bennie M. Lucas; V. Krishnamurthy, and John R. Bonser, all of Odessa, Tex., assignors to Rexene Corporation, Dallas, Tex.

Continuation of Ser. No. 747,964, Aug. 21, 1991, abandoned.

This application May 11, 1992, Ser. No. 883,897

The portion of the term of this patent subsequent to Nov. 30,

2010, has been disclaimed.

Int. Cl.<sup>6</sup> C08J 3/28

U.S. Cl. 522-157

4 Claims

1. A polymer composition having improved resistance to thermoforming sag, the composition comprising:

- from about 1.3 to about 10 wt % of a substantially gelled irradiated first polymer having a melt flow rate of less than 0.5 g/10 min. prior to irradiation, said first polymer selected from the group consisting of propylene homopolymers, propylene-ethylene copolymers having an ethylene content of at least 6% and mixtures thereof and including from 500 to 3000 ppm of an antioxidant, said first polymer being irradiated in air with from 10 to 20 Mrads of gamma or electron beam ionizing radiation and containing at least 30 wt. % xylene insolubles after irradiation;
- from about 90 to 98.7 wt. % a non-irradiated second polymer selected from the group consisting of polypropylene, propylene-ethylene copolymers or mixtures thereof;
- the combined first polymer and non-irradiated second polymer comprising a polymer composition having at least a 10 % increase in elasticity in the molten state as compared to the elasticity of said non-irradiated polymer in the molten state.

5,439,950

# WATER MISCIBLE NON-HYDROLYZABLE CROSS-LINKERS AND HIGH REFRACTIVE INDEX HYDROGELS PREPARED THEREWITH

Xingao Liao, Alhambra; Yading Wang, Pasadena; Stephen O. Zhou, Hacienda Heights, all of Calif., and Thomas P. Richards, Shelton, Wash., assignors to Kabi Pharmacia Ophthalmics, Inc., Monrovia, Calif.

Filed Jun. 27, 1994, Ser. No. 266,951

Int. Cl.<sup>6</sup> C08F 226/06; A61L 27/00

U.S. Cl. 523-108

9 Claims

1. A hydrogel comprising a copolymer cross-linked with a non-hydrolyzable, hydrophilic cross-linking agent selected from the group consisting of 4,6-divinylpyrimidine, 2,5-divinylpyrazine, 1,4-divinylimidazole, and 1,5-divinylimidazole.

5,439,951

# ISOLATION OF THE CALCIUM-PHOSPHATE CRYSTALS OF BONE

Melvin J. Glimcher, Boston; Hyun-Man Kim, Brookline, both of Mass., and Christian Rey, Castanet, France, assignors to Children's Medical Center Corporation, Boston, Mass.

Filed Mar. 24, 1993, Ser. No. 36,412

Int. Cl.<sup>6</sup> C08K 3/32, 3/36; A61F 2/02, 2/28

U.S. Cl. 523-115

13 Claims

1. A method for isolating calcium-phosphate apatite crystals from bone which avoids exposure of the crystals to water comprising the steps of

- grinding in the absence of water at a temperature equivalent to liquid nitrogen clean bone pieces into particles ranging in size of up to approximately 200 microns, where the bone is selected from the group consisting of bone, cartilage, cementum, dentin, and enamel;
- separating the calcium-phosphate crystals in the bone from the collagen fibrils in the bone by sonication of the particles suspended in a non-aqueous solvent which is less polar than methanol for the collagen fibril but not the

crystals at a temperature just above the freezing temperature of the solvent; and



separating the non-aqueous solvent and collagen fibrils from the calcium phosphate crystals.

5,439,952

# SELF-CURING COATING COMPOSITION EXHIBITING REDUCED DISCOLORATION UPON STORAGE

Dorey Lum, Suffern, N.Y., and Patel Prashant, Aliso Viejo, Calif., assignors to The Thompson Minwax Company, Montvale, N.J.

Filed Dec. 21, 1993, Ser. No. 171,037

Int. Cl.<sup>6</sup> C08K 3/20; C08L 63/02

U.S. Cl. 523-410

20 Claims

1. A water-based, storage stable coating composition which is self-curing at room temperature, comprising:

- a) an aqueous dispersion having a pH of from about 7.5 to about 10, and comprising a self-curing vinyl polymer prepared by addition polymerization of:
- i) an ethylenically unsaturated polymerizable monomer having an active methylene group,
- ii) an ethylenically unsaturated polymerizable monomer having an epoxy group,
- iii) an ethylenically unsaturated polymerizable carboxylic acid monomer, and
- iv) one or more additional ethylenically unsaturated polymerizable monomers other than those in groups i) ii) and iii),

provided that:

- the weight ratio of monomer i) to monomer ii) is less than or equal to about 1:2 or greater than or equal to about 3:2 based on the total weight of monomers i) and ii),
- the weight ratio of monomer ii) to monomer iii) is greater than or equal to about 3:2 based on the total weight of monomers ii) and iii),
- the total amount of monomers i), ii) and iii) incorporated into said vinyl polymer is from about 8 to about 60 weight percent, and
- monomer iv) is present in an amount of from about 40 to about 92 weight percent,

- b) a polyurethane dispersion prepared by chain extension of a prepolymer reaction product of a diisocyanate and one or more polyols, at least one polyol being a carboxy-substituted polyol, said polyurethane being neutralized,
- c) a water-soluble catalyst for initiating crosslinking of said self-curing vinyl polymer, and
- d) at least about 0.01 percent, based on total composition weight, of a compound selected from the group consisting of an aldehyde, a carbodiimide and a polyfunctional aziridine,



the weight ratio of said self-curing vinyl polymer to said polyurethane being from about 1:9 to about 9:1.

5,439,953

# STARCH-BASED MATERIALS AND/OR MOLDED PARTS MODIFIED BY SYNTHETIC POLYMER COMPOUNDS AND PROCESS FOR PRODUCING THE SAME

Wolfgang Ritter, Haan; Rainer Bergner, Düldorf, and Wolfgang Kempf, Köln, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany  
PCT No. PCT/EP91/02295, § 371 Date Oct. 12, 1993, § 102(e) Date Oct. 12, 1993, PCT Pub. No. WO92/10539, PCT Pub. Date Jun. 25, 1992

PCT Filed Dec. 3, 1991, Ser. No. 70,409

Claims priority, application Germany, Dec. 5, 1990, 40 38 732.1

Int. Cl. C08L 3/02; C08B 30/12

U.S. Cl. 524-47

10 Claims

1. A process for making a polymer-modified starch based material, said process comprising steps of:

- (A) providing an intimate mixture comprising:
  - (1) solid starch, and
  - (2) an aqueous dispersion of a synthetic polymer, and, optionally,
  - (3) a component selected from the group consisting of ethylene glycol, propylene glycol, butanediol, glycerol, and ethers, including partial ethers, thereof, and mixtures of any two or more of ethylene glycol, propylene glycol, butanediol, and ethers thereof, and
- (B) heating the mixture provided in step (A), while maintaining it in mixed condition, to a sufficient temperature for a sufficient time under sufficient pressure to convert the starch component of the mixture provided in step (A) into a homogenized mixture of thermoplasticized starch and synthetic polymer from component (2) of the mixture provided in step (A); and, optionally,
- (C) shaping the homogeneous mixture produced in step (B) into a solid article of manufacture.

5,439,954

# SUBSTITUTED PHENYL-1,3-DIKETONES AS PROTECTANTS AGAINST SKIN DAMAGE

Rodney D. Bush, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

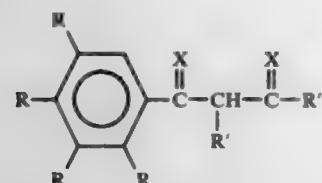
Filed Oct. 11, 1991, Ser. No. 776,506

Int. Cl. A61K 7/06, 7/42, 9/10; C11D 3/48

U.S. Cl. 424-59

17 Claims

1. A photoprotective composition comprising:
  - A. A safe and effective amount of a compound having the structure:



wherein each R is independently C<sub>1</sub>-C<sub>20</sub> alkyl or hydrogen, at least two being alkyl; R' is hydrogen, or C<sub>1</sub>-C<sub>20</sub> alkyl or aryl; R'' is C<sub>1</sub>-C<sub>20</sub> alkyl or halo; and each X is independently oxygen or sulfur; and

B. a cosmetically-acceptable topical carrier.

5,439,955

# 2-(BENZOTRIAZOL-2-YL)-4-ALKYL-6-(2-HYDROXY-3-BENZOYL-6-ALKOXYBENZYL)PHENOLS AND STABILIZED COMPOSITIONS

Robert A. Falk, New City; John J. Luzzi, Carmel, and Gregory R. Coughlin, Poughkeepsie, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 26,961, Mar. 5, 1993, Pat. No. 5,387,691.

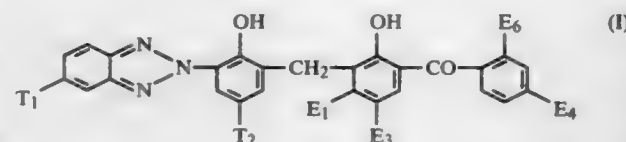
This application Nov. 1, 1994, Ser. No. 333,101

Int. Cl. C08K 5/3475

U.S. Cl. 524-91

6 Claims

1. A stabilized composition which comprises
  - (a) an organic material subject to degradation by the imposition of actinic light, and
  - (b) an effective stabilizing amount of a compound of formula I



wherein

- T<sub>1</sub> is hydrogen, chloro, alkyl of 1 to 4 carbon atoms or -SO<sub>3</sub>H;  
T<sub>2</sub> is alkyl of 1 to 12 carbon atoms,  
E<sub>1</sub> is hydrogen, chloro or -OE<sub>2</sub>,  
E<sub>2</sub> is hydrogen or alkyl of 1 to 18 carbon atoms,  
E<sub>3</sub> is hydrogen, alkyl of 1 to 4 carbon atoms, chloro or -SO<sub>3</sub>H,  
E<sub>4</sub> is hydrogen, chloro or -OE<sub>5</sub>,  
E<sub>5</sub> is hydrogen or alkyl of 1 to 18 carbon atoms, and  
E<sub>6</sub> is hydrogen, hydroxyl or carboxy.

5,439,956

# THERMO-CURABLE AND ULTRAVIOLET-CURABLE ADHESIVE CAPABLE OF HIGH PRECISION BONDING

Hiromichi Noguchi, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 34,661, Mar. 22, 1993, abandoned, which is a continuation of Ser. No. 376,571, Jul. 7, 1989, abandoned. This application Feb. 9, 1994, Ser. No. 193,883

Claims priority, application Japan, Jul. 9, 1988, 63-170040

Int. Cl. C09J 163/02, 163/04, 175/16, 163/10

U.S. Cl. 522-92

8 Claims

1. A photosensitive and heat-sensitive adhesive having a composition which comprises:
  - component (A) comprising a vinyl ester of an urethanated bisphenol A epoxy resin;
  - component (B) comprising a partial vinyl ester of a cresol novolak epoxy resin;
  - component (C) comprising an acrylic reactive diluent;
  - component (D) comprising photopolymerization initiator; and
  - component (E) comprising an epoxy cure agent;
 wherein the composition ratio range of said component (A): said component (B): said component (C) is 20-60:20-60:10-40 by weight percent based on the total weight of said components (A), (B) and (C).

5,439,957

# THERMOSETTING COATING COMPOSITION

Masaaki Takimoto, Kadoma; Hisataka Yamamoto, Tokyo, and Kohichi Kimura, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Sep. 1, 1993, Ser. No. 115,045

Claims priority, application Japan, Sep. 2, 1992, 4-234743

Int. Cl. C08K 5/34

U.S. Cl. 524-101

20 Claims

1. A thermosetting coating composition comprising
  - (A) a thermosetting resin-hardener mixture which is a mix-

5,439,959

# COMPOSITIONS FOR THE STABILIZATION OF SYNTHETIC POLYMERS

Giuseppe Raspanti, Alzano Lombardo, Italy, assignor to 3V Inc., Weehawken, N.J.

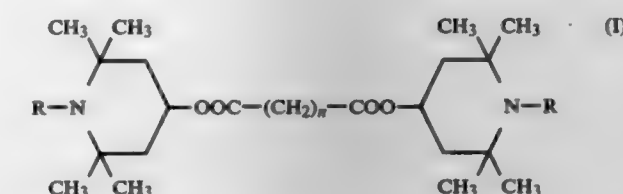
Filed May 24, 1994, Ser. No. 248,008

Int. Cl. C08K 5/3492

U.S. Cl. 524-100

17 Claims

1. A composition for the stabilization of synthetic polymers consisting of:
  - a) a compound of formula (I)



wherein:

- R is hydrogen or methyl,  
n is a number ranging from 2 to 8, included;  
or a mixture of compounds of formula (I);  
b) a compound of formula (II)

5,439,958

# POLYALKYL-4-PIPERIDINOL DERIVATIVES FOR USE AS STABILIZERS FOR ORGANIC MATERIALS

Roberto Scrima, Bologna; Graziano Zagnoni, Vergato, both of Italy; Michael H. Ackerman, New City, N.Y.; James P. Galbo, Wingdale, N.Y., and Roland A. E. Winter, Armonk, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 21, 1994, Ser. No. 278,593

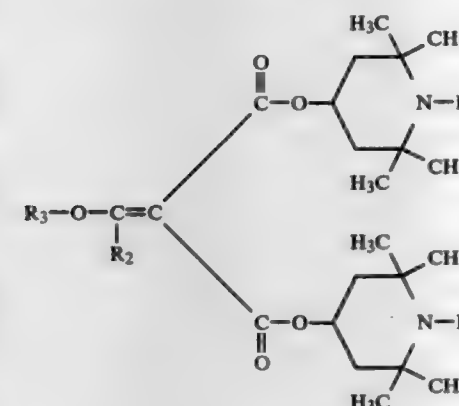
Claims priority, application Italy, Jul. 28, 1993, MI93A1685

Int. Cl. C07D 211/46, 211/94; C08K 5/3435

U.S. Cl. 524-102

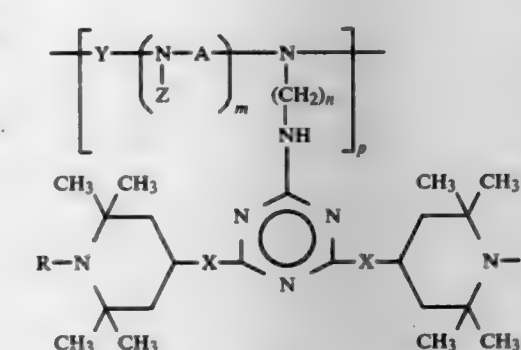
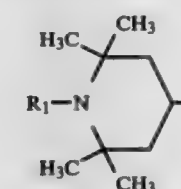
12 Claims

1. A compound of the formula (I)



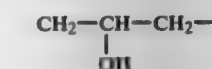
in which

- R<sub>1</sub> is hydrogen, C<sub>1</sub>-C<sub>8</sub>alkyl, O, OH, CH<sub>2</sub>CN, C<sub>1</sub>-C<sub>18</sub>alkoxy, C<sub>3</sub>-C<sub>12</sub>cycloalkoxy, C<sub>3</sub>-C<sub>6</sub>alkenyl, C<sub>7</sub>-C<sub>9</sub>phenylalkyl unsubstituted or mono-, di- or tri-substituted on the phenyl by C<sub>1</sub>-C<sub>4</sub>alkyl; or aliphatic C<sub>1</sub>-C<sub>8</sub>acyl,  
R<sub>2</sub> is hydrogen or C<sub>1</sub>-C<sub>8</sub>alkyl and  
R<sub>3</sub> is C<sub>1</sub>-C<sub>18</sub>alkyl, C<sub>3</sub>-C<sub>12</sub>cycloalkyl unsubstituted or mono-, di- or tri-substituted by C<sub>1</sub>-C<sub>4</sub>alkyl; C<sub>7</sub>-C<sub>9</sub>phenylalkyl unsubstituted or mono-, di- or tri-substituted on the phenyl by C<sub>1</sub>-C<sub>4</sub>alkyl; or a group of the formula (II)

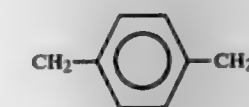


wherein R is hydrogen or methyl, X is oxygen or the group N-R<sub>2</sub> in which R<sub>2</sub> is hydrogen or C<sub>1</sub>-C<sub>12</sub> straight or branched alkyl group, n is a number ranging from 2 to 8, included

A is -(CH<sub>2</sub>)<sub>r</sub>-, in which r can be a number from 2 to 8, the group



or the group



Z is hydrogen, C<sub>1</sub>-C<sub>18</sub> alkyl, the group of formula (III)





compounds being selected from the group consisting of di-(2-ethylhexyl)-phthalate, phthalic acid dialkyl esters, adipic acid dialkyl esters, fatty acid esters, glyoxalic acid diethyl ester, and monomeric or oligomeric carbonates, and the binder system further containing a polyfunctional compound capable of crosslinking the polyester by transesterification, the polyfunctional compound consisting of an ester based on glycerol, trimethylol propane, pentaerythritol, furanose, glucose, cellulose, starch, or polyvinyl alcohol.

#### 5,439,965 ABRASION RESISTANT CROSSLINKABLE INSULATION COMPOSITIONS

Steven W. Horwath, and James W. Biggs, both of West Chester, Ohio, assignors to Quantum Chemical Corporation, Cincinnati, Ohio

Filed Sep. 16, 1993, Ser. No. 123,017  
Int. Cl.<sup>6</sup> C08K 5/54

U.S. Cl. 524—371

15 Claims

1. A crosslinkable polymeric composition comprising:
  - (a) 70 to 97 weight percent of a copolymer of ethylene and 5 to 12 weight percent vinyl ester of a C<sub>2-6</sub> aliphatic carboxylic acid;
  - (b) 2 to 25 weight percent of a halogenated compound wherein bromine or chlorine is substituted on an aromatic or cycloaliphatic ring;
  - (c) 0.03 to 8 weight percent antimony trioxide; and
  - (d) 0.1 to 3 weight percent organic peroxide.

#### 5,439,966 POLYETHYLENE OXIDE TEMPERATURE - OR FLUID-SENSITIVE SHAPE MEMORY DEVICE

Neil B. Graham, Bearsden, and Marion E. McNeill, Milngavie, both of Scotland, assignors to National Research Development Corporation, London, United Kingdom  
Continuation of Ser. No. 865,658, Apr. 7, 1992, abandoned, which is a continuation of Ser. No. 678,196, Apr. 1, 1991, abandoned, which is a continuation of Ser. No. 275,624, Nov. 15, 1988, abandoned, which is a continuation of Ser. No. 841,526, Mar. 12, 1986, abandoned. This application Jan. 7, 1993, Ser. No. 1,414

Claims priority, application United Kingdom, Jul. 12, 1984, 8417810

Int. Cl.<sup>6</sup> C08J 5/00

U.S. Cl. 528—421

5 Claims

1. A device which changes its shape when its temperature is increased above a threshold level or when it has its surface contacted by a polar fluid, in which the device is made of a shaped body of material which comprises a chemically crosslinked, water-insoluble, hydrophilic polymer having polyethylene oxide units, said units having a number average molecular weight ( $\bar{M}_n$ ) of from 1,500 to 12,000, which polymer has in it regions of crystalline material of which the crystallite melting temperature ( $T_m$ ) lies in the range from  $-10^\circ\text{C}$ . to  $70^\circ\text{C}$ ., and in which the body has been mechanically strained to a deformation ratio in the range of 1.1 to 10 prior to its being heated or exposed to a polar fluid, being retained in its strained shape solely by internal forces which may be reduced or removed to permit the device to resile towards its unstrained shape.

#### 5,439,967 PROPYLENE GLYCOL STEARATE VESICLES

Rajiv Mathur, Sewell, N.J., assignor to Micro Vesicular Systems, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 761,253, Sep. 17, 1991, Pat. No. 5,260,065. This application Nov. 8, 1993, Ser. No. 148,952  
The portion of the term of this patent subsequent to Nov. 9, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 9/127

U.S. Cl. 424—450

8 Claims

1. A paucilamellar lipid vesicle having 2-10 bilayers sur-

rounding an amorphous central cavity, each of said bilayers comprising a mixture of propylene glycol stearate and at least one other amphiphilic selected from the group consisting of stearyl alcohol, polyoxyethylene fatty alcohols, and polyoxyethylene derivatives of sorbitan fatty acid esters having 10-20 oxyethylene groups, wherein the fatty alcohol portion of said polyoxyethylene fatty alcohol is derived from an alcohol selected from the group consisting of palmityl alcohol, stearyl alcohol, lauryl alcohol, and oleyl alcohol, and mixtures thereof, and wherein the fatty acid portion of said polyoxyethylene derivatives of sorbitan fatty acid esters is selected from the group consisting of palmitic acid stearic acid lauric acid, and oleic acid, and mixtures thereof.

#### 5,439,968 FLUORESCENT PIGMENT CONCENTRATES

Kenneth W. Hyche, Kingsport, Tenn., assignor to Eastman Chemical Company, Kingsport, Tenn.

Continuation of Ser. No. 790,917, Nov. 13, 1991, abandoned.

This application Sep. 1, 1993, Ser. No. 115,721

Int. Cl.<sup>6</sup> C08L 77/00

U.S. Cl. 524—504

4 Claims

1. A low plate-out fluorescent pigment concentrate comprising:
  - (a) a pigment comprising a polyamide and a fluorescent dye and
  - (b) the reaction product of (1) polyethylene or polypropylene having a molecular weight of about 1,000 to about 100,000 with (2) maleic acid or anhydride or dimethyl maleate said reaction product being present in sufficient amount to disperse said pigment.

#### 5,439,969 SUBSTRATE-REACTIVE COATING COMPOSITION

Mohan L. Sanduja, Flushing; Irene Berlina; Carl Horowitz, both of Brooklyn, and Paul Thottathil, New Hyde Park, all of N.Y., assignors to James A. Bolton, Stratford, Conn.

Filed Apr. 21, 1993, Ser. No. 50,849

Int. Cl.<sup>6</sup> C08F 20/02; C08L 75/04; C08K 5/3412, 3/10  
U.S. Cl. 524—534

2 Claims

1. A coating composition in the form of an aqueous dispersion comprising a mixture of:
  - a) a water dispersible polymer selected from the group consisting of acrylic polymers, urethane polymers and mixtures thereof containing functional groups which are reactive under ambient conditions with a polyfunctional aziridine crosslinking agent;
  - b) at least one di or tri acrylate or methacrylate ester;
  - c) urea peroxide;
  - d) silver nitrate; and
  - e) a polyfunctional aziridine crosslinking agent;
 said composition containing from about 75 to about 95% by weight of component (a), on a dry weight basis; from about 0.05 to about 5% by weight of component (b); from about 0.0001 to about 0.1% by weight of component (c); from about 0.0001 to about 0.01% by weight of component (d); and from about 1 to about 15% by weight of component (e) per 100 parts by weight of component (a), on a dry weight basis.

#### 5,439,970 PAINT LATICES COMPRISING BENZOPHENONE/ACRYLIC COPOLYMERIZATES

Roland Reeb, Gressy, France, assignor to Rhone-Poulenc Chemie, Courbevoie Cedex, France

Filed Nov. 4, 1993, Ser. No. 145,622

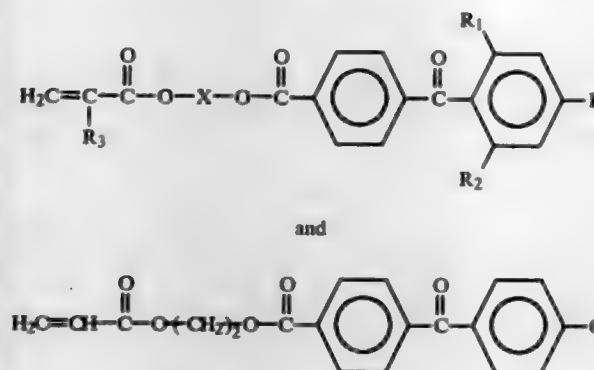
Claims priority, application France, Nov. 4, 1992, 92 13196  
Int. Cl.<sup>6</sup> C28L 33/08, 33/10, 39/00, 27/04

U.S. Cl. 524—558

18 Claims

1. An exterior latex paint comprising an aqueous dispersion of an acrylic polymer and a pigment, said acrylic polymer having a glass transition temperature of less than  $0^\circ\text{C}$ . and

comprising the copolymerize of (a) at least one alpha, beta-monoolefinically unsaturated carboxylic monomer, (b) at least one (meth)acrylic acid ester of a primary or secondary alcohol having from 1 to 18 carbon atoms, and a comonomer: (c) the formula selected from the group consisting of:



in which the radicals R, R<sub>1</sub> and R<sub>2</sub>, which may be identical or different, are each H, CH<sub>3</sub>, OH, NH<sub>3</sub>, COOH or COOCH<sub>3</sub>; and R<sub>3</sub> is H or CH<sub>3</sub> and X is a linear or branched C<sub>1</sub>-C<sub>6</sub> hydrocarbon radical, or an oxygen-containing such hydrocarbon radical.

#### 5,439,971 FLUORESCENT PIGMENT CONCENTRATES

Kenneth W. Hyche, Kingsport, Tenn., assignor to Eastman Chemical Company, Kingsport, Tenn.

Continuation of Ser. No. 112,636, Aug. 26, 1993, abandoned, which is a continuation of Ser. No. 792,335, Nov. 12, 1991, abandoned. This application Aug. 2, 1994, Ser. No. 284,710  
Int. Cl.<sup>6</sup> C08L 91/06; C09K 11/06

U.S. Cl. 524—763

4 Claims

1. A low plate-out fluorescent pigment concentrate comprising:
  - (a) a pigment comprising a polymer selected from the group consisting of polyesters, melamine-formaldehyde resins and triazine-formaldehyde resins and a fluorescent dye, and
  - (b) a copolymer of ethylene and carbon monoxide selected from the group consisting of copolymers having a melt viscosity in the range of about 50 to about 20,000 centipoise at  $150^\circ\text{C}$ . and copolymers having a melt index in the range of about 0.2 up to 100 g/10 min at  $190^\circ\text{C}$ ., said copolymer containing carbon monoxide residue in the amount of about 14-30% by weight, said copolymer being present in sufficient amount to disperse said pigment.

#### 5,439,972 WATER-SOLUBLE COMPOUNDS DERIVED FROM A HOMOPOLYMER OR COPOLYMER OF MALEIC ANHYDRIDE, AND APPLICATIONS OF THE SAID COMPOUNDS TO SUPPORTING BIOLOGICAL MOLECULES

Marie-Helene Charles, Condrieu; Thierry Delair, Lyons; Monique Jaubert, Craponne, and Bernard F. Mandrand, Villeurbanne, all of France, assignors to Bio Merieux, Marcy L'Etoile, France

Division of Ser. No. 32,027, Mar. 16, 1993. This application Oct. 12, 1994, Ser. No. 321,447

Claims priority, application France, Mar. 17, 1992, 92 03425  
Int. Cl.<sup>6</sup> C08F 8/00

U.S. Cl. 525—54.1

10 Claims

1. A water-soluble compound derived from a homopolymer or copolymer of maleic anhydride bonded directly or indirectly to at least one biological molecule selected from the group consisting of proteins, antibodies, fragments of antibodies or antigens, polypeptides, enzymes, haptens and fragments of nucleic acids, said compound having available anhydride

functional groups and hydrolyzed anhydride functional groups, wherein the hydrolyzed anhydride functional groups consist of carboxyl functional groups and functional groups derived from carboxyl functional groups carrying a residue of a compound corresponding to the formula I:



in which:

- a) A is a nitrogen atom of a primary, secondary or tertiary amine functional group or a sulfur atom of a thiol functional group,
- b) x, z and t, independently of each other, are nonzero integers, and
- c) y is a non-zero integer, not less than 5 when A is a nitrogen atom and not less than 4 when A is a sulfur atom.

#### 5,439,973

##### CYCLOOLEFIN RESIN COMPOSITION

Saneshiro Yamamoto; Toshio Kimura; Takasi Nakagawa, and Akinori Toyota, all of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan  
Continuation of Ser. No. 940,316, Sep. 3, 1992, abandoned. This application Nov. 2, 1994, Ser. No. 333,337

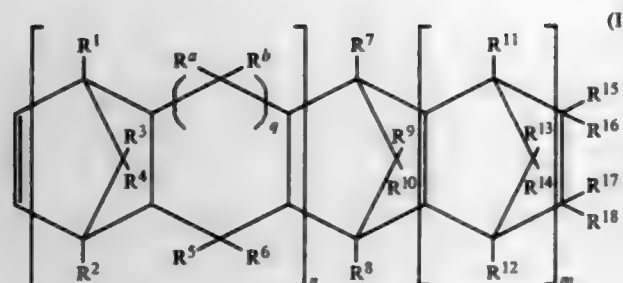
Claims priority, application Japan, Sep. 12, 1991, 3-233139; Sep. 12, 1991, 3-233140; Sep. 12, 1991, 3-233141; Sep. 12, 1991, 3-233142

Int. Cl.<sup>6</sup> C08L 77/00

U.S. Cl. 525—66

15 Claims

1. A cycloolefin resin composition comprising:
  - (A) at least one cycloolefin resin selected from the group consisting of:
    - (a-1) a random copolymer of ethylene and a cycloolefin represented by the following formula (I),
    - (a-2) a ring opening polymer or a ring opening copolymer of a cycloolefin represented by the following formula (I), and
    - (a-3) a hydrogenation product of said ring opening polymer or said ring opening copolymer;
  - (A') (a-4) a graft-modified product obtained by modifying the random copolymer (a-1), the ring opening polymer or copolymer (a-2) or the hydrogenation product thereof (a-3) with an unsaturated carboxylic acid or its derivative;
  - (B) (b-2) a graft-modified  $\alpha$ -olefin copolymer rubber having a tensile modulus at  $23^\circ\text{C}$ . of 0.1 to 2,000 kg/cm<sup>2</sup> and being obtained by modifying an elastomer having a tensile modulus at  $23^\circ\text{C}$ . of 0.1 to 2,000 kg/cm<sup>2</sup>, a glass transition temperature of not higher than  $0^\circ\text{C}$ . and a crystallinity of not more than 30% with an unsaturated carboxylic acid or its derivative; and
  - (C) a polyamide resin;
 said cycloolefin resin composition containing the component (A) in an amount of 0 to 59.5 parts by weight, the component (A') in an amount of 0.5 to 60 parts by weight, the component (B) in an amount of 2 to 30 parts by weight and the component (C) in an amount of less than 20 parts by weight, each based on 100 parts by weight of the total amounts of the component (A), the component (A'), the component (B) and the component (C);



wherein

n is 0 or 1;

m is 0, 1 or 2;

q is 0 or 1;

R<sup>1</sup> to R<sup>18</sup>, and R<sup>a</sup> and R<sup>b</sup> are each independently selected from the group consisting of hydrogen atom, halogen atom and hydrocarbon group;

with the proviso that R<sup>16</sup> to R<sup>18</sup> can link to each other to form a monocyclic or polycyclic group, and the monocyclic or polycyclic group can have a double bond; and

with the further proviso that R<sup>15</sup> and R<sup>16</sup> together can form an alkylidene group or R<sup>17</sup> and R<sup>18</sup> together can form an alkylidene group.

5,439,974

#### PROPYLENE-BASED EXTRUDABLE ADHESIVE BLENDS

Diana C. Mattson, Loveland, Ohio, assignor to Quantum Chemical Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 800,443, Nov. 27, 1991, abandoned, and a continuation-in-part of Ser. No. 954,225, Oct. 7, 1992, Pat. No. 5,367,022, which is a continuation-in-part of Ser. No. 800,443, Nov. 27, 1991, abandoned. This application Oct. 14, 1992, Ser. No. 961,131

The portion of the term of this patent subsequent to Nov. 22, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C08L 51/06

U.S. Cl. 525—74

16 Claims

1. An adhesive blend consisting essentially of a mixture of a modified impact copolymer and a grafted polymeric product comprising an impact propylene-ethylene copolymer grafted with an ethylenically unsaturated carboxylic acid or derivative grafting monomer, said modified impact copolymer comprising a blend selected from the group consisting of:

(I) a blend of (A) an impact copolymer selected from the group consisting of (a) reactor-made intimate mixtures of propylene homopolymers and statistically oriented copolymers of propylene and ethylene, and (b) blends of propylene homopolymers and statistically oriented copolymers of propylene and ethylene and (B) high density polyethylene (HDPE); and,

(II) a visbroken blend of (A) an impact copolymer selected from the group consisting of (a) reactor-made intimate mixtures of propylene homopolymers and statistically oriented copolymers of propylene and ethylene, and (b) blends of propylene homopolymers and statistically oriented copolymers of propylene and ethylene and (B) high density polyethylene (HDPE);

said modified impact copolymer having an MFR of between about 1 and about 200 g/10 min. measured at a condition test temperature of 230° C.

#### 5,439,975 THERMOPLASTIC POLYETHERAMIDE/STYRENE COPOLYMER COMPOSITION

Jean-Pierre Jacquemin, Bernay, and Gerard Deleens, Beaumesnil, both of France, assignors to Atochem, Puteaux, France  
Continuation of Ser. No. 895,250, Jun. 8, 1992, abandoned, which is a continuation of Ser. No. 693,090, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 338,567, Apr. 14, 1989, abandoned, which is a continuation of Ser. No. 942,185, Dec. 16, 1986, abandoned. This application Jun. 4, 1993, Ser. No. 71,611

Claims priority, application France, Dec. 16, 1985, 85 18599  
Int. Cl.<sup>6</sup> C08L 77/12

U.S. Cl. 525—89

9 Claims

1. A thermoplastic polymeric composition of matter, comprising an aliphatic polyetheresteramide block polymer and a styrene/diene copolymer consisting essentially of styrene and diene, wherein the aliphatic polyetheresteramide block polymer is the predominant component of the polymeric composition relative to the styrene/diene copolymer.

5,439,976

#### POLYESTER COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Satoshi Kinoshita; Hideo Takamatsu; Kazushige Ishiura, all of Ibaraki; Haruhisa Masuda, and Shunro Taniguchi, both of Kurashiki, all of Japan, assignors to Kuraray Company Ltd., Kurashiki, Japan

Continuation of Ser. No. 178,656, Jan. 7, 1994, Pat. No. 5,393,837. This application Jul. 12, 1994, Ser. No. 274,040  
Claims priority, application Japan, Jan. 21, 1993, 5-26270; Nov. 4, 1993, 5-275812; Nov. 4, 1993, 5-275813

The portion of the term of this patent subsequent to Feb. 28, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> C08L 67/02, 53/00, 53/02

U.S. Cl. 525—92

11 Claims

1. A polyester composition comprising:

(a) at least one polyester; and

(b) a first block copolymer (b-1) having chain-terminating hydroxyl groups, said first block copolymer comprising: at least one block A selected from the group consisting of a polymer block consisting essentially of an aromatic vinyl compound and a hydrogenated polybutadiene block obtained by hydrogenating a polybutadiene block having not more than 20% of a 1,2-bond and

at least one block B selected from the group consisting of a hydrogenated polyisoprene block and a hydrogenated isoprene-butadiene random copolymer block; and/or a second block copolymer (b-2) having chain-terminating hydroxyl groups, said second block copolymer comprising:

at least one polymer block C consisting essentially of an aromatic vinyl compound and at least one polyisobutylene block D;

said composition obtained by a process which comprises, upon preparation of a polyester (a) by esterification or transesterification and the succeeding polycondensation, adding a block copolymer (b) in a ratio by weight of said polyester/said block copolymer of 98/2 to 40/60 at a time before completion of polycondensation of said polyester.

5,439,977

#### ACID ANHYDRIDE-CONTAINING ONE PACKAGE OF EPOXY RESIN COMPOSITION

Tadahiko Yokota; Hiroyuki Sakata; Kiyomiki Hirai, and Koji Takeuchi, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 38,249, Mar. 29, 1993, abandoned. This application Apr. 15, 1994, Ser. No. 227,995  
Int. Cl.<sup>6</sup> C08G 59/18, 59/68, 59/42

U.S. Cl. 525—113

9 Claims

1. An acid anhydride-containing one package epoxy resin

composition comprising:

- (1) 100 pbw of an epoxy resin having two or more epoxy groups in one molecule;
- (2) an acid anhydride, wherein the ratio of acid anhydride equivalents in (2) to the number of epoxy equivalents in (1) is from 0.8 to 1.2;
- (3) 0.1 to 10 pbw of a monosecondary monoamine or a salt thereof; and
- (4) 0.1 to 10 pbw of an imidazole-epoxy adduct, the amounts of (3) and (4) being on 100 pbw of (1) for each.

5,439,978

#### OXAZINE-AND OXAZOLINE-BASED COPOLYMERS USEFUL AS ANTIELECTROSTATIC AGENTS AND POLYMERIC COMPOSITIONS PREPARED THEREWITH

Dean B. Parkinson, deceased, late of Redwood City by Elfriede Parkinson, executrix; Asutosh Nigam, Fremont, and Subhash Narang, Redwood City, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Aug. 9, 1993, Ser. No. 104,216

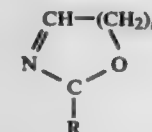
Int. Cl.<sup>6</sup> C08L 81/06

U.S. Cl. 525—185

30 Claims

1. A composite of a first polymeric material and an antielectrostatic agent comprising a copolymer comprising:

- (a) a first block formulated from monomer units of the structure



wherein n is 1 or 2, and R is a substituent selected from the group consisting of hydrogen and a C<sub>1</sub>-C<sub>40</sub> side chain, wherein the side chain is a linear or branched aliphatic hydrocarbon radical optionally containing 1 to 3 ether, imine and/or sulfide linkages, an alicyclic or aromatic hydrocarbon radical, polyethylene imine, a polyethylene oxide, a polythioether or a thioether linkage-containing polyalkylene glycol; and  
(b) a second block comprising a thioether linkage-containing polyalkylene glycol.

5,439,979

#### SEPARATING MATERIALS

Margot Mack, Flirth, and Joachim Kinkel, Guldental, both of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Germany

Filed Feb. 22, 1991, Ser. No. 658,903

Claims priority, application Germany, Feb. 24, 1990, 40 05 868.9

Int. Cl.<sup>6</sup> C08L 33/24

U.S. Cl. 525—218

11 Claims

1. A sorbent for thin-layer chromatography, based on sorbent-coated supports, which essentially comprises optically active poly(meth)acrylamides bonded to silica gel and a binder system comprising a mixture of carboxyl-containing polyvinyl polymers and acrylate polymers.

5,439,980

#### PROCESS FOR PREPARING POLYMER

Yuji Yutani, and Masayoshi Tatemoto, both of Osaka, Japan, assignors to Daikin Industries, Osaka, Japan

Continuation-in-part of Ser. No. 32,541, Mar. 17, 1993, abandoned, which is a continuation of Ser. No. 798,759, Nov. 27, 1991, abandoned. This application Dec. 20, 1993, Ser. No. 169,753

Claims priority, application Japan, Nov. 29, 1990, 2-335861  
Int. Cl.<sup>6</sup> C08F 259/08

U.S. Cl. 525—276

10 Claims

1. A process for preparing a polymer which comprises polymerizing at least one monomer M<sub>1</sub>, having a radically polymerizable unsaturated bond, in the presence of a monomer M<sub>2</sub>, which is different from said monomer M<sub>1</sub>, a radical generating source and an iodide compound having a cleavable carbon-iodine bond and capable of producing a carbon radical and an iodine atom upon cleavage, to form at least one polymer chain between said carbon radical and said iodine atom,

wherein said monomer M<sub>2</sub> has a larger addition reactivity with said carbon radical than said monomer M<sub>1</sub>, and a copolymerization reaction rate r<sub>2</sub> of zero, wherein said monomer M<sub>1</sub> has a copolymerization reaction rate r<sub>1</sub> greater than 1 and less than 100, and

wherein said iodine atom of said iodide compound may be withdrawn by a radical of said M<sub>2</sub> monomer to form a terminal iodide bond between said M<sub>2</sub> monomer radical and said iodine atom, said iodine atom of said terminal iodide bond having substantially the same transfer activity as said iodine atom when bonded to said iodide compound.

5,439,981

#### GRAFT POLYMERS, THEIR PREPARATION AND USE AS POUR POINT DEPRESSANTS AND FLOW IMPROVERS FOR CRUDE OILS, RESIDUAL OILS AND MIDDLE DISTILLATES

Juliane Balzer, Frankfurt; Michael Feustel, Kelkheim; Matthias Krull, Bad Soden, and Werner Reimann, Oberhausen, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany  
Filed Dec. 7, 1993, Ser. No. 163,085

Claims priority, application Germany, Dec. 12, 1992, 42 41 948.4

Int. Cl.<sup>6</sup> C08F 255/02; C10M 143/02

U.S. Cl. 525—282

20 Claims

1. A method of improving flow properties of paraffin-containing mineral oils and mineral oil distillates comprising adding to said oils and said distillates a graft polymer of 20% to 99.9% of an ethylene copolymer and 0.1% to 80% of a graft component,

said ethylene copolymer comprising 30% to 95% of ethylene and 5% to 70% of vinyl esters of saturated aliphatic C<sub>2</sub>- to C<sub>18</sub>-monocarboxylic acids or 4% to 50% of vinyl esters of saturated aliphatic C<sub>2</sub>- to C<sub>18</sub>-monocarboxylic acids and 1% to 20% of linear or branched C<sub>3</sub>- to C<sub>18</sub>-monoolefins, and

said graft component being selected from the group consisting of N-substituted α,β-unsaturated dicarboxylic acid imides, N-substituted α,β-unsaturated dicarboxylic acid amides, N-substituted α,β-unsaturated dicarboxylic acid half-amides, ammonium salts of said half-amides, and mixtures thereof.



5,439,982

**REACTIVE POLYMERS HAVING PENDANT FLEXIBLE SIDE CHAINS PREPARED FROM ETHYLENICALLY UNSATURATED CARBODIIMIDES**

James W. Taylor, Kingsport; Martha J. Collins, Blountville, both of Tenn., and David R. Bassett, Cary, N.C., assignors to Union Carbide Chemical & Plastic Technology Corporation, Danbury, Conn.

Division of Ser. No. 81,976, Jun. 23, 1993, Pat. No. 5,371,148. This application Aug. 25, 1994, Ser. No. 296,119

Int. Cl.<sup>6</sup> C08F 265/02; D06M 15/263; C09D 11/00, 133/02

U.S. Cl. 525—293

14 Claims

1. A process for preparing a polymer having one or more pendant flexible side chains connected thereto comprising:

- (a) preparing a precursor polymer having carboxyl group functionality from one or more ethylenically unsaturated monomers;
- (b) post reacting the precursor polymer with one or more ethylenically unsaturated carbodiimides; and
- (c) optionally recovering the step (b) polymer and redissolving it in an organic solvent.

5. An ambient curable coating composition comprising a polymer having one or more pendant flexible side chains connected thereto, wherein said pendant flexible side chains contain ethylenic unsaturation and are connected to said polymer by an N-acyl urea linkage, said N-acyl urea linkage formed by the reaction of an ethylenically unsaturated carbodiimide with a carboxylic acid group on said polymer, optionally a plasticizer, and optionally one or more drier salts.

8. A thermally curable coating composition comprising a polymer having one or more pendant flexible side chains connected thereto, wherein said pendant flexible side chains contain ethylenic unsaturation and are connected to said polymer by an N-acyl urea linkage, said N-acyl urea linkage formed by the reaction of an ethylenically unsaturated carbodiimide with a carboxylic acid group on said polymer, an oxygen-producing compound, and optionally a plasticizer and/or one or more drier salts.

10. A radiation curable coating composition comprising a polymer having one or more pendant flexible side chains connected thereto, wherein said pendant flexible side chains contain ethylenic unsaturation and are connected to said polymer by an N-acyl urea linkage, said N-acyl urea linkage formed by the reaction of an ethylenically unsaturated carbodiimide with a carboxylic acid group on said polymer, a photoinitiator, and one or more radiation-polymerizable unsaturated compounds.

5,439,983

**GRAFTED COPOLYMERS HIGHLY ABSORBENT TO AQUEOUS ELECTROLYTE SOLUTIONS**

Iqbal Ahmed, Bartlesville, Okla., and Henry L. Hsieh, Pittsboro, N.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 53,038, Apr. 26, 1993, Pat. No. 5,357,000, which is a division of Ser. No. 917,700, Jul. 21, 1992, Pat. No. 5,206,326, which is a continuation of Ser. No. 665,880, Mar. 7, 1991, abandoned. This application Jul. 27, 1994, Ser. No. 290,955

The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C08F 255/02; D21H 17/45; A61L 15/24, 15/28

U.S. Cl. 525—296

13 Claims

1. A method of absorbing an aqueous electrolyte solution comprising contacting a graft copolymer formed by:

- (A) graft polymerizing onto a first polymer of propylene at least one comonomer selected from the group consisting of acrylamide, methacrylamide, acrylonitrile, acrylic acid, methacrylic acid, alkali salts of acrylic acid, alkali salts of methacrylic acid, 2-methacryloyloxyethylamine, 2-acrylamido-2-methylpropane sulfonic acid, alkali salts of 2-acrylamido-2-methylpropane sulfonic acid, 2-methacryloyloxyethane sulfonic acid, alkali salts of 2-methacryloyloxyethane sulfonic acid, alkali salts of 2-methacryloyloxyethane sulfonic acid, N-vinyl-2-pyrrolidone and combinations of two or more thereof;

cryloyloxyethane sulfonic acid, N-vinyl-2-pyrrolidone and combinations of two or more thereof;

(B) graft copolymerizing therewith an ampholytic ion pair monomer having an ammonium cation and a sulfonate anion wherein

- (i) the ammonium cation is 2-methacryloyloxyethylammonium; and
- (ii) the sulfonate anion is selected from the group consisting of 2-acrylamido-2-methylpropane sulfonate, 2-methacryloyloxyethane sulfonate, vinyl sulfonate, styrene sulfonate and any combination of two or more thereof;

wherein the comonomers and ion pair monomers are provided in amounts which are effective to produce a highly absorbent graft copolymer; and

(C) partially saponifying/neutralizing of said graft copolymer formed in step (B); with an electrolyte solution.

12. A paper towel containing therein a graft copolymer formed by

- (a) graft polymerizing onto a first polymer selected from the group consisting of polysaccharide, polypropylene, and polyethylene; at least one comonomer selected from the group consisting of acrylamide, methacrylamide, acrylonitrile, acrylic acid, methacrylic acid, alkali salts of acrylic acid, alkali salts of methacrylic acid, 2-methacryloyloxyethane sulfonic acid, alkali salts of 2-methacryloyloxyethane sulfonic acid, N-vinyl-2-pyrrolidone and combinations of two or more thereof;

(b) graft copolymerizing therewith an ampholytic ion pair monomer having an ammonium cation and a sulfonate anion wherein

- (i) the ammonium cation is 2-methacryloyloxyethyl-diethylammonium; and
- (ii) the sulfonate anion is selected from the group consisting of 2-acrylamido-2-methylpropane sulfonate, 2-methacryloyloxyethane sulfonate, vinyl sulfonate, styrene sulfonate and any combination of two or more thereof;

wherein said graft copolymer is composed of from about 1 weight percent to about 50 weight percent of polypropylene; and the mole percent of the comonomer and ampholytic ion pair grafted therewith are in the range of from about 75 mole percent to about 98 mole percent of comonomer; and from about 2 mole percent to about 25 mole percent of said ampholytic ion pair.

13. A disposable diaper containing therein a graft copolymer formed by:

- (a) graft polymerizing onto a first polymer selected from the group consisting of polysaccharide, polypropylene, and polyethylene; at least one comonomer selected from the group consisting of acrylamide, methacrylamide, acrylonitrile, acrylic acid, methacrylic acid, alkali salts of acrylic acid, alkali salts of methacrylic acid, 2-methacryloyloxyethane sulfonic acid, N-vinyl-2-pyrrolidone and combinations of two or more thereof;

(b) graft copolymerizing therewith an ampholytic ion pair monomer having an ammonium cation and a sulfonate anion wherein

- (i) the ammonium cation is 2-methacryloyloxyethyl-diethylammonium;
- (ii) the sulfonate anion is selected from the group consisting of 2-acrylamido-2-methylpropane sulfonate, 2-methacryloyloxyethane sulfonate, vinyl sulfonate, styrene sulfonate and any combination of two or more thereof;

wherein said graft copolymer is composed of from about 1 weight percent to about 50 weight percent of polypropylene; and the mole percent of the comonomer and ampholytic ion pair grafted therewith are in the range of from about 75 mole percent to about 98 percent of comonomer; and from about 2 mole percent to about 25 mole percent of the ampholytic ion pair.

5,439,984

**PLASMA TREATMENT OF POLYMER POWDERS**

Jun Kodama, 403 Morigaoka Daini 1980-7 Ozenji, Aso-ku Kawasaki, 215, Japan; Renate Foersch, Untere Schwemmbach 7, 6227 Oestrich - Winkel, 2, Germany; N. Stewart McIntyre, 94 Shavian Boulevard, London, Ontario, Canada N6C 2P3, and George S. P. Castle, 6 Brentwood Place, London, Ontario, Canada N6G 1X7

Continuation of Ser. No. 995,990, Dec. 23, 1992, Pat. No. 5,283,086. This application Dec. 22, 1993, Ser. No. 171,690

Int. Cl.<sup>6</sup> C08F 8/42

U.S. Cl. 525—332.8

7 Claims

1. A polymer powder comprising:

- a polymer particle; and
  - a dopant which is doped on the surface of said polymer particle;
- said dopant consisting of nitrogen or indium which is incorporated into the particle's surface structure, whereby the charge to mass ratio (Q/M) is increased and stabilized.

5,439,985

**BIODEGRADABLE AND HYDRODEGRADABLE DIBLOCK COPOLYMERS COMPOSED OF POLY(β-HYDROXYALKANOATES) AND POLY(LACTONES) OR POLY(LACTIDE) CHAIN SEGMENTS**

Richard A. Gross, Chelmsford; Stephen P. McCarthy, Tyngsboro, and Michael S. Reeve, Lowell, all of Mass., assignors to University of Massachusetts Lowell, Lowell, Mass.

Filed Jul. 28, 1993, Ser. No. 98,709

Int. Cl.<sup>6</sup> C08G 63/08, 63/84

U.S. Cl. 525—411

17 Claims

1. A biodegradable and hydrodegradable diblock copolymer comprising:

- a) one naturally-occurring poly(β-alkanoate) segment; and
- b) one biodegradable poly(lactone) or poly(lactide) segment.

5,439,986

**THERMO-CURABLE RESIN COMPOSITION, AND A METHOD FOR PRODUCING A COPPER-CLAD LAMINATE USING SAME**

Tadayuki Hosogane, Yokohama; Hiroshi Nakajima, Sawa, and Eichihiro Takiyama, Kamakura, all of Japan, assignors to Showa Highpolymer Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/01074, § 371 Date Nov. 16, 1993, § 102(e)

Date Nov. 16, 1993, PCT Pub. No. WO94/03517, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 30, 1993, Ser. No. 146,067

Claims priority, application Japan, Aug. 3, 1992, 4-206800; Oct. 20, 1992, 4-281933; May 17, 1993, 5-114894; May 17, 1993, 5-114895; May 17, 1993, 5-114896

Int. Cl.<sup>6</sup> C08F 283/04; C08L 63/00

U.S. Cl. 525—423

8 Claims

1. A thermo-curable resin composition which contains:

- (a) an aromatic polyamide oligomer having polymerizable unsaturated group(s) at both terminals or within side chain(s);
- (b) a maleimide compound; and
- (c) an epoxy resin.

5,439,987

**HIGH HEAT DEFLECTION TEMPERATURE BLENDS OF CERTAIN POLYESTERS WITH POLYETHERIMIDES**

Christopher E. Scott; Max F. Meyer; Kenneth E. Breeding, and Jeffrey T. Owens, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed May 31, 1994, Ser. No. 251,761

Int. Cl.<sup>6</sup> C08L 77/00

U.S. Cl. 525—425

13 Claims

1. A thermoplastic polymer blend comprising

- (A) about 20 to 65 weight percent of a polyetherimide and
- (B) about 80 to 35 weight percent of copolyester of

- (a) an acid component comprising terephthalic acid or isophthalic acid or mixture of said acids, and
- (b) a glycol component comprising about 40 to about 70 mol percent ethylene glycol and about 30 to about 60 mol percent 1,4-cyclohexanedimethanol.

5,439,988

**CARBOXYL-TERMINATED POLYESTERS FOR THE PREPARATION OF POWDER COATING COMPOSITIONS**

Luc Moens, Sint-Genesius-Rode; Daniel Maetens; Jean-Marie Loutz, both of Bruxelles, and Michel Baudour, Angreau, all of Belgium, assignors to UCB S.A., Brussels, Belgium

Filed Mar. 9, 1993, Ser. No. 28,159

Claims priority, application European Pat. Off., Mar. 16, 1992, 92870044

Int. Cl.<sup>6</sup> C08L 67/02

U.S. Cl. 525—437

9 Claims

1. A carboxyl-terminated polyester consisting essentially of the reaction product of

- (a) an all aliphatic hydroxyl-terminated polyester prepared from 1,4-cyclohexanedicarboxylic acid as the sole acid component and as the alcohol component
- (1) from 10 to 100 equivalent % of a cycloaliphatic diol and
- (2) from 90 to 0 equivalent % of at least one straight or branched chain aliphatic polyol having 2 to 12 carbon atoms, with
- (b) an aliphatic and/or aromatic dicarboxylic acid or the corresponding anhydride the amount of 1,4-cyclohexanedicarboxylic acid of the carboxyl-terminated polyester being of from 50 to 90 mole % with respect to the total amount of carboxylic acids and the said carboxyl-terminated polyester having an acid number of from 25 to 70 mg KOH/g and a number-average molecular weight between 2,000 and 10,000.

5,439,989

**EPOXY RESINS BASED ON MACROCYCLIC COMPOUNDS**

Trevor C. Morton, Hampton; Jonathan H. Hodgkin, Burwood, and Bun N. Dao, Lalor, all of Australia, assignors to Commonwealth Scientific & Industrial Research Organisation, Campbell, Australia

PCT No. PCT/AU91/00455, § 371 Date May 3, 1993, § 102(e)

Date May 3, 1993, PCT Pub. No. WO92/06128, PCT Pub. Date Apr. 16, 1992

PCT Filed Oct. 3, 1991, Ser. No. 30,303

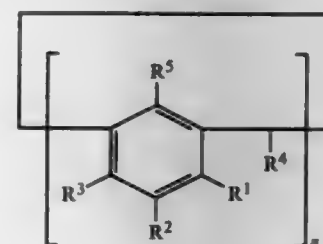
Claims priority, application Australia, Oct. 3, 1990, PK2610/90; Dec. 12, 1990, PK3871/90

Int. Cl.<sup>6</sup> C08G 8/12, 8/28, 8/32, 8/36

U.S. Cl. 525—502

10 Claims

1. A macrocyclic compound of the formula (I)



wherein

n is an integer from 3 to 10;

R<sup>1</sup> and R<sup>3</sup> are either the same or different and are hydrogen, hydroxyl, alkoxy, allyloxy, or epoxypropyloxy;

R<sup>2</sup> is hydrogen, aralkyl optionally substituted with halogen, alkyl optionally substituted with halogen, or aryl optionally substituted with halogen;



R<sup>4</sup> is hydrogen, alkyl optionally substituted with halogen, aralkyl optionally substituted with halogen, or aryl optionally substituted with alkyl and/or halogen;  
R<sup>5</sup> is hydrogen, aryl or alkyl;  
with the proviso that the compound contains on average at least one epoxy group per molecule.

5,439,990

# PHOTOLYTIC POLYMER AND PHOTORESIST COMPOSITION

Katsumi Maeda; Kaichiro Nakano, and Etsuo Hasegawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan  
Filed Aug. 30, 1993, Ser. No. 113,060

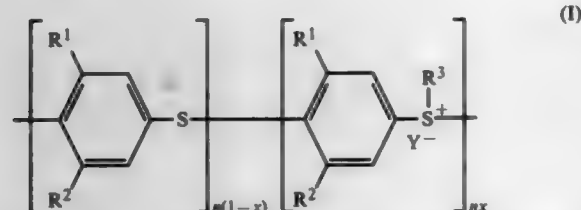
Claims priority, application Japan, Aug. 28, 1992, 4-229027; Feb. 26, 1993, 5-037696

Int. Cl.<sup>6</sup> C08L 81/04; C08G 75/04

U.S. Cl. 525—535

4 Claims

1. A polymer of the formula:



where at least one of R<sup>1</sup> and R<sup>2</sup> is either an alkyl group having 1 to 3 carbon atoms or an alkoxy group having 1 to 3 carbon atoms and the other is hydrogen, R<sup>3</sup> is either a phenyl group or an alkyl group having 1 to 3 carbon atoms, x is 0.1 to 0.7, n is a positive integer in the range of from 10 to 700, Y<sup>-</sup> is a non-nucleophilic paired ion.

5,439,991

# METHOD OF MIXING HETEROGENEOUS SYSTEMS

Derek A. Colman, Hampshire, and William Tallis, Surrey, both of United Kingdom, assignors to BP Chemicals Limited, London, England

Filed Jun. 16, 1994, Ser. No. 260,892

Claims priority, application United Kingdom, Jun. 30, 1993, 9313442

Int. Cl.<sup>6</sup> C08F 2/00

U.S. Cl. 526—64

15 Claims

1. A process for uniformly mixing heterogeneous or multiphase systems comprising a continuous phase and at least a solid, dispersed phase in a pulsatile flow reactor (PUFR) wherein the uniform mixing is carried out by actuating means for pulsing the continuous phase in the reactor.

5,439,992

# CONTINUOUS PROCESS FOR MAKING MELT-PROCESSABLE OPTICAL GRADE RING-OPENED POLYCYCLIC (CO)POLYMERS IN A SINGLE-STAGE MULTI-ZONED REACTOR

Kong S. Yi, Marietta, Ga.; Linwood P. Tenney, Birmingham, Ala.; Parley C. Lane, Jr., Cuyahoga Falls, Ohio; John V. Wessel, Independence, Ohio, and Nancy S. Marchant, Brunswick, Ohio, assignors to The B. F. Goodrich Company, Brecksville, Ohio

Continuation-in-part of Ser. No. 48,621, Apr. 16, 1993, Pat. No. 5,319,034, which is a continuation of Ser. No. 845,207, Mar. 3, 1992, Pat. No. 5,206,306, which is a division of Ser. No. 331,330, Mar. 31, 1989, abandoned. This application Jun. 6, 1994, Ser. No. 254,381

Int. Cl.<sup>6</sup> C08F 232/08

U.S. Cl. 526—73

10 Claims

1. A process for polymerizing a substantially anhydrous solution in which a processable ring-opened polymer is formed by ring opening metathesis polymerization in at least a first and a last reaction zone of a multi-zoned, single-stage, reaction vessel, said solution including at least one multi-ringed

monoolefinically unsaturated cycloolefin monomer selected from the group consisting of bicyclo[2.2.1]hept-2-ene ("norbornene") "NB") and substituted embodiments thereof, comprising,

(a) continuously introducing said monomer into said first reaction zone in combination with (i) a diluent amount of a C<sub>4</sub>–C<sub>8</sub>-cycloalkane, and (ii) a minor molar amount, relative to the moles of said monomer, of a lower C<sub>3</sub>–C<sub>7</sub> alkene chain transfer agent present in a predetermined amount correlatable with a desired weight average molecular weight Mw in the range from about 30,000 to about 500,000 of said polymer, and (iii) a catalyst system consisting essentially of a catalyst selected from the group consisting of organoammoniummolybdate, Mo(CI)<sub>5</sub>, W(CI)<sub>6</sub>, WO(CI)<sub>4</sub>, WO(OR)<sub>4</sub>, xCl<sub>x</sub> where R represents alkyl, phenyl, phenyl substituted phenyl, phenylalkyl, and halogen substituted derivatives of alkyl, phenyl, and phenyl substituted phenyl and phenylalkyl; x is an integer in the range from 0 to 4; in combination with an organoaluminumhalide co-catalyst, present in an amount effective to produce said polymer, said co-catalyst being represented by R'<sub>3</sub>AlCl<sub>3-y</sub>, wherein R' represents C<sub>2</sub>–C<sub>6</sub> alkyl; y is an integer in the range from 0 to 3, or an alkyltin hydride represented by R''<sub>3</sub>SnH where R'' is C<sub>2</sub>–C<sub>6</sub> alkyl; at a pressure in the range from about atmospheric (1 bar) to about 6 bar (90 psig);

(b) maintaining said at least first and second zones in restricted, substantially one-way fluid communication, one zone with a contiguous zone;

(c) maintaining said last reaction zone at a higher temperature than a contiguous preceding reaction zone, said higher temperature being at least 20° C. higher than in said preceding reaction zone, and said last reaction zone is at a temperature in the range from 23° C.–55° C.;

(d) controlling only the amount of said catalyst system and said C<sub>3</sub>–C<sub>7</sub> alkene relative to said monomer so as to convert >95% of said monomer in less than 20 min residence time through said reaction vessel, yet continuously maintaining a temperature in a chosen range in each reaction zone; and,

(e) recovering a polymer from said last reaction zone, said polymer having a Mw/Mn < 5 and a T<sub>g</sub> in the range from about 135° C.–200° C.

5,439,993

# PROCESS FOR THE PRODUCTION OF HIGHLY WATER ABSORPTIVE POLYMERS

Kitichi Ito; Shinji Tsunoi, and Tetsuya Yamamoto, all of Yokkai-chi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 899,985, Jun. 17, 1992, abandoned.

This application Mar. 31, 1994, Ser. No. 220,931

Claims priority, application Japan, Jun. 20, 1991, 3-148857

Int. Cl.<sup>6</sup> C08F 2/12

U.S. Cl. 526—93

4 Claims

1. A process for producing a water-insoluble highly water absorptive polymer, comprising the step of:

polymerizing an acrylic monomer comprising as the main component acrylic acid and/or an alkali metal salt thereof, and a crosslinking monomer, in the presence of a salt of a metal selected from the group consisting of Fe(II), Fe(III), Cu(II), Mn(II), VO(II), Co(II) and Ni(II), wherein the amount of said salt of a metal is 0.001 to 1% by weight based on the acrylic monomer.

5,439,994

# METHOD OF POLYMERIZING AN OLEFIN USING A NOVEL TRANSITION METAL COMPOUND

Norihide Inoue, Yokohama; Tetsunosuke Shiomura, Tokyo; Masahiro Kouno, Kanagawa; Yoshiho Sonobe, and Kazumi Mizutani, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 941,056, Oct. 8, 1992, Pat. No. 5,359,102.

This application Jul. 20, 1994, Ser. No. 277,570

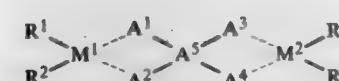
Claims priority, application Japan, Mar. 11, 1991, 3-44682

Int. Cl.<sup>6</sup> C08F 4/642

U.S. Cl. 526—114

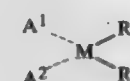
6 Claims

4. A method for polymerizing an olefin in the presence of a catalyst comprising a promoter and at least two kinds of transition metal compounds which comprise a combination of transition metal compound represented by the formula

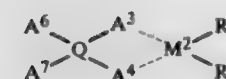


wherein each of A<sup>1</sup>, A<sup>2</sup>, A<sup>3</sup> and A<sup>4</sup> is a cyclopentadienyl group, an indenyl group, or a fluorenyl group; A<sup>5</sup> is a hydrocarbondiylidene having 4 to 30 carbon atoms; A<sup>1</sup> and A<sup>2</sup> are bonded to the identical carbon atom in A<sup>5</sup> and A<sup>3</sup> and A<sup>4</sup> are bonded to the identical carbon atom in A<sup>5</sup> to form a cross-linked structure; each of R<sup>1</sup> and R<sup>2</sup> is a halogen, hydrogen, alkyl having 1 to 10 carbon atoms or a silicon-containing alkyl having 1 to 10 carbon atoms, aryl having 6 to 20 carbon atoms, alkylaryl having 6 to 20 carbon atoms, arylalkyl having 6 to 20 carbon atoms, or a halogenated aryl having 6 to 20 carbon atoms; R<sup>1</sup> and R<sup>2</sup> are identical or different; each of M<sup>1</sup> and M<sup>2</sup> is titanium, zirconium or hafnium; and M<sup>1</sup> and M<sup>2</sup> are mutually identical or different.

and another transition metal compound represented by the formula



or



wherein each of A<sup>1</sup> and A<sup>2</sup> is a cyclopentadienyl group, an indenyl group or a fluorenyl group; A<sup>1</sup> and A<sup>2</sup> are identical or different; each of A<sup>6</sup> and A<sup>7</sup> is an alkyl having 1 to 10 carbon atoms, aryl having 6 to 20 carbon atoms, alkylaryl having 6 to 20 carbon atoms, arylalkyl having 6 to 20 carbon atoms, halogenated aryl having 6 to 20 carbon atoms or a heteroatom-containing hydrocarbon group having 6 to 20 carbon atoms wherein the heteroatom is selected from the group consisting of oxygen, nitrogen, sulfur and silicon, or a hydrogen; Q is a hydrocarbon having 1 to 10 carbon atoms or a silicon, germanium or tin-containing hydrocarbon having 1 to 10 carbon atoms, which links with A<sup>1</sup> and A<sup>2</sup>; A<sup>6</sup> and A<sup>7</sup> may be mutually bonded to form a ring structure composed of A<sup>6</sup>, A<sup>7</sup> and Q; each of R<sup>1</sup> and R<sup>2</sup> is a halogen, hydrogen, alkyl having 1 to 10 carbon atoms or a silicon-containing alkyl having 1 to 10 carbon atoms, aryl having 6 to 20 carbon atoms, alkylaryl having 6 to 20 carbon atoms, arylalkyl having 6 to 20 carbon atoms or a halogenated aryl having 6 to 20 carbon atoms; R<sup>1</sup> and R<sup>2</sup> are identical or different; and M is titanium, zirconium or hafnium.

5,439,995

# CATALYST AND PREPOLYMER USED FOR THE PREPARATION OF POLYOLEFINS

Jean-Claude Bailly, Martigues; Philippe Bres, Fos-Sur-Mer; Christine Chabrand, Martigues, and Erick Daire, Chateaufort-Les-Martigues, all of France, assignors to BP Chemicals Limited, London, United Kingdom

Continuation of Ser. No. 92,283, Jul. 15, 1993, abandoned, which is a continuation of Ser. No. 824,080, Jan. 23, 1992, abandoned, which is a division of Ser. No. 625,829, Dec. 11, 1990, Pat. No. 5,106,804. This application Feb. 3, 1994, Ser. No. 192,183

Claims priority, application France, Dec. 22, 1989, 89 17402

Int. Cl.<sup>6</sup> C08F 4/654, 10/02

U.S. Cl. 526—125

39 Claims

1. A process for preparing ethylene (co-)polymers, which comprises (co-)polymerizing ethylene in the presence of a solid supported catalyst containing a zirconium metallocene and a support based on magnesium chloride and a cocatalyst based on an organoaluminum compound, at a temperature of 10° to 110° C. under a total pressure of 0.1 to 5 MPa, wherein said solid supported catalyst consists of spheroidal particles having a mass-average diameter, D<sub>m</sub>, of 10 to 100 microns and a particle size distribution such that the ratio of D<sub>m</sub> to the number-average diameter, D<sub>n</sub>, of the particles is not higher than 3, and comprises (1) a support containing from 80 to 99.9 mol % of magnesium dichloride and from 0.1 to 20 mol % of at least one organic electron-donor compound, D, free from labile hydrogen, (2) a tetravalent zirconium metallocene, and (3) an aluminoxane.

5,439,996

# SYNTHESIS OF POLYMERS OF VINYL ETHERS, 1,5-HEXADIENE AND N-VINYLCARBAZOLE

Michael C. Baird, and Qinyan Wang, both of Kingston, Canada, assignors to Queen's University at Kingston, Kingston, Canada

Filed Jun. 1, 1994, Ser. No. 251,989

Int. Cl.<sup>6</sup> C08F 11/76

U.S. Cl. 526—134

10 Claims

1. A process for polymerizing monomers selected from the group consisting of vinyl ethers, hexadienes, dihydrofurans, dihydropyrans and vinylcarbazoles, comprising reacting a selected said monomer in the presence of a catalyst comprising (II) Cp\*MMe<sub>2</sub> where Cp\* is η<sup>5</sup> pentamethylcyclopentadienyl, M is selected from the group consisting of Titanium, Hafnium and Zirconium and Me is methyl; and a borane co-initiator in a solvent therefor.

5,439,997

# POLYMERS AND DETERGENT COMPOSITIONS CONTAINING THEM

Stephen G. Hales, Willaston; Ezat Khoshdel, Neston, and Robert Polywka, Mickle Trafford, all of Great Britain, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Apr. 7, 1993, Ser. No. 44,523

Claims priority, application United Kingdom, Apr. 9, 1992, 9207795

Int. Cl.<sup>6</sup> C08F 24/00

U.S. Cl. 526—240

13 Claims

1. A polymer composed of at least two different types of structural unit, said polymer consisting essentially of:

(i) structural units containing a group of the formula I



(I)

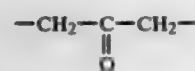
wherein



R represents a hydrogen atom, a C<sub>1</sub>-C<sub>3</sub> alkyl or hydroxy-alkyl group, or a group of the formula A<sub>2</sub>-COOM, each of A<sub>1</sub> and A<sub>2</sub>, which are the same or different, represents a direct bond or an optional spacer group containing from 1 to 4 carbon atoms;

M represents a hydrogen atom or a sodium, potassium, ammonium or lower-alkyl-substituted ammonium ion; and

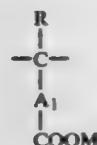
structural units of the formula II



said polymer comprising from 70 to 99 mole % of units (i) and from 1 to 30 mole % of units (ii), having a weight-average molecular weight within the range of from 2000 to 2,000,000 and having a number-average molecular weight within the range of from 100 to 100,000.

11. A process for the preparation of a polymer composed of at least two different types of structural unit, said polymer consisting essentially of

(i) structural units containing a group of the formula I

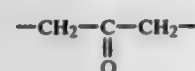


wherein

R represents a hydrogen atom, a C<sub>1</sub>-C<sub>3</sub> alkyl or hydroxy-alkyl group, or a group of the formula A<sub>2</sub>-COOM, each of A<sub>1</sub> and A<sub>2</sub>, which are the same or different, represents a direct bond or an optional spacer group containing from 1 to 4 carbon atoms;

M represents a hydrogen atom or a sodium, potassium, ammonium or lower-alkyl-substituted ammonium ion; and

(ii) structural units of the formula II

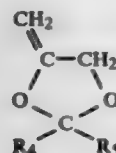


said polymer comprising from 70 to 99 mole % of units (i) and from 1 to 30 mole % of units (ii), having a weight-average molecular weight within the range of from 2000 to 2,000,000 and having a number-average molecular weight within the range of from 100 to 100,000,

which process comprises copolymerizing

(a) an unsaturated carboxylic acid, salt or anhydride, and

(b) a compound of the formula VI



wherein

each of R<sub>4</sub> and R<sub>5</sub>, which are the same or different, represents a substituent capable of stabilising free radicals, at a temperature within the range of from 60° to 130° C. in the presence of a free radical initiator, whereby copolymerization of the unsaturated carboxylic acid or salt or anhydride and the compound of the formula VI with ring opening of the compound of the formula VI is effected.

5,439,998

# FLUORINE-CONTAINING COPOLYMERS AND THEIR USE FOR COATING AND IMPREGNATING VARIOUS SUBSTRATES

Marie-Jose Lina, Lyons; Christian Collette, Paris; Jean-Marc Corpart, Nogent-Sur-Oise, and Andre Dessaint, Clermont, all of France, assignors to Elf Atochem, Puteaux, France

Continuation of Ser. No. 973,036, Nov. 10, 1992, abandoned.

This application Aug. 3, 1994, Ser. No. 283,762

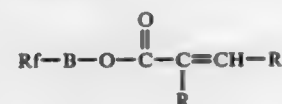
Claims priority, application France, Nov. 12, 1991, 91 13867 Int. Cl.<sup>6</sup> C08F 220/22

(II) U.S. Cl. 526—243

13 Claims

1. Fluorine-containing copolymers, optionally in salt or quaternized form, consisting essentially of by weight:

(a) 92 to 50% of at least one polyfluorinated monomer of formula:



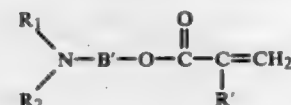
in which:

Rf is a straight chain or branched perfluorinated radical, having 2 to 20 carbon atoms;

B is a bivalent bridge linked to O by a carbon atom and being able to include at least one oxygen, sulfur and/or nitrogen atom;

one symbol R representing a hydrogen atom and the other symbol R being a hydrogen atom or an alkyl radical having 1 to 4 carbon atoms;

(b) 1 to 25% of at least one monomer of formula:



in which:

B' is a straight or branched chain alkylene radical having 1 to 4 carbon atoms;

R' is a hydrogen atom or an alkyl radical having 1 to 4 carbon atoms;

R<sub>1</sub> and R<sub>2</sub>, which is the same or different, each represent a hydrogen atom or a linear or branched alkyl radical containing 1 to 18 carbon atoms, hydroxyethyl or benzyl, or R<sub>1</sub> and R<sub>2</sub> together with the nitrogen atom to which they are bound form a morpholino, piperidino or pyrrolidinyl-1 radical;

(c) 1 to 25% of a vinylic compound defined by the formula:



in which:

R'' is an alkylcarboxylate group containing 1 to 18 carbon atoms;

(d) 0 to 10% of a monomer selected from the group consisting of:

- (1) ethylene, propylene, isobutene, chloro-3-isobutene-1, butadiene, isoprene, chloro- and dichloro-butadienes, fluoro- and difluoro-butadienes, and dimethyl-2, 5-hexadiene-1, 5, diisobutylene;
- (2) vinylidene chloride, vinyl or vinylidene fluoride, allyl bromide and methylallyl chloride;
- (3) vinyl-toluene, α-methylstyrene, α-cyanomethylstyrene, divinylbenzene, and N-vinylcarbazole;
- (4) methylvinylketone;
- (5) methacrylic α-chloroacrylic, crotonic, maleic, fumaric, itaconic, citraconic and senecioic acid, and anhydrides and esters thereof including allyl, methyl, butyl, isobutyl, hexyl, heptyl, ethyl-2-hexyl, cyclohexyl, lauryl, stearyl or cellosolve acrylates and methacrylates, dimethyl maleate, ethyl crotonate, methyl acid maleate,

butyl acid itaconate, glycol or polyalkyleneglycol diacrylates and dimethacrylates;

(6) acrylonitrile, methacrylonitrile, chloro-2-acrylonitrile, cyano-2-ethyl acrylate, methylene glutaronitrile, vinylidene cyanate, isopropyl cyanoacrylate, trisacryloyl-hexahydro-s-triazine, vinyltrichlorosilane, vinyltrimethoxysilane and vinyltriethoxysilane;

(7) allyl alcohol, allylglycolate, isobutenediol, allyloxy-ethanol, o-allylphenol, divinylcarbinol, glycerol-allylether, acrylamide, methacrylamide, maleamide and maleimide, N-(cyanoethyl)acrylamide, N-isopropylacrylamide, diacetone-acrylamide, N-(hydroxymethyl)acrylamide and methacrylamide, N-(alkoxymethyl)acrylamides and methacrylamides, glyoxal-bis-acrylamide, sodium acrylate, methacrylate, sulfo-2-ethyl acrylate, vinyl-sulfonic and styrene-p-sulfonic acids and alkaline salts thereof, amino-3-crotononitrile, monoallylamine, vinylpyridines, glycidyl acrylate or methacrylate allylglycidylether, and acroleine; and allyl-acetate and allyl heptanoate; and excluding N-vinyl-pyrrolidone.

5,439,999

# BULK POLYMERISATION PROCESS AND PRODUCT

Adrian Archer, Penfields, and Mohsen Zakikhani, both of Kidderminster, England, assignors to Albright & Wilson Limited, Oldbury, United Kingdom

Filed Feb. 22, 1994, Ser. No. 199,676

Claims priority, application United Kingdom, Mar. 24, 1993, 9306109

Int. Cl.<sup>6</sup> C08F 30/02

U.S. Cl. 526—278

11 Claims

1. A method for the production of a copolymer of an aryl-substituted phosphonic acid, said phosphonic acid containing at least one unsaturated carbon-to-carbon bond, with an unsaturated hydrocarbon monomer, wherein said method comprises subjecting said phosphonic acid and said monomer to bulk polymerisation in the presence of a free-radical initiator, wherein said bulk polymerisation comprises the following stages:

- (a) heating a mixture of said phosphonic acid with sufficient of said unsaturated monomer to dissolve said acid but insufficient to cause significant homopolymerisation of said monomer;
- (b) further heating said mixture under an inert atmosphere;
- (c) adding to said mixture a quantity of said free-radical initiator;
- (d) further heating said mixture and said free-radical initiator;
- (e) adding, in a dropwise manner, the required stoichiometric quantity of said unsaturated monomer (wherein a further quantity of said free-radical initiator is dissolved) to bring about essentially complete copolymerisation of said phosphonic acid and said monomer;
- (f) further heating said phosphonic acid, said monomer and said free-radical initiator until copolymerisation is complete; and
- (g) recovering said copolymer so produced.

5,440,000

# DISPERSANT/ANTIOXIDANT VII LUBRICANT ADDITIVE

Shailaja M. Shirodkar; Nicholas Benfaremo, both of Wappingers Falls, and Rosemary J. Jennejohn, Nelsonville, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 37,698, Mar. 26, 1993, abandoned. This application Jul. 18, 1994, Ser. No. 276,503

Int. Cl.<sup>6</sup> C08F 226/02

U.S. Cl. 526—307.3

5 Claims

1. A dispersant/antioxidant, viscosity index improving methacrylate polymer composition, having a molecular weight ranging from about 20,000 to about 250,000, said composition

comprising a base oil and effective amounts of antioxidant monomers, said composition being prepared by:

- (a) mixing a antioxidant/dispersant methacrylamide with alkyl methacrylates and an oil solvent to provide an intermediate reaction mixture;
- (b) stirring and purging said reaction mixture by nitrogen ebullition for about 25–35 minutes at about 200 ml/min;
- (c) heating said purged mixture to about 75°–85° C.;
- (d) adding both a chain transfer agent and a radical polymerization catalyst to said heated mixture and then after about 2.0 hours adding an additional amount of said catalyst to said heated mixture, and then heating said heated mixture for an additional 2.0 hours;
- (e) increasing the temperature of said heated mixture to about 95°–105° C. and maintaining said mixture at such temperature for a sufficient period of time to remove any excess of said polymerization catalyst; and
- (f) recovering the product methacrylate polymer; wherein the methacrylate polymer comprises polymerized monomers of:
- a) a (C<sub>1</sub>-C<sub>5</sub>) alkyl methacrylate selected from the group consisting of methyl methacrylate, propyl methacrylate, butyl methacrylate and isopentyl methacrylate;
- b) a (C<sub>10</sub>-C<sub>15</sub>) alkyl methacrylate selected from the group consisting of decyl methacrylate and undecyl methacrylate, dodecyl methacrylate, tridecyl methacrylate, tetradecyl methacrylate and pentadecyl methacrylate;
- c) a (C<sub>16</sub>-C<sub>20</sub>) alkyl methacrylate selected from the group consisting of hexadecyl methacrylate, heptadecyl methacrylate, octadecyl methacrylate; and
- d) an alkyl methacrylate which contains an amine or phenol.

5,440,001

# EPOXYSILOXANE CONTROLLED RELEASE COMPOSITION

Roy M. Griswold, Ballston Spa, and Michael J. O'Brien, Clifton Park, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 923,114, Jul. 30, 1992, Pat. No. 5,292,787.

This application Dec. 30, 1993, Ser. No. 175,982

The portion of the term of this patent subsequent to Mar. 8, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C08G 77/08

U.S. Cl. 528—15

9 Claims

1. An epoxy-functional siloxane release additive to control adhesion comprising unit(s) of the formula (I):



(I)

and unit (s) of the formula (II);



(II)

where R is unsubstituted or substituted C<sub>(1-8)</sub> alkyl, R<sup>1</sup> is a monovalent epoxy-functional organic radical of from 2 to about 20 carbon atoms; a is 1, 2 or 3; b is 0, 1, 2 or 3; and a+b is 2 or 3; and with the provision that at least one unit of formula (I) contains an unsubstituted or substituted epoxy-functional radical per molecule.

5,440,002

ROOM TEMPERATURE CURABLE  
ORGANOPOLYSILOXANE COMPOSITION HAVING  
EXCELLENT SHELF STABILITYTsuneo Kimura, Annaka; Kazuyuki Suzuki, Matsuida, and  
Masatoshi Arai, Annaka, all of Japan, assignors to Bayer  
Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 14, 1993, Ser. No. 166,008

Claims priority, application Japan, Dec. 14, 1992, 4-353584

Int. Cl.<sup>6</sup> C08G 77/08

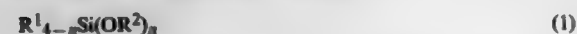
U.S. Cl. 528—17

7 Claims

1. A room temperature curable organopolysiloxane composition comprising of:

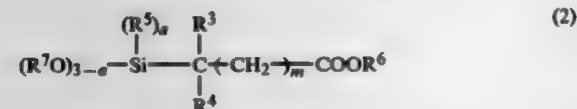
(A) 100 parts by weight of a diorganopolysiloxane blocked by a mono-, di- or tri-alkoxysilyl group at both terminal ends of the molecular chain,

(B) from 1 to 25 parts by weight of at least one member selected from the group consisting of an alkoxysilane represented by the general formula (1):

wherein R<sup>1</sup> and R<sup>2</sup> may be the same or different and are each an unsubstituted or substituted monovalent hydrocarbon group and n is 3 and 4, and a partially hydrolyzed product thereof,

(C) from 0.01 to 10 parts by weight of a titanate ester or a titanium complex, and

(D) from 1 to 10 parts by weight of an organosilicon compound represented by the general formula (2):

wherein R<sup>3</sup> and R<sup>4</sup> are each a hydrogen atom or an alkyl group and may be the same or different, R<sup>5</sup> and R<sup>6</sup> are each a substituted or unsubstituted monovalent hydrocarbon group and may be the same or different, R<sup>7</sup> is an alkyl group or an alkoxyalkyl group, a is 0 or 1, and m is an integer of 0 to 3.

5,440,003

## LIQUID METHYLENE DIPHENYL DIISOCYANATE

William E. Slack, Moundsville, W. Va., assignor to Miles Inc., Pittsburgh, Pa.

Filed Sep. 2, 1993, Ser. No. 116,183

The portion of the term of this patent subsequent to Jun. 7, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C08G 18/72

U.S. Cl. 528—48

7 Claims

1. A process for the production of a prepolymer containing an allophanate-modified MDI by reacting

(i) 4,4'-diphenylmethane diisocyanate containing from 2 to 60% by weight of 2,4'-MDI and less than 6% by weight of 2,2'-MDI with

(ii) an aromatic alcohol containing between 6 and 18 carbon atoms in the presence of

(iii) an allophanate-forming catalyst in amounts sufficient to produce a prepolymer having an isocyanate group content of from 12 to 32% by weight which prepolymer is stable and liquid at 25° C.

5,440,004

METHOD AND APPARATUS FOR THE PRODUCTION  
OF ALKYLENE CARBONATEMasaharu Doya; Yutaka Kanbara; Ken-ichi Kimizuka, and  
Takashi Okawa, all of Niigata, Japan, assignors to Mitsubishi  
Gas Chemical Company, Inc., Tokyo, Japan

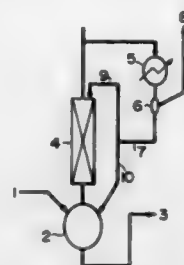
Filed May 5, 1994, Ser. No. 238,743

Claims priority, application Japan, May 19, 1993, 5-117202

Int. Cl.<sup>6</sup> C08G 64/00

U.S. Cl. 528—196

5 Claims



1. A method for producing alkylene carbonate by reacting urea and alkylene glycol of the formula

where R is hydrogen or a C<sub>1</sub>–C<sub>4</sub> aliphatic alkyl group, comprising:

disposing a gas washing member and a cooling member above a reaction portion where urea and alkylene glycol, in excess relative to urea, are allowed to react under atmospheric pressure or reduced pressure at a temperature in the range of from 120 to 200° C.,

washing ammonia-containing steam exhausted from the reaction portion with condensate obtained in the cooling member in the gas washing member and then downwardly introducing the washed ammonia-containing steam into the cooling member from above the cooling member, gas-liquid separating the condensate and ammonia gas exhausted from a bottom of the cooling member, introducing the condensate into the gas washing member, and

removing the ammonia gas from the reaction system.

5,440,005

PROCESS AND APPARATUS FOR SOLID PHASE  
POLYMERIZATION OF POLYMERS

Ilya Pikus, Plymouth, Minn., assignor to Hosokawa Bepex Corporation, Minneapolis, Minn.

Filed Jul. 8, 1994, Ser. No. 272,027

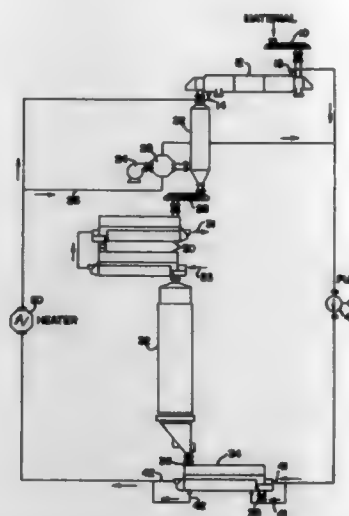
Int. Cl.<sup>6</sup> C08G 63/00

U.S. Cl. 528—308.2

10 Claims

1. In a process for the solid phase polymerization of polymers wherein cold amorphous polymer is introduced to a crystallizer at temperatures in the order of 20°–50° F. and heated to temperatures in the order of 320°–360° F. to crystallize the polymer, the crystallized polymer is discharged from the crystallizer to a reactor for heating to temperatures in the order of 420°–450° F. to achieve solid phase polymerization, and the polymer is then discharged from said reactor to a cooler for cooling to a temperature of about 150° F., each including indirect heat exchange means defining internal fluid passages, the improvement wherein said indirect heat exchange means include internal fluid passages, introducing cold fluids to the internal fluid passages of said cooler and cooling said polymer through indirect heat exchange with said cold fluids, discharging the fluids from said internal fluid passages of said cooler after said indirect heat exchange in said cooler, and recirculating the fluids from the cooler to the internal fluid passages of said crystallizer whereby said fluids from said cooler comprise at least a portion of said hot fluids introduced to said crystallizer, and discharging the fluids from said inter-

nal fluid passages of said crystallizer after said indirect heat exchange in said crystallizer, and recirculating the fluids from



the crystallizer to the internal fluid passages of said cooler whereby said fluids from said crystallizer comprise at least a portion of said cold fluids introduced to said cooler.

5,440,006

SEMI-CRYSTALLINE, SEMI-AROMATIC  
COPOLYAMIDES

Pierre-Yves Lahary, Lyons, and Jean Coquard, Grezieu-la-Varenne, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Division of Ser. No. 930,528, Nov. 2, 1992, Pat. No. 5,322,923.

This application Mar. 16, 1994, Ser. No. 213,698

Claims priority, application France, Mar. 30, 1990, 30 04398

The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> C08G 69/28

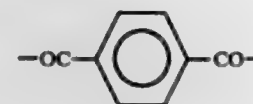
U.S. Cl. 528—349

15 Claims

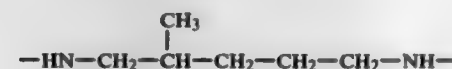
1. Semi-crystalline, semi-aromatic copolyamides obtained from reagents comprising terephthalic acid and 2-methylpentamethylenediamine, which copolyamides have a glass transition temperature T<sub>g</sub> of at least 120° C. and a bending temperature under load under 1.8 MPa of at least 240° C. when these copolyamides are filled with at least 10 to 60% of a padding or reinforcing filler of fibrous nature and then molded, a viscosity index of at least 60 ml/g and a molecular weight of at least 9000 g/mole, the said copolyamides being characterized by the following points:

they essentially contain in their structure recurring units of formula (I), (II), (III) and (IV):

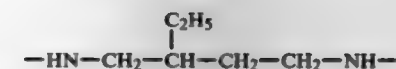
(I) denoting the structure:



(II) denoting the structure:



(III) denoting the structure:



(IV) denoting the structure:  $-HN-(CH_2)_6-NH-$  the units of formula (III) being optional, the molecular ratio of units (I) with respect to the sum of the units (II)+(III)+(IV) is 1; the amount of units (III) in the mixture (II)+(III) is in the range ranging from 0 to 5 mole % and that of the units (II), with respect to the same reference, is in the range ranging from 100 to 95 mole %; the amount of units (IV) in the mixture (II)+(III)+(IV) is in the range ranging from 40 to 90 mole %; they also contain a proportion of non-conforming units derived from bis-hexamethylenetriamine, expressed as a percentage by weight of bis-hexamethylenetriamine with respect to the weight of the copolyamide obtained, which is less than 0.5%.

5,440,007

COMPOSITION OF AND METHOD FOR FORMING  
HIGH MOLECULAR WEIGHT PREDOMINANTLY  
SYNDIOTACTIC SUBSTITUTED-POLY  
(β-PROPIOESTERS)Richard A. Gross, Chelmsford; John E. Kennitzer, Dracut, and  
Stephen P. McCarthy, Tyngsboro, all of Mass., assignors to  
University of Massachusetts Lowell, Lowell, Mass.

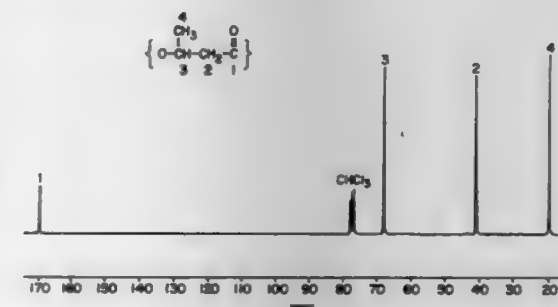
Continuation of Ser. No. 965,134, Oct. 22, 1992, abandoned.

This application Apr. 25, 1994, Ser. No. 232,870

Int. Cl.<sup>6</sup> C08G 63/08

U.S. Cl. 528—354

17 Claims



1. A high molecular weight polymer having a number average molecular weight of at least about 2,000 grams/mole, comprising a poly(β-propioester), wherein said poly(β-propioester) further comprises substituted-β-propioester repeat units at α-positions of the poly(β-propioester), and are distributed in a predominantly syndiotactic sequence, and wherein a substituent of said substituted-β-propioester repeat unit is selected from the group consisting essentially of a protected amino, protected thiol, protected hydroxyl, vinyl, alkyl, aryl, halogenated alkyl, halogenated aryl and ester functional groups, said halogenated alkyl and halogenated aryl functional groups having between about one and thirteen carbons per functional group.









placeable and reactive moiety at one end of the aliphatic chain, the reactive moiety being displaced during reaction with the tertiary substituted carbon atom of the valproic acid precursor carbanion intermediate, and a moiety at the other end of the aliphatic chain selected from the group consisting of cyano functionalities capable of hydrolyzing to form an amino functionality and functionalities capable of hydrolyzing to form a carboxy functionality;

- (b) transforming the alkylated valproic acid precursor into a valproic acid derivative by hydrolyzing the alkylated valproic acid precursor in a liquid medium, and;
- (c) separating the valproic acid derivative from the liquid medium, the valproic acid derivative consisting essentially of a valproic acid molecule having,
- (i) an  $\alpha$ -n-propyl group;
  - (ii) a carboxylic acid group; and
  - (iii) an  $\alpha$ -saturated aliphatic chain of at least four carbons in length, wherein the free end of the saturated aliphatic chain is attached to the moiety hydrolyzed to form a functionality selected from the group consisting of an amino functionality and a carboxy functionality, the saturated aliphatic chain thereby providing at least a one carbon atom extension of a  $\delta$  carbon atom of the valproic acid molecule.

5,440,024

### 3-CYANO-5-NITROTHIOPHENE TYPE MONOAZO DYES AND MIXTURES THEREOF

Kiyoshi Himeno, Munakata; Toshio Hihara, and Wataru Shimizu, both of Kitakyushu, all of Japan, assignors to Hoechst Mitsubishi Kasei Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1993, Ser. No. 90,311

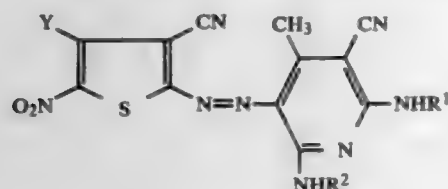
Claims priority, application Japan, Jul. 13, 1992, 4-206950

Int. Cl.<sup>6</sup> C09B 29/42, 29/36, 29/033, 29/33; D06P 1/118

U.S. Cl. 534—766

12 Claims

1. A monoazo disperse dye of the following formula (I):



wherein one of R<sup>1</sup> and R<sup>2</sup> is



wherein W is hydrogen, halogen, C<sub>1</sub>-C<sub>2</sub> alkyl or alkoxy, the other of R<sup>1</sup> and R<sup>2</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl, or C<sub>2</sub>-C<sub>4</sub> alkyl substituted by cyano, halogen, hydroxy, hydroxyalkoxy, C<sub>1</sub>-C<sub>4</sub> alkoxy, hydroxyalkoxyalkoxy, acetoxyalkoxy, acetoxyalkoxyalkoxy, alkoxyalkoxy, alkoxyalkoxyalkoxy or acetoxy and Y is hydrogen or halogen.

5,440,025

### PROCESS FOR SEPARATING NUCLEIC ACID POLYMERS

Kenneth A. Marx, Francetown, N.H., and Sukant K. Tripathy, Acton, Mass., assignors to University of Massachusetts at Lowell, Lowell, Mass.

Filed Mar. 12, 1992, Ser. No. 850,654

Int. Cl.<sup>6</sup> C07H 1/00, 21/02, 21/04

U.S. Cl. 536—25.4

13 Claims

1. A method of separating a nucleic acid polymer from a

liquid medium without substantially denaturing the nucleic acid polymer, comprising the steps of:

- a) forming an electrically-conductive polymer substrate by electrochemical deposition, the substrate having sufficient electrooxidation charges to cause at least a portion of a nucleic acid polymer in a liquid medium contacted with the substrate to bind to said substrate without causing substantial denaturation of the bound nucleic acid polymer;
- b) contacting the liquid medium with the electrically-conducting polymer substrate, whereby at least a portion of the nucleic acid polymer in the liquid medium binds to the substrate;
- c) separating said substrate from the liquid medium, whereby the bound nucleic acid polymer is removed from the liquid medium, thereby separating the bound nucleic acid polymer from the liquid medium without substantially denaturing the nucleic acid polymer; and
- d) conducting an electrical current across the substrate having the nucleic acid bound thereto, whereby a sufficient electroreduction potential is placed across the substrate to cause at least a substantial portion of the nucleic acid to be released from the substrate.

5,440,026

### PROCESS FOR THE PREPARATION OF SUCROSE 6-ESTERS

Riaz A. Khan, Sonning; Keith Smith, Mayals; Andrew Pelter, and Jin Zhao, both of Uplands, all of England, assignors to Tate & Lyle Public Limited Co., London, England

Filed May 21, 1992, Ser. No. 886,633

Claims priority, application United Kingdom, May 21, 1991, 9110931

Int. Cl.<sup>6</sup> C07H 13/00, 1/00

U.S. Cl. 536—115

18 Claims

1. A method for the preparation of a sucrose 6-ester comprising:

- (i) reacting sucrose with a ketene acetal in the presence of an acid catalyst in an inert organic solvent to form a sucrose alkyl 4, 6-orthoester;
- (ii) subjecting the sucrose alkyl 4, 6-orthoester to mild acidic hydrolysis to provide a mixture of 4- and 6-monoesters of sucrose; and
- (iii) treating the mixture of sucrose monoesters with a base to convert the sucrose 4-monoester into sucrose 6-monoester.

5,440,027

### METHOD FOR PREPARING SACCHARIDE FATTY ACID POLYESTERS BY TRANSESTERIFICATION

Gerry Hasenhuettl, Highland Park, Ill., assignor to Kraft General Foods, Inc., Northfield, Ill.

Filed Oct. 5, 1993, Ser. No. 132,106

Int. Cl.<sup>6</sup> C07H 1/00, 13/04

U.S. Cl. 536—115

36 Claims

1. A method for making a saccharide fatty acid polyester comprising:

- (1) esterifying hydroxyl groups of a saccharide to form a partially esterified saccharide having, on average, between about 1.5 and 3.5 lower acyl ester groups;
- (2) mixing the partially esterified saccharide, a fatty acid-containing reagent, and a transesterification catalyst under essentially anhydrous conditions to form a reaction mixture, wherein the fatty acid-containing reagent is selected from the group consisting of fatty acids, fatty acid salts, lower alkyl esters of fatty acids, fatty acid anhydrides, and mixtures thereof; and
- (3) heating the reaction mixture to about 95° to 200° C. for a time sufficient to form the saccharide fatty acid polyester.

5,440,028

### PROCESS FOR PREPARING PURIFIED GLYCOLIPIDS BY MEMBRANE SEPARATION PROCESSES

Rainer Buchholz, Berlin; Ulrich Fricke, and Johann Mixich, both of Kelheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 30,090, Mar. 23, 1993, abandoned. This application Jun. 8, 1994, Ser. No. 257,445

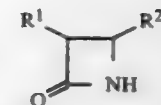
Claims priority, application Germany, Sep. 25, 1990, 40 30 264.4

Int. Cl.<sup>6</sup> C07H 1/06, 3/00

U.S. Cl. 536—124

16 Claims

1. A process for preparing purified glycolipids wherein the purification is carried out using a membrane separation process at acid pH with a membrane which has a cut-off size of molecules with a molecular weight of more than 30,000.



(II)

wherein R<sup>1</sup> is as defined above, and R<sup>2</sup> represents a hydrogen atom, a lower alkyl group, a lower alkoxyalkyl group, or a carboxyl group, with a carboxylic acid represented by formula (III):



(III)

wherein R<sup>3</sup> is as defined above, in the presence of (1) a ruthenium compound selected from Ru(NO)Cl<sub>3</sub>·H<sub>2</sub>O, Ru(NO)Br<sub>3</sub>·H<sub>2</sub>O, K(RuO<sub>4</sub>) or Ba(RuO<sub>3</sub>(OH))<sub>2</sub>, (2) an aldehyde having 2 or more carbon atoms, provided that the carbon atom at the  $\alpha$ -position thereof should not have two or more halogen atoms, and (3) oxygen.

5,440,029

### TITANYL PHTHALOCYANINE CRYSTAL

Hidemichi Nukada; Yasuo Sakaguchi; Taketoshi Hoshizaki; Fumio Ojima; Masayuki Nishikawa; Kohichi Yamamoto, and Yumiko Komori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 775,853, Oct. 15, 1991, abandoned.

This application Aug. 23, 1993, Ser. No. 109,984

Claims priority, application Japan, Nov. 28, 1990, 2-323181

Int. Cl.<sup>6</sup> C09B 67/12, 47/04

U.S. Cl. 540—141

2 Claims

1. A titanyl phthalocyanine crystal having a primary particle diameter ranging from 0.03 to 0.15  $\mu$ m, showing a maximum X-ray diffraction peak at a Bragg angle ( $2\theta \pm 0.2^\circ$ ) of  $27.3^\circ$ , having an ellipsoidal tabular form, and having a BET specific surface area of not less than 35 m<sup>2</sup>/g.

5,440,031

### 1,4,10,13-TETRAOXA-7,16-DIAZACYCLOOCTADECANE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND THEIR USE FOR THE

### REMOVAL OF TOXIC METAL IONS AND RADIOACTIVE ISOTOPES FROM LIVING ORGANISM

László Varga; László B. Szatnyik; Béla Kanyár; Ödön Király, all of Budapest; Ernő Brücher, Debrecen; József Emri, Debrecen; Béla Györi, Debrecen, and Zoltán Kovács, Kiszvárd, all of Hungary, assignors to Országos "Frederic Joliot-Curie" Sugárbiológiai és Sugáregészségügyi Kutató Intézet and Kossuth Lajos Tudományegyetem, Hungary

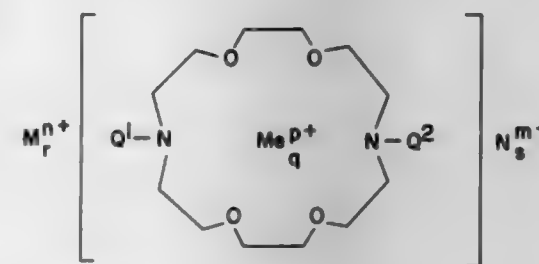
Continuation of Ser. No. 761,345, Sep. 27, 1991, abandoned. This application Aug. 6, 1993, Ser. No. 102,955

Claims priority, application Hungary, Jan. 16, 1990, 145/90

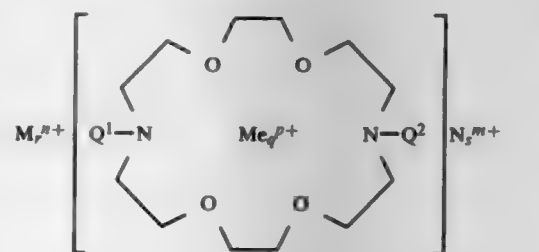
Int. Cl.<sup>6</sup> C07D 225/02; A61K 9/02

U.S. Cl. 540—465

3 Claims



1. A compound of the formula (I)



(I)

wherein Q<sup>1</sup> and Q<sup>2</sup> stand for a group of the formula (III)

### RU CATALYZED ACYLOXYLATION PROCESS FOR PREPARING 4-ACYLOXYAZETIDINONE DERIVATIVES

Takao Saito; Hidenori Kumabayashi, both of Tokyo, and Shunichi Murahashi, Osaka, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

Division of Ser. No. 869,171, Apr. 16, 1992, Pat. No. 5,288,862.

This application Dec. 16, 1993, Ser. No. 167,201

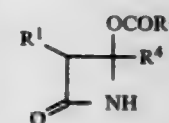
Claims priority, application Japan, Apr. 18, 1991, 3-86588

Int. Cl.<sup>6</sup> C07B 41/12; C07D 205/08

U.S. Cl. 540—357

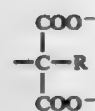
6 Claims

1. A process for preparing a 4-acyloxyazetidinone or a derivative thereof represented by formula (IV):



(IV)

wherein R<sup>1</sup> represents a hydrogen atom, a lower alkyl group, a hydroxyethyl group, or a protected hydroxyethyl group; R<sup>3</sup> represents an alkyl group having from 1 to 10 carbon atoms which may be substituted with a halogen atom, a cyano group, a lower alkoxy group or a phenyl group, or a substituted or unsubstituted phenyl group, wherein said substituted phenyl group is substituted with p-chlorophenyl, p-ethoxyphenyl, or 2, 4-dinitrophenyl, provided that the  $\alpha$ -positioned carbon atom of said alkyl group should not have more than two halogen atoms; and R<sup>4</sup> represents a halogen atom, a lower alkyl group or a lower alkoxyalkyl group, which comprises reacting azetidinone or a derivative thereof represented by formula (II):



the group of the formula (III)

R substituents independently represent hydrogen, a C<sub>1-5</sub> straight or branched chain alkyl group, a C<sub>2-5</sub> straight or branched chain alkenyl group, phenyl or phenyl-C<sub>1-5</sub>-alkyl group, the phenyl groups being optionally being substituted on their aromatic part by one or more halogen(s), C<sub>1-5</sub>-alkyl, C<sub>1-5</sub>-alkoxy, cyano or nitro group(s); Me stands for an alkaline metal or alkaline earth metal or transition metal ion; q is 0 or 1; M and N, independently from each other, stand for hydrogen or an alkaline metal, alkaline earth metal or optionally substituted ammonium ion; m, n and p are integers each being equal to the charge of M, N or Me, respectively; s and r are, independently from each other, 0, 1, 2, 3, or 4, with the proviso that

- r, s and q cannot simultaneously be 0;
- the number of hydrogens in the meaning of M or N may be 0, 1 or 2;
- q is 1 when R means hydrogen; and
- M and N are other than sodium or lithium ions when q is 0.

5,440,032

#### METHOD FOR PURIFYING ORGANIC SOLUTION CONTAINING LACTAMS

Kazuhiro Hirose; Yasuhiro Kurokawa; Tomohiko Yamamoto; Masaru Matsunishi, and Yoshihiro Nawata, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan  
Filed Jun. 10, 1991, Ser. No. 712,442

Claims priority, application Japan, Jun. 12, 1990, 2-151572  
Int. Cl.<sup>6</sup> C07D 201/16

U.S. Cl. 540—540

9 Claims

1. A method for purifying a lactam-containing organic solution which comprises:

- obtaining an organic solution containing ε-caprolactam and ω-dodecanolactam by the colactamization method comprising
  - oximating simultaneously a mixture of cyclohexanone and cyclododecanone,
  - subjecting the resulting mixture from (i) of cyclohexanone oxime or a salt thereof and cyclododecanone oxime or a salt thereof to Beckmann rearrangement in the presence of sulfuric acid or fuming sulfuric acid,
  - neutralizing the resulting mixture of (ii) with ammonia gas or aqueous ammonia to obtain a lactam mixture mainly containing ε-caprolactam, ω-dodecanolactam, and ammonium sulfate, and
  - extracting the lactam mixture of (iii) or an oily layer obtained by allowing the lactam mixture of (iii) to stand and separate into an oily layer and an aqueous layer, with an organic solvent to obtain an organic solution containing ε-caprolactam, ω-dodecanolactam and an anionic surface active substance,
- processing the organic solution of (a)(iv) with an anion exchange resin in the presence of 5% by weight or less of water based on the weight of said organic solution to remove the anionic surface active substance contained in said organic solution, and then
- extracting the product of (b) with water to separate ε-caprolactam contained in the organic solution into an aqueous solution.

(III)

#### 5,440,033 INDOLYL-, PYRROLYL- AND PYRAZOLYL- SUBSTITUTED BENZAZEPINES

Joel G. Berger, Cedar Grove; Joseph A. Kozlowski, Plainsboro, and Wei Chang, Livingston, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

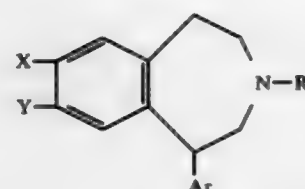
Filed Nov. 9, 1993, Ser. No. 149,411

Int. Cl.<sup>6</sup> C07D 403/04; A61K 31/55

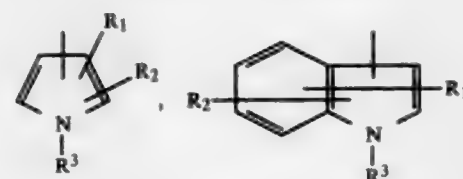
U.S. Cl. 540—549

6 Claims

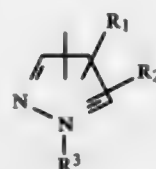
1. A compound of the formula:



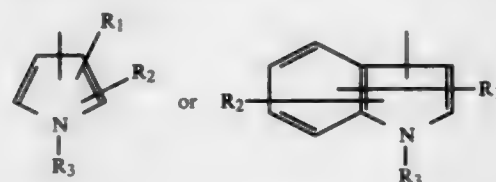
or a pharmaceutically acceptable salt thereof, wherein Ar is selected from the group consisting of



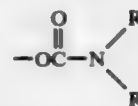
and



R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are each independently hydrogen or lower alkyl with the proviso that when Ar is



R<sub>1</sub> and R<sub>2</sub> cannot both be hydrogen; X is hydrogen, halogen, lower alkyl or —CF<sub>3</sub>; and Y is —OR, —OH,



wherein each R is independently as described above.

5,440,034

#### METHOD OF PREPARING AZACYCLOHEPTANES

Leonid B. Galperin, Wilmette, and Jeffrey C. Bricker, Buffalo Grove, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Dec. 28, 1993, Ser. No. 174,093

Int. Cl.<sup>6</sup> C07D 223/04

U.S. Cl. 540—612

17 Claims

1. A process for the synthesis of an azacycloheptane comprising dehydrocyclizing in the presence of a dehydrocycliza-

tion catalyst, and optionally hydrogen and/or ammonia, at dehydrocyclization conditions an amine of formula [CH<sub>3</sub>C(R<sub>1</sub>R<sub>2</sub>)C(R<sub>3</sub>R<sub>4</sub>)]<sub>2</sub>+xNH<sub>(1-x)</sub> where x=0 or 1, where each of R<sub>1</sub> and R<sub>2</sub> is independently selected from the group consisting of methyl or hydrogen, and where each of R<sub>3</sub> and R<sub>4</sub> is independently selected from the group consisting of hydrogen, methyl, or ethyl, where said dehydrocyclization catalyst is a molecular sieve in which at least 95% of the hydrogen cations are exchanged by a metal cation, said metal selected from the group consisting of the alkali, alkaline earth, lanthanide series metals, zinc, and all combinations thereof, said molecular sieve impregnated with at least one zerovalent metal selected from the group consisting of the group VIII metals iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, and platinum, and any combination thereof, and recovering the azacycloheptane produced.

5,440,035

#### HETEROCYCLIC AMIDE DERIVATIVES

Peter R. Bernstein, Wallingford, Pa.; Frederick J. Brown, Newark, Del.; Victor G. Matassa, Wilmington, Del., and Ying K. Yee, Kennett Square, Pa., assignors to Zeneca Inc., London, United Kingdom

Division of Ser. No. 254,350, Jun. 6, 1994, Pat. No. 5,391,758, which is a division of Ser. No. 981,718, Nov. 25, 1992, Pat. No. 5,338,734, which is a division of Ser. No. 711,478, Jun. 6, 1991, Pat. No. 5,179,112, which is a division of Ser. No. 380,059, Jul. 14, 1989, Pat. No. 5,030,643, which is a division of Ser. No. 852,798, Apr. 16, 1986, Pat. No. 4,859,692. This application Oct. 25, 1994, Ser. No. 328,469

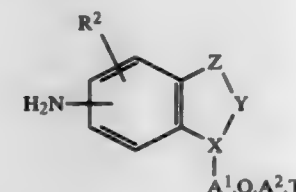
Claims priority, application United Kingdom, Apr. 17, 1985, 85/09882; Oct. 17, 1985, 85/25658

Int. Cl.<sup>6</sup> C07D 231/56, 249/18, 265/36, 279/16

U.S. Cl. 544—51

6 Claims

1. A compound of formula IV



wherein the group >X—Y—Z— is selected from the group consisting of

- >C=N—Za—
- >C=CRa—Zb—
- >N—CRa=N—
- >N—CRbRe—CRcRf—Zb—
- >N—N=N—
- >N—NRg—CO—
- >N—N=C.ORD—

wherein

Ra is hydrogen or (1-4C)alkyl;  
Rb and Rc are each hydrogen or, together with the existing carbon to carbon bond, form an unsaturated linkage;  
Rd is hydrogen or (1-10C)alkyl optionally containing one or two double or triple bonds and in which a carbon atom may optionally be replaced by oxygen or sulphur, said (1-10C)alkyl additionally optionally bearing a substituent selected from the group consisting of (1-4C)alkoxy, cyano, carboxy, H-tetrazol-5-yl, carbamoyl, N-(1-4C)carbamoyl, N,N-di[(1-4C)alkyl]carbamoyl, and (1-4C)alkoxycarbonyl, or Rd is selected from the group consisting of (3-8C)cycloalkyl, (3-8C)cycloalkyl-(1-4C)alkyl, (2-6C)alkanoyl and phenyl-(1-4C)alkyl, the phenyl moiety of which may optionally bear a substituent selected from the group consisting of cyano, halogeno, (1-4C)alkyl, (1-4C)alkoxy and trifluoromethyl;  
Re and Rf are independently hydrogen or (1-4C)alkyl;  
Rg is (1-4C)alkyl;

Za is oxy, thio, or substituted imino of the formula —N(R-d)— in which Rd has any of the meanings defined above; Zb is oxy or thio;

R<sup>2</sup> is hydrogen, halogeno, (1-4C)alkyl or (1-4C)alkoxy;

Q is phenylene optionally bearing 1 or more substituents independently selected from the group consisting of halogeno, hydroxy, (1-4C)alkyl, (1-4C)alkoxy and trifluoromethyl;

A<sup>1</sup> is (1-2C)alkylene or vinylene;

A<sup>2</sup> is methylene, vinylene or a direct link to T; and

T is an acidic group selected from the group consisting of carboxy, 1H-tetrazol-5-yl and an acyl-sulphonamide residue of the formula —CO.NH.SO<sub>m</sub>R<sup>3</sup> in which m is the integer 1 or 2 and R<sup>3</sup> is selected from the group consisting of (1-6C)alkyl, (3-8C)cycloalkyl, (6-12C)aryl, heteroaryl comprising 5-12 atoms at least one of which is carbon and at least one of which is selected from a group consisting of oxygen, sulfur and nitrogen, and (6-12C)aryl-(1-4C)alkyl, in any of which the aromatic or heteroaromatic moiety may bear 1 or 2 substituents selected from the group consisting of halogeno, (1-4C)alkyl, (1-4C)alkoxy, trifluoromethyl, nitro and amino.

5,440,036

#### 1,4-BENZOXAZINE DERIVATIVES

Kazuo Yamazaki; Shigeru Adegawa, both of Narita; Yoichiro Ogawa, Chiba; Hideaki Matsuda, Abiko, and Tadayuki Kuraishi, Narashino, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1993, Ser. No. 161,264

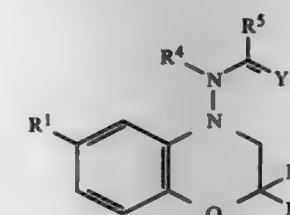
Claims priority, application Japan, Dec. 3, 1992, 4-324329; Apr. 22, 1993, 5-095925

Int. Cl.<sup>6</sup> C07D 265/36

U.S. Cl. 544—105

15 Claims

1. A 1,4-benzoxazine derivative represented by the following formula (1):



(1)

wherein:

R<sup>1</sup> represents a halogenated lower alkyl, a halogenated lower alkylsulfonyl, nitro or cyano group,  
R<sup>2</sup> and R<sup>3</sup> may be the same or different and individually represent a hydrogen atom or a lower alkyl group or are fused together with the adjacent carbon atom into a 3- to 6-membered carbon ring,  
R<sup>4</sup> represents a hydrogen atom, a lower alkyl group or a lower alkanoyl group,  
R<sup>5</sup> represents a hydrogen atom; a lower alkyl group; a lower alkyl group substituted by hydroxy, nitroxy, phenyl, lower alkyl amino or morpholino; a lower alkenyl group; a lower alkenyl group substituted by phenyl; a lower alkoxy group; a phenyl group; a phenyl group substituted by halogen, aminosulfonyl, nitro or cyano; a naphthyl group; a phenoxy group; a pyrrolyl group; an oxazolyl group; an imidazolyl group; a pyridyl group; a pyrimidyl group; a furanyl group; or a thienyl group; and  
Y represents an oxygen or sulfur atom.



5,440,037

## METHOD FOR PRODUCTION OF

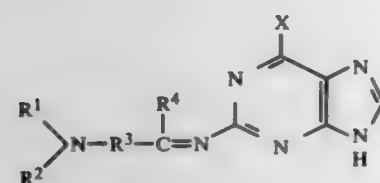
## 2-AMINO-6-HALOGENOPURINE DERIVATIVES

Masami Igi, Osaka, and Taketo Hayashi, Yao, both of Japan, assignors to Sumika Fine Chemicals Co., Ltd., Osaka, Japan Division of Ser. No. 115,015, Sep. 2, 1993, Pat. No. 5,389,637, which is a division of Ser. No. 937,427, Aug. 31, 1992, Pat. No. 5,391,733. This application Oct. 26, 1994, Ser. No. 329,272 Claims priority, application Japan, Nov. 22, 1991, 3-334053 Int. Cl.<sup>6</sup> C07D 473/32

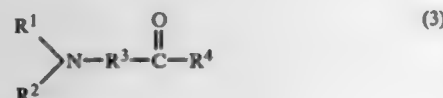
U.S. Cl. 544—118

5 Claims

1. A method for production of the compound represented by Formula (1):



wherein R<sup>1</sup> and R<sup>2</sup> represent, respectively, a hydrogen atom, an alkyl group having 1 to 5 carbon atoms or an aromatic group, or they may form a ring, which may contain a nitrogen atom, an oxygen atom or a sulfur atom together with N group; R<sup>3</sup> represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms or an aromatic group; R<sup>4</sup> represents a single bond or an alkylene group having 1 to 5 carbon atoms; and X represents a chlorine atom, a bromine atom, an iodine atom or a fluorine atom, comprising reacting guanine with a compound represented by Formula (3):



wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are as defined as above, in the presence of a halogenating agent.

5,440,038

## PROCESS FOR THE PURIFICATION OF SUBSTITUTED 4-AMINO-1,2,4-TRIAZINE-5-ONES

Vidyanatha A. Prasad, LeaWood; David M. Mayes, Overland Park; Peter E. Newallis, LeaWood, all of Kans., and Karl G. Steinbeck, Leverkusen Monheim, Germany, assignors to Miles Inc., Pittsburgh, Pa.

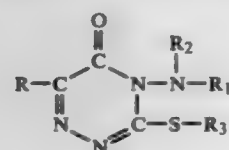
Filed Dec. 7, 1993, Ser. No. 163,466

Int. Cl.<sup>6</sup> C07D 253/075

U.S. Cl. 544—182

10 Claims

1. A process for removing N-isomers from a reaction product containing a compound represented by the formula



in which

R represents an alkyl group having from 1-6 carbon atoms, a cycloalkyl group having from 5 to 6 ring carbon atoms, an aralkyl group having from 6 to 10 ring carbon atoms in the aryl moiety and from 1 to 2 carbon atoms in the alkyl moiety, or an aryl group having from 6-10 ring carbon atoms;

R<sub>1</sub> and R<sub>2</sub> each represents hydrogen, or an alkyl group having from 1 to 4 carbon atoms; and

R<sub>3</sub> represents an alkyl group having from 1 to 4 carbon atoms by treating the compound represented by formula I

5,440,039

## PROCESS FOR THE CONTINUOUS REACTION OF CYANURIC FLUORIDE WITH AMINES AND A REACTOR FOR CARRYING OUT THIS PROCESS

Hans-Georg Frosch, Koeln; Manfred Hoppe, Kürten; Wolfgang Müllers, Bergisch Gladbach, and Frank-Michael Stöhr, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 9, 1991, Ser. No. 697,862

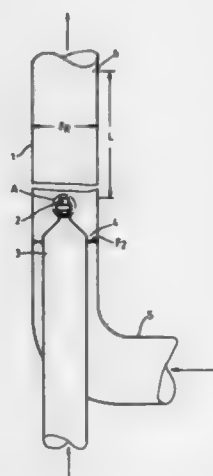
Claims priority, application Germany, May 19, 1990, 40 16

(1) 159.5

Int. Cl.<sup>6</sup> C07D 251/54

U.S. Cl. 544—211

7 Claims



1. A process for the continuous reaction of cyanuric fluorides with amines in which cyanuric fluoride and an aqueous amine solution are introduced into a reactor (1) and the reaction product is subsequently removed, characterized in that the reactants are introduced simultaneously and continuously into the reactor (1) at different rates, intensive mixing is produced by the difference between the flow rates and the reaction is substantially completed in this reactor (1) with no back-mixing.

5,440,040

## PYRIMIDINE INTERMEDIATES

Saló Gronowitz, Lund, Sweden, assignor to Medivir AB, Hudinge, Sweden

PCT No. PCT/SE89/00322, § 371 Date Jan. 18, 1991, § 102(e)

Date Jan. 18, 1981, PCT Pub. No. WO89/12061, PCT Pub.

Date Dec. 14, 1989

PCT Filed Jun. 7, 1989, Ser. No. 613,900

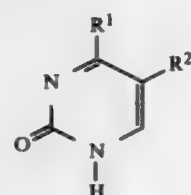
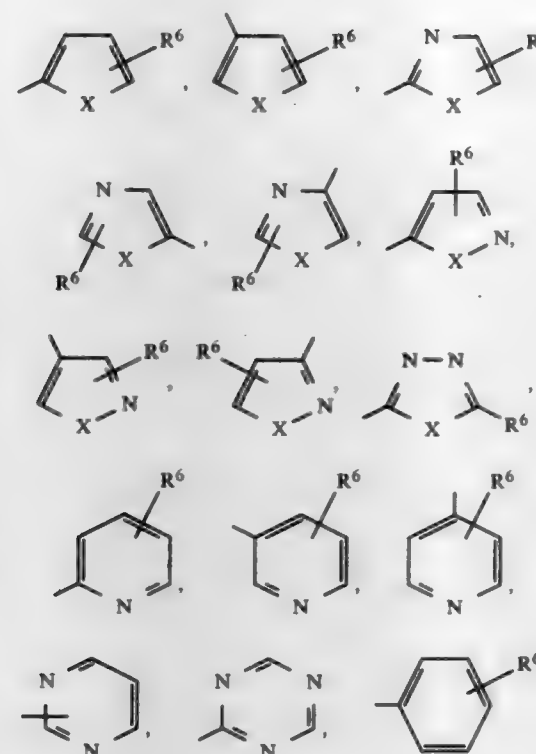
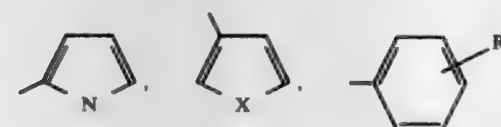
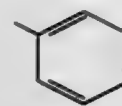
Claims priority, application Sweden, Jun. 10, 1988, 8802173

Int. Cl.<sup>6</sup> C07D 251/24, 239/22

U.S. Cl. 544—216

2 Claims

1. A compound of the formula

wherein R<sup>1</sup> and R<sup>2</sup> are defined as followsR<sup>1</sup> is OH, NH<sub>2</sub>;R<sup>2</sup> iswherein X is O, S, N—R<sup>7</sup>, Se;R<sup>6</sup> is H, straight or branched C<sub>1-10</sub> alkyl, F, Cl, Br, I, X—R<sup>7</sup>,—CH=CH—R<sup>7</sup>, —C≡C—R<sup>7</sup>, CO<sub>2</sub>R<sup>7</sup>, CH<sub>2</sub>X—R<sup>7</sup>;R<sup>7</sup> is H, straight or branched C<sub>1-15</sub> alkyl, phenyl;with the provisos that when R<sup>1</sup> is OH, R<sup>2</sup> is notwhen R<sup>6</sup> is H, straight or branched C<sub>1-10</sub> alkyl, or X—R<sup>7</sup> whenX is O and R<sup>7</sup> is H, or straight or branched C<sub>1-15</sub> alkyl;and when R<sup>1</sup> is NH<sub>2</sub>, R<sup>2</sup> is not

5,440,041

## ACETAL OR KETAL SUBSTITUTED XANTHINE COMPOUNDS

Alistair Leigh, Edmonds, and Gail Underiner, Brier, both of Wash., assignors to Cell Therapeutics, Inc., Seattle, Wash.

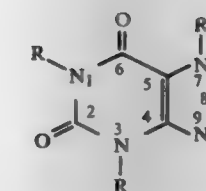
Continuation of Ser. No. 4,353, Jan. 14, 1993, abandoned. This application Feb. 8, 1994, Ser. No. 194,135

Int. Cl.<sup>6</sup> C07D 473/06

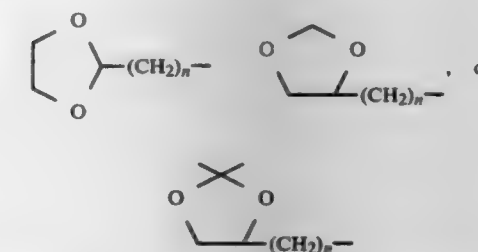
U.S. Cl. 544—267

9 Claims

1. A compound for inhibiting a second messenger pathway, comprising an acetal or ketal substituted xanthine core of the formula:



wherein each of one or two R is independently



wherein n is an integer from about 5 to about 18 forming a hydrocarbon chain, wherein the hydrocarbon chain may have one or more double bonds, and may be substituted by a hydroxyl, halo or dimethylamino group and/or interrupted by an oxygen atom.

5,440,042

## THIOHETEROCYCLIC NEAR-INFRARED DYES

Dietrich M. Fabricius, Hendersonville, N.C., and Gregory C. Weed, Towanda, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

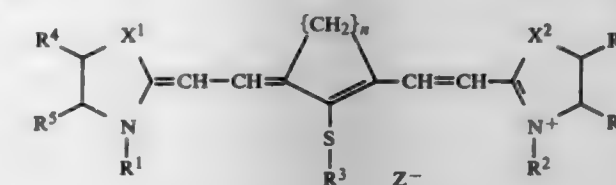
Filed May 26, 1993, Ser. No. 72,851

Int. Cl.<sup>6</sup> C07D 239/38, 263/58, 257/04, 249/12

U.S. Cl. 544—315

6 Claims

1. A dye of formula:



wherein

X<sup>1</sup>, X<sup>2</sup> represent —Cr<sup>8</sup>R<sup>9</sup>—;

n is 3;

R<sup>1</sup> and R<sup>2</sup> independently represent alkyl of 1 to 10 carbons or substituted alkyl of 1 to 10 carbons;

R<sup>3</sup> represents a substituted or unsubstituted, 5 or 6-membered heterocyclic ring containing hetero atoms chosen from N, O, S and Se;

R<sup>4</sup> and R<sup>5</sup> are taken together to represent the atoms necessary to form a 10-membered aromatic ring, benzene ring or substituted benzene ring;

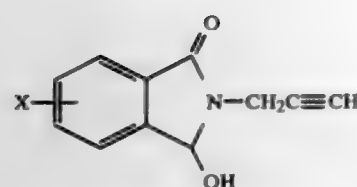
R<sup>6</sup> and R<sup>7</sup> are taken together to represent the atoms necessary to form a 10-membered aromatic ring, benzene ring or substituted benzene ring;

R<sup>8</sup>, R<sup>9</sup> independently represent alkyl of 1-10 carbons, substituted alkyl of 1-10 carbons, aryl of 6-10 carbons, substituted aryl of 6-10 carbons;

Z is CF<sub>3</sub>SO<sub>3</sub><sup>-</sup>, Et<sub>3</sub>NH<sup>+</sup>, Na<sup>+</sup> or K<sup>+</sup>.







wherein X is hydrogen, halogen, loweralkoxy, loweralkyl, or trifluoromethyl.

5,440,049

## PROCESS FOR PRODUCING ENYNE DERIVATIVES

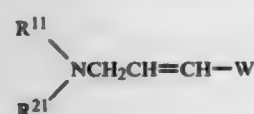
Susumu Nakagawa; Akira Asai; Satoru Kuroyama; Makoto Ishihara, and Yoshiharu Tanaka, all of Okazaki, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan. Division of Ser. No. 153,956, Nov. 18, 1993, Pat. No. 5,359,091, which is a division of Ser. No. 974,488, Nov. 12, 1992, Pat. No. 5,296,612, which is a division of Ser. No. 861,160, Mar. 27, 1992, Pat. No. 5,231,183, which is a continuation of Ser. No. 588,931, Sep. 27, 1990, abandoned. This application Jun. 13, 1994, Ser. No. 258,772.

Claims priority, application Japan, Oct. 2, 1989, 1-257310 Int. Cl.<sup>6</sup> C07D 333/58; C07C 209/08, 209/16

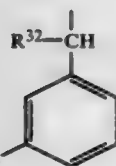
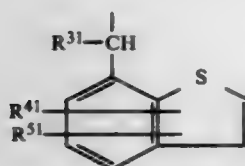
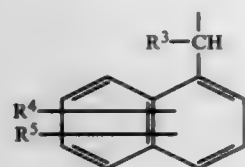
U.S. Cl. 549-49

2 Claims

1. A process for producing a compound of the formula:



wherein R<sup>11</sup> is hydrogen, lower alkyl, haloloweralkyl, lower alkenyl, lower alkynyl or cycloalkyl; R<sup>21</sup> is a group of the formula:

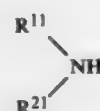


wherein each of R<sup>3</sup>, R<sup>31</sup>, and R<sup>32</sup>, which may be the same or different, is a hydrogen atom or a lower alkyl group, each of R<sup>4</sup>, R<sup>5</sup>, R<sup>41</sup> and R<sup>51</sup>, which may be the same or different, is a hydrogen atom, a halogen atom, a hydroxyl group, a lower alkyl group or a lower alkoxy group, R<sup>42</sup> is a hydroxyl group, a halogen atom, a group of the formula R<sup>8</sup>-O- wherein R<sup>8</sup> is a protecting group for a hydroxyl group, a hydroxymethyl group, a formyl group, a carboxyl group, a lower alkoxy carbonyl group, a lower alkanoyl group, an amino group, a mer-

capto group or a group of the formula R<sup>6</sup>-X-Y- wherein R<sup>6</sup> is a phenyl or thienyl group which may have one or two substituents selected from the group consisting of a halogen atom, a hydroxyl group, a lower alkyl group, a cyano group, a lower alkoxy group, a furyl group, a tetrahydrofuryl group, a pyrrolyl group, pyrrolydyl group, an imidazolyl group, a pyrazolyl group, an oxazolyl group, an isoxazolyl group, a furazanyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a thienyl group, a pyridyl group, a piperidyl group, a pyrazinyl group, a pyrimidinyl group, a pyridazinyl group, a piperidinyl group, a morpholinyl group, a thiomorpholinyl group, a triazinyl group, a quinolyl group, an isoquinolyl group, a phthalazinyl group, a naphthyridinyl group, a quinoxalinyl group, a quinazolinyl group, a benzofuranyl group, a benzothienyl group, a benzoisoxazolyl group, a benzothiazolyl group and a benzofurazanyl group, each of X and Y, which may be the same or different, is an oxygen atom, a sulfur atom, a carbonyl group, a group of the formula -CHR<sup>8</sup>- wherein R<sup>8</sup> is a hydrogen atom or a lower alkyl group or a group of the formula -NR<sup>b</sup>- wherein R<sup>b</sup> is a hydrogen atom or a lower alkyl group, or X and Y together form a vinylene group or an ethynylene group, provided that when either one of X and Y is an oxygen atom, a sulfur atom or a group of the formula -NR<sup>b</sup>- wherein R<sup>b</sup> is as defined above, the other is a carbonyl group or a group of the formula -CHR<sup>8</sup>- wherein R<sup>8</sup> is as defined above; and W is chlorine or bromine which comprises reacting a compound of the formula:



wherein W is as defined above and Z is a leaving group with an amine of the formula:



wherein R<sup>11</sup> and R<sup>21</sup> are as defined above.

5,440,050

## PROCESS FOR THE MANUFACTURE OF SPIROKETALS

Maria do Céu Gonçalves da Costa, Lisbon; Maria J. V. de Oliveira Baptista Marcelo Curto, Oeiras; Maria R. de Loureiro da Silva Tavares da Rosa, Parede, all of Portugal, and William B. Motherwell, Twickenham, United Kingdom, assignors to Givaudan-Roure Corporation, Clifton, N.J.

Continuation of Ser. No. 987,278, Mar. 9, 1993, abandoned. This application Oct. 18, 1994, Ser. No. 325,560

[III<sup>c</sup>]

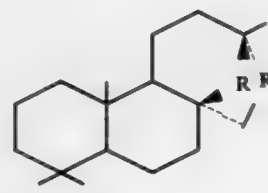
Claims priority, application Portugal, Jul. 17, 1991, 98344

Int. Cl.<sup>6</sup> C07D 311/78

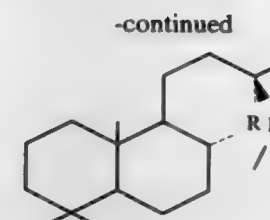
U.S. Cl. 549-383

11 Claims

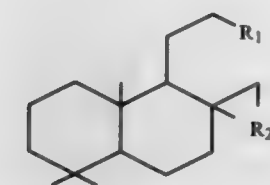
1. A process for the manufacture of mixtures of compounds of the general formulae I and II in yields of at least 70%



and/or



wherein the mixture comprises compound II in yields of at least 70%, and R represents oxygen, said process comprising the intramolecular cyclisation or ketalisation of the epoxyketone of general formula III



where R<sub>1</sub>=COCH<sub>3</sub> and R<sub>2</sub> represents oxygen, effected by a solid catalyst activated by acid, or by heat treatment, or by a Lewis acid catalyst with the exception of BF<sub>3</sub> or its complexes, and in the presence or absence of an organic solvent, at room temperature or at elevated temperatures, where the solid catalyst is a microporous solid, which is a sheet or phyllosilicate, or a tectosilicate, selected from the group consisting of clay, vermiculite, montmorillonite, HY zeolite, silicalite, or another microporous solid with comparable crystallographical characteristics.

5,440,051

## PROCESS FOR THE α-CHLORINATION OF ARYL ETHERS

Albrecht Marhold, Leverkusen, and Klaus Jelich, Wuppertal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 48,165, Apr. 15, 1993, abandoned. This application Mar. 22, 1994, Ser. No. 216,239

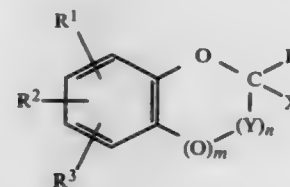
Claims priority, application Germany, Apr. 27, 1992, 42 13 849.3

Int. Cl.<sup>6</sup> C07D 319/14

U.S. Cl. 549-362

14 Claims

1. A process for the α-chlorination of aryl ethers of formula (I):



in which

R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> independently of one another represent hydrogen, fluorine, chlorine, CF<sub>3</sub>, OCF<sub>3</sub>, OCHF<sub>2</sub>, OCF<sub>2</sub>CF<sub>2</sub>H, or OCF<sub>2</sub>Cl, X<sup>1</sup> is hydrogen, fluorine, chlorine or CF<sub>3</sub>, m is zero or 1 and

when m=zero, n is 1 and Y is hydrogen, chlorine or fluorine, and when

m=1, n is zero or 1 and Y is CH<sub>2</sub>, CHCl, CCl<sub>2</sub> or CF<sub>2</sub>, in which process, in the presence of chlorination products of an aryl ether of formula (I), in the presence of fluorination products of chlorination products of aryl ether of formula (I), or in the presence of an inert aromatic solvent, all the aryl ether

of formula (I) to be used is metered into a reaction vessel at the same time as chlorine, the reaction being carried out at temperature in the range from 60° to 150° C.

5,440,052

## COMPOSITIONS USEFUL AS A CANNABINOID RECEPTOR PROBE

Alexandros Makriyannis, Ashford; Guo Yan, Storrs, and Vasiliki Abadji, Willington, all of Conn., assignors to University of Connecticut, Storrs, Conn.

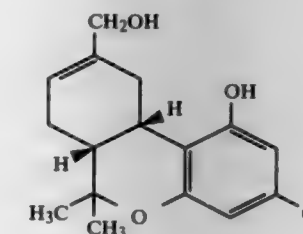
Filed Aug. 6, 1993, Ser. No. 103,883

Int. Cl.<sup>6</sup> C07D 311/80

U.S. Cl. 549-390

3 Claims

1. A cannabinol compound having the following structure



wherein:

Q is -C(R<sup>1</sup>)(Y<sup>1</sup>)-(CH<sub>2</sub>)<sub>n</sub>-Z<sup>1</sup>;  
R<sup>1</sup> is -H or -CH<sub>3</sub>;  
Y<sup>1</sup> is -CH<sub>3</sub> or Y<sup>2</sup>;  
Y<sup>2</sup> is -N<sub>3</sub> or -NCS;  
n is 4 or 6;  
Z<sup>1</sup> is -H, when Y<sup>1</sup> is Y<sup>2</sup>, or is Z<sup>2</sup>, when Y<sup>1</sup> is -CH<sub>3</sub>; and  
Z<sup>2</sup> is -N<sub>3</sub> or -NCS.

5,440,053

## RECOVERY OF MALTOL THROUGH AQUEOUS EXTRACTION

Alexander Fleisher, Wayne; Yan Gorenshcheyn, Edgewater; Ilya Nakhimovich, Bloomfield, and Olga Vselyubsvaya, Leonia, all of N.J., assignors to Florasynth, Inc., Teterboro, N.J.

Filed May 9, 1994, Ser. No. 240,112

Int. Cl.<sup>6</sup> C07D 309/40

U.S. Cl. 549-418

8 Claims

1. A process for recovering maltol from water-insoluble source material containing maltol, comprising:

contacting said source material with a solution in water of solute material, wherein said solute material is an alkali or alkaline earth metal halide which increases the specific gravity of said water and which increases the immiscibility of said water with said source material, which alkali or alkaline earth metal halide is more soluble in water at low temperatures than said maltol, under conditions effective to extract maltol from said source material into said solution; and separating said maltol from said solution and said alkali or alkaline earth metal halide.

5,440,054

## COMPOUND FOR TREATMENT OF CARDIAC ARRHYTHMIA, SYNTHESIS, AND METHODS OF USE

Pascal Druzgala, Gainesville, Fla., assignor to Advanced Therapies, Inc., Half Moon Bay, Calif.

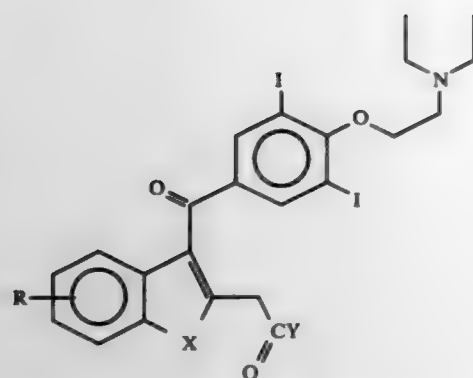
Continuation-in-part of Ser. No. 78,371, Jun. 16, 1993, Pat. No. 5,364,880. This application Jun. 16, 1994, Ser. No. 260,869

Int. Cl.<sup>6</sup> C07D 307/80

U.S. Cl. 549-467

7 Claims

1. A method for synthesizing a compound having the structure



wherein R is H, X is O, and Y is OCH<sub>3</sub>, said method comprising the steps:

- chemically converting salicylaldehyde to benzofuran acetic acid;
- methylating the benzofuran acetic acid of step (a);
- reacting the methyl benzofuranacetate from step (b) with p-anisoylchloride in the presence of a catalyst to form a methyl-2-(3-anisoylbenzofuran)acetate;
- chemically converting the compound obtained in step (c) from the acetate form to the carboxylic acid form and the methoxy benzoyl moiety to its hydroxybenzoyl form to yield 2-(3-p-hydroxybenzoylbenzofuran)acetic acid;
- iodinating the compound resulting from step (d) to form a diiodo form of the compound;
- esterifying the carboxylic acid group of the diiodo compound of step (e) to form methyl-2-[3-(3,5-diiodo-4-hydroxybenzoyl)benzofuran]acetate; and
- chemically reacting the hydroxybenzoyl group with diethylaminoethyl chloride to obtain methyl-2-[3-(3,5-diiodo-4-diethylaminoethoxybenzoyl)benzofuran]acetate (compound A).

5,440,055

#### METHOD AND APPARATUS FOR EXTRACTING TAXOL FROM SOURCE MATERIALS

Trevor P. Castor, Arlington, Mass., assignor to Aphios Corporation, Woburn, Mass.

Filed Mar. 12, 1993, Ser. No. 30,696

Int. Cl.<sup>6</sup> C07D 305/14

U.S. Cl. 549—510

21 Claims

1. A method of extracting taxoids from taxoid containing source materials comprising the steps:

- dewaxing the source material by subjecting said source material to first fluid, which first fluid is comprised of a critical or near critical fluid, said waxes dissolving in the first fluid to form a wax laden extractant and a dewaxed source material;
- subjecting said dewaxed source material to a second fluid said second fluid comprising a critical or near critical fluid and a polar cosolvent, to form a taxoid extractant and waste material;
- separating taxoids from impurities in said taxoid extractant through chromatography means to produce a taxoid and an eluant.

5,440,056

#### 9-DEOXTAXANE COMPOUNDS

Larry L. Klein, Lake Forest; Clinton M. Yeung, Skokie, and Leping Li, Gurnee, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

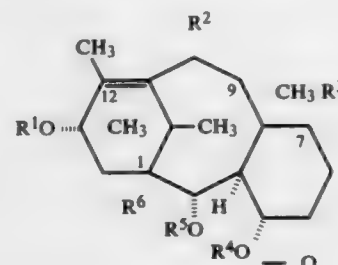
Continuation-in-part of Ser. No. 46,678, Apr. 14, 1993, Pat. No. 5,352,806, which is a continuation-in-part of Ser. No. 914,720, Jul. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 870,509, Apr. 17, 1992, abandoned. This application Mar. 9, 1994, Ser. No. 208,509

Int. Cl.<sup>6</sup> C07D 305/14

U.S. Cl. 549—510

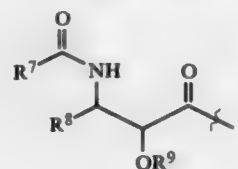
10 Claims

1. A compound having the formula



or a prodrug thereof, wherein

R<sup>1</sup> is alkanoyl or a radical having the formula



in which R<sup>7</sup> is selected from the group consisting of hydrogen, alkyl, phenyl, substituted phenyl, alkoxy, substituted alkoxy, amino, substituted amino, phenoxy and substituted phenoxy; R<sup>8</sup> is selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, alkoxyalkyl, aminoalkyl, phenyl, substituted phenyl, α-naphthyl, and β-naphthyl, and R<sup>9</sup> is selected from the group consisting of hydrogen, alkanoyl, substituted alkanoyl and aminoalkanoyl;

R<sup>2</sup>, R<sup>3</sup> and R<sup>6</sup> are independently selected from the group consisting of hydrogen, hydroxy, alkoxy, aminoalkanoyl and alkanoyloxy;

R<sup>4</sup> is selected from the group consisting of alkyl, alkanoyl, aminoalkanoyl and aroyl; and

R<sup>5</sup> is selected from the group consisting of alkyl, alkanoyl, aminoalkanoyl and aroyl.

5,440,057

#### ACCESS TO TAXOL ANALOGS

K. C. Nicolaou, La Jolla; Philippe G. Nantermet, San Diego; Rodney K. Guy, San Diego, and Hiroaki Ueno, San Diego, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Filed Aug. 20, 1993, Ser. No. 110,095

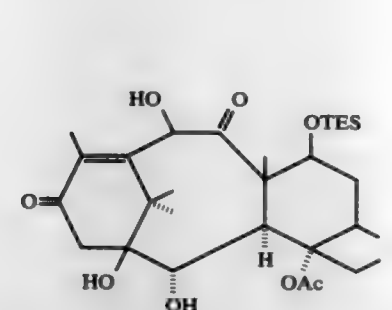
Int. Cl.<sup>6</sup> C07D 305/14

U.S. Cl. 549—511

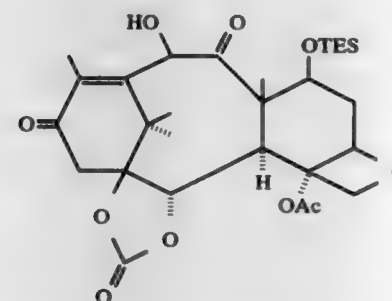
1 Claim

1. A method for producing a taxol analog comprising the following steps:

Step A: reacting key intermediate 4, represented by the following formula:



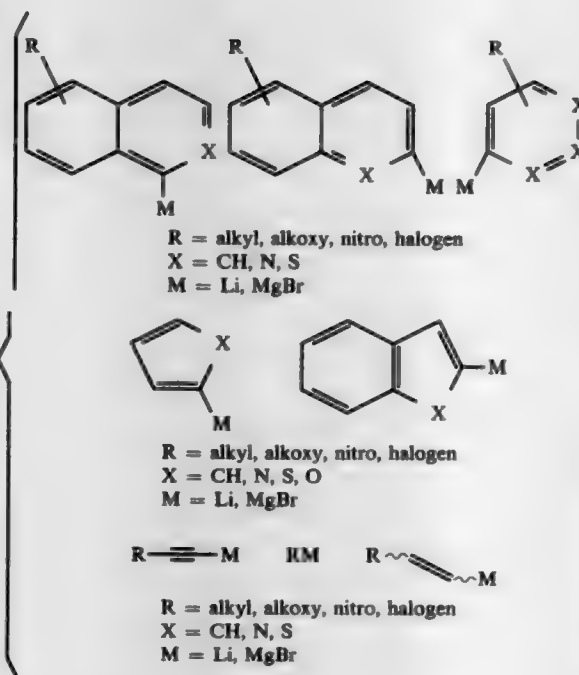
with phosgene to produce carbonate 5, represented by the following formula:



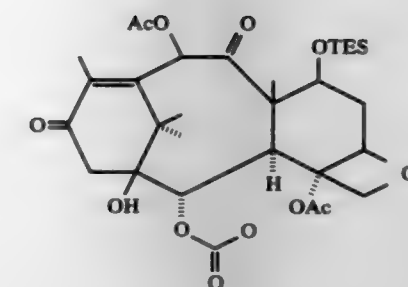
wherein OTES is O-triethylsilyl; and then

Step B: acylating the carbonate 5 of said Step A with G, wherein G is selected from the group consisting of phenyllithium and the following structures:

G =



to produce the taxol analog represented by the following formula:



5,440,058

#### METHOD FOR SEPARATING COMPOUNDS IN PROCESS STREAMS

William C. Hoffman, Dunbar, and John P. Dever, Charleston, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Jun. 7, 1994, Ser. No. 255,338

Int. Cl.<sup>6</sup> C07D 301/32, 303/04; C07C 29/88, 31/20

U.S. Cl. 549—538

20 Claims

1. A method for removing a reactive, relatively volatile, impurity or by-product in a process from an aqueous process stream in which such impurity is dissolved, comprising:

- applying to said aqueous process stream a water-soluble reactant under conditions under which said reactant reacts with said impurity or by-product to form in aqueous solution a reaction product or products having a lower volatility than said impurity or by-product, and
- removing at least a portion of said reaction product or products from the process.

15. In a process for making alkylene oxide by the reaction of alkene and oxygen in which a stream containing alkene, oxygen, gas-phase inhibitor and at least one efficiency-enhancing gaseous member of a redox-half reaction pair is fed under alkylene oxide-producing conditions to a bed of catalyst comprising an impregnated silver metal on an inert, refractory solid support and an efficiency-enhancing amount of at least one efficiency-enhancing salt of a member of a redox-half reaction pair, a method for separating aldehyde by-product from higher molecular weight aldehyde by-products and from the alkylene oxide in a process stream in which they are dissolved in water, comprising:

- mixing with said aqueous process stream a water-soluble reactant which preferentially reacts with formaldehyde, before other aldehydes that may be present, under the ambient conditions of the process stream to form in aqueous solution a reaction product having lower volatility than formaldehyde, and
- removing at least a portion of said reaction product from the process.

5,440,059

CLAY-CATALYZED SYNTHESIS OF ARYL-SUBSTITUTED FATTY ACIDS AND FATTY ESTERS AND COMPOSITIONS RELATED THERETO  
Bernardus A. O. Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 2, 1993, Ser. No. 161,826

Int. Cl.<sup>6</sup> C07C 53/134

U.S. Cl. 554—220

2 Claims

1. Xylylstearyl acid.



5,440,060

SURFACE-ACTIVE COMPOUNDS BASED ON  
ALKOXYLATED FATTY AMINES

Heinz Uhrig, Steinbach/Taunus, and Albert Münkler, Liederbach, both of Germany, assignors to Hoechst AG, Frankfurt, Germany

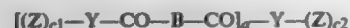
Filed Aug. 30, 1993, Ser. No. 114,388

Claims priority, application Germany, Aug. 29, 1992, 42 28 871.1

Int. Cl.<sup>6</sup> C07C 101/80

U.S. Cl. 559—107

1. A compound of the formula (I)



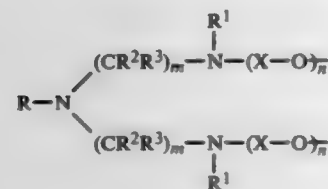
in which

a is a number from 1 to 9;

c1 is the number 2 or 3;

c2 is the number 3;

each Y is a unit of the formula (Ia) which is identical to or different from that of the other Y radicals



in which

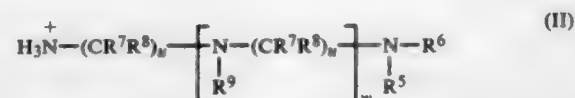
X is selected from the group consisting of the formulae  $-CH_2CH_2-$ ,  $-CH(CH_3)CH_2-$  and  $-CH_2-CH(CH_3)-$  or a combination thereof;R is selected from the group consisting of a saturated straight-chain  $C_{12}$ - $C_{22}$ -alkyl radical, unsaturated straight-chain  $C_{12}$ - $C_{22}$ -alkyl radical, saturated branched  $C_{12}$ - $C_{22}$ -alkyl radical and unsaturated branched  $C_{12}$ - $C_{22}$ -alkyl radical; $R^1$  is a hydrogen atom or a divalent group of the formula  $-(X-O)_n-$ ; $R^2$  and  $R^3$  are identical or different and are a hydrogen atom or a methyl group;

m is a number from 2 to 3, and

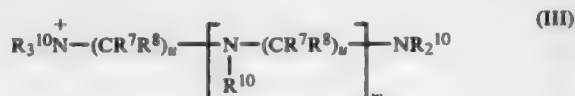
each n is a number from 1 to 200 which can be identical to or different from that of the other n;

each Z is a radical selected from the group consisting of  $Z^1$  to  $Z^7$  which is identical to or different from that of the other Z, in which $Z^1$  is hydrogen; $Z^2$  is an acyl radical of a straight-chain, saturated or unsaturated  $C_2$ - $C_{22}$ -carboxylic acid, which is unsubstituted or substituted by one or two hydroxyl groups; $Z^3$  is an acyl radical of a dicarboxylic acid or tricarboxylic acid based on a dimerized  $C_8$ - $C_{24}$ -fatty acid or trimerized  $C_8$ - $C_{24}$ -fatty acid; $Z^4$  is an acyl radical of the formula  $R^4-CO-$ , in which  $R^4$  is selected from the group consisting of a phenyl, naphthyl, hydroxyphenyl and hydroxynaphthyl radical; $Z^5$  is an acyl radical of an unmodified or modified natural resin acid;each  $Z^6$  is a radical selected from the group consisting of  $-CO-CH=CH-COOM$ ,  $-CO-(CH_2)_q-COOM$ ,  $-CO-CH_2-CH(SO_3M)-COOM$ ,  $-CO-CH(SO_3M)-CH_2-COOM$ , and  $-CO-C_6H_4-COOM$  which is identical to or different from that of the other  $Z^6$ , in which q is an integer from 0 to 10, and $Z^7$  is  $-SO_3M$ ;in which M is hydrogen; an alkali metal; one equivalent of an alkaline earth metal; and oxyalkyl radical of the formula  $(X-O)_nH$ ; an ammonium group which is unsubstituted or substituted by one to four  $C_1$ - $C_3$ -alkyl radicals or one to four  $C_2$ - $C_3$ -alkylol radicals; an ammonium group obtained from ammonia or from  $C_1$ - $C_3$ -alkylamines or  $C_2$ - $C_3$ -alkylolamines

by an addition reaction with 1 to 150 ethylene oxide or propylene oxide units or a combination of ethylene oxide and propylene oxide units; or a group of the formula (II)



15 Claims

in which  $R^9$ ,  $R^5$  and  $R^6$  are identical or different and are a hydrogen atom or a hydroxyalkyl group having 1 to 6 carbon atoms, and  $R^7$  and  $R^8$  are identical or different and are hydrogen or methyl, each u is identical to or different from the others and is an integer from 2 to 14, and w is an integer from zero to 25; or in which M is a group of the formula (III)

(Ia)

in which  $R^{10}$  is the group  $H-(O-X)_y$ , in which X has the abovementioned meanings and y is an integer from 1 to 100, andB is a straight-chain, branched or cyclic aliphatic radical each having 1 to 60 carbon atoms, and is  $C_6$ - $C_{22}$ -arylene or a group of the formula  $-CH=CH-$ ,  $-CH(SO_3M)C-H_2-$  or  $-CH_2CH(SO_3M)-$ , in which M is a cation or a radical of the formula  $-(X-O)_nH$ .

5,440,061

HYDROLYSIS OF METHYL ESTERS IN  
DIMETHYLSULFOXIDE FOR PRODUCTION OF FATTY  
ACIDS

Michael S. Gibson, Loveland, Ohio, assignor to The Procter &amp; Gamble Company, Cincinnati, Ohio

Filed Mar. 29, 1994, Ser. No. 219,066

Int. Cl.<sup>6</sup> C07C 51/377

U.S. Cl. 554—160

26 Claims

1. A process for the production of fatty acids comprising the following steps:

(a) mixing fatty acid ester of a volatile alcohol with water, acid catalyst, and DMSO to form a single phase reaction mixture; and

(b) heating the single phase reaction mixture to a temperature of from about 70° C. to about 130° C. to hydrolyze said fatty acid ester into the corresponding acid and volatile alcohol and removing said volatile alcohol;

wherein the acid catalyst is heat and water stable; wherein the reaction mixture is essentially free of  $C_2$ - $C_5$  carboxylic acids; and wherein the initial stoichiometric ratio of water to ester is at least about 1:1 on a molar basis.

5,440,062

ENANTIOSELECTIVE ADDITION OF HYDROCARBONS  
TO ALPHA,BETA-UNSATURATED CARBONYL  
COMPOUNDS

Gilberto M. Villacorta, Hoboken, N.J.; Kwang-Hyun Ahn, Somerville, and Stephen J. Lippard, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Boston, Mass.

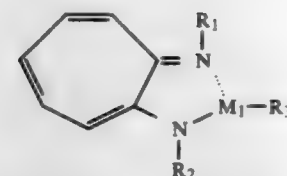
Division of Ser. No. 349,584, May 9, 1989, Pat. No. 5,162,586, which is a continuation-in-part of Ser. No. 193,246, May 11, 1988, Pat. No. 4,962,214. This application Nov. 10, 1992, Ser. No. 974,132

Int. Cl.<sup>6</sup> C07F 1/08

U.S. Cl. 556—33

5 Claims

1. An optically active complex of the formula:

wherein  $R_1$  and  $R_2$  are chiral hydrocarbon groups with or without heteroatom substituents having 4 to 24 carbon atoms, wherein  $R_1$  and  $R_2$  are the same or different, and wherein  $R_3$  is a negatively charged group or a hydrocarbon group having 1 to 24 carbon atoms and  $M_1$  is a transition metal.

5,440,063

CONCURRENT PREPARATION OF  
DIMETHYLCHLOROSILANE AND  
TRIORGANOCHLOROSILANE

Masaki Takeuchi; Akira Yamamoto; Mikio Endo; Tohru Kubota, and Yasufumi Kubota, all of Niigata, Japan, assignors to Shin-Etsu Chemical Company, Limited, Tokyo, Japan

Filed Nov. 3, 1994, Ser. No. 335,415

Claims priority, application Japan, Nov. 5, 1993, 5-301222

Int. Cl.<sup>6</sup> C07F 7/08

U.S. Cl. 556—469

6 Claims

1. A method for concurrently preparing dimethylchlorosilane and a triorganochlorosilane of the formula:  $R^1R^2R^3SiCl$  wherein  $R^1$ ,  $R^2$ , and  $R^3$  are independently selected from monovalent hydrocarbon groups, comprising the step of:reacting dimethyldichlorosilane with a SiH bond-containing silane compound of the formula:  $R^1R^2R^3SiH$  wherein  $R^1$ ,  $R^2$ , and  $R^3$  are as defined above in the presence of a Lewis acid catalyst.

5,440,064

PROCESS FOR THE PREPARATION OF  
ORGANOSILICON DISULFIDE COMPOUNDS

Giorgio Agostini, Cruchten, Luxembourg; Leon E. E. Christians, Nandrin, Belgium; Uwe E. Frank, Ettelbruck, Luxembourg; Thierry F. E. Materne, Attert; Vincent L. A. Tadino, Liege, both of Belgium; Friedrich Visel, Bofferdange, and Rene J. Zimmer, Howald, both of Luxembourg, assignors to The Goodyear Tire &amp; Rubber Company, Akron, Ohio

Filed Dec. 23, 1994, Ser. No. 363,110

Int. Cl.<sup>6</sup> C07F 7/08

U.S. Cl. 556—427

10 Claims

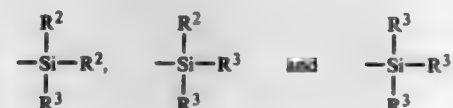
1. A process for the preparation of a organosilicon disulfide compounds of the formula



comprising oxidizing a compound of the formula



II

in the presence of a  $MnO_2$ , wherein Z is selected from the group consisting ofwherein  $R^2$  may be the same or different and is independently selected from the group consisting of an alkyl group having 1 to 4 carbon atoms and phenyl;  $R^3$  may be the same or different and is independently selected from the group consisting of alkyl groups having 1 to 4 carbon atoms, phenyl, alkoxy groups having 1 to 8 carbon atoms and cycloalkoxy groups with 5 to 8 carbon atoms; and  $R^1$  is selected from the group consisting of a substituted or unsubstituted alkylene group

having a total of 1 to 18 carbon atoms and a substituted or unsubstituted arylene group having a total of 6 to 12 carbon atoms.

5,440,065

PROCESS FOR PREPARING 4-AMINO-5-HEXENOIC  
ACID

Patrick Casara, Ittenheim, France, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 184,762, Jan. 19, 1994, Pat. No. 5,380,936, which is a continuation of Ser. No. 986,636, Dec. 7, 1992, abandoned. This application Jul. 22, 1994, Ser. No. 279,620

Claims priority, application European Pat. Off., Dec. 10, 1991, 91403351

Int. Cl.<sup>6</sup> C07C 249/00

U.S. Cl. 558—6

1 Claim

1. Ethyl 6-trichloroacetimidoxyl-4-hexenoate.

5,440,066

## PROCESS FOR SPLITTING POLYCARBONATES

Hans-Josef Buysch; Norbert Schön, both of Krefeld; Steffen Kühling, Meerbusch, and Heinrich Hähnen, Duisburg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 4, 1994, Ser. No. 222,777

Claims priority, application Germany, Apr. 13, 1993, 43 12 037.7

The portion of the term of this patent subsequent to Nov. 30, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> C07C 68/06

U.S. Cl. 558—277

5 Claims

1. A continuous process for splitting an aromatic polycarbonate resin comprising reacting in a distillation column and in the presence of a catalyst

(i) a polycarbonate resin in solution with

(ii) methanol

to produce a dihydroxy compound and dimethyl carbonate, wherein said solution contains polycarbonate and monohydroxy compound solvent exclusive of methanol, and wherein said solution is fed into the upper section of said column and wherein said methanol is fed into the lower section of said column in the form of a mixture containing methanol and dimethyl carbonate, and wherein dimethyl carbonate thus produced is removed from an upper section of said column and wherein said dihydroxy compound thus produced is removed from a lower section of said column and wherein said mixture contains about 1 to 50% of dimethyl carbonate, said percent being relative to the weight of said mixture.

5,440,067

CATALYZED GAS PHASE ISOMERIZATION OF  
NONCONJUGATED  
2-ALKYL-3-MONOALKENENITRILES

Joe D. Druliner, Newark, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

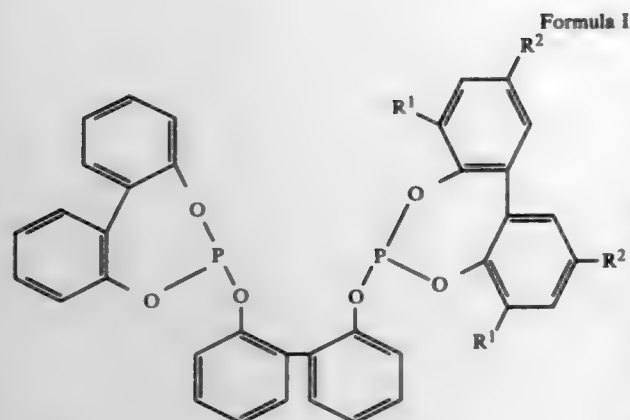
Filed Nov. 18, 1994, Ser. No. 341,726

Int. Cl.<sup>6</sup> C07C 253/30

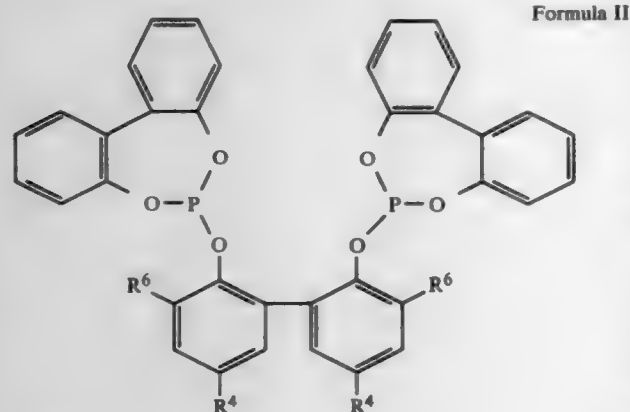
U.S. Cl. 558—355

12 Claims

1. A process for the gas phase isomerization of an acyclic, aliphatic, nonconjugated 2-alkyl-3-monoalkenenitrile comprising, contacting the starting nitrile, at a temperature within the range of 135° C. to 170° C. with a supported catalyst composition comprising zero-valent nickel and at least one bidentate phosphite ligand selected from the group consisting of Formula I and II:



wherein  
each  $R^1$ , independently, is a secondary or tertiary hydrocarbyl of 3 to 12 carbon atoms;  
each  $R^2$ , independently, is H, a  $C_1$  to  $C_{12}$  alkyl, or  $OR^3$ , wherein  $R^3$  is  $C_1$  to  $C_{12}$  alkyl; and



wherein

each  $R^4$ , independently, is a tertiary hydrocarbon of up to 12 carbon atoms, or  $OR^5$ , wherein  $R^5$  is a  $C_1$  to  $C_{12}$  alkyl; and each  $R^6$ , independently, is a tertiary hydrocarbon of up to 12 carbon atoms, to produce nonconjugated, linear, acyclic 3- and/or 4-monoalkenenitriles.

5,440,068

#### ACETONITRILE PURIFICATION VIA AN ADSORPTION-BASED PROCESS

Marc W. Blackman, Lyndhurst; Mark C. Cesa, South Euclid, and Thomas G. Attig, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 30, 1993, Ser. No. 176,369

Int. Cl.<sup>6</sup> C07C 253/34

U.S. Cl. 558—435

16 Claims

1. A process for the substantial removal of water and impurities from acetonitrile wherein at least one impurity is selected from the group consisting of acrylonitrile, crotonitrile and acetamide comprising

- adding a solid strong base to the acetonitrile in an amount sufficient to convert substantially all of said impurities into products which are capable of being easily separated from said acetonitrile by absorption
- passing the acetonitrile containing said products and water through a series of absorbent beds to separate said products and water from said acetonitrile thereby producing substantially pure acetonitrile and
- recovering said substantially pure acetonitrile from said absorbent beds.

5,440,069

#### DOMINANT ORANGE ALLELE IN PEPPER

Steven J. Czaplewski, Naples, Fla., and Herman E. J. Koning, Re DeLier, Netherlands, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 102,397, Aug. 4, 1993, abandoned,

which is a continuation of Ser. No. 801,985, Dec. 3, 1991,

abandoned. This application Aug. 2, 1994, Ser. No. 284,717

Int. Cl.<sup>6</sup> A01H 5/00, 5/10; A01B 79/00

U.S. Cl. 800—200

12 Claims

1. Inbred bell pepper (*Capsicum annum* L.) seed designated 434 which has a dominant orange allele for fruit color and having ATCC accession No. 75975.

## ELECTRICAL

5,440,070

#### ELECTRONIC MUSICAL INSTRUMENT HAVING SELECTABLE ANGLE-TO-TONE CONVERSION

Tetsuo Okamoto, and Naota Katada, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

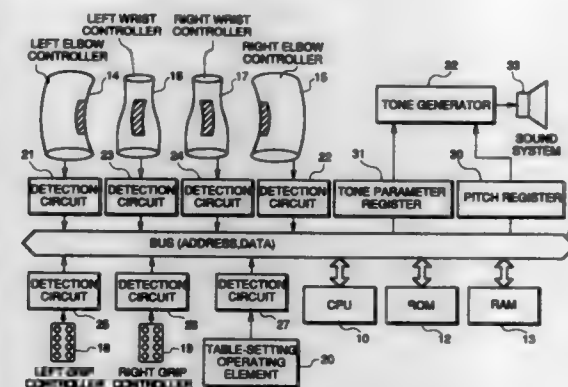
Filed Aug. 30, 1993, Ser. No. 114,379

Claims priority, application Japan, Sep. 2, 1992, 4-234562

Int. Cl.<sup>6</sup> G10H 1/32

U.S. Cl. 84—600

7 Claims



1. An electronic musical instrument comprising:

- a plurality of detecting means, arranged respectively at predetermined joints of a human body or in the vicinity thereof, for detecting angles formed by respective ones of said predetermined joints, and for generating a plurality of angle data indicative of the respective detected angles;
- a plurality of converting means, having different input/output characteristics, for converting angle data from the detecting means into respective frequency data each indicative of a frequency of a musical tone; and
- selecting means for selecting a desired converting means out of said plurality of converting means for use with a desired detecting means, whereby different input/output characteristics may be selected for the respective detecting means.

5,440,071

#### DYNAMIC CHORD INTERVAL AND QUALITY MODIFICATION KEYBOARD, CHORD BOARD CX10

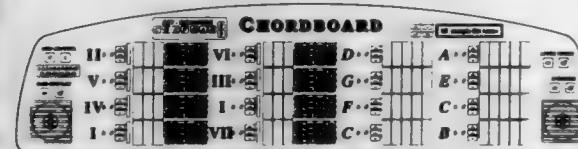
Grant Johnson, 5025 Deepark Cr., Fair Oaks, Calif. 95628

Filed Feb. 18, 1993, Ser. No. 19,137

Int. Cl.<sup>6</sup> G10H 7/00, 1/38

U.S. Cl. 84—637

15 Claims



1. An electronic musical instrument comprising:

- a plurality of sets of performance key groups (BPK and TPK) and chord selection toggle switches (CSB) which are electronically linked together as a unit (BPK-CSB-TPK), and each grouping of BPK, CSB and TPK located adjacent to one another so as to facilitate the playing of the BPK set and CSB panel with say, the left hand, and the TPK set with the right hand
- wherein each electronically/physically associated BPK-TPK-CSB unit is independent from all other BPK-TPK-CSB units within the same musical instrument,
- wherein each said BPK-TPK-CSB unit employs a plurality of BPK's and TPK's to play one or more of the notes within a user selectable chord grouping, wherein each said individual BPK and TPK plays a note unique from all other said BPK's and TPK's within said performance key

group, and each CSB panel may be used to provide continuously variable means to alter interval and quality of selected chord group for said set of BPK's and TPK's, wherein said CSB panel may be used to alter the note assignment for it's associated BPK and TPK set, whereby the chord interval, quality, octave or scale may be selected and altered instantly and dynamically during a musical performance,

- a microprocessor used to sample the status and activity of said electronic BPK-TPK-CSB unit at regular intervals for the purpose of generating digital musical information,
- a data transfer interface electronically connected to said microprocessor that facilitates the transfer of musical data obtained and generated by said microprocessor to and from an external communication device, such as a sound module.

5,440,072

#### SYSTEM FOR REJUVENATING VINTAGE ORGANS AND PIANOS

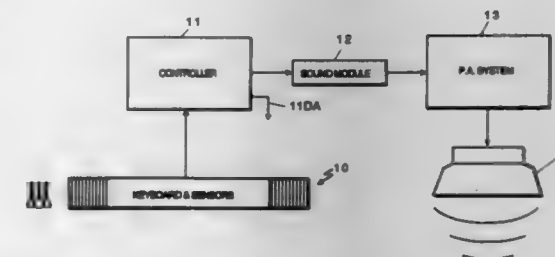
Raymon A. Willis, 419 E. 33rd St., Savannah, Ga. 31401

Filed Sep. 25, 1992, Ser. No. 950,518

Int. Cl.<sup>6</sup> G10H 7/00

U.S. Cl. 84—645

8 Claims



1. A system for rejuvenating conventional old keyboard musical instruments having keys to MIDI standards said keyboard instrument being an acoustic piano having an array of piano strings which are adapted to be struck by an array of hammers, comprising:

- one or more linear arrays of key actuation sensors, printed circuit board means carrying said key actuation sensors for sensing key actuation and expression effects by a musician, means for mounting said one or more linear arrays adjacent the keyboard of said musical instrument to sense and convert each key actuation and expression effect of the musician to first coded electrical signals, respectively,
- control means connected to receive said first coded digital electrical signals and provide digital note control signals in MIDI format,
- means for simultaneously silencing all keys of said conventional keyboard musical instrument, including sound absorbing mens positionable between said arrays of hammers and piano strings,
- transducer means for converting actuation of foot pedals by a musician to foot pedal control signals and means connecting said foot pedal control signals to said control means, and
- one or more performance modules connected to receive said digital note control signals and produce a musical performance.



5,440,073

**ELECTRIC CABLE MOUNTING DEVICE**

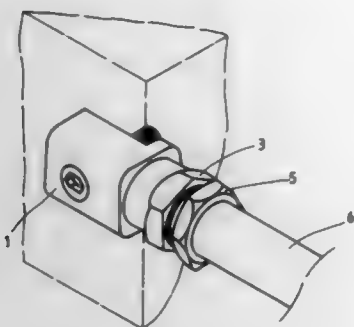
Kuang-Ts'an Lin Lin, and Shih-Tzung Liang, both of No. 360, Sec. 1, Min-Sheng N. Rd., Kuei-Shan Hsiang, Taoyuan County, Taiwan

Filed May 2, 1994, Ser. No. 235,921

Int. Cl.<sup>6</sup> H02G 15/02

U.S. Cl. 174—74 R

1 Claim



1. An electric cable mounting device comprising:
  - a connector for fastening to one terminal of an electric apparatus, having a taper hole at one end made gradually smaller toward the inside and an inner thread portion made around the periphery of the taper hole;
  - a taper jacket mounted around the conductor of the electric cable to be mounted and fitted into the taper hole on said connector and having a straight longitudinal through hole through the longitudinal axis thereof, which receives the conductor of the electric cable, and a plurality of longitudinal splits spaced around the outside wall thereof and alternatively arranged in reversed directions;
  - a first hollow screw member having an outer thread portion threaded into the inner thread portion on said connector and stopped against said taper jacket, a longitudinal through hole through the longitudinal axis thereof, which receives the electric cable, an inner thread portion made around the periphery of the longitudinal through hole of said first hollow screw member at one end, and a tapered inside wall disposed around the longitudinal through hole of said first hollow screw hole in the middle between the inner thread portion and outer thread portion of said first hollow screw hole;
  - a clamping ring clamped on the electric cable and received inside the longitudinal through hole of said first hollow screw member, said clamping ring having a split for easy mounting onto the electric cable and a tapered portion at one end fitted into the tapered inside wall of said first hollow screw member; and
  - a second hollow screw member mounted around the electric cable, said second hollow screw member having an outer thread portion threaded into the inner thread portion of said first hollow screw member causing said clamping ring compressed onto the electric cable.

5,440,074

**METHOD FOR PRODUCING A TIGHT TERMINATION AT THE END OF A SHRINKABLE CABLE SLEEVE AND A SEAL ELEMENT USED THEREWITH**

Hans-Juergen Meltach, Schwerte, and Wolfgang Schulte, Hagen, both of Germany, assignors to RXS Schrumpftechnik-Garnituren GmbH, Hagen, Germany

Filed Dec. 8, 1993, Ser. No. 163,879

Claims priority, application Germany, Dec. 8, 1992, 42 41 304.4

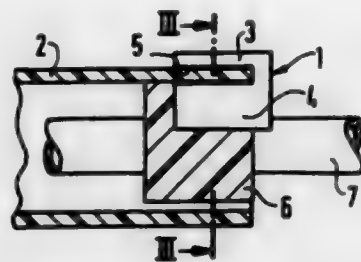
Int. Cl.<sup>6</sup> H02G 15/04; H01R 43/00

U.S. Cl. 174—88 R

40 Claims

1. A method for producing a tight termination at an introduction region of a cable sleeve containing at least two cables with the assistance of a seal element introduced between the at least two cables, said cable sleeve having a sleeve wall which

is shrinkable at least in the introduction region, said method comprising the steps of introducing at least two cables into the introduction region of the cable sleeve, positioning a seal element between the at least two cables, said seal element having a heat-deformable sealing part, selectively fixing said seal element to one side of said cable sleeve and between said at least two cables, then applying heat to cause the heat-deformable sealing part to deform to fill the gore region between the introduced cables and the sleeve wall of the cable sleeve and to shrink the sleeve wall maximally up to a tangential course between the at least two cables in a sealing fashion.



17. A seal element for being arranged between cables positioned in an introduction region of a shrinkable cable sleeve for forming a tight termination therebetween with said cable sleeve extending tangentially relative to each of said cables, said seal element including an inner fixing part and an outer fixing part, said element having means for fixing the seal element selectively to one side of the cable sleeve, the inner fixing part including a sealing part composed of a material deformable upon the application of heat.

5,440,075

**TWO-SIDED PRINTED CIRCUIT BOARD A MULTI-LAYERED PRINTED CIRCUIT BOARD**

Kouji Kawakita, Joyo; Masahide Tsukamoto, Nara; Yasuhiko Horio, Osaka; Seichi Nakatani, Hirakata, and Akihito Hatakeyama, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

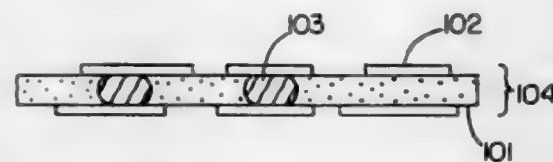
Filed Sep. 20, 1993, Ser. No. 124,317

Claims priority, application Japan, Sep. 22, 1992, 4-252594

Int. Cl.<sup>6</sup> H05K 1/02

U.S. Cl. 174—265

16 Claims



1. A two-sided printed circuit board, comprising:
  - a base having a first surface, and a second surface substantially parallel to the first surface, the base having a plurality of through-holes;
  - a first conductive layer provided on the first surface of the base;
  - a second conductive layer provided on the second surface of the base; and
  - a conductive particle provided in each of the through-holes in a pressurized state for electrically connecting the first conductive layer and the second conductive layer.

5,440,076

**WEIGHT-CHECKING APPARATUS**

Jan van Roostelaar, Scherpenzeel, Netherlands, assignor to Eerste Nederlandse Fabriek van Weegwerktuigen Jan Molenschot BV, Netherlands

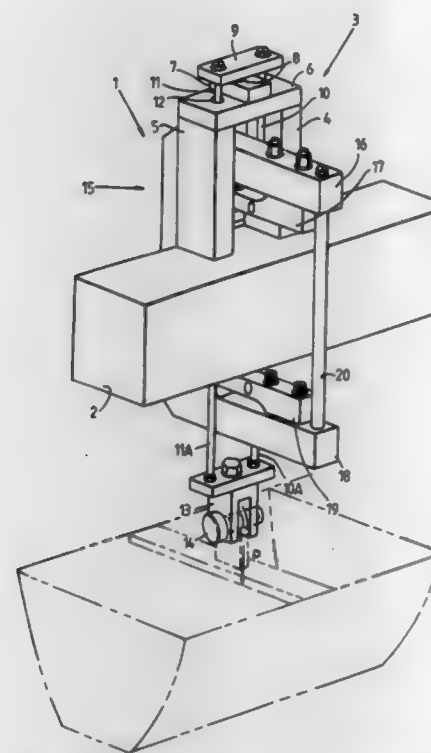
PCT No. PCT/EP90/01983, § 371 Date Jan. 6, 1993, § 102(e) Date Jan. 6, 1993, PCT Pub. No. WO92/08960, PCT Pub. Date May 29, 1992

PCT Filed Oct. 18, 1991, Ser. No. 910,334

Int. Cl.<sup>6</sup> G01G 19/52

U.S. Cl. 177—50

11 Claims



1. Automatic weighing apparatus for weighing batches of material contained in a weighing hopper coupled to the apparatus, said apparatus being mountable on a support and interposed between the support and the weighing hopper so that a force generated by the material in the weighing hopper is applied to the apparatus along a direction extending between the support and the weighing hopper, said apparatus comprising:
  - a U-shaped frame having a pair of arms extending normal to the direction of force application;
  - primary load cell means operatively associated with one of said arms and providing a signal proportional to the force applied to said primary load cell means;
  - secondary load cell means operatively associated with another of said arms and providing a signal proportional to the force applied to said secondary load cell means;
  - means coupling said primary load cell means to the support;
  - means coupling said secondary load cell means to the weighing hopper;
  - the coupling of said primary and secondary load cells means to the support and weighing hopper, respectively, being such that a same force is simultaneously applied to each of said load cell means by the material contained in the weighing hopper; and
  - comparator means coupled to said primary and secondary load cells means for comparing the signal from said primary load cell means with the signal from said secondary load cell means to check a correctness of the signal provided by said primary load cell means.

5,440,077

**COMBINED WEIGHTING AND DISPLACEMENT SENSOR AND WEIGHING APPARATUS USING THE SAME**

Hiroyuki Konishi; Michito Utsunomiya, and Kazufumi Naito, all of Shiga, Japan, assignors to Ishida Co., Ltd., Kyoto, Japan

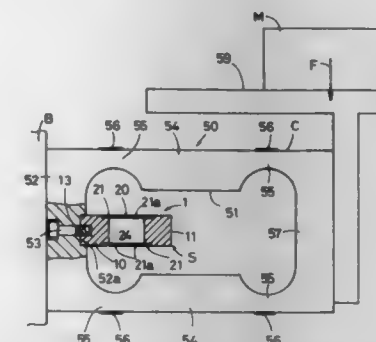
Filed Jul. 20, 1994, Ser. No. 277,748

Claims priority, application Japan, Jul. 22, 1993, 5-202849

Int. Cl.<sup>6</sup> G01G 3/14

U.S. Cl. 177—185

12 Claims



1. A combination of a weighing cell with a displacement sensor, said combination comprising:
  - said weighing cell including:
    - a strain inducing element having a strain generating region at which strain is generated in response to application of a load thereto; and
    - a strain gauge for detecting the strain generated in the strain generating region;
  - said strain inducing element including a fixed rigid body adapted to be secured to a base and a movable rigid body adapted to receive the load to be measured, and first and second beams rigidly secured at opposite ends to the fixed and movable rigid bodies and extending parallel to each other between the fixed and movable rigid bodies; and
  - said displacement sensor including:
    - fixed and movable rigid components, said movable rigid component forming a weight element;
    - a generally elongated beam member rigidly secured at opposite ends to the fixed and movable rigid components so as to extend between the fixed and movable rigid components, and
    - a displacement detecting element mounted on said elongated beam member for outputting an electric signal of a magnitude proportional to the amount of displacement of the movable rigid component in a direction generally perpendicular to the elongated beam member; wherein
    - said fixed rigid component of said displacement sensor is fixedly attached to the fixed rigid body of the weighing cell, and
    - said displacement sensor is discrete from said weighing cell.

5,440,078

**PORTABLE SCALE WITH LOAD CELL**

Daniel D. Schuler, Griswold, Iowa, assignor to Schrran Engineering, Inc., Griswold, Iowa

Filed Jul. 19, 1993, Ser. No. 92,876

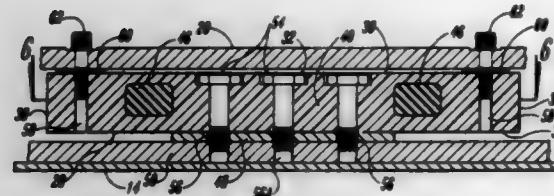
Int. Cl.<sup>6</sup> G01G 3/14, 3/08

U.S. Cl. 177—211

15 Claims

1. A load cell for scales comprising:
  - an elongated bar having opposite ends, opposite sides, a center portion, and a top surface and a bottom surface, said bar having cavity openings extending into the sides thereof adjacent each of said opposite ends,
  - a strain gauge in each of said cavity openings and being

sensitive to deflection of said bar caused by downward forces exerted on the top surface of said bar, means on said strain gauges for connection to means for receiving deflection data from said strain gauges, a cantilever support portion centrally positioned on the bottom surface of said bar and having a length less than said bar to create a space below the bottom surface of said



bar and to create a support surface upon which cantilever support bar is positioned, said opposite ends and said cavity openings of said bar being suspended in cantilever fashion from said center of said bar, and load receiving elements rigidly fixed on said bar inwardly adjacent said opposite ends and outwardly adjacent said cantilever support portion.

5,440,079

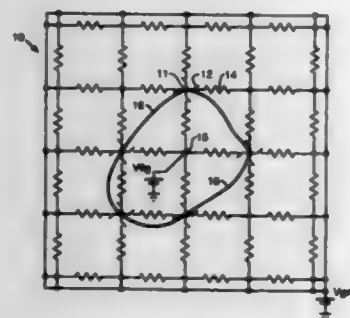
# OBJECT-BACKGROUND DISCRIMINATION USING ANALOG VLSI CIRCUIT

Bimal P. Mathar, Thousand Oaks, and Christof Koch, Pasadena, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Jun. 21, 1993, Ser. No. 80,905  
Int. Cl.<sup>6</sup> G08C 21/00; G06K 9/52

U.S. Cl. 178—18

12 Claims



1. An analog circuit, comprising:  
a network having a plurality of electrical nodes;  
a plurality of switchable means, each of said switchable means for connecting one of said nodes to an adjoining node;  
means for biasing a periphery of said network to a first voltage;  
means for mapping a sensor image into said network, said image including background and an object having an edge contour;  
means for opening said switches in said network at positions corresponding to said edge contour; and  
a current injection circuit for biasing nodes of said network within said edge contour to a second voltage different from said first voltage, thereby discriminating said object from said background.

5,440,080

# INFORMATION INPUT DEVICE

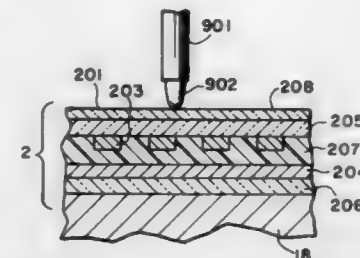
Makoto Nagaoka, Kiyose, and Tetsuya Sugiyama, Soka, both of Japan, assignors to Pentel Kabushiki Kaisha, Japan  
PCT No. PCT/JP93/00400, § 371 Date Dec. 22, 1993, § 102(e)  
Date Dec. 22, 1993, PCT Pub. No. WO93/20500, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 31, 1993, Ser. No. 150,187

Claims priority, application Japan, Mar. 31, 1992, 4-108665; Mar. 31, 1992, 4-108666; Jul. 31, 1992, 4-59572 U; Oct. 30, 1992, 4-315954; Feb. 26, 1993, 5-13182 U  
Int. Cl.<sup>6</sup> G08C 21/00

U.S. Cl. 178—18

27 Claims



1. An information input device comprising: an input pen as a coordinate indication means; a tablet comprising a transparent coordinate input board for placing the input pen in contact and a coordinate detection board for detecting the contact coordinate of the input pen; a display unit for placing the tablet thereon; and an arithmetic portion for calculating the contact coordinate of the input pen relative to the transparent input board, in which the input pen is formed by applying a coating of a high polymer film whose bending elastic modulus is 300 kg/mm<sup>2</sup> or less and hardness of 50 to 120 on the Rockwell R scale to at least a contact portion of a nib formed from a conductive member with the transparent coordinate input board, and a coefficient of dynamic friction between the input pen and the coordinate input board is 0.15 to 0.4.

5,440,081

# SYSTEM AND METHOD OF PROTECTING OPTICAL ELEMENTS FROM DOWN-HOLE FLUIDS

Jack T. Thompson, Port Hueneme, Calif., assignor to Westech Geophysical, Inc., Ventura, Calif.

Continuation of Ser. No. 263,482, Jun. 21, 1994, abandoned, which is a continuation of Ser. No. 62,691, May 21, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 343,205

Int. Cl.<sup>6</sup> G01V 1/40

U.S. Cl. 181—102

23 Claims



1. A method of preventing down-hole well fluid including oil from obscuring a down-hole viewing instrument having an

optical element exposed to such down-hole well fluid, comprising the step of:

applying a down-hole well fluid repelling surfactant to an exterior surface of an optical element of the viewing instrument, said surfactant containing tricresyl phosphate as an active ingredient to prevent said down-hole well fluid from adhering to the surface of said optical element.

5,440,082

# METHOD OF MANUFACTURING AN IN-THE-EAR HEARING AID, AUXILIARY TOOL FOR USE IN THE METHOD, AND EAR MOULD AND HEARING AID MANUFACTURED IN ACCORDANCE WITH THE METHOD

Rudi-A. M. Claes, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

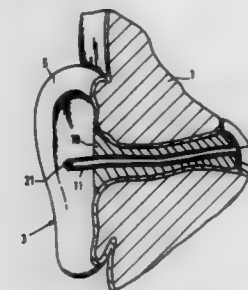
Filed Sep. 10, 1992, Ser. No. 943,366

Claims priority, application European Pat. Off., Sep. 19, 1991, 91202438

Int. Cl.<sup>6</sup> B29C 33/40

U.S. Cl. 181—135

13 Claims



1. A method of making an in-the-ear hearing aid for insertion into an ear canal of a person in proximity to a tympanic membrane, which method employs a mould of the ear canal of the person's ear, which mould is used for making a moulding die for the manufacture of a hearing-aid housing, comprising the steps of: inserting an auxiliary tool comprising a flexible tube having a flange at one end into the ear canal with said one end in the ear canal in order to form the mould, thereafter introducing a curable material into the ear canal and, after the material has cured, removing the material with the tube and the flange from the ear canal, wherein the flange has an opening situated opposite the opening of the end of the tube so that the tube is open at both ends, wherein the step of inserting the auxiliary tool comprises bringing the tube with the flange into the proximity of the tympanic membrane such that the step of introducing the curable material presses the flange against the tympanic membrane, thereby precluding the ingress of material between the flange and the tympanic membrane.

5,440,083

# EXHAUST MUFFLER FOR INTERNAL COMBUSTION ENGINE

Isao Masuda, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Continuation of Ser. No. 12,891, Feb. 3, 1993, abandoned. This application Feb. 18, 1994, Ser. No. 198,544

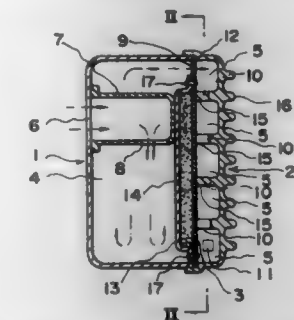
Claims priority, application Japan, Feb. 10, 1992, 4-13391 U  
Int. Cl.<sup>6</sup> F01N 7/10, 7/18

U.S. Cl. 181—240

4 Claims

1. An exhaust muffler for an internal combustion engine comprising a canister having a box-like body provided with an inlet port for exhaust gas on one side and being open on the opposite side, a cover having an outlet port open to atmosphere and being removably attached to said body to enclose said open side, a partition held between said body and said cover to define with said body a gas receiving chamber and with said cover a gas discharge chamber, said partition having a communicating hole remote from said inlet and outlet ports connecting said receiving chamber and said discharge chamber

for the movement of gas from said inlet port to said outlet port, a catalyst mounted on one surface of said partition within said gas receiving chamber to purify said exhaust gas as said exhaust gas flows through said receiving chamber, and partitioning walls formed on at least the interior surface of said cover,



said partitioning walls having offset vent holes to define within said gas discharge chamber a winding passage from said communicating hole to discharge outlet and fins formed on the exterior or said cover to cool the gas flowing therethrough prior to discharge to the atmosphere.

5,440,084

# SHOCK DETECTING SYSTEM

Akira Fuse, Yuji Tsuda, and Tsutomu Nakada, all of Yokohama, Japan, assignors to Nippon Aleph Corporation, Yokohama, Japan

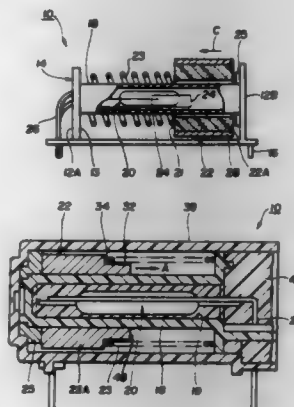
Filed Jan. 7, 1994, Ser. No. 178,528

Claims priority, application Japan, Jan. 8, 1993, 5-002596 U; Oct. 20, 1993, 5-056670 U

Int. Cl.<sup>6</sup> H01H 35/14

U.S. Cl. 200—61.45 R

18 Claims



1. A sensor for detecting shocks, comprising:  
an elongated switch containing contacts that are closed by applying a magnetic force to put the switch in an on state and opened by removing the magnetic force to put the switch in an off state;  
a movable member having a magnet for applying the magnetic force, said movable member being movable along the longitudinal axis of the switch, between a first position at a first end of the switch corresponding to the off state, and a second position at a second opposite end of the switch corresponding to the on state, said movable member moving along said switch from the first position to the second position as a result of an application of a shock to the sensor in the longitudinal direction;  
an elastic member which normally biases said movable member into the first position; and  
means, connected to the moveable means, for increasing the



kinetic energy of the movable member and prolonging the period that said movable member is in the on state.

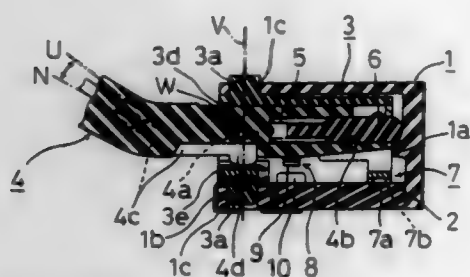
5,440,005

## LEVER SWITCH ASSEMBLY

Taketoshi Suzuki, and Kazumi Honjo, both of Tokyo, Japan, assignors to Niles Parts Co., Ltd., Japan  
Filed May 31, 1994, Ser. No. 251,369  
Claims priority, application Japan, Mar. 30, 1994, 6-083914  
Int. Cl.<sup>6</sup> H01H 9/00

U.S. Cl. 200—61.54

14 Claims



1. A lever switch assembly comprising:
  - a case;
  - a movable switch element disposed in said case and pivotally supported on said case so as to be pivotal about a first axis, said movable element having a cavity; and
  - an operating lever having an end portion received in said cavity, said operating lever being pivotally supported on said movable switch element by first and second lug members which are coaxially arranged and which extend out from either side of said operating lever so as to be pivotal about a second axis which has a predetermined angled relationship with said first axis, said movable switch element having a pair of integral resilient supporting portions which are each formed with bores in which said first and second lug members are rotatably received, said pair of resilient supporting portions supporting said operating lever so that said operating lever is pivotal about said second axis and so that selective connection and disconnection between said operating lever and said movable switch element is facilitated.

5,440,086

## UNBALANCE SWITCH MECHANISM

Keith E. Kropf, Newton, Iowa, assignor to Maytag Corporation, Newton, Iowa  
Filed Apr. 4, 1994, Ser. No. 222,540  
Int. Cl.<sup>6</sup> D06F 33/02; H01H 3/16

U.S. Cl. 200—61.62

18 Claims



1. A switch mechanism for use in an appliance having a

supporting structure, a movable appliance member mounted to said supporting structure for movement between a desired position and an undesired position relative to said supporting structure, a lid and a lid linkage mechanism movable from a lid open position to a lid closed position, said switch mechanism comprising:

- a first switch mounted to said supporting structure and being changeable from an open condition to a closed condition;
- a switch arm pivotally mounted to said supporting structure and operable responsive to movement of said lid linkage mechanism from said lid open position to said lid closed position for pivotal movement from a first switch arm position permitting said first switch to be in one of its said open and said closed conditions to a second switch arm position engaging and holding said first switch in the other of its said open and said closed conditions;
- said switch arm further being linearly movable in response to movement of said movable appliance member to said undesired position of said movable appliance member from said second switch arm position to a third switch arm position permitting said first switch to return to said one of said open and said closed conditions.

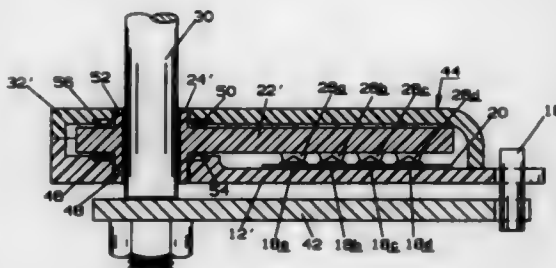
5,440,087

## SWITCH SYSTEM FOR USE WITH MOTOR VEHICLE TRANSMISSIONS

Carleton M. Cobb, III, East Walpole, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Filed Jan. 3, 1994, Ser. No. 176,753  
Int. Cl.<sup>6</sup> H01H 9/00

U.S. Cl. 200—61.88

10 Claims



1. A switch system for use with motor vehicle transmission apparatus having a pivotally mounted manual shaft mounted in a transmission housing and having a longitudinal axis and a detent lever with a plurality of detents on an outer edge surface thereof, each detent corresponding to a specific transmission gear selection, a roller movable toward and away from the manual shaft biased into engagement with the outer edge surface of the detent lever, the detent lever being mounted on the shaft so that the angular orientation of the detent lever is fixed relative to that of the shaft, the switch system comprising a switch housing mounted adjacent to the detent lever, the switch housing having two opposite ends, one end coupled to the roller to maintain the said one end of the housing in a fixed position relative to the transmission housing, the other end of the switch housing being pivotally mounted on the manual shaft, the switch housing having a base, a switch arm disposed within the housing fixedly mounted relative to the manual shaft so that the angular orientation of the switch arm relative to the manual shaft remains constant, at least a portion of the switch arm disposed in the switch housing being generally parallel to and spaced from the base, switch means mounted within the switch housing including at least one first electrical contact being mounted on one of the switch arm and the base and at least one spring biased second electrical contact being mounted on the other of the switch arm and base, one of the first and second electrical contact being slidable between respective contacts engaged and contacts disengaged positions with the other electrical contact as the manual shaft and switch

arm are pivoted, means to prevent ingress of debris into the switch housing wherein the switch arm and the switch housing have aligned annular surface portions extending around the manual shaft, each annular surface portion lying in a plane perpendicular to the longitudinal axis of the manual shaft and an annular sealing element having outer and inner peripheral edges formed of resilient material having a curved surface portion extending in a radial direction, the curved surface portion having a selected crown height between a plane in which the sealing element lies and that portion of the curved surface portion furthest removed from the plane, the annular sealing element disposed between the annular surface portions of the switch arm and switch housing, the annular surface portion being spaced from one another a distance less than the selected crown height and means for electrically energizing the switch and for outputting a signal therefrom corresponding to the respective contacts engaged and disengaged positions.

5,440,088

## MOLDED CASE CIRCUIT BREAKER WITH AUXILIARY CONTACTS

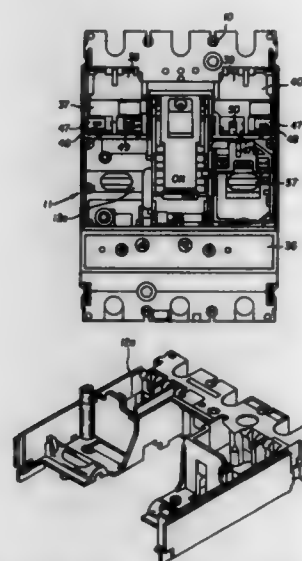
Patrick Coudert, Eybens; Jean-Pierre Nereau, Seyssinet, and Philippe Perrier, Lumbin, all of France, assignors to Merlin Gerin, France

Filed Sep. 14, 1993, Ser. No. 120,418

Claims priority, application France, Sep. 29, 1992, 92 11730  
Int. Cl.<sup>6</sup> H01H 3/04

U.S. Cl. 200—303

10 Claims



1. A low-voltage electrical circuit breaker, comprising:
  - a plurality of juxtaposed poles, each pole comprising at least one stationary contact, a movable contact and a bar section bearing the movable contact;
  - a molded case which houses said poles, said molded case having a base and a cover, and a plurality of compartments arranged in said cover;
  - a spring mechanism for actuating the bar sections, said spring mechanism having two stable positions, including a set position and a discharged position;
  - a manual operating handle connected to said spring mechanism, said manual operating handle protruding through said cover;
  - a trip device for automatically opening said movable and stationary contacts when a fault occurs; and
  - at least one auxiliary unit adapted for reception in any of the compartments, said at least one auxiliary unit being adapted to perform at least one of an indication and control function, wherein each compartment has a standard configuration and includes a control device for activating said at least one auxiliary unit.

5,440,089

## FOOT/TABLE SWITCH LOCKOUT FOR ELECTRIC PUNCHES

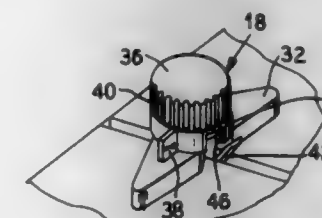
Gary F. Prokop, Berwyn, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Continuation of Ser. No. 57,895, May 7, 1993, abandoned. This application Jan. 6, 1995, Ser. No. 369,326

Int. Cl.<sup>6</sup> H01H 1/52

U.S. Cl. 200—321

18 Claims



1. A lockout assembly for an electric press alternatively operable by a table switch, said lockout assembly comprising the following:

- a table switch having a pivotable actuating lever;
- a lock knob; and
- an annular switch ring rotatably mounted beneath said lock knob surrounding said actuating lever in a locking position, said switch ring including a release opening; whereby said switch ring is rotatable between said locking position in which said release opening is out of alignment with said actuating lever of the table switch, and a release position in which said release opening is in alignment with the actuating lever of the table switch allowing the actuating lever to pivot to escape said switch ring for manual actuation of the actuating lever.

5,440,090

## DUPLEX STAINLESS STEEL WELDING METHOD

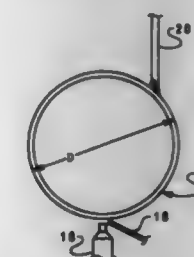
Randall L. Davis, Belpre, Ohio, and William N. Hill, Lakewood, Colo., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 7, 1993, Ser. No. 73,030

Int. Cl.<sup>6</sup> B23K 9/00

U.S. Cl. 219—61

6 Claims



1. A method for welding sections of generally cylindrical pipe of duplex stainless steel having a chromium content of about 24 percent to about 26 percent, a nickel content of about 6 percent to about 8 percent and a molybdenum content of about 3 percent to about 4 percent, said welding being carried out by electric arc welding with a gas shielded tungsten electrode comprising the steps of:

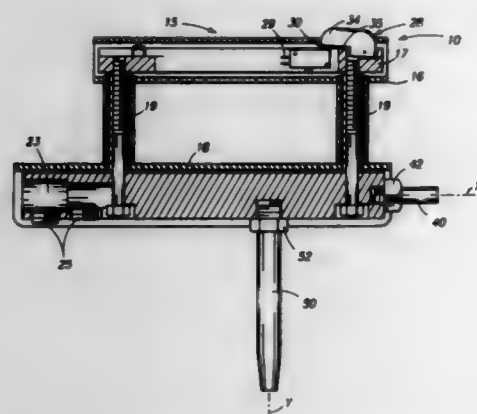
- making at least one circumferential root weld between end to end, abutted sections of pipe using a filler metal rod of a first diameter wherein said at least one circumferential root weld is formed by making a plurality of separate segment welds about the circumference of said abutted pipe sections;
- making at least one circumferential cover weld using a filler metal rod of a second diameter greater than said first diameter to form said weld wherein said at least one cir-

cumferential cover weld is formed by making a plurality of separate segment welds over said at least one circumferential root weld.

# 5,440,091 SHEET METAL WORKING ELECTRODE AND HANDPIECE

Donald L. Galbraith, and Richard P. Tice, both of Spokane, Wash., assignors to U.S. Dent Master, Inc., Spokane, Wash.  
Filed Aug. 23, 1993, Ser. No. 110,571  
Int. Cl.<sup>6</sup> B23K 11/00, 11/28  
U.S. Cl. 219—86.21

17 Claims



1. A sheet metal working electrode handpiece for delivering welding current from a source of electrical energy to a selected location on a sheet metal workpiece, wherein the electrode handpiece is comprised of:

- an electrically insulated handle;
- an electrical conductor mounted to the handle, electrically isolated from the handle for electrical contact with a source of electrical energy;
- a control switch on the handle for electrical connection to the source of electrical energy to control delivery of electrical energy to the conductor;
- a first electrode adapter on the electrical conductor, oriented along a first axis;
- a second electrode adapter on the electrical conductor, oriented along a second axis spaced apart from the first axis; and
- a sheet metal engageable electrode removably mountable on at least one of the adapters, the electrode including an elongated shank formed of a medium carbon alloy steel bolt shank and extending to a pointed end and including a torque surface on the shank in fixed position thereon.

# 5,440,092 WELDING CONTROLLER AND/OR PINCHING FORCE CONTROLLER

Shingo Kawai, Nagoya, Japan, assignor to Nadex Co., Ltd., Nagoya, Japan  
Filed Jun. 9, 1993, Ser. No. 73,390  
Claims priority, application Japan, Jun. 10, 1992, 4-177473  
Int. Cl.<sup>6</sup> B23K 11/24

U.S. Cl. 219—110

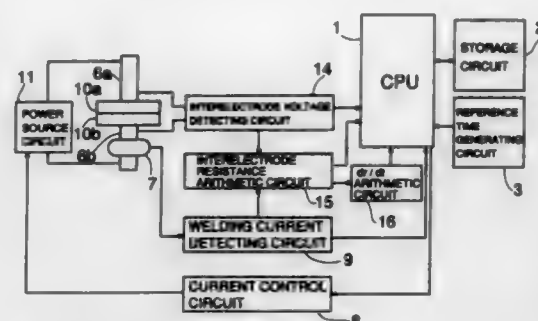
5 Claims

1. A controller for a welding machine in which workpieces are pinched between a pair of electrodes through which welding current is supplied to weld the workpieces, said controller comprising:

- first means for detecting an amount of interelectrode resistance between the electrodes;
- second means for monitoring the amount of interelectrode resistance between the electrodes and for detecting the occurrence of a phenomenon that the interelectrode resistance detected by the first means shifts from an upward tendency to a downward tendency;
- third means for increasing welding current periodically until

occurrence of the phenomenon is detected by the second means;

fourth means for maintaining welding current, after occurrence of the phenomenon, at a value present when occurrence of the phenomenon is detected by the second means; and



fifth means for cutting off welding current after occurrence of the phenomenon is detected by the second means and when an absolute value of a time derivative of the interelectrode resistance detected by the first means becomes less than a predetermined value.

# 5,440,093 STRUCTURE OF CONSTRAINED CHIP FOR PLASMA JET TORCH, AND PLASMA JET WORKING METHOD USING THIS CONSTRAINED CHIP

Toshikatu Sugaya, Mito; Mitsuo Hara, Ibaragi; Yutaka Kikuchi; Kenichi Tanimoto, both of Mito; Tokujirou Sagisaka, Hitachi-ohta, and Shuuichi Oomori, Katsuta, all of Japan, assignors to Doryokuro Kakunaryo Kaihatsu Jigyodani, Tokyo, Japan  
Filed Jul. 12, 1994, Ser. No. 274,007  
Claims priority, application Japan, Jul. 14, 1993, 5-196805  
Int. Cl.<sup>6</sup> B23K 10/00

U.S. Cl. 219—121.5

4 Claims

NOZZLE DIAMETER (mm)	NOZZLE LENGTH (mm)	CONSTRAINT RATIO (mm)	ABRASION WEAR TIME (min)	SHAPE OF JET
3	1	1635/24		
6	2	142/30		
7.5	2.5	0/30		
18	5	1/30		

1. A constrained chip which is forcedly cooled and which functions as one discharge electrode for a plasma jet torch, the constrained chip comprising:

- a nozzle through which a plasma generated by gas discharge between a discharge electrode of the plasma jet torch and the constrained chip is jetted,
- wherein said constrained chip is made of an alloy containing Cu and Zr, a bore diameter of the nozzle of the constrained chip is in the range of 3.0 mm to 3.5 mm, and the nozzle of the constrained chip has a constraint ratio, which is a ratio of a length of the nozzle to the bore diameter of the nozzle, in the range of 2.5 to 3.

# 5,440,094 PLASMA ARC TORCH WITH REMOVABLE ANODE RING

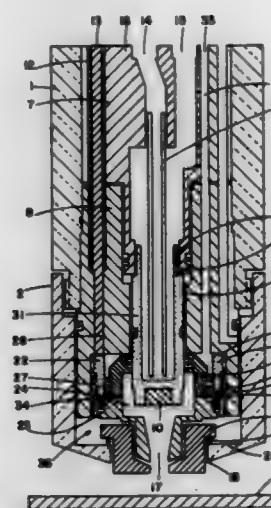
Jiri Zapletal, P.O. Box 82, Cornish, N.H. 03746, assignor to Douglas G. Carroll, Brooklandville, Md. and Jiri Zapletal, Claremont, N.H.

Filed Apr. 7, 1994, Ser. No. 224,255

Int. Cl.<sup>6</sup> B23K 10/00

U.S. Cl. 219—121.52

3 Claims



1. In a plasma torch having a torch housing, a retainer removably connected to the torch housing, the retainer having an inlet and an outlet at opposite ends thereof, a means for directing a flow of gas within the retainer from the inlet to the outlet, a negatively-charged electrode mounted within the retainer adjacent to the outlet, a nozzle mounted within the retainer adjacent to the outlet, and an electrical insulator mounted within the retainer, the improvement comprising: an anode ring removably mounted to the electrical insulator and electrically connected to a power source, the anode ring further comprising two cylindrical portions of different diameters, and a flat portion therebetween.

# 5,440,095 APPARATUS FOR MANUFACTURING METAL TUBE COVERED OPTICAL FIBER CABLE AND METHOD THEREFOR

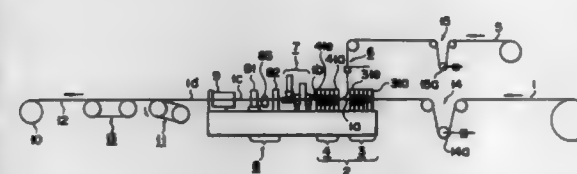
Yasunori Yoshie, and Takashi Tenkul, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan  
Continuation of Ser. No. 730,891, Jul. 26, 1991, Pat. No. 5,241,153. This application Jun. 17, 1993, Ser. No. 78,574  
Claims priority, application Japan, Dec. 5, 1989, 1-314295; Jul. 20, 1990, 1-190714

The portion of the term of this patent subsequent to Aug. 31, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> B23K 26/00

U.S. Cl. 219—121.63

6 Claims



1. A method of manufacturing an optical fiber cable covered with a metal tube, comprising the steps of: causing both side edges of a metal strip to be subjected to traction and forming the metal strip into a metal tube with said side edges facing

each other, the metal tube having abutment portions along said facing side edges;

guiding an optical fiber or an optical fiber bundle into the formed metal tube; and

welding the abutment portions of the metal tube with a laser beam to seal the abutment portions;

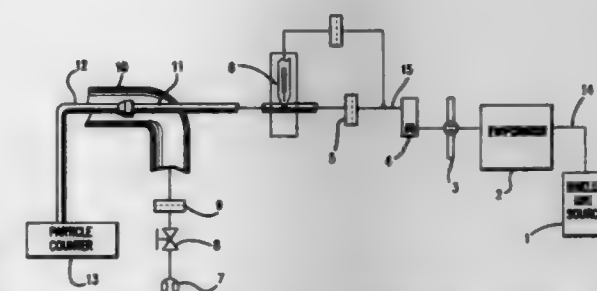
wherein said guiding step comprises guiding the optical fiber or the optical fiber bundle into the metal tube through a guide tube which is provided across a welding position.

# 5,440,096 WELDING PROCESS WITH DELAYED APPLICATION OF FULL CURRENT UNTIL AFTER START OF ARC

Nobukazu Ikeda; Hiroshi Morokoshi, and Akihiro Morimoto, all of Osaka, Japan, assignors to Masako Kiyohara, Kumamoto, Japan  
Filed Jul. 5, 1994, Ser. No. 270,578  
Claims priority, application Japan, Jul. 5, 1993, 5-165365  
Int. Cl.<sup>6</sup> B23K 9/06

U.S. Cl. 219—130.5

4 Claims



1. A welding process for arc welding two stainless steel pipes, said process comprising:

placing said pipes in an abutting relationship in an automatic TIG welder using argon as an arc gas;

starting an arc in the arc welder with a welding current less than that required to cause fusion of stainless steel while flowing an argon back shielding gas into an end of one of said pipes wherein the internal pressure of said pipes is maintained at 3–120 mm(H<sub>2</sub>O) by said argon back shielding gas from a time prior to start of said arc until a time after the welding of said pipes is completed; and

increasing said welding current to a magnitude corresponding to the normal welding current of the automatic TIG welder and sufficient to cause fusion of stainless steel, said welding current being increased after a lapse of an interval of time of 1 to 3 seconds measured from the start of said arc.

# 5,440,097 PROCESS FOR CONTROLLING THE WELDING CURRENT AS A FUNCTION OF WELDING SPEED IN ARC WELDING EQUIPMENT

Wolfram Klebl, Isernhagen, and Jens Metz, Burgwedel, both of Germany, assignors to Kabelmetal elektro GmbH, Hanover, Germany

Continuation of Ser. No. 62,777, May 17, 1993, abandoned. This application May 19, 1994, Ser. No. 278,168

Claims priority, application Germany, May 20, 1992, 42 16 594.6

Int. Cl.<sup>6</sup> B23K 9/095

U.S. Cl. 219—130.21

12 Claims

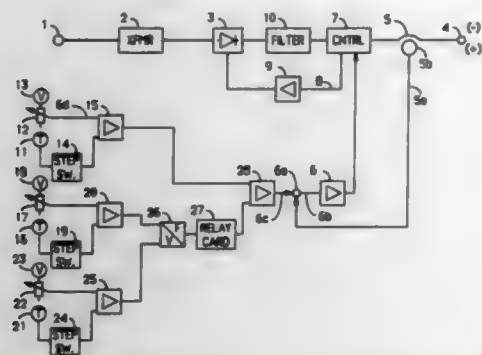
1. A process for controlling the welding current as a function of welding speed in DC arc welding equipment, for the continuous welding of longitudinal seams of tube-shaped metal bands, comprising the steps of

adding a welding speed-dependent voltage to a variable fixed voltage,

providing a control voltage by superimposing a pulsed DC



voltage on the sum of the speed-dependent voltage and variable fixed voltage, and



controlling the welding current in accordance with said control voltage.

5,440,098

## GAS CYLINDER LIFTING SYSTEM

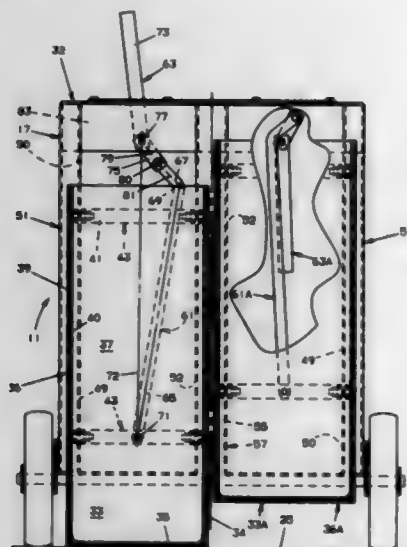
Tim A. Matus, Appleton, Wis., assignor to Miller Electric Manufacturing Co., Appleton, Wis.

Filed Dec. 23, 1993, Ser. No. 173,159

Int. Cl.<sup>6</sup> B23K 9/32; B62D 43/00

U.S. Cl. 219—136

27 Claims



1. A gas cylinder lifting system for loading and unloading gas cylinders or the like onto and off of the running gear of a welding power supply comprising:

- a frame mounted on the running gear;
- slider means reciprocable on the frame for supporting a gas cylinder or the like thereon;
- a linkage pivotally connected to the slider means; and
- lever means rotatably connected to the frame and to the linkage for rotating along a path to selectively raise and lower the slider means.

5,440,099

## WELDING COMPLICATED, DIFFICULT-TO-WELD METAL COMPONENTS

Walt Smith, 1698 Blaney Rd., Elgin, S.C. 29045

Filed Dec. 22, 1993, Ser. No. 172,836

Int. Cl.<sup>6</sup> B23K 9/173

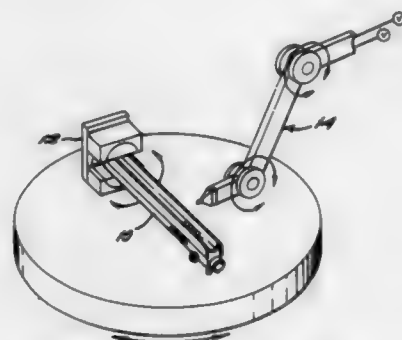
U.S. Cl. 219—137 R

56 Claims

1. A process for welding a first part to a second part, said process comprising the steps of:

- placing said first part proximate to said second part so as to

define a joint therebetween, said joint having a periphery and a center;  
applying a first electrical potential difference between a wire and said first part near said joint;  
blowing a first gas mixture onto said joint to displace substantially all air from the vicinity of said joint;  
moving said wire proximate to said joint until said first part, said second part and said wire become molten, said molten wire fills said joint, diffusing into said first part and said second part;



reducing said first electrical potential difference to a second electrical potential difference lower than said first potential difference after said first and said second parts become molten;  
applying said second electrical potential difference to said center of said joint so that cooling is slowed in said center with respect to said periphery; and  
blowing a second gas mixture onto said joint to cool said joint.

5,440,100

## TIPS AND DIFFUSERS FOR MIG WELDING GUNS

Kyle H. Stuart, and Dale R. Bervig, both of Wichita, Kans., assignors to Tweco Products, Inc., Wichita, Kans.

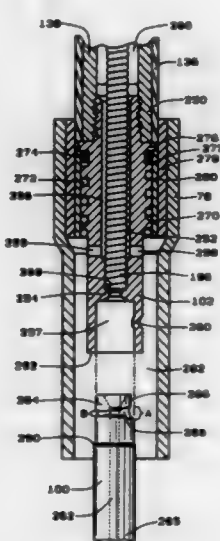
Continuation-in-part of Ser. No. 843,322, Feb. 26, 1992, Pat. No. 5,338,917. This application Sep. 14, 1993, Ser. No. 121,304

The portion of the term of this patent subsequent to Aug. 16, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B23K 9/173

U.S. Cl. 219—137.31

21 Claims



1. A contact tip and gas diffuser for use with a welding gun using a shielding gas and continuous welding wire comprising:  
a. said gas diffuser defining a first interior chamber and a second interior chamber divided by an interior constrict-

tion, said interior constriction having a central bore passing therethrough permitting communication between said first interior chamber and said second interior chamber;  
b. a plurality of gas passageways in said gas diffuser allowing shielding gas to pass from said first interior chamber to an exterior of said gas diffuser;  
c. a protrusion extending into said second interior chamber to engage and removably connect said contact tip;  
d. said interior constriction formed in said gas diffuser between said gas passageways and said protrusion;  
e. said contact tip being cylindrical and defining a first end and a second end with a longitudinal bore extending from said first end to said second end, said first end of said contact tip sized and configured to register and be held in place in said second interior chamber during operation of the welding gun;  
f. a tangential flat surface formed on said first end of said contact tip allowing said contact tip to freely slip into said second interior chamber of said gas diffuser, avoiding said protrusion;  
g. a circumferential shoulder formed on said contact tip between said first and second ends and adapted to abut a circumferential end of said second interior chamber remote from said interior constriction of said gas diffuser when said contact tip is placed into said second interior chamber; and  
h. a circumferential channel cut in an outer circumference of said contact tip through said tangential flat surface, said circumferential channel having a first width and a first depth intersecting said tangential flat surface and circumferentially tapering to a second width and a second depth at a point radially diametrically opposite said tangential flat, said circumferential channel receiving said protrusion when said contact tip is rotated in said second interior chamber of said gas diffuser, and as said contact tip is rotated in said second interior chamber said second width and said second depth cause said contact tip to axially and radially wedge within said second interior chamber, and said circumferential shoulder to abut said circumferential end of said second interior chamber.

5,440,101

## CONTINUOUS OVEN WITH A PLURALITY OF HEATING ZONES

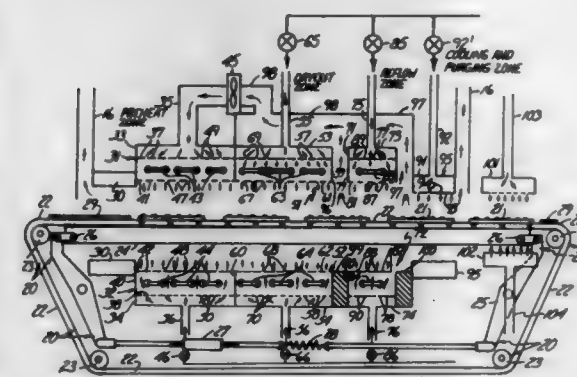
Norman R. Cox, Eden Prairie; Jean P. Menard, Hastings; Wayne W. Baer, Minnetonka, and Bradley C. Anderson, Shakopee, all of Minn., assignors to Research, Incorporated, Eden Prairie, Minn.

Filed Apr. 19, 1993, Ser. No. 49,123

Int. Cl.<sup>6</sup> F27B 9/06

U.S. Cl. 219—388

20 Claims



1. A pass-through convection oven having provided therein at least a portion of a conveying means for conveying therethrough selected items positioned on a conveying surface moving at a selected rate, said oven comprising:  
an initial gas jet distribution means, having a gas intake

suited to receive a flow of a gas, and being capable of providing from a plurality of output orifices therein an initial plurality of gas jets positioned about and directed toward a selected initial portion of that path followed by said conveying surface in moving at said selected rate, said gas jets being in such numbers, and of such output orifice temperatures and gas flow rates, as to establish said selected items at temperatures substantially in a first range of temperatures as they move adjacent to said initial path portion at said selected rate;

a subsequent gas jet distribution means, having a gas intake suited for connection to a supply of gas, and being capable of providing from a plurality of output orifices therein a subsequent plurality of gas jets positioned about and directed toward a selected subsequent portion of that path followed by said conveying surface in moving at said selected rate after passing said initial portion thereof, said gas jets being in such numbers, and of such output orifice temperatures and gas flow rates, as to establish said selected items in a second range of temperatures as they move adjacent to said subsequent path portion at said selected rate, said second range of temperatures substantially exceeding said first range of temperatures; and  
an exhaust means, having an outlet suited to provide a flow of a gas, and having a gas gathering means, said gas gathering means being capable of gathering gases located in a vicinity of said subsequent path portion so as to provide a flow thereof through said exhaust means outlet, said exhaust means outlet being connected to said initial gas jet distribution means gas intake.

5,440,102

## SYSTEM FOR THE PROTECTION OF LUGGAGE

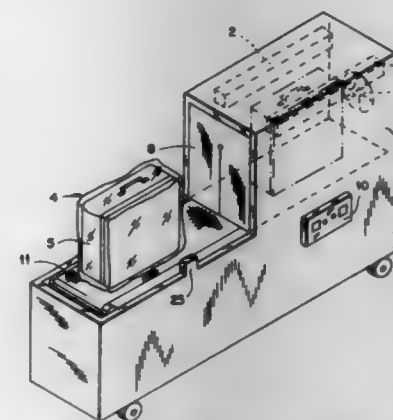
Norberto C. Pena, 8, Concha Espina, 28036 Madrid, Spain

Filed Mar. 3, 1994, Ser. No. 205,585

Int. Cl.<sup>6</sup> F27D 7/04; F27B 9/06

U.S. Cl. 219—388

10 Claims



1. A system for the protection of luggage, based on the application by thermic effect of a polyethylene retractile material around the luggage in order to obtain an external protection against damage produced by possible improper handling, comprising in combination an upright luggage article, said luggage article having a handle on a top edge thereof, an oven, said oven having inside a set of electric resistances, a fan, a thermostat and on the front side of said oven a flexible curtain said flexible curtain being made of an insulating material, said flexible curtain covering an entrance to said oven; said system further including a horizontal conveyor to introduce said luggage article into said oven and to take said luggage article out, said conveyor provided with a proximity detector, said system having an electric board to command and control all automatic functions of said system.

5,440,103

# COOKING APPARATUS, LATCHING CONSTRUCTION THEREFOR AND METHODS OF MAKING THE SAME

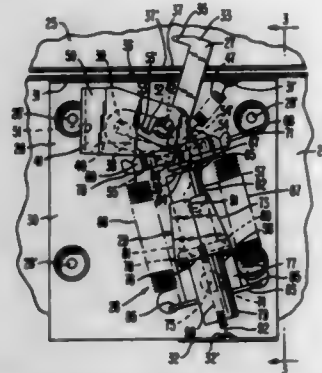
David D. Martin, Dunbar, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 27, 1994, Ser. No. 250,006

Int. Cl.<sup>6</sup> F24C 7/08; H05B 1/02

U.S. Cl. 219-413

20 Claims



1. In a cooking apparatus comprising a frame means, a cooking chamber means carried by said frame means, heating means carried by said frame means and being adapted to be actuated to heat clean said chamber means, switch means for permitting said heating means to heat clean said chamber means only when said switch means is actuated, a movable door means carried by said frame means for opening and closing said cooking chamber means, a movable latch member carried by said frame means and being movable between a non-latching position thereof that permits said door means to be opened and closed and a latching position thereof that locks said door means in its closed position and actuates said switch means if said door means is in its closed position at the time said latch member is moved to said latching position thereof, and drive means carried by said frame means and having moving means operatively interconnected to said latch member to move said latch member between said positions thereof only when said moving means of said drive means moves from a first position thereof to a second position thereof, said drive means comprising a cylinder means having opposite ends and a movable piston means extending from one of said opposite ends and comprising said moving means operatively interconnected to said latch member, said drive means having actuating means to extend said piston means so as to be adapted to move said latch member from its said non-latching position thereof to its said latching position thereof when said actuating means is first actuated for a door locking operation thereof, the improvement wherein said drive means has additional means adapted to cause said piston means to be retracted after said latch member has been moved to said latching position thereof by said first activation of said actuating means while maintaining said latch member in its said latching position until said actuating means is again actuated.

5,440,104

# PROCESS FOR A UNIFORM HEATING, PASTEURIZATION AND STERILIZATION OF PRODUCTS BY MEANS OF MICROWAVE

Klaus Koch, Lastzen, and Rolf Skubich, Langenhagen, both of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover, Germany

Filed Apr. 5, 1994, Ser. No. 223,038

Claims priority, application Germany, Apr. 23, 1993, 43 175.N

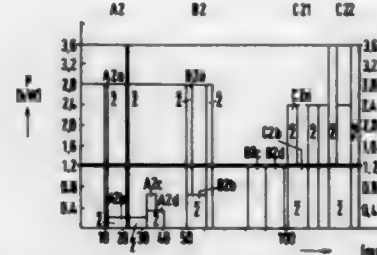
Int. Cl.<sup>6</sup> H05B 6/78

U.S. Cl. 219-700

4 Claims

1. A method of a uniform and fast heating of products by means of microwaves that are pulsed and introduced intermittently into the products, with chemical and pharmaceutical

products and ready-cooked meals to be treated being conveyed by a continuously working conveying system through a treatment chamber in open or closed microwave-permeable trays and with the treatment chamber being equipped with microwave generator supply channels that are arranged in a vertical or inclined position relative to the conveyor belt and whose energy supply is pulsed and can be controlled by means of a computer, comprising the step of:



providing power pulses generated by a working frequency within a range of 20 to 100 kHz, having an edge steepness of below 1 millisecond, and having an amplitude which is greater than a rated power of actuated microwave generators, wherein a mean power does not exceed the rated power due to allocation of corresponding pulse breaks, and the length of said pulse breaks depends on the power overamplification.

5,440,105

# METHOD FOR CONTROLLING THE POSITION OF A COOKING VESSEL IN A COOKING APPLIANCE

Kyung D. Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

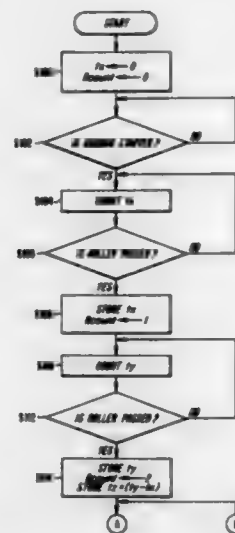
Filed Sep. 1, 1994, Ser. No. 299,453

Claims priority, application Rep. of Korea, Sep. 17, 1993, 1993-19015

Int. Cl.<sup>6</sup> H05B 6/78

U.S. Cl. 219-754

7 Claims



1. A method for controlling the position of a cooking vessel disposed on a turntable of a cooking appliance, comprising the steps of:

- placing said cooking vessel in an orientation on said turntable;
- beginning a cooking operation;
- rotating said turntable about a vertical axis during said cooking operation so that elements carried by said turntable in equidistantly spaced relationship about said axis are sequentially sensed by a sensor arranged to sense said elements;

- measuring a first time period (tx) from the initiation of the rotation of said turntable to the sensing of a first of said elements;
- measuring a second time period (ty) from the sensing of said first element to the sensing of the next of said elements;
- continuing to rotate said turntable until the completion of said cooking operation; and thereafter
- rotating said turntable until all of said elements have been sensed the same number of times and additionally for a time period equal to ty minus tx, so that said cooking vessel returns to said orientation of step A.

5,440,106

# POINT-OF-SALE CHECK WRITING ASSIST APPARATUS

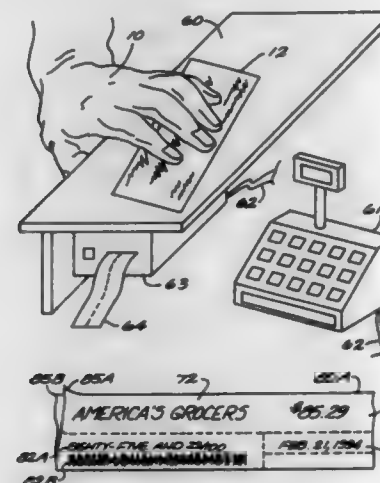
Thomas S. Duck, Tucson, Ariz., assignor to Canard Resources, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 103,079, Aug. 6, 1993, Pat. No. 5,342,094. This application Mar. 1, 1994, Ser. No. 204,617

Int. Cl.<sup>6</sup> G07G 1/00

U.S. Cl. 235-3

32 Claims



1. An point-of-sale apparatus designed to assist in check writing comprising:

- registering means for determining a tendered amount;
- a reel of adhesive label removably attached to a substrate, said adhesive label being permanently bondable to paper; and,
- printer means, in communication with said register means, for printing the tendered amount onto a first adhesive label portion of said tape.

5,440,107

# METHOD AND APPARATUS FOR AN IMPROVED MONEY DRAWER ASSEMBLY WITH MONEY CLIP ALARM SYSTEM

Jimmy R. Phillips, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 29, 1993, Ser. No. 145,265

Int. Cl.<sup>6</sup> G07G 1/00

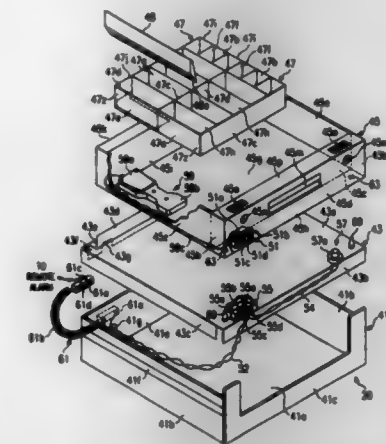
U.S. Cl. 235-10

24 Claims

1. A money drawer assembly adapted to be coupled to an alerting means comprising:

- a drawer housing;
- a connection means on said drawer housing for coupling to said alerting means;
- a drawer tray removably mounted to said drawer housing, said drawer tray having a drawer tray bottom;
- a money clip attached to said drawer tray including a switch in a first state when bills are in said money clip and in a second state upon removal of said bills; and
- an electrical coupling means coupled to said money clip at one end and coupled to said connection means at a second

opposite end, said electrical coupling means includes a first contact means mounted to said drawer tray mating



with a second contact means mounted to said drawer housing when said drawer tray is mounted in said drawer housing.

5,440,108

# SYSTEM AND METHOD FOR DISPENSING AND REVALUING CASH CARDS

Dich C. Tran, Cupertino; Yiu T. Liu, Hercules; Stanley Y. W. Lui, Santa Clara; Joseph Y. Kwong, Mountain View, and Junqi Yan, Stanford, all of Calif., assignors to Verifone, Inc., Redwood City, Calif.

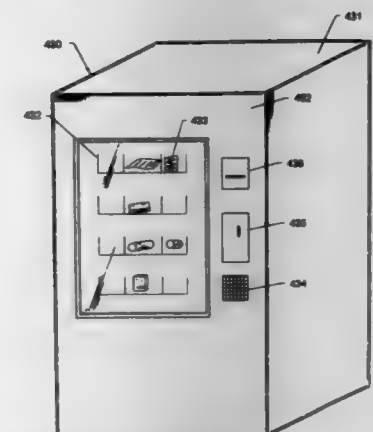
Continuation of Ser. No. 775,736, Oct. 11, 1991, abandoned.

This application Aug. 11, 1993, Ser. No. 105,110

Int. Cl.<sup>6</sup> G06F 7/08

U.S. Cl. 235-381

2 Claims



1. A stand-alone unitary magnetic stripe card dispensing and revaluing apparatus for dispensing and revaluing a prevalued magnetic stripe card, said magnetic stripe card including a medium having leading and trailing edges and at least one data stripe formed thereon at a prearranged location and adapted to be used repeatedly as a multi-use monetary transaction medium for performing a monetary transaction to access a different product or service dispensing machine not electrically or mechanically coupled to said card dispensing and revaluing apparatus, said card dispensing and revaluing apparatus comprising:

- a bill validator apparatus for accepting and validating a cash payment of a monetary amount;
- a credit/debit card reader and validator apparatus for accepting and validating a credit/debit payment of a monetary amount;
- a personal identification number (PIN) keypad coupled to said apparatus to permit a customer to enter a personal



- identification number to access monetary funds in a debit account as payment of said monetary amount;
- a modem for automatically dialing and communicating with a host computer having a credit/debit database in response to recognizing a request to obtain a magnetic stripe cash card using said credit card or said debit card as payment of said monetary amount, said host computer validating said credit card based upon a comparison of data in said credit/debit database with the amount of credit/debit selected as said payment;
  - a magnetic stripe card dispenser for storing at least one prevalued magnetic stripe card and for dispensing said prevalued magnetic stripe card upon identifying a request for a magnetic stripe card and accepting and validating said payment of said predetermined monetary amount;
  - a magnetic stripe card linear reader/writer apparatus including:
    - revalue apparatus for revaluing the monetary value stored on said magnetic stripe card upon accepting said card into said reader/writer apparatus by altering data passively magnetically recorded on said at least one magnetic stripe of said card, said data representing the instantaneous cash value of said card, said instantaneous cash value being stored only on said card, said means for revaluing being capable of increasing said instantaneous cash value of said card by an arbitrary monetary amount;
    - said magnetic stripe card reader/writer apparatus adapted for reading and recording a first magnetic data stripe having security information stored thereon and for reading and recording a second information stripe having said instantaneous cash value of said card and card identification information stored thereon;
    - a linear card guide apparatus for defining a linear card guide path and having an entrance slit for accepting said card into said guide path;
    - said linear card guide apparatus including a pressure plate for biasing said data card toward said transducer apparatus;
    - a latching shutter assembly for selectively covering the card guide path at said entrance slit for enhanced security;
    - a first card drive apparatus cooperatively associated with said linear card guide for driving said card through said entrance slit and into said card guide and for positioning said card at a stationary prearranged location within said linear reader/writer apparatus;
    - said first card drive comprising a first bidirectional drive for driving said data card alternatively in a forward direction to pull said data card through said entrance slit and in a reverse direction to discharge said data card through said entrance slit;
    - said first card drive being adapted to drive cards of varying thicknesses so that cards of varying thickness and material are properly read and written to by said card linear reader/writer apparatus including magnetic stripe paper cards, magnetic stripe plastic credit cards, and magnetic stripe plastic debit cards;
    - said first card drive including card swallowing apparatus for retaining a magnetic stripe card submitted to said card reader/writer apparatus for revaluing when said card has predetermined characteristics including card invalidity, card damage, cards identified as stolen based on comparison with a list of cards stored in a database, cards having a predetermined detectable amount of card wear, and cards identifiable as a promotional card based on information magnetically stored on said card that enables the holder to receive a specific product one or more times either for free or at a reduced cost and enables the card issuer to track the purchase patterns of consumers by collecting the swallowed promotional cards and tabulating the geographical distribution of their use;
    - said card swallow apparatus including a rectangular slot opened in the rear of the housing of said magnetic stripe card reader/writer, said first card drive passing

said card through said stationary prearranged location and out of said rear slot into a card collecting receptacle;

- a transducer apparatus for communicating with said at least one data stripe of said card positioned by said first card drive;
- said transducer apparatus including at least one magnetic head for reading and writing data to said at least one data stripe and an electrical circuit for processing said data read from said data stripe and for transmitting data to said data stripe; and
- a second drive cooperatively associated with said transducer apparatus for driving said transducer apparatus in a linear manner along said at least one data stripe of said card at said stationary prearranged location;
- said second drive comprising a second bidirectional drive for linearly driving said transducer apparatus alternately in one direction and in an opposite direction such that said data on said at least one data stripe is detected by said transducer apparatus;
- said magnetic stripe card reader/writer apparatus maintaining said magnetic stripe card within said card reader/writer apparatus when revaluing said card so that access to said card from the outside of said apparatus is prevented and attempts at fraudulently revaluing said card are thwarted;
- said magnetic stripe card reader/writer apparatus accepting said data card upon user insertion of the card into said entrance slit of said reader/writer apparatus, said insertion of the card triggering a sensor apparatus which engages a mechanism that pulls said card through said entrance slit and positions it at said predetermined stationary position within said card reader/writer apparatus for subsequent data reading and writing; and
- microcontroller having a bidirectional data bus, an address bus, and a plurality of I/O ports;
- keypad connector coupled to a least one of said I/O ports for removably coupling a hand-held keypad;
- diagnostics apparatus to diagnose and configure parameters for said magnetic stripe card dispensing and revaluing apparatus; said diagnostics including as memory diagnostics, display test, keypad test, motor test, transducer drive test, and cable connectivity tests; said system parameters including such as a site ID for accounting purposes, enable the card swallow function, select an interface type from a menu to correspond to a specific application, set a price table, set a clock, enable the security reading circuitry, setting the writing density, and adjusting timing; and
- memory storage means internal to said apparatus for selectively storing and recalling transaction information relating to each operation of said dispensing and revaluing apparatus;
- said payment acceptance means, said magnetic stripe card dispenser, said magnetic stripe card reader/writer apparatus, and said card retainer means being located in a single stand-alone housing and not coupled to said different product dispensing machine;
- whereby a cash balance between payments made to said payment acceptance apparatus and debits incurred by purchases from said different product dispensing machine is recorded only on said magnetic stripe cash card, and whereby said magnetic stripe cash card provides the only communication of monetary value between said card dispensing and revaluing apparatus and said different product dispensing machine.

5,440,109

## AUTOMATIC TOLL TICKETING SYSTEM

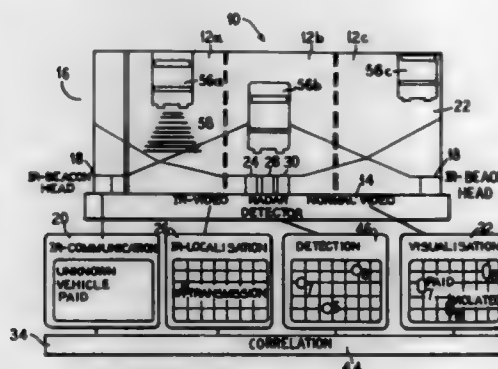
Bernhard Hering, Karl Wurst, both of Munich; Joachim Seemann, Germering, and Peter Wenter, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany  
Filed Mar. 11, 1994, Ser. No. 208,813

Claims priority, application Germany, Mar. 31, 1993, 43 10 580.7

Int. Cl. G07B 15/02

U.S. Cl. 235—384

14 Claims



1. An automatic toll ticketing system for a roadway with vehicles thereon, the vehicles having an on-board apparatus with a first communication means, a vehicle transceiver, and an electronic purse in the form of a processor card capable of debiting a use toll while preserving anonymity of a user; at least one pay station on the roadway, the at least one pay station constructed and arranged to implement a data exchange with at least one wireless communication means attached at the roadway wherein the pay stations debit the use toll while preserving the anonymity of the user; and a vehicle localization means operatively communicating with the at least one wireless communication means at the pay station, said vehicle localization means identifying a position of the vehicle, the vehicle communicating by outputting brief-duration optical signals by the vehicle transceiver without diminishing speed or stopping of the vehicle, a temporary identifier being known from a communication protocol allocated to the optical signal.

5,440,110

## BAR CODE SCANNER AND METHOD OF SCANNING

Michael T. Brooks, Veneta, Oreg., assignor to Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.

Continuation of Ser. No. 922,875, Jul. 31, 1992, Pat. No. 5,311,000. This application Feb. 8, 1994, Ser. No. 193,446

The portion of the term of this patent subsequent to May 10, 2011, has been disclaimed.

Int. Cl. G06K 7/10

U.S. Cl. 235—462

11 Claims

1. A method of scanning an Add-On code portion of a bar code label to determine the bar code data printed thereon by sweeping a scanning beam in a scan path across the bar code label, said bar code label bearing a bar code of the type which includes a primary code portion and which may also include an Add-On code portion, said method comprising the steps of:
  - sweeping a scanning beam across the label until the beam sweeps a scanning pass along a scan path which traverses a possible Add-On code portion;
  - providing data indicative of the structure of the possible Add-On code portion;
  - subjecting the data indicative of the structure of the possible Add-On code portion to at least one test to determine the existence of an adjacent margin;
  - subjecting the data indicative of the structure of the possible Add-On code portion to at least one test to determine the existence of information indicating the presence of an

Add-On code portion without requiring the successful location of any portion of the primary code portion;



decoding the characters of the Add-On code portion of the label without requiring the successful decoding of any portion of the primary code portion; and terminating decoding.

5,440,111

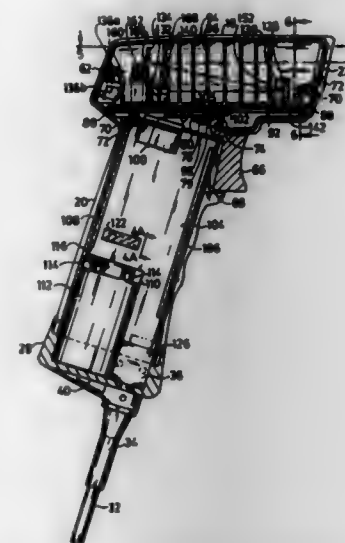
## OPTICAL SYSTEM FOR SCANNING AND READING BARCODES WITH MANUALLY CONTROLLED SEAN BEAM LENGTH

Jay M. Eastman, Pittsford; Anna M. Quian, Rochester; Scott R. Grodevant, Hilton, and John A. Boles, Fishers, all of N.Y., assignors to PSC, Inc., Webster, N.Y.

Continuation of Ser. No. 960,021, Oct. 13, 1992, abandoned, which is a continuation of Ser. No. 652,158, Feb. 7, 1991, Pat. No. 5,200,597. This application Jun. 30, 1994, Ser. No. 268,876  
Int. Cl. G06K 7/10

U.S. Cl. 235—462

10 Claims



1. In a bar code scanner which has a motor, a source providing an optical beam and means driven by said motor for scanning the beam across a code, a system for controlling a motor to vary a distance across the code over which the beam is scanned which comprises:
  - means for driving said motor with first control signals operative to provide a marker beam that is indexed at an initial location at a point or area on the code where said marker beam is located on the code by visual observation;

manual control means for generating multi bit digital second control signals which increase said distance such that said marker beam becomes a variable scan length scanning beam which scans across the codes with a generally constant velocity to illuminate said code to provide light which is returned from said code corresponding thereto; and  
means for obtaining signals corresponding to data represented by said code from said light which is returned from said code.

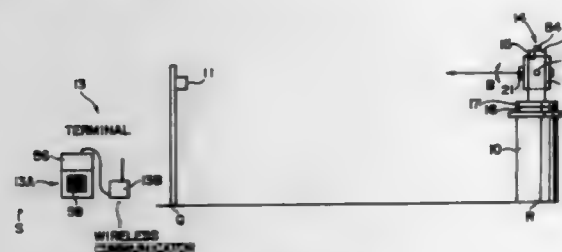
#### 5,440,112 SURVEYING INSTRUMENT HAVING MODE JUDGEMENT MEANS

Ritsuo Sakimura; Kazuaki Kimura, and Hiroshi Inaba, all of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Feb. 14, 1994, Ser. No. 195,136  
Claims priority, application Japan, Feb. 12, 1993, 5-024000  
Int. Cl.<sup>6</sup> G01J 1/20

U.S. Cl. 250—203.1

5 Claims



1. A surveying instrument comprising:
  - a main body including a measuring unit capable of operating in a tracking mode in which a target for searching a set out point to be set out at a desired point of land is tracked and a measuring mode in which a position of said target is measured; and
  - a terminal portion located away from said main body; said main body further including:
    - a first communication unit for transmitting data concerning a target position measured by said measuring unit to said terminal portion;
    - a mode judging unit for judging that said measuring unit is operating in said tracking or measuring mode; and
    - a result informing unit for informing a result obtained by said mode judging unit toward the side of said target;
  - said terminal portion including:
    - a second communication unit for receiving data transmitted from said first communication unit;
    - a memory unit for storing position data concerning said set out point;
    - a calculating unit for calculating a difference between the positions of said set out point and said target on the basis of data concerning said set out point stored in said memory unit and data transmitted from said main body; and
    - a display unit for displaying said difference.

#### 5,440,113 APPARATUS FOR SERVO-CONTROLLING THE BIAS VOLTAGE OF A LIGHT SOURCE

Stéphane Morin, Lannion, and Franck Giraud, Pleumeur Bodou, both of France, assignors to ALCATEL CIT, Paris, France

Filed Jun. 28, 1994, Ser. No. 266,578  
Claims priority, application France, Jul. 1, 1993, 93 08068  
Int. Cl.<sup>6</sup> H01S 3/10

U.S. Cl. 250—205

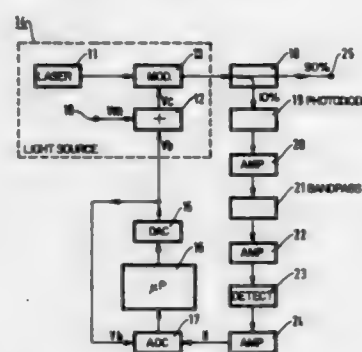
3 Claims

1. Apparatus for servo-controlling the bias voltage of a light source whose power of emission is modulated by a control voltage which is the sum of a DC voltage called the "bias voltage" and a varying voltage called the "modulation volt-

age", that is centered on a zero voltage; said modulation voltage being capable of taking at least two discrete values to represent a string of digital values having a fixed rate; the power emitted by said source being a function of the control voltage which function is at least approximately symmetrical about an "optimum" value of the bias voltage when the control voltage varies over a range of values centered on said optimum value of the bias voltage; and said optimum voltage being liable to drift;

the apparatus including:

- means for taking off a fraction of the optical signal emitted by the source and for converting it into an electrical signal referred to as the "take-off" signal;



- means for detecting any possible difference in need of correction between the value of the bias voltage and its optimum value; and
  - means for deducing a new value of the bias voltage if there is a difference to be corrected, which new value is closer to the optimum value;
- wherein the means for detecting possible difference comprise:
- means for determining the amplitude of a spectrum line in the take-off signal that is centered on a frequency equal to the rate of the digital values; and
  - means for determining whether or not there exists a difference that needs to be corrected, as a function of the amplitude of said spectrum line.

#### 5,440,114 COMBINED DEVICE FOR SCREEN DISPLAY AND FOR THE DETECTION OF THE POSITION OF A LOCATION MARKER IN RELATION TO THE SCREEN WITH AN INFRARED SURFACED DETECTOR

Bruno Barbier, Le Bouscat; Jean-Jacques Favot, Martignas en Jalles; Patrick Lach, Bordeaux, and Jean-Noël Perbet, Eyssines, all of France, assignors to Sextant Avionique, Meudon La Foret, France

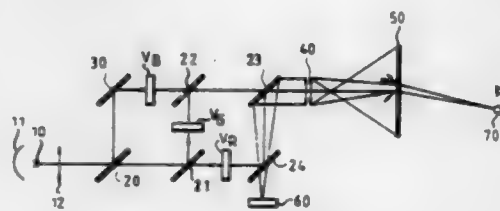
Continuation of Ser. No. 153,972, Nov. 18, 1993, abandoned.

This application Sep. 27, 1994, Ser. No. 313,557

Claims priority, application France, Nov. 19, 1992, 92 13900  
Int. Cl.<sup>6</sup> G01C 21/02, 21/24

U.S. Cl. 250—206.2

9 Claims



1. A combined device for screen display and for the detection of the position of a location marker with respect to a projection screen, said device comprising:
  - a system of display by projection with a color imageforming

device operating by adding three monochrome primary images, one blue, another green and the last red, and illuminating the projection screen (50), which is a transparent and at least partially scattering screen, by means of an optical objective conjugating the visible image produced by the color image-forming device and the projection screen, said color image-forming device comprising three separate optical valves each illuminated by a monochrome light respectively blue, green and red and situated at a same distance from the optical objective on various optical paths, a first dichroic mirror facing the optical valves dedicated to the blue and green monochrome images and bringing together their optical paths leading to the optical objective, and a second dichroic mirror facing the optical objective and bringing together the optical path of the red monochrome image leading to the optical objective with the common optical paths of the blue and green monochrome images coming from the first dichroic mirror,

an infrared emitter fitted into the location marker whose position in relation to the projection screen is to be detected, said infrared emitter being constituted by at least one directional, point infrared source giving rise to an infrared spot on the projection screen,

a device for the separation of visible radiation and infrared radiation by orientation in two different directions, interposed in front of the optical objective, on the side of the color image-forming device, in such a way that the visible light emitted by the color image-forming device is transmitted to the optical objective and the infrared light coming from the optical objective, which is also transparent for this type of radiation, is deflected from the color image-forming device, and

a surface detector of infrared radiation that is positioned beside the color image-forming device, behind the separator device in the path of the infrared radiation coming from the optical objective so that said optical objective which, already in one direction of transmission, conjugates the visible image produced by the color image-forming device and the projection screen, also conjugates, in the other direction of transmission, the infrared image produced by the infrared emitter on the projection screen and the surface detector of infrared radiation, wherein said device for the separation of visible radiation and infrared radiation comprises a third dichroic mirror interposed between the optical valve dedicated to the red monochrome image and the second dichroic mirror bringing together the path of the red monochrome image and the common paths of the blue and green monochrome images.

#### 5,440,115 ZENER DIODE BIASED ELECTRON MULTIPLIER WITH STABLE GAIN CHARACTERISTIC

Anthony S. Bauco, Vernon, Conn., and Alan M. Then, Auburn, Mass., assignors to Galileo Electro-Optics Corporation, Sturbridge, Mass.

Filed Apr. 5, 1994, Ser. No. 222,811

Int. Cl.<sup>6</sup> H01J 43/10

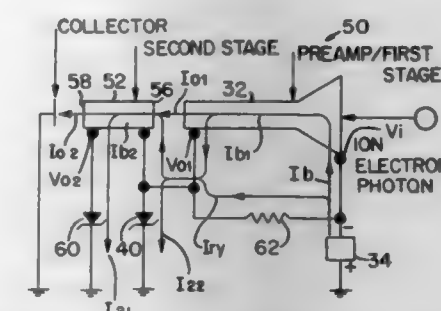
U.S. Cl. 250—207

12 Claims

1. An electron multiplier having an input and an output for connection to a high voltage supply at a level to produce a desired gain comprising:

- a continuous saturable dynode for producing an output current which varies linearly in a region below saturation;
- a bias circuit coupled between the input and the output for

establishing a fixed output voltage and a substantially constant gain characteristic in said linear region, including



at least one zener diode being reverse biased relative to the supply.

#### 5,440,116 LASER WARNING DEVICE PROVIDING A DIRECTION OF LASER RADIATION

Göran Bolander, Linköping, and Kurt Nilsson, Skänninge, both of Sweden, assignors to Försvarets Forskningsanstalt, Sundbyberg, Sweden

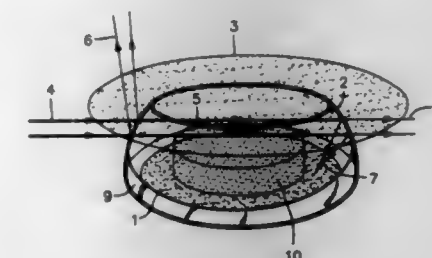
PCT No. PCT/SE92/00091, § 371 Date Dec. 6, 1993, § 102(e)  
Date Dec. 6, 1993, PCT Pub. No. WO92/15024, PCT Pub. Date Sep. 3, 1992

PCT Filed Feb. 14, 1992, Ser. No. 107,697

Claims priority, application Sweden, Feb. 14, 1991, 9100455  
Int. Cl.<sup>6</sup> G01S 3/782

U.S. Cl. 250—216

7 Claims



1. A laser warning device, which gives the direction of incidence towards the warning device for certain laser radiation or its perpendicular projection on a defined plane through the warning device, comprising a position sensitive detector or a position sensitive detector arrangement having a detector surface that is protected from radiation that falls directly onto it and that lies in said defined plane, including a reflector that is made on the inner surface of a rotationally symmetrical dome that surrounds the detector surface and that reflects towards said detector surface, while focusing towards the line of intersection between the detector surface and a plane that is perpendicular to said surface and lies in the direction of incidence for the incoming radiation that falls on the laser warning device and is on the whole parallel to the plane of the detector surface, defined as falling within  $\pm 30^\circ$  of said plane and comes from an arbitrary angle within said plane, up to  $360^\circ$ , so that the position for the concentrated radiation energy determines said arbitrary angle.



5,440,117

# ROTATING WAVEPLATE SYSTEM WITH AVERAGING OF THE DETECTED SIGNAL TO COMPENSATE FOR POLARIZATION DEPENDENCE

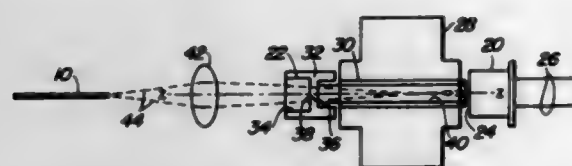
Carey M. Garrett, Kanata, and John O. Smiley, Ottawa, both of Canada, assignors to JDS Fitel Inc., Nepean, Canada

Filed Jan. 21, 1994, Ser. No. 183,857

Int. Cl.<sup>6</sup> G02F 1/01

U.S. Cl. 250—225

8 Claims



1. Optical apparatus comprising an optical detector having an input port for receiving input light by way of an optical path and an output for a corresponding detection signal, a polarization-transformation element mounted in the optical path so that the input light passes through the element to reach the input port, the polarization-transformation element transforming a particular of polarization of a light beam passing there-through in dependence upon relative angular displacement between the element and a plane of polarization of the input light beam, drive means coupled to the polarization-transformation element for rotating the element relative to the input light beam plane of polarization, and means for processing the detection signal and providing an output signal substantially independent of polarization state of the input light beam.

5,440,118

# METHODS AND APPARATUS FOR DETERMINING FORMATION LITHOLOGY BY GAMMA RAY SPECTROSCOPY

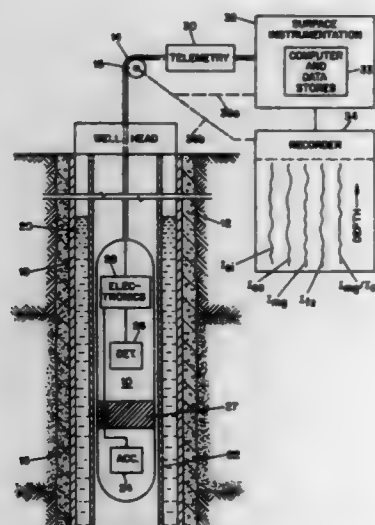
Bradley A. Roscoe, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, Ridgefield, Conn.

Filed Mar. 31, 1994, Ser. No. 221,158

Int. Cl.<sup>6</sup> G01V 5/10

U.S. Cl. 250—269.6

51 Claims



1. A method of investigating an earth formation traversed by a borehole, comprising the steps of:

(a) repetitively irradiating an earth formation with bursts of high energy neutrons, which neutrons undergo inelastic scattering reactions and thermal neutron capture reactions with constituents in the borehole and the formation and produce gamma rays as a result thereof;

(b) detecting gamma rays resulting from at least said inelastic scattering reactions;

(c) generating an energy spectrum of the detected inelastic scattering gamma rays;

(d) comparing said detected inelastic gamma ray energy spectrum with a composite spectrum, including a combination of standard inelastic gamma ray spectra for elements postulated to have contributed to said detected inelastic gamma ray spectrum and including at least one of silicon and calcium, to determine the relative inelastic elemental yield in said composite spectrum for each of said postulated elements contributing to the inelastic spectrum;

(e) where silicon is included among the postulated elements in step (d), deriving from the relative inelastic yield for silicon, in accordance with a predetermined relationship relating the relative inelastic silicon yields determined in calibration apparatus having formation materials of known composition to the silicon content of the formation materials, an estimate of at least one of the volumetric content of sandstone and the concentration of silicon in the irradiated formation; and

(f) where calcium is included among the postulated elements in step (d), deriving from the relative inelastic yield for calcium, in accordance with a predetermined relationship relating the relative inelastic calcium yields determined in calibration apparatus having formation materials of known composition to the calcium content of the formation materials, an estimate of at least one of the volumetric content of limestone and the concentration of calcium in the irradiated formation.

5,440,119

# METHOD FOR ELIMINATING NOISE AND ARTIFACT PEAKS IN THE DECONVOLUTION OF MULTIPLY CHARGED MASS SPECTRA

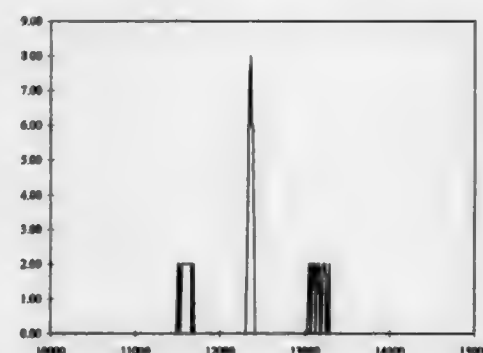
Michael J. Labowsky, 67 Howe Ave., Wayne, N.J. 07470

Continuation-in-part of Ser. No. 892,113, Jun. 2, 1992, Pat. No. 5,300,771. This application Mar. 30, 1994, Ser. No. 220,369

Int. Cl.<sup>6</sup> B01D 59/44; H01J 49/02

U.S. Cl. 250—282

9 Claims



1. A method for determining the molecular weight  $M_r$  of a distinct polyatomic parent molecule species and the accuracy of said molecular weight determination comprising the steps of:

(i) Producing a primary population of multiply charged ions from a sample containing said distinct polyatomic parent molecular species, each one of said multiply charged ions being characterized by the symbol  $x_i$ , the numerical value of  $x_i$  being the  $m/z$  value for said one of said multiply charged ions such that  $x_i = M_r/i + m_e$  wherein  $M_r$  is the molecular weight of said distinct parent molecular species,  $i$  is an integer equal to the number of adduct charges attached to said distinct parent molecular species to form said multiply charged ion, and  $m_e$  is the total mass of adduct charges on said one multiply charged ion, said primary population of ions comprising a plurality of sub-populations, the ions of each sub-population having the

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# SCANNING PROBE MICROSCOPE

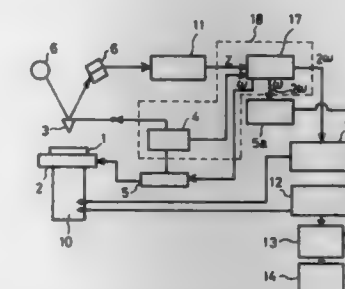
Masatoshi Yasutake, and Nobutaka Nakamura, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Dec. 28, 1993, Ser. No. 174,292

Int. Cl.<sup>6</sup> H01J 37/00

U.S. Cl. 250—306

4 Claims



1. A scanning probe microscope comprising:

a sample stage defining a sample holding position for holding a sample;

electronic lever means having a conductive probe with a sharply pointed tip, said tip facing said sample holding position;

oscillator means connected for applying a sine wave voltage to said lever means for causing said probe to undergo a sine wave oscillation in a direction between said probe and the sample position;

displacement detecting means connected for detecting a quantity which is one of displacement and amplitude of oscillatory movement of said probe;

servo means and piezoelectric actuator means connected to said detecting means for controlling the quantity which is detected by said displacement means to cause the quantity to have a selected value;

means connected for applying a direct current voltage between said probe and a sample in the sample holding position; and

processing means connected for calculating distribution of surface potential and surface permittivity of a sample at said sample holding position after detection is performed by said displacement detecting means, said processing means comprising an analog processor using a discrete Fourier transformation.

5,440,122

# SURFACE ANALYZING AND PROCESSING APPARATUS

Masatoshi Yasutake, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

Filed Jan. 24, 1994, Ser. No. 186,137

Claims priority, application Japan, Jan. 22, 1993, 5-009585

Int. Cl.<sup>6</sup> H01J 37/00, 37/30

U.S. Cl. 250—443.1

11 Claims

1. Apparatus for analyzing and processing a surface of a sample, comprising:

a vacuum chamber;

an elastic lever having a tip and a conductive probe mounted on said tip, said lever and said probe being mounted inside said vacuum chamber at a location such that said tip is above the surface of a sample installed in said vacuum chamber;

displacement detecting means connected to said lever for detecting displacement of said lever;

a servo system and piezoelectric actuator connected for controlling at least one of: the displacement of said lever so as to keep said lever at a constant position; and the distance between the surface of a sample and the probe so as to keep the distance at a specified value;

a thermostatic controlling system disposed for controlling

5,440,120

# SAMPLING ARRANGEMENT FOR THERMAL GRAVIMETRIC ANALYZER

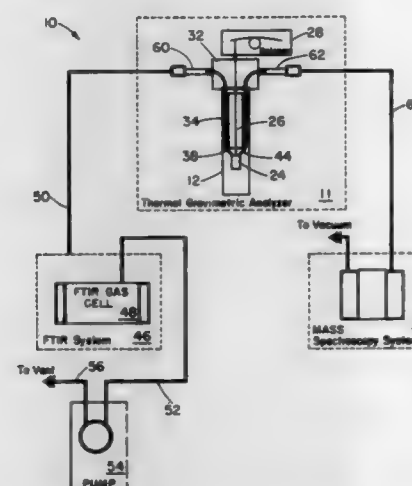
Dean E. Roberts, Deerfield, Wis., and Robert L. Wolfe, Lahabra, Calif., assignors to Analytical Technology, Inc., Boston, Mass.

Filed Apr. 5, 1994, Ser. No. 223,163

Int. Cl.<sup>6</sup> H01J 49/00; B01D 59/44

U.S. Cl. 250—288

13 Claims



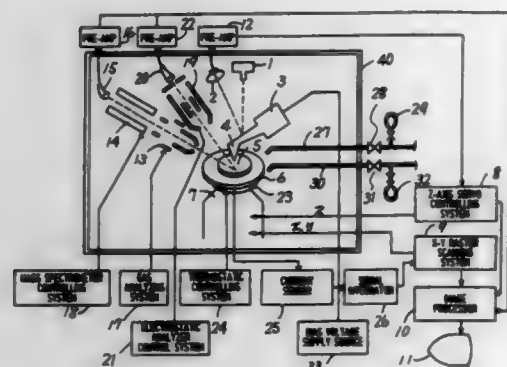
1. Apparatus for detecting and measuring reaction of a reaction gas with a sample in a thermal gravimetric analyzer including a balance and a spectrometer for determining characteristics of an off-gas produced by interaction of said reaction gas and said sample, said apparatus comprising:

a reactor container for receiving the reaction gas;

cup means suspended from the balance and disposed in said reactor container for supporting and maintaining the sample in position in said reactor container; and

sampling means disposed immediately adjacent said cup means for receiving off-gas produced by interaction of the sample and the reaction gas and for providing said off-gas to the spectrometer for analysis.

the temperature of the surface of the sample to maintain the temperature at a specified value;  
a bias voltage supply source connected for selectively applying one of a pulsed voltage and a continuous voltage between said probe and the sample;  
current measuring means connected for detecting minute levels of current flowing out from the surface of the sample when a voltage is applied between said probe and the sample by said bias voltage supply source, said current measuring means supplying a signal representative of the detected current;



signal integrating means coupled to said current measuring means for producing an integration signal representative of the time integral of the detected current;  
analyzing means disposed for analyzing particles scattered from the surface of the sample when a voltage is applied by said bias voltage supply source; and  
a plurality of nozzles extending into said vacuum chamber for introducing a selected one of a plurality of gasses into said vacuum chamber under a controlled pressure.

5,440,123

# METHOD FOR PREPARATION OF TRANSMISSION ELECTRON MICROSCOPE SAMPLE MATERIAL UTILIZING SHEET MESH

Yuji Ikeda, Kanagawa, Japan, assignor to Sony Corporation, Japan

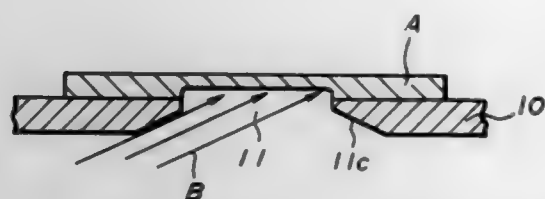
Filed Aug. 27, 1993, Ser. No. 112,718

Claims priority, application Japan, Sep. 3, 1992, 4-235026

Int. Cl.<sup>6</sup> H01J 37/26

U.S. Cl. 250-307

15 Claims



1. A method for irradiation processing of laminate material used in a semiconductor device, comprising the steps of:  
providing first and second substrates;  
applying a material layer to at least one surface of said first substrate and a material layer to at least one surface of said second substrate;  
applying a protective layer over said material layer on said first substrate and a protective layer over said material layer on said second substrate;  
joining said material layer on said first substrate and said material layer on said second substrate by joining each protective layer with an adhesion layer, thereby forming a laminate;  
cutting said laminate to a predetermined dimension such that said material layer on said first substrate, said protective

layer on said material layer on said first substrate, said adhesion layer, said protective layer on said material layer on said second substrate, and said material layer on said second substrate together define a line formed substantially through a center of the cut laminate;

forming an opening between first and second surfaces of a sheet mesh;  
tapering edge portions of said opening between said first and second surfaces at a predetermined irradiation angle;  
mounting said laminate over said opening on said first surface of said sheet mesh;  
irradiating said laminate via an energy beam at said irradiation angle through said opening in said sheet mesh.

5,440,124

# HIGH MASS RESOLUTION LOCAL-ELECTRODE ATOM PROBE

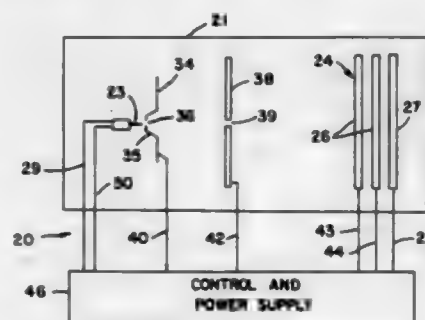
Thomas F. Kelly, Madison; Patrick P. Camus; David J. Larson, both of Middleton; Louis M. Holzman, and Sateeshchandra S. Bajlikar, both of Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 8, 1994, Ser. No. 272,204

Int. Cl.<sup>6</sup> H01J 37/285

U.S. Cl. 250-309

31 Claims



1. Atom probe apparatus comprising:  
(a) a tip adapted to have atoms evaporated from the surface of the tip;  
(b) a local-extraction electrode positioned closely adjacent to the tip, the extraction electrode having an aperture therein positioned adjacent to the tip to allow ions evaporated from the tip to pass through the aperture;  
(c) a detector mounted to receive charge from ion evaporation events at the tip and provide a signal indicative of the time of incidence of a charge cloud thereon resulting from an ion evaporation event at the tip; and  
(d) power supply means for applying voltages to the tip, to the extraction electrode and to the detector, the power supply means maintaining the extraction electrode at a potential intermediate that of the potential between the tip and the detector so that the potential difference between the tip and the extraction electrode is low relative to the potential between the tip and the detector, and for pulsing the potential difference between the tip and the extraction electrode sufficiently to extract ions from the tip by field evaporation which pass through the aperture in the extraction electrode and are accelerated to the detector by the potential difference between the extraction electrode and the detector.

5,440,125

# RADIATION DETECTOR HAVING A PYROELECTRIC CERAMIC DETECTION ELEMENT

Detlev Hennings, and Joseph Pankert, both of Aachen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 882,330, May 13, 1992, abandoned.

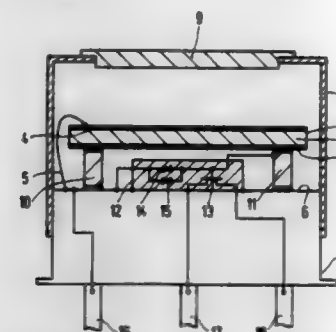
This application Jun. 23, 1994, Ser. No. 264,229

Claims priority, application Germany, May 16, 1991, 41 15 949.7

Int. Cl.<sup>6</sup> G01J 5/00

U.S. Cl. 250-338.1

6 Claims



1. A radiation detector comprising a housing, a window in said housing which is transparent to the radiation to be detected and a radiation detecting element of pyroelectric ceramic material on the basis of lead titanate, wherein the composition of the ceramic material corresponds to the formula



where RE is at least one rare earth metal and  $0.04 \leq x \leq 0.20$  and  $0.01 \leq y \leq 0.04$ .

5,440,126

# OPTICAL PROBE HEADS

Evelyn E. K. Kemsley, Norwich, England, assignor to British Technology Group Ltd., London, England

PCT No. PCT/GB92/00744, § 371 Date Oct. 25, 1993, § 102(e)

Date Oct. 25, 1993, PCT Pub. No. WO92/19956, PCT Pub.

Date Nov. 12, 1992

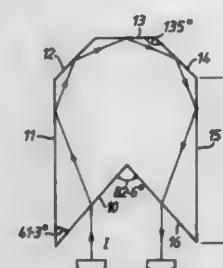
PCT Filed Apr. 23, 1992, Ser. No. 140,013

Claims priority, application United Kingdom, Apr. 26, 1991, 9108974

Int. Cl.<sup>6</sup> G01N 21/55, 21/31

U.S. Cl. 250-339.12

13 Claims



1. A probe head for use in attenuated total reflectance optical spectroscopy including a prism, said prism comprising:  
a chamfered input face for accepting a beam of radiation as an input beam of radiation into said prism;  
a plurality of reflecting surfaces each providing an interface between said prism and a sample of a material under test, said input beam of radiation being substantially totally reflected internal to said prism in succession by said plurality of reflecting surfaces; and  
a chamfered output face for releasing said input beam of radiation external to said prism as an output beam of radiation substantially parallel to said beam of radiation accepted by said chamfered input face.

5,440,127

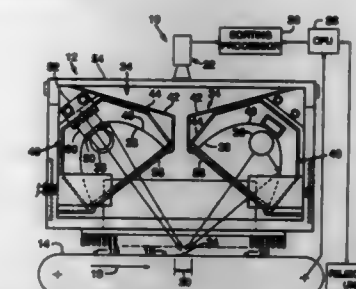
# METHOD AND APPARATUS FOR ILLUMINATING TARGET SPECIMENS IN INSPECTION SYSTEMS

Henry P. Squyres, Medford, Oreg., assignor to Simco/Ramic Corporation, Medford, Oreg.

Filed May 17, 1993, Ser. No. 63,401

Int. Cl.<sup>6</sup> G01N 21/35

17 Claims



1. A method of operating an automated optical inspection system to separate selected items from a mixture including blueberries and the selected items, comprising:

illuminating the mixture with illumination characterized by a spectral power distribution including a high intensity of power at wavelengths in the near infrared;  
detecting reflections of wavelengths of the illumination in the near infrared from the mixture;  
identifying the selected items in the mixture based on the detected reflections; and  
separating the selected items from the mixture with use of the identification.

5,440,128

Patent Not Issued For This Number

5,440,129

# DETECTOR FOR HIGH-ENERGY RADIATION

Martin Schmidt, Emiskirchen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 4, 1994, Ser. No. 283,192

Claims priority, application Germany, Oct. 11, 1993, 43 34 594.8

Int. Cl.<sup>6</sup> G01T 1/20, 1/24

U.S. Cl. 250-366

5 Claims



1. A detector for high-energy radiation comprising:  
a row of parallel, bar-shaped scintillators, each scintillator having a longitudinal direction;  
a row of optical conductors for each scintillator, wherein each row of optical conductors extends in said longitudinal direction and is in optical contact with a respective scintillator, said optical conductors of each row being separated from each other by slots, with the slots between the optical conductors of neighboring scintillators being in registry;  
a plurality of chips, each chip having photodiodes thereon,



respectively disposed in said slots with each photodiode being in optical contact with an optical conductor; and a reflector surrounding each scintillator and the optical conductors in optical contact therewith.

#### 5,440,130 X-RAY IMAGING SYSTEM AND SOLID STATE DETECTOR THEREFOR

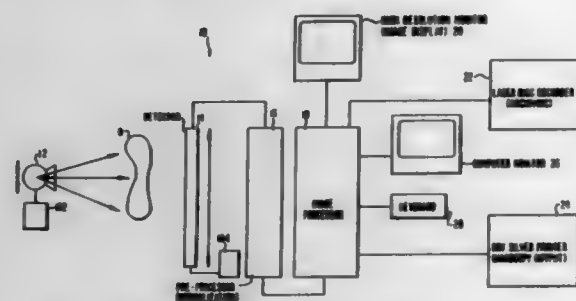
John D. Cox; William R. Eisenstadt, and Robert M. Fox, all of Gainesville, Fla., assignors to General Imaging Corporation, Gainesville, Fla.

Continuation of Ser. No. 750,273, Aug. 27, 1991, Pat. No. 5,220,170, which is a continuation-in-part of Ser. No. 462,042, Jan. 8, 1990, Pat. No. 5,043,582, which is a continuation-in-part of Ser. No. 151,235, Feb. 1, 1988, Pat. No. 4,905,265, which is a continuation-in-part of Ser. No. 807,650, Dec. 11, 1985. This application Jun. 14, 1993, Ser. No. 76,138

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.  
Int. Cl.<sup>6</sup> G01T 1/24, 1/16

U.S. Cl. 250—370.09

4 Claims



1. An x-ray imaging system comprising:  
an x-ray source for producing an x-ray spectrum of at least 30 kVp;  
an x-ray detector comprising a solid state device having a plurality of contiguous solid state layers, one of said contiguous solid state layers including a semiconductor material with a plurality of charge storage devices forming pixels, each of said pixels being at least about 50 microns on a side to increase sensitivity of said detector to x-ray radiation of at least 30 keV, said x-ray radiation directly producing free electrons which interact with said charge storage devices.

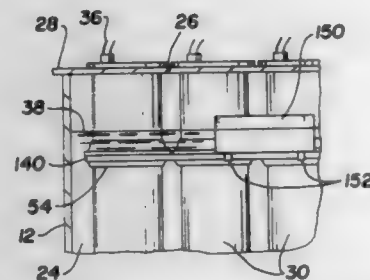
#### 5,440,131 WIPER ASSEMBLY FOR ULTRAVIOLET-LIGHT REACTOR TUBES

Joseph A. Hutchison, Dallas, and Paul T. Schertz, Carrollton, both of Tex., assignors to Solar Kinetics Inc., Dallas, Tex.

Filed Jul. 21, 1994, Ser. No. 278,407  
Int. Cl.<sup>6</sup> A61L 2/10

U.S. Cl. 250—435

7 Claims



1. An ultraviolet-light reactor comprising: a bottom wall and side walls defining a reactor chamber; at least one ultraviolet-light reactor tube supported within the reactor chamber; an inlet port and an outlet port for circulating a fluid through the

reactor chamber; a wiper having circular opening sufficiently large to accommodate the reactor tube and having a blade circumferential of the opening, the blade being deflected such that when the reactor tube is positioned through the opening, the blade engages the outer surface of the reactor tube; a support platform positioned within the reactor chamber, the platform supporting the wiper in the reactor chamber such that the reactor tube extends through the opening; and at least one float attached to the platform, whereby the platform floats near the surface of water in the reactor chamber to raise with the water level when the reactor chamber is filled and lower when the chamber is drained.

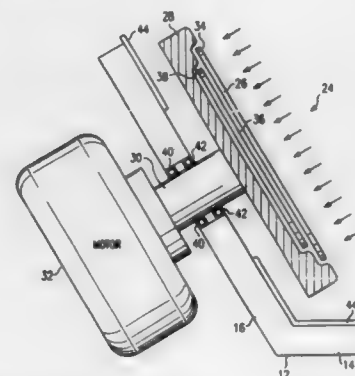
#### 5,440,132 SYSTEMS AND METHODS FOR CONTROLLING THE TEMPERATURE AND UNIFORMITY OF A WAFER DURING A SIMOX IMPLANTATION PROCESS

Keith A. Joyner, Richardson, Tex., and James B. Hollingsworth, Woodland Park, Colo., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 30, 1994, Ser. No. 220,308  
Int. Cl.<sup>6</sup> H01J 37/317

U.S. Cl. 250—492.21

20 Claims



1. A system for implanting ions in a semiconductor wafer, comprising:  
a beam generator operable to generate a beam of ions;  
a rotating drum having a rim and a base;  
a wafer chuck disposed proximate the rim of the drum and rotatably fixed with respect to the rim such that the wafer chuck passes through the beam generated by the beam generator as the drum rotates;  
a wafer chuck rotation mechanism coupled to the wafer chuck and operable to turn the wafer chuck during the implantation process; and  
a thermal reflector disposed proximate the wafer chuck and operable to reflect thermal energy emitted by a semiconductor wafer disposed in the wafer chuck.

#### 5,440,133 CHARGED PARTICLE BEAM SCATTERING SYSTEM

Michael F. Moyers, Redlands, and Jeffrey V. Siebers, Grand Terrace, both of Calif., assignors to Loma Linda University Medical Center, Loma Linda, Calif.

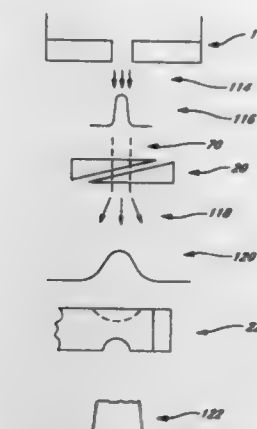
Continuation-in-part of Ser. No. 87,196, Jul. 2, 1993, abandoned.  
This application Aug. 6, 1993, Ser. No. 102,770  
Int. Cl.<sup>6</sup> H01J 33/00

U.S. Cl. 250—492.3

22 Claims

1. A radiation treatment apparatus, comprising:  
a source of charged particles which provides a charged particle beam; and  
a scattering foil in the path of the particle beam, said scattering foil being comprised of a high z material which substantially changes the diameter of the particle beam without substantially changing the energy of the particles, said beam intercepting said scattering foil at a beam intercept

portion, said scattering foil having a thickness at said beam intercept portion of said scattering foil, said scattering foil being configured so that said thickness at said beam inter-



cept portion is continuously adjustable through a range of thicknesses, the thickness of said scattering foil being uniform throughout said beam intercept portion through said range of thicknesses.

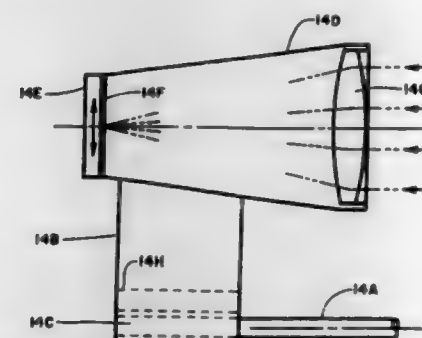
#### 5,440,134 INFRARED BORESCOPE-THERMAL

Lewis E. Lough, Springfield, and Donald A. Ferrett, Manassas, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 14, 1993, Ser. No. 166,193  
Int. Cl.<sup>6</sup> H01J 1/00

U.S. Cl. 250—504 R

5 Claims



1. A borescope for aligning the optical axis of a passive thermal night sight, responsive only to radiation in the mid and far infrared wavelength range and mounted on a rifle, substantially parallel with the bore axis of said rifle; comprising only:  
a wafer of material that does not substantially absorb radiation in said range; coated on one side except for a central portion defining an aperture: with a material that absorbs substantially all radiation in said range;  
a support means for mounting said wafer in a fixed normal relationship to said bore axis, with said aperture centered on said optical axis and said one side facing said sight;  
said support means including an integral circularly cylindrical mandrel slightly smaller in diameter than the rifle bore extending into said bore for a substantial portion of its length; and  
a lens for collimating only ambient radiation in said range passing through said aperture toward said sight.

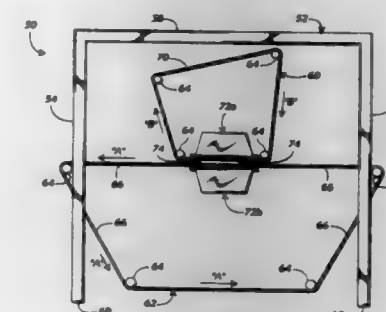
#### 5,440,135 SELF-CALIBRATING RADIATION DETECTORS FOR MEASURING THE AREAL EXTENT OF CONTAMINATION

Joseph J. Shonka, Marietta, Ga., assignor to Shonka Research Associates, Inc., Marietta, Ga.

Filed Sep. 1, 1993, Ser. No. 115,203  
Int. Cl.<sup>6</sup> G01T 1/167, 1/185

U.S. Cl. 250—374

19 Claims



1. A method of measuring radiation emitted from a source, the method comprising the steps of:  
placing a wire near the source so that radiation emitted from the source causes charges to deposit upon the wire to cause pulses to travel to opposite ends of the wire; and  
electronically monitoring each of the opposite ends of the wire including, at least, the steps of,  
determining positions along the wire where charges deposit,  
designating a plurality of segments along the wire, each segment of the plurality of segments including a plurality of positions along the wire,  
determining a count rate for each segment by summing the number of charges deposited upon each segment in a given period of time,  
designating a plurality of overlapping zones as overlapping combinations of segments, and  
determining a count rate for each zone of the plurality of overlapping zones by combining the count rates of the segments that comprise each zone.

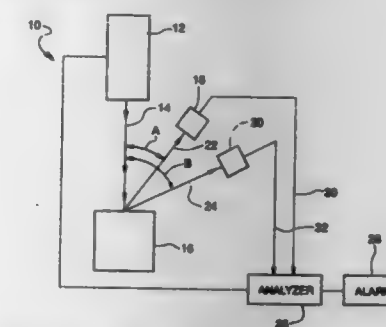
#### 5,440,136 ANISOTROPIC NEUTRON SCATTER METHOD AND APPARATUS

Henry J. Gombert, Ann Arbor, Mich., assignor to Penetron, Inc., Ann Arbor, Mich.

Filed Jun. 17, 1994, Ser. No. 262,043  
Int. Cl.<sup>6</sup> G01T 3/00

U.S. Cl. 250—390.04

8 Claims



1. An apparatus for the non-invasive inspection of an object to determine the presence of at least one preselected element therein, said apparatus comprising:  
a neutron source operative to provide a monoenergetic beam of neutrons and to direct said beam onto said object, said





approximate values  $d1'$  and  $d2'$  each by a fixed amount and calculating deviations between the theoretical spectral reflectance and the measured spectral reflectance with respect to the thicknesses  $d1$ ,  $d2$  and  $d3$  to thereby find a combination ( $d1$ ,  $d2$ ) having the minimum deviation, the thickness  $d3$  being a value which is calculated at said second step; and

a seventh step of performing nonlinear optimization on the thicknesses  $d1$  and  $d2$  of said combination ( $d1$ ,  $d2$ ) which is found at said sixth step, thereby finally determining the thicknesses  $d1$  and  $d2$  as the thicknesses of said transparent insulation film and said silicon film.

5,440,142

# SYSTEM AND METHOD FOR TESTING BARCODE SCANNER WINDOW VIABILITY

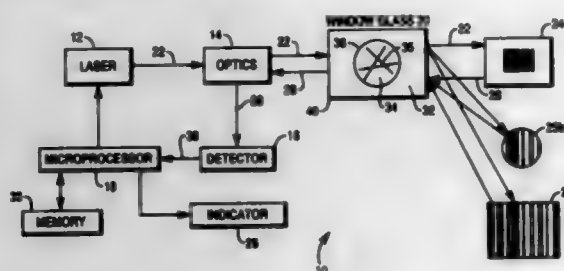
Craig E. Maddox, Lilburn, Ga., assignor to AT&T Global Information Solutions Company, Dayton, Ohio

Filed Feb. 9, 1994, Ser. No. 193,825

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 250—566

10 Claims



1. An optical scanning system comprising:
  - a laser beam source;
  - a window glass through which the laser beam passes for scanning a bar code label to obtain bar code information and through which light reflected from the bar code label passes, the window glass being susceptible to damage from items coming in contact with the window glass during scanning; and
  - a processor which determines the bar code information from the reflected light and which determines whether the window glass is damaged enough that the bar code information cannot accurately be determined.

5,440,143

# FOLDED-PATH OPTICAL ANALYSIS GAS CELL

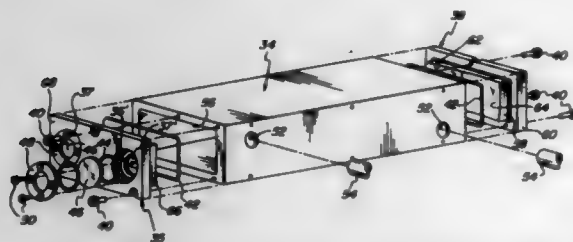
Robert M. Carangelo, Glastonbury, Conn., and David D. Wright, Vershire, Vt., assignors to On-Line Technologies, Inc., East Hartford, Conn.

Filed Feb. 25, 1994, Ser. No. 201,814

Int. Cl.<sup>6</sup> G01N 15/06

U.S. Cl. 250—573

11 Claims



1. A folded-path radiation absorption gas cell comprising: an enclosure having first and second ends, and defining a substantially closed chamber therewithin; spaced input radiation and output radiation windows formed through said first end of said enclosure and aligned on a first axis; a concave reflective field surface extending at least partially between said windows at said first end of said enclosure; a pair of substantially spherical,

concave reflective objective surfaces at said second end of said enclosure disposed in confronting relationship to said field surface, said objective surfaces being aligned side-by-side on an axis parallel to said first axis and in optical registry with said windows, at least one of said objective surfaces having a cylindrical component added thereto to increase coincidence of foci in two orthogonal planes, thereby to maximize the energy throughput characteristic of said cell; and means for the introduction and withdrawal of gas into and from said chamber of said enclosure.

5,440,144

# APPARATUS FOR THE THREE-DIMENSIONAL DETERMINATION OF FLOWS

Markus Raffel, Göttingen; Jürgen Kompenhans, Gleichen, and Hans Höfer, Göttingen, all of Germany, assignors to Deutsche Forschungsanstalt für Luft- und Raumfahrt E.V., Cologne, Germany

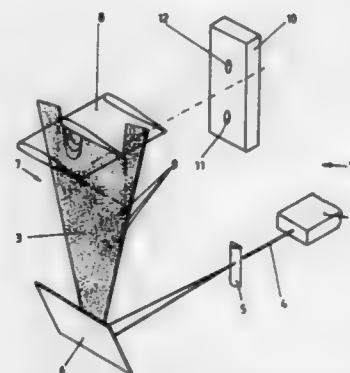
Filed Oct. 25, 1993, Ser. No. 142,607

Claims priority, application Germany, Nov. 6, 1992, 42 37 440.5

Int. Cl.<sup>6</sup> G01N 15/06

U.S. Cl. 250—574

9 Claims



1. An apparatus for the three-dimensional determination of flows, said apparatus comprising:
  - a light source (2) for intermittently forming a sheet (3) of light;
  - a stereoscopic recording device (10) which has two objectives (11, 12) with optical axes (18, 19) aligned parallel to each other as well as perpendicular to a plane (22) of the sheet (3) of light;
  - two optical sensor fields (15, 16) arranged to receive light from the objectives (11, 12), and aligned perpendicular to the plane (22);
  - an image shifting device for shifting the projections of the light source (2) onto the two sensor fields (15, 16);
  - said image shifting device including a drive shaft (24), two mirrors (13, 14) mounted parallel to each other on said drive shaft (24), motor means (25) for rotating said drive shaft (24) and mirrors (13, 14) about a common axis of rotation (23);
  - the axis of rotation (23) of said mirrors (13, 14) extending parallel to an imaginary line joining said two objectives (11, 12);
  - an encoder (26) associated with said drive shaft (24), for emitting a start signal (28) and a position signal (29) per revolution of said drive shaft (24) as said drive shaft (24) rotates;
  - said position signal being composed of a multiplicity  $n$  of equally spaced intermediate signals (41) per revolution of the drive shaft, with one of the intermediate signals (41) coinciding with the time of the start signal (28);
  - a digital control (33) for synchronizing the rotation of the revolving mirrors (13, 14) with the intermittent forming of the sheet (3) of light from the light source (2);
  - said digital control (33) including means for forming a differ-

ence signal (35) from said position signal (29) and said start signal (28) of the encoder (26), superimposing a feedback signal (37) from the light source (2) on the difference signal to make a control signal (38), adding up pulses in the control signal (38) in a counter (39) and, upon reaching a count  $n$ , sending a trigger signal (40) to the light source (2) and resetting the counter (39); and

said light source (2) including means for emitting two flashes of light, one after the other, in response to receiving the trigger signal (40) to intermittently form the sheet (3) of light as well as simultaneously emitting the feedback signal (37) with one of the flashes of light.

5,440,145

# SAMPLING CHAMBER FOR A POLLUTION DETECTOR

Martin T. Cole, Keysborough, Australia, assignor to I.E.I. Pty. Ltd., Australia

PCT No. PCT/AU92/00546, § 371 Date Mar. 25, 1994, § 102(e) Date Mar. 25, 1994, PCT Pub. No. WO93/08461, PCT Pub. Date Apr. 29, 1993

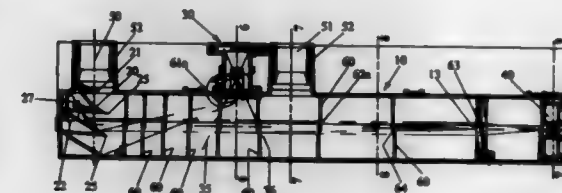
PCT Filed Oct. 14, 1992, Ser. No. 211,233

Claims priority, application Australia, Oct. 14, 1991, PK8877

Int. Cl.<sup>6</sup> G01N 15/06, 21/49

U.S. Cl. 250—574

8 Claims



1. In a pollution detection apparatus comprising a sample chamber having a flashing light source of predetermined light intensity for irradiating light rays into a specific volume of the chamber, fluid inlet and outlet means for passing fluids being surveyed into said specific volume so that the fluid travels across the path of said light rays, the arrangement being such that a particle struck by the light rays will cause random reflection and scattering of said rays, a light receptor device positioned in the chamber to receive at least some of said scattered rays to provide a signal indicating the extent of light scattering and therefore pollution existing in the sample, the improvement wherein the chamber is of two separable interfitting pans including a series of spaced apertured baffles forming, when the parts are assembled, a series of aligned apertures between the specific volume and the light receptor acting to prevent transmission of unscattered light onto the light receptor.

5,440,146

# RADIOGRAPHIC IMAGE READER

James E. Steffen, Woodbury, Minn.; Jay A. Each, River Falls, Wis.; Robert J. Mattila, Mahtomedi, Minn.; Eric J. Donaldson, St. Paul, Minn.; Timothy S. Vraa, Apple Valley, Minn.; Owen L. Nelson, St. Paul, Minn.; John E. Potts, Woodbury, Minn.; Jathan D. Edwards, Oakdale, Minn.; Kenneth J. Krepel, North St. Paul, Minn., and Joseph A. Hoffman, Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 31, 1994, Ser. No. 221,191

Int. Cl.<sup>6</sup> G01N 23/04; G01T 1/24; G01G 13/00, 15/00

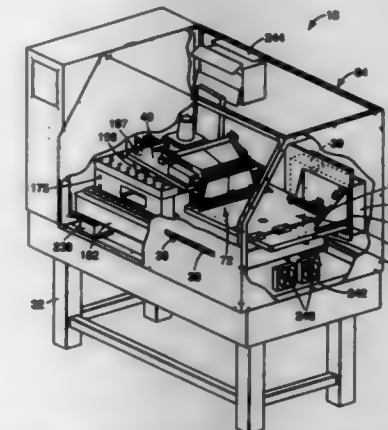
U.S. Cl. 250—580

42 Claims

1. A radiographic image reader for acquiring electronic signals corresponding to a latent image of an object produced by radiation exposure of a photoreceptive medium within a cassette, comprising:
  - a light-tight enclosure with at least one access port for inserting and removing the cassette;
  - a scanning subsystem mounted within the light-tight enclosure for scanning the photoreceptive medium within the

cassette to initiate the acquisition of the electronic signals representative of the latent image; and

a cassette registration and interface subsystem within the light-tight enclosure comprising an electronic interface



structure for electronically connecting the photoreceptive medium within the cassette to an electronic component external of the cassette to obtain the electronic signals corresponding to the latent image within the photoreceptive medium.

5,440,147

# OPTOELECTRIC DEVICE HAVING A VERY LOW STRAY CAPACITANCE AND ITS PRODUCTION PROCESS

Christophe Kazmieraki, Morangis, and Didier Robein, Fontenay aux Roses, both of France, assignors to France Telecom

PCT No. PCT/FR92/00338, § 371 Date Sep. 29, 1993, § 102(e) Date Sep. 29, 1993, PCT Pub. No. WO92/19029, PCT Pub. Date Oct. 29, 1992

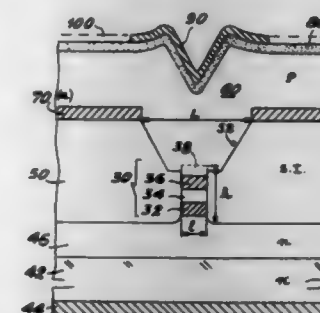
PCT Filed Apr. 15, 1992, Ser. No. 122,610

Claims priority, application France, Apr. 16, 1991, 91 04636

Int. Cl.<sup>6</sup> H01L 33/00

U.S. Cl. 257—13

9 Claims



1. An optoelectronic device comprising:
  - an n-doped, semiconductor material substrate layer (46);
  - on said substrate layer (46), a lateral confinement layer (50) of a semiconductor material doped so as to make it semi-insulating;
  - a stripe (30) including an active material (32), said stripe (30) being buried in the lateral confinement layer (50) and in contact with the substrate layer (46), the lateral confinement layer (50) having a groove (52) hollowed out above and along the stripe (30);
  - an n-doped, semiconductor material blocking layer (70) deposited on each side of the groove (52) on the lateral confinement layer (50);
  - an p-doped, semiconductor material, vertical confinement layer (60) deposited on the layer (70) and filling the groove (52) of the lateral confinement layers (50), the layer (70) being made from a material having a different

composition from that of the lateral confinement layer and that of the vertical confinement layer;  
a first electrical contact (90, 90) on the vertical confinement layer at least vertically of the stripe (30); and  
a second electrical contact (44) on the substrate layer (46).

5,440,148

## QUANTUM OPERATIONAL DEVICE

Kazumasa Nomoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

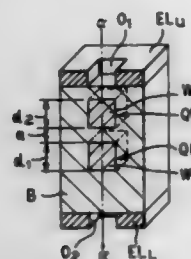
Filed Apr. 18, 1994, Ser. No. 229,303

Claims priority, application Japan, Apr. 16, 1993, 5-114141

Int. Cl.<sup>6</sup> H01L 29/205, 29/88

U.S. Cl. 257-21

22 Claims



1. A quantum operation memory device, comprising:  
a barrier layer of a first material and having first and second opposite and parallel end faces;  
first and second respective metal electrodes on each of the first and second opposite end faces, said metal electrodes each having means for permitting light to pass through the electrode at an end face where the light originates and into the barrier layer and along a longitudinal path therein running between the first and second end faces;  
a controllable light source for emitting said light at a first frequency or at second and third frequencies into said barrier layer and along said longitudinal path;  
first and second quantum boxes each formed of a box-shaped region of materials which are different than said first material, said first and second quantum boxes being positioned along and on said longitudinal path in series one after the other, said quantum boxes being dimensioned so that each quantum box can accommodate only one electron or hole and such that inter-electron or inter-hole Coulombic interaction prevents an electron or hole in one of the boxes from tunnelling to the other box if that other box already has an electron or hole therein, and a spacing between the boxes being chosen to allow tunnelling of an electron or hole between the boxes;  
a bias voltage for application between the first and second electrodes for creation of an electron or hole in one of the quantum boxes when the light of said first frequency is emitted into said barrier layer, and for permitting an electron or hole to tunnel from one of the quantum boxes to the other quantum box when an electron or hole does not exist in the other quantum box; and  
means for measuring absorption of said light at said second frequency to determine whether or not an electron or hole exists in the second quantum box, and for measuring absorption of said light at said third frequency to determine whether or not an electron or hole exists in the first quantum box, said electron or hole in the quantum boxes functioning as memory bits whose presence or absence determines a memory state of the respective quantum box.

5,440,149  
PLANAR TYPE IMAGE SENSOR HAVING ELECTRODES ON A PHOTOELECTRIC CONVERSION LAYER

Kousaku Shimizu, and Setsuo Kaneko, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

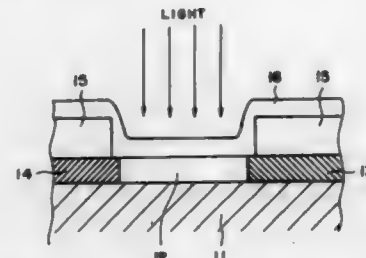
Filed Apr. 28, 1994, Ser. No. 234,838

Claims priority, application Japan, Apr. 28, 1993, 5-102058

Int. Cl.<sup>6</sup> H01L 27/14

U.S. Cl. 257-53

9 Claims



1. An image sensor having a pin planar type photodiode comprising:  
an insulating substrate;  
a photoelectric conversion layer provided on said insulating substrate;  
a pair of electrodes provided over said insulating substrate; and  
a p-type region and an n-type region respectively provided to said pair of electrodes at locations at which light incident on an upper surface of said photoelectric conversion layer is unintercepted, said p-type region and said n-type region having their upper surfaces at a level not lower than the unintercepted upper surface of said photoelectric conversion layer.

5,440,150

NON-CRYSTALLINE SILICON ACTIVE DEVICE FOR LARGE-SCALE DIGITAL AND ANALOG NETWORKS

Stanley G. Burns, Ames, and Robert J. Weber, Boone, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 759,182, Sep. 10, 1991, abandoned,

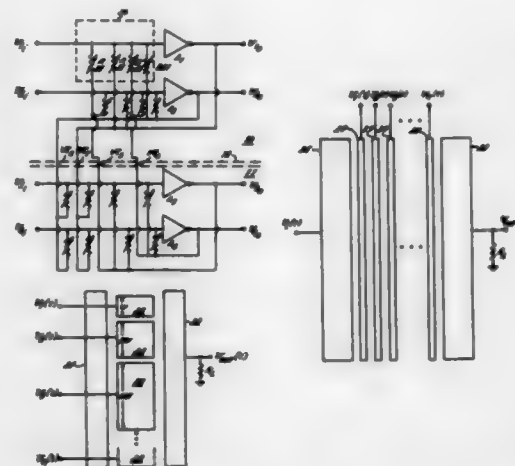
which is a continuation of Ser. No. 464,894, Jan. 16, 1990,

abandoned. This application Sep. 13, 1994, Ser. No. 305,403

Int. Cl.<sup>6</sup> H01L 29/786, 29/04

U.S. Cl. 257-57

39 Claims



1. A non-crystalline silicon active device for processing electrical signals, said device comprising:  
a flexible substrate of large dimension;  
a plurality of non-crystalline silicon layers formed on said substrate, said silicon layers being electrically isolated

from one another by dielectric layers interposed therebetween and each silicon layer having formed therein a plurality of semiconductor devices, at least one of said semiconductor devices comprising a multi-input thin-film summing transistor having a threshold voltage characteristic and a parallel array of weighted gate electrodes, said gate electrodes having binary-scaled widths for providing the corresponding weights thereto; and  
multiple interlayer and intralayer interconnections electrically connecting outputs of a preselected plurality of said semiconductor devices to variably weighted inputs of another preselected plurality of said semiconductor devices, thus providing a highly-connected morphology including neural network architectures.

5,440,151

ELECTROSTATIC DISCHARGE PROTECTION DEVICE FOR MOS INTEGRATED CIRCUITS

Philippe Crevel, Saint Jean de Boisseau, and Alain Quero, Nantes, both of France, assignors to Matra MHS, France

Continuation-in-part of Ser. No. 224,141, Apr. 4, 1994,

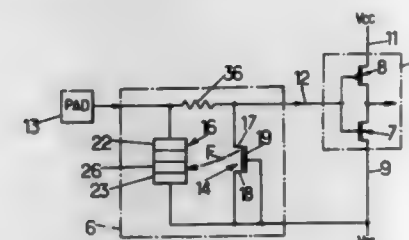
abandoned. This application Sep. 21, 1994, Ser. No. 309,574

Claims priority, application France, Apr. 9, 1993, 93 04263

Int. Cl.<sup>6</sup> H01L 29/06, 29/78

U.S. Cl. 257-173

29 Claims



1. An electrostatic discharge protection device for an integrated circuit, the integrated circuit including a substrate made of semiconductor and doped with impurities of a first type, said protection device comprising:

at least one MOS transistor having a source consisting of a diffusion of a second type of impurities formed in the substrate and connected to a reference terminal of the integrated circuit, and a drain consisting of a diffusion of the second type of impurities formed in the substrate and connected to a pad of the integrated circuit; and  
a thyristor having a well formed in the substrate and doped with the second type of impurities, a first electrode consisting of a diffusion of the first type of impurities formed in the well and connected to said pad, a second electrode consisting of a diffusion of the second type of impurities formed in the substrate between the well and the drain of said MOS transistor and connected to said reference terminal, and a control electrode consisting of a region of the substrate situated between the well and the second electrode of the thyristor.

5,440,152

HETEROJUNCTION BIPOLAR TRANSISTOR HAVING PARTICULAR GE DISTRIBUTIONS AND GRADIENTS

Toru Yamazaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 28, 1994, Ser. No. 348,216

Claims priority, application Japan, Nov. 26, 1993, 5-296496

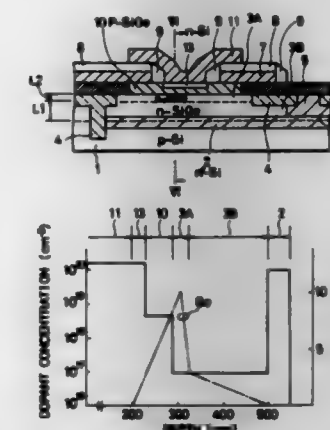
Int. Cl.<sup>6</sup> H01L 29/73, 27/082, 27/00

U.S. Cl. 257-197

16 Claims

1. A semiconductor device comprising:  
an emitter region of a first conductivity type, said emitter region being made of single-crystal Si;  
a base region of a second conductivity type opposite in

polarity to said first conductivity type, said base region being made of Ge-containing single-crystal Si;  
a first collector region of said first conductivity type, said first collector region being made of Ge-containing single-crystal Si and being adjacent to said base region;  
a second collector region of said first conductivity type, said second collector region being made of Ge-containing single-crystal Si;  
said emitter region, said base region and said first and second collector regions forming a heterojunction bipolar transistor;  
said base region having a first distribution of Ge concentration that is graded as a function of depth of said base region, Ge concentration of said first distribution increasing at a first gradient as a function of depth of said base region from a base-emitter junction to a base-collector junction;



said first collector region having a second distribution of Ge concentration graded as a function of depth of said first collector region;  
said second collector region having a third distribution of Ge concentration graded as a function of depth of said second collector region;  
a minimum value of Ge concentration of said second distribution being higher than or equal to a maximum value of Ge concentration of said third distribution; and  
in said vicinity of an interface of said first and second collector regions, Ge concentration of said second distribution in said first collector region decreasing at a second gradient as a function of depth of said first collector region to said interface, Ge concentration of said third distribution in said second collector region decreasing at a third gradient as a function of depth of said second collector region from said interface toward an opposite end of said interface, and said third gradient being smaller than said second gradient.

5,440,153

ARRAY ARCHITECTURE WITH ENHANCED ROUTING FOR LINEAR ASICS

Barry J. Male, Nashua, N.H., and Douglas L. Anneser, Chelmsford, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 1, 1994, Ser. No. 222,736

Int. Cl.<sup>6</sup> H01L 29/70, 27/102

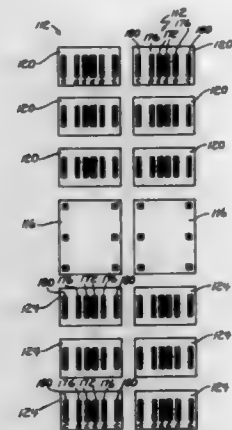
U.S. Cl. 257-204

19 Claims

1. An integrated circuit, comprising:  
a semiconductor substrate;  
b. at least one column of a plurality of cells formed in the semiconductor substrate, each cell in the column including at least one pair of complimentary bi-polar PNP and NPN transistors, each transistor having at least one emitter terminal, at least one base terminal and at least one collector terminal, and wherein each cell further includes



a capacitor disposed between innermost ones of the at least one NPN transistor and the at least one PNP transistor; and



c. a first power plane disposed adjacent to one or more of the PNP transistors and extending at least the entire length of the column, a second power plane disposed adjacent to one or more of the NPN transistors and extending at least the entire length of the column.

5,440,154

#### NON-RECTANGULAR MOS DEVICE CONFIGURATIONS FOR GATE ARRAY TYPE INTEGRATED CIRCUITS

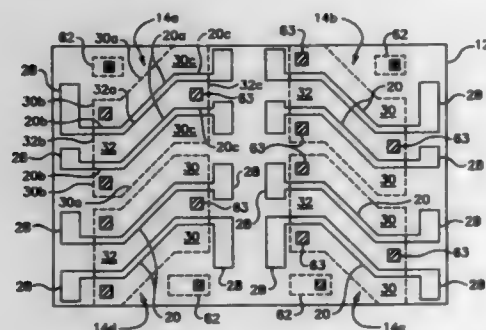
Tim Carmichael, San Jose; Gobi Padmanabhan, Sunnyvale; Abraham Yee, Santa Clara, and Stanley Yeh, Fremont, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Jul. 1, 1993, Ser. No. 86,217

Int. Cl.<sup>6</sup> H01L 27/02, 29/78

U.S. Cl. 257-206

14 Claims



1. An integrated circuit structure comprising:
  - a substrate of semiconductor material of a first conductivity type;
  - a first region on said substrate of a conductivity type differing from the first conductivity type of said substrate and having a non-rectangular configuration;
  - a second region on said substrate of a conductivity type differing from the first conductivity type of said substrate and having a non-rectangular configuration, said first and second regions defining a channel therebetween; and
  - a gate region having a non-rectangular configuration disposed above said channel;
 wherein said gate region includes a first end portion having a first longitudinal axis, a middle portion having a second longitudinal axis forming an acute angle with respect to said first longitudinal axis of the first end portion, and a second end portion having a third longitudinal axis forming an acute angle with respect to said second longitudinal axis of the middle portion and being substantially parallel to said first longitudinal axis of the first end portion.

#### 5,440,155 ACOUSTIC CHARGE TRANSPORT CONVOLVER, METHOD OF USE AND FABRICATION

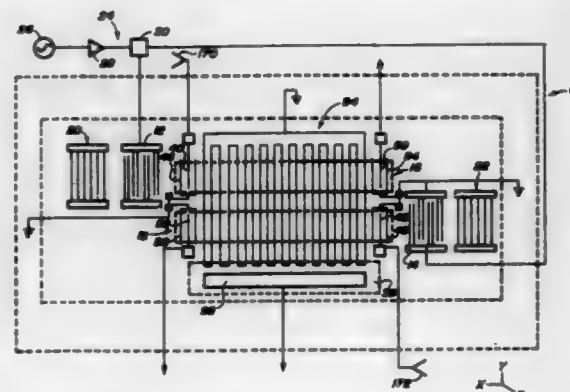
Billy J. Hunsinger, and Frederick M. Fliegel, both of Urbana, Ill., assignors to Electronic Decisions Incorporated, Urbana, Ill.

Filed Oct. 15, 1987, Ser. No. 108,602

Int. Cl.<sup>6</sup> H01L 29/796, 27/20

U.S. Cl. 257-241

38 Claims



1. A convolver, comprising:
  - a) first and second buried channels, each of said channels comprised of a piezoelectric semiconductor;
  - b) each channel has a signal input and a signal output, the input of one channel being spatially associated with the output of the other channel;
  - c) transducer means operably associated with each of said inputs for generating an acoustic wave which propagates through the associated channel and transports charge representative of an input signal from the input to the output thereof, and the wave of one channel propagates in a direction opposite to the direction in which the wave of the other channel propagates;
  - d) a plurality of sensing means overlying each channel for sampling the charge transported thereunder;
  - e) means operably associating each sensing means of one channel with an associated sensing means of the other channel for combining the sensed charges thereof and for generating a product; and
  - f) means operably associated with said combining means for integrating the products and generating a convolution signal.

#### 5,440,156 METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR CELL ADAPTABLE FOR USE IN AN INTEGRATOR

Guoliang Shou; Weikang Yang; Wiwat Wongwirawipat; Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc., Tokyo, Japan

Filed Dec. 8, 1992, Ser. No. 986,764

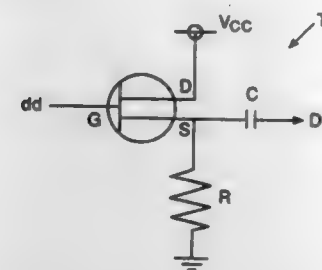
Claims priority, application Japan, Sep. 1, 1992, 4-257253 Int. Cl.<sup>6</sup> H01L 27/108, 29/00; H03K 17/687; G06G 7/18

U.S. Cl. 257-296

4 Claims

1. A repeatable cell for an integrated circuit connectable to one of an output and a next cell input terminal and also connectable to a power supply and a ground potential comprising:
  - a metal oxide semiconductor field effect transistor having a gate, a source and a drain, said drain connectable to said power supply;
  - an input terminal connected to said gate of said transistor;
  - a resistance connected to said source of said transistor and connectable between said source and said ground potential; and

an output capacitor having a first electrode connected to said source of said transistor and a second electrode con-



nnectable to said one of said output and said next cell input terminal, but not to said gate of said field effect transistor.

5,440,157

#### SEMICONDUCTOR INTEGRATED-CIRCUIT CAPACITOR HAVING A CARBON FILM ELECTRODE

Keitaro Imai, Kawasaki; Haruo Okano, Tokyo; Tomonori Aoyama, and Yasunori Okayama, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

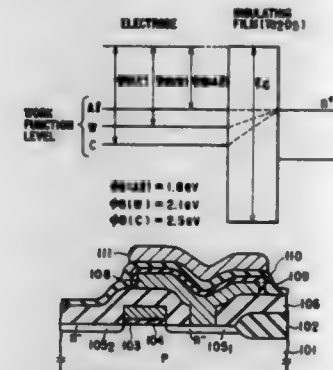
Filed Jul. 16, 1993, Ser. No. 94,422

Claims priority, application Japan, Jul. 17, 1992, 4-191117; Jul. 2, 1993, 5-164726

Int. Cl.<sup>6</sup> H01L 29/43, 29/92

U.S. Cl. 257-310

14 Claims



1. A semiconductor integrated-circuit capacitor comprising a lower electrode formed on a semiconductor substrate, a capacitor insulating film formed on said lower electrode, and an upper electrode formed on said insulating film, wherein said capacitor insulating film comprises a high-permittivity material, and only one of said upper electrode and said lower electrode comprises a carbon film.

5,440,158

#### ELECTRICALLY PROGRAMMABLE MEMORY DEVICE WITH IMPROVED DUAL FLOATING GATES

Hsu Sung-Mu, I-Lan, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company Ltd., Hsinchu, Taiwan

Filed Jul. 5, 1994, Ser. No. 270,737

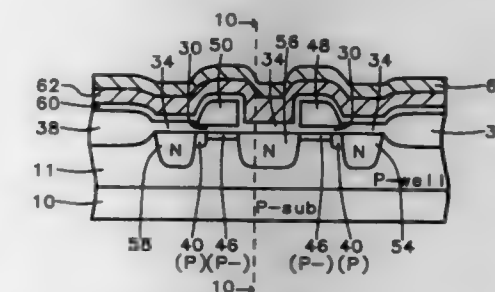
Int. Cl.<sup>6</sup> H01L 29/76

U.S. Cl. 257-314

23 Claims

12. The method of fabricating an improved erasable programmable read only memory device, having a dual sidewall floating gate on a semiconductor substrate comprising the steps of:
  - forming a thin insulating layer on the surface of a semiconductor substrate having a background doping of a first conductivity type;
  - forming field oxide regions in the substrate;

forming a masking line with vertical sidewalls in between the field oxide regions; removing the exposed thin insulating layer; forming a tunnel oxide layer on the substrate surface; forming dual floating gates on the vertical sidewalls of said masking line; removing the masking line leaving the dual spaced floating gates; ion implanting impurity ions of a second conductivity type into said substrate utilizing the dual floating gates as masks to form a central source region located between the float-



ing gate structures and two spaced drain regions in the substrate located on either side of the floating gate structures; thickening said tunnel oxide layer forming a thick insulation layer; depositing a composite layer over the surface of the substrate over the dual floating gate; forming wordlines, electrical contacts and metallurgy lines with appropriate passivation, and connecting the source, drain and gate elements to forms an erasable programmable memory device.

5,440,159

#### SINGLE LAYER POLYSILICON EEPROM HAVING UNIFORM THICKNESS GATE OXIDE/CAPACITOR DIELECTRIC LAYER

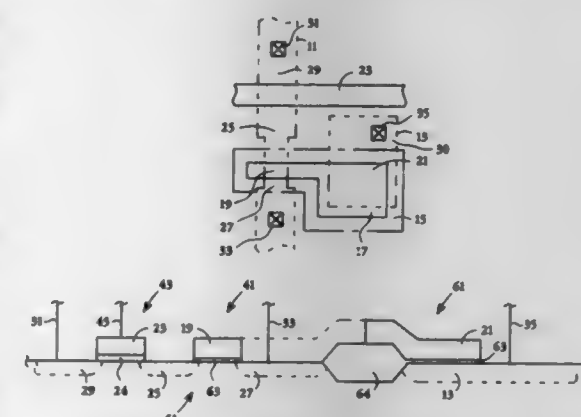
Bradley J. Larsen, Woodland Park; Todd A. Randazzo, Colorado Springs, both of Colo., and Geoffrey S. Gongwer, Campbell, Calif., assignors to Atmel Corporation, San Jose, Calif.

Continuation of Ser. No. 123,919, Sep. 20, 1993, abandoned. This application Dec. 16, 1994, Ser. No. 357,525

Int. Cl.<sup>6</sup> H01L 29/68, 29/78

U.S. Cl. 257-318

12 Claims



1. An EEPROM transistor of the type having a single polysilicon layer comprising:
  - an MOS transistor region, formed in a semiconductor substrate of a first conductivity type with a surface, having a generally linear subsurface active first stripe defined by a dopant of a second conductivity type, a second stripe of thin tunnel oxide adjointly traversing the first stripe,

said second tunnel oxide having a thickness of at most 120 Å, a polysilicon third stripe having a portion traversing the first stripe parallel to and adjoining the second stripe, substantially all of the portion separated from the first stripe by essentially only the second stripe, with implanted ion source and drain regions disposed in the first stripe aligned on opposite lateral sides of the third stripe, the third stripe functioning as a gate electrode relative to the source and drain,

- a capacitor region formed in the semiconductor substrate adjacent to the transistor region having a subsurface active first plate of a parallel plate capacitor, defined by dopant of the second conductivity type, an insulative second plate of thin oxide over the first plate, said second plate of thin oxide having a thickness substantially equal to that of said second stripe, said second plate of thin oxide extending to and connecting with said second stripe of thin tunnel oxide to form a single thin oxide layer with substantially uniform thickness throughout and a third plate of polysilicon parallel to and disposed over the first and second plates and joining the third stripe distal to the portion, wherein the third stripe and the connected third plate are defined within a perimeter of the second stripe and connected second plate such that said third stripe and said connected third plate overlie only said thin oxide of said second stripe and connected second plate the third plate serving as a charge storage member.

5,440,160

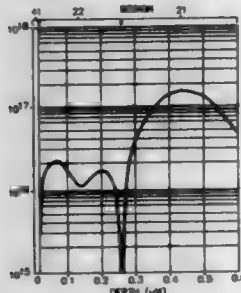
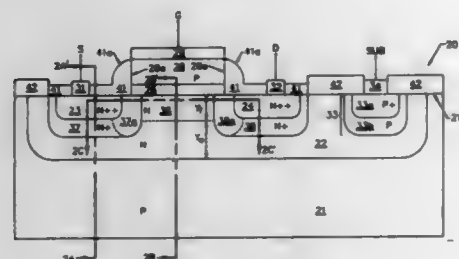
#### HIGH SATURATION CURRENT, LOW LEAKAGE CURRENT FERMI THRESHOLD FIELD EFFECT TRANSISTOR

Albert W. Vinal, Cary, N.C., assignor to Thunderbird Technologies, Inc., Research Triangle Park, N.C.  
Continuation-in-part of Ser. No. 37,636, Feb. 23, 1993, Pat. No. 5,374,836, which is a continuation-in-part of Ser. No. 977,689, Nov. 18, 1992, Pat. No. 5,369,295, which is a continuation of Ser. No. 826,939, Jan. 28, 1992, Pat. No. 5,194,923. This application Jan. 5, 1994, Ser. No. 177,847

Int. Cl.<sup>6</sup> H01L 29/78

U.S. Cl. 257-327

36 Claims



34. A field effect transistor comprising:

- a semiconductor substrate having a first doping concentration of first conductivity type;  
a tub region having a second doping concentration of second conductivity type in said substrate at a surface thereof, and extending a first depth from said substrate surface;  
spaced apart source and drain regions of said second conductivity type in said tub region at said substrate surface;  
a channel of said second conductivity type in said tub region,

between said spaced apart source and drain regions, and extending a second depth from said substrate surface, wherein said second depth is less than said first depth, and wherein said first doping concentration is greater than said second doping concentration;  
a gate insulating layer on said substrate surface, between said spaced apart source and drain regions; and  
source, drain and gate electrodes contacting said source and drain regions and said gate insulating layer, respectively.

5,440,161

#### SEMICONDUCTOR DEVICE HAVING AN SOI STRUCTURE AND A MANUFACTURING METHOD THEREOF

Toshiaki Iwamoto, Yasuo Yamaguchi, Yasuo Inoue, and Tada-shi Nishimura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

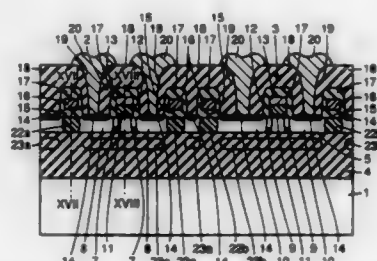
Filed Jul. 26, 1994, Ser. No. 273,175

Claims priority, application Japan, Jul. 27, 1993, 5-184908; Jul. 11, 1994, 6-158536

Int. Cl.<sup>6</sup> H01L 27/01, 29/06, 21/265

U.S. Cl. 257-349

18 Claims



1. A semiconductor device having an SOI structure, comprising:

- a semiconductor substrate having a main surface;  
an insulating layer formed on the main surface of said semiconductor substrate;  
a semiconductor layer formed on said insulating layer and having an element formation region and an element isolation region;  
a channel region formed in said element formation region of said semiconductor layer and including a first conductivity type impurity of a first concentration;  
a pair of impurity diffusion regions of a second conductivity type formed to sandwich said channel region in said element formation region;  
a gate electrode formed on said channel region with an insulating layer interposed therebetween;  
a channel stop region formed in said element isolation region of said semiconductor layer so as to be connected to said channel region, and including the first conductivity type impurity of a second concentration higher than said first concentration; and  
a field shield gate formed on said channel stop region with an insulating layer interposed therebetween.

5,440,162

#### ESD PROTECTION FOR SUBMICRON CMOS CIRCUITS

Eugene R. Worley, Irvine; Addison B. Jones, Yorba Linda, and Rajiv Gupta, Brea, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Jul. 26, 1994, Ser. No. 280,417

Int. Cl.<sup>6</sup> H01L 29/06; H02H 9/00

U.S. Cl. 257-355

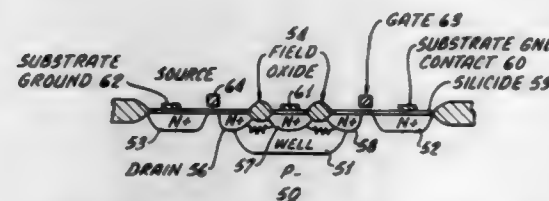
20 Claims

1. An ESD protection circuit for an integrated circuit ("IC") employing silicide-clad N<sup>+</sup> and P<sup>+</sup> regions having a plurality of contact pads, said IC being coupled to first V<sub>dd</sub> and first V<sub>ss</sub>, and substrate ground, comprising:

- a first N<sup>+</sup> diode whose cathode is coupled to one of the

contact pads forming a first node and whose anode is coupled to said substrate ground, said first diode comprising:

- a substrate of one of P<sup>-</sup>-type and P<sup>-</sup>-on-P<sup>+</sup> epitaxial type;  
N<sup>+</sup> regions disposed over said substrate to form a diode;  
P<sup>+</sup> regions disposed over said substrate and connected to substrate ground;



field oxide regions formed to electrically insulate said N<sup>+</sup> regions from said P<sup>+</sup> regions;

N-well formed within said substrate enclosing the perimeter of said N<sup>+</sup> regions, such that the first robust diode is prevented from avalanching below a predetermined voltage level applied to said pad.

5,440,163

#### CMOS ESD PROTECTION STRUCTURE

Masayuki Ohhashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 113,059, Aug. 30, 1993, abandoned.

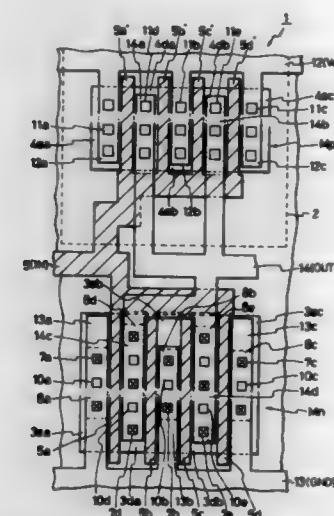
This application Jan. 5, 1995, Ser. No. 369,317

Claims priority, application Japan, Sep. 1, 1992, 4-233225

Int. Cl.<sup>6</sup> H01L 27/02

U.S. Cl. 257-355

16 Claims



1. A semiconductor integrated circuit device comprising:

- a semiconductor substrate;  
an MOS transistor composed of a source region and a drain region formed in said substrate and a gate electrode formed through a gate insulator on a surface of said substrate;  
a first wiring layer electrically connected to said gate electrode, a signal being supplied to said MOS transistor through said first wiring layer;  
a first interlayer insulator film having first contact holes arranged at intervals, said first interlayer insulator film being formed on said substrate and covering said source region and said drain region and said gate electrode;  
a first contact layer and a second contact layer formed on said first interlayer insulator film, said first contact layer being selectively placed over only said source region and

5,440,164

#### MOS/BIPOLAR DEVICE

Adrian D. Finney, Oldham, and David N. Casey, Ramsbottom, both of United Kingdom, assignors to Zetek plc, Oldham, United Kingdom

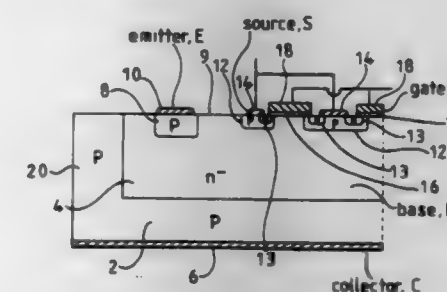
Filed Apr. 6, 1994, Ser. No. 223,761

Claims priority, application United Kingdom, Oct. 22, 1993, 932119

Int. Cl.<sup>6</sup> H01L 27/02, 29/78

U.S. Cl. 257-378

17 Claims



1. A monolithically integrated semiconductor device, comprising:

- first, second, third and gate terminals;  
a vertically formed bipolar transistor output stage having a base region and a collector region and comprising a substrate comprising a first semiconductor, an epitaxial layer comprising a second semiconductor, and a first region comprising said first semiconductor; and  
at least one short channel metal oxide semiconductor field effect transistor comprising a second region of said first semiconductor and a third region of said second semiconductor;  
said first terminal being connected to said substrate, said epitaxial layer being formed on said substrate, said first region being within said epitaxial layer and being connected to said second terminal, said second region being within said epitaxial layer, said third region being within said second region, said third terminal being connected to said second and third regions, and said gate terminal being adjacent sections of said second and third regions but substantially insulated therefrom and from said third terminal such that said at least one short channel metal oxide field effect transistor is arranged to control a current flow



in said base region and is separate from said collector region.

5,440,165

# SEMICONDUCTOR DEVICE WITH MEANS FOR SUPPRESSING ELECTRIC FIELDS

Kazumasa Mitsunaga; Kaoru Motonami, and Hisaaki Yoshida, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

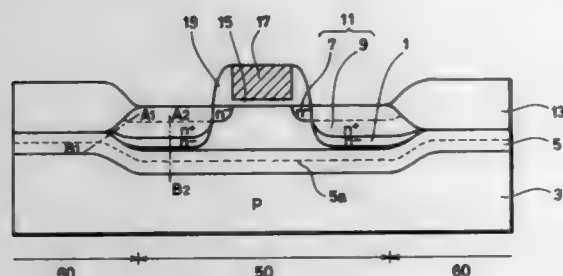
Continuation of Ser. No. 45,620, Apr. 9, 1993, abandoned. This application Sep. 12, 1994, Ser. No. 302,482

Claims priority, application Japan, Aug. 3, 1992, 4-206641

Int. Cl.<sup>6</sup> H01L 21/336, 29/784, 31/068

U.S. Cl. 257-408

7 Claims



1. A semiconductor device comprising:

- a semiconductor substrate of a first conductivity type having a main surface and element forming regions at the main surface;
- a separating and insulating film formed in said main surface of said semiconductor substrate for separation of adjacent element forming regions;
- a region which has a peak concentration of impurity of the first conductivity type, located in said semiconductor substrate and extending from a lower surface of said separating and insulating film to a position at a predetermined depth in an individual element forming region;
- a first impurity region of a second conductivity type which has a first concentration, located in said individual element forming region adjacent to and in contact with said separating and insulating film and formed in said main surface of said semiconductor substrate above the region having a peak concentration of impurity of the first conductivity type; and
- a second impurity region of the second conductivity type, located adjacent to and below said first impurity region and between said first impurity region and said region having a peak concentration of the impurity of the first conductivity type, said second impurity region contacting said region having a peak concentration of the impurity of the first conductivity type and said first impurity region, said second impurity region having a second concentration lower than said first concentration.

5,440,166

# PLANARIZED ISOLATION STRUCTURE FOR CMOS DEVICES

Girish A. Dixit; Fuen E. Chen, both of Dallas, and Robert O. Miller, The Colony, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 52,886, Apr. 26, 1993, abandoned, which is a division of Ser. No. 785,774, Oct. 31, 1991, Pat. No. 5,244,827. This application Jul. 15, 1994, Ser. No. 276,039

Int. Cl.<sup>6</sup> H01L 21/473

U.S. Cl. 257-506

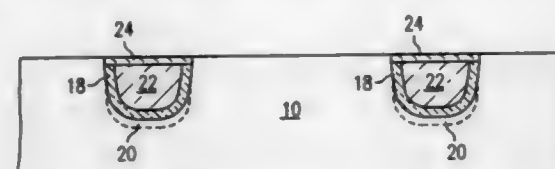
6 Claims

- 1. An isolation structure for an integrated circuit device, comprising:
  - a substrate having a substantially planar upper surface;
  - a cavity formed in the substrate, extending from the upper surface into the substrate, wherein the cavity has a U-shaped cross section, with a bottom portion substantially

parallel to the substrate upper surface, and with sidewalls perpendicular to the substrate upper surface;

a first layer of oxide covering lower portions of the sidewalls and the bottom portion of the cavity leaving a thin upper portion of the sidewalls uncovered by the first layer of oxide, wherein the first layer has the physical characteristics of thermally grown oxide;

a second layer of oxide contacting the first layer of oxide and covering the cavity to define, along with the first oxide



layer, an internal region within the cavity, wherein the second layer of oxide contacts the substrate sidewalls in the thin upper portion uncovered by the first layer of oxide and has an upper surface coplanar with the substrate upper surface, and further wherein the second layer of oxide has the physical characteristics of an undoped oxide; and

a region of glass completely filling the internal region within the cavity, wherein the region of glass has the physical characteristics of a reflowable glass.

5,440,167

# ANTIFUSE WITH DOUBLE VIA CONTACT AND METHOD OF MANUFACTURE THEREFOR

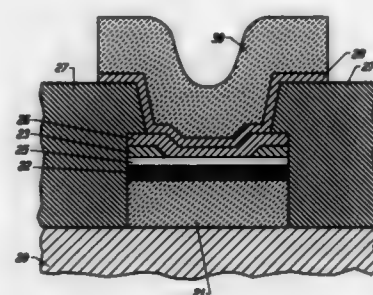
Ali Iranmanesh, Sunnyvale, Calif., assignor to Crosspoint Solutions, Inc., Santa Clara, Calif.

Filed Feb. 23, 1994, Ser. No. 200,262

Int. Cl.<sup>6</sup> H01L 27/02, 45/00, 21/44, 21/48

U.S. Cl. 257-530

15 Claims



- 1. An antifuse structure in an integrated circuit comprising:
  - a first interconnection line on a first insulating layer;
  - a programming layer on said first interconnection line;
  - a relatively thin insulating layer on said programming layer, said relatively thin insulating layer having a first aperture exposing a portion of a top surface of said programming layer;
  - a first barrier metal layer over said relatively thin insulating layer and in said first aperture to contact said portion of said top surface of said programming layer;
  - a relatively thick insulating layer on said first barrier metal layer, said relatively thick insulating layer having a second aperture exposing a portion of a top surface of said first barrier metal layer;
  - a second interconnection line over said relatively thick insulating layer and in said second aperture contacting said portion of said top surface of said first barrier metal layer; whereby said semiconductor programming layer is relatively flat to permit relatively consistent programming voltages for the antifuse structure and a relatively uniform conducting link between said first and second interconnection lines.

5,440,168

# THIN-FILM TRANSISTOR WITH SUPPRESSED OFF-CURRENT AND $V_{th}$

Hisayuki Nishimura; Shigeto Maegawa, and Shigenobu Maeda, all of Hyogo, Japan, assignors to Ryoden Semiconductor System Engineering Corporation and Mitsubishi Denki Kabushiki Kaisha, both of Japan

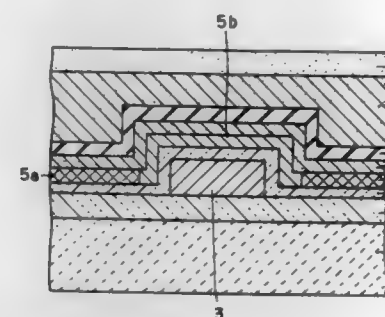
Filed Feb. 18, 1994, Ser. No. 198,058

Claims priority, application Japan, Feb. 22, 1993, 5-031811; Nov. 26, 1993, 5-296592

Int. Cl.<sup>6</sup> H01L 27/00, 29/78

U.S. Cl. 257-640

13 Claims



1. A thin-film transistor comprising:

- a substrate;
  - a gate electrode provided on said substrate;
  - a gate insulating film provided on said substrate and covering said gate electrode;
  - a semiconductor layer provided on said substrate and covering said gate electrode with said gate insulating film therebetween, said semiconductor layer including an active layer forming a channel as well as a source region and a drain region located at opposite sides of said active layer;
  - a first silicon nitride film provided on said semiconductor layer;
  - a first silicon oxide film provided on said first silicon nitride film; and
  - a second silicon nitride film provided on said first silicon oxide film,
- wherein a quantity of hydrogen contained in said first silicon nitride film is smaller than that of hydrogen contained in said second silicon nitride film,
- wherein said first silicon nitride film has a thickness in a range from 50Å to 150Å measured at a position above said gate electrode.

5,440,169

# SEMICONDUCTOR DEVICE WITH FLOW PREVENTION DIMPLES

Yoshihiro Tomita, and Shunichi Abe, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

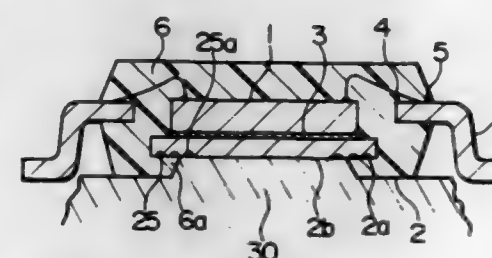
Filed Jan. 5, 1994, Ser. No. 177,380

Claims priority, application Japan, Jan. 8, 1993, 5-002092

Int. Cl.<sup>6</sup> H01L 23/28, 23/48

U.S. Cl. 257-667

5 Claims



1. A resin-packaged semiconductor device comprising:

- a semiconductor element having opposed first and second surfaces;
- a mounting pad having a first surface on which the second surface of said semiconductor element is mounted;
- inner leads extending across part of and spaced from the first surface of said semiconductor element and electrically connected to said semiconductor element;
- conduction means electrically connecting said semiconductor element and said inner leads to each other;
- a molding material encapsulating said semiconductor element, said mounting pad, said inner leads, and said conduction means; and
- outer leads continuing from said inner leads and extending outside of said molding material wherein said mounting pad has an edge encapsulated in a frame-shaped portion of said molding material, and wherein a second surface of said mounting pad opposite the first surface has a central portion not part of said edge of said mounting pad and not covered by said molding material, said central portion of said second surface being exposed as an outside surface of said device, said mounting pad having flow prevention dimples on said second surface said flow prevention dimples being located at first and second locations of said second surface, said first location being included in said edge of said mounting pad covered by said frame-shaped portion of said molding material and said second location being adjacent to said first location and not covered by said molding material.

5,440,170

# SEMICONDUCTOR DEVICE HAVING A DIE PAD WITH ROUNDED EDGES AND ITS MANUFACTURING METHOD

Kazuto Tsuji; Yoshiyuki Yoneda, and Junichi Kasai, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP91/01195, § 371 Date Jun. 29, 1992, § 102(e) Date Jun. 29, 1992, PCT Pub. No. WO92/04730, PCT Pub. Date Mar. 19, 1992

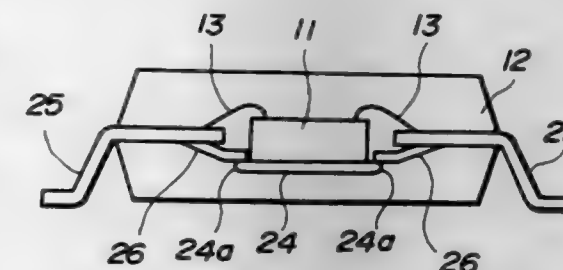
PCT Filed Sep. 9, 1991, Ser. No. 849,378

Claims priority, application Japan, Sep. 10, 1990, 2-239622

Int. Cl.<sup>6</sup> H01L 23/48, 29/44, 29/52, 29/60

U.S. Cl. 257-676

6 Claims



- 1. A semiconductor device manufactured employing a lead frame including a die pad and a plurality of leads provided outside said die pad, and manufactured by sealing of said die pad and its periphery by resin after said die pad is fitted with a semiconductor chip, said die pad being formed separately from a main part of the lead frame having leads and having a flat plate shape, wherein said die pad has a rounded outermost edge having a radius of curvature greater than or equal to 0.03 mm.

5,440,171

**SEMICONDUCTOR DEVICE WITH REINFORCEMENT**  
Ichiro Miyano, Kooji Serizawa, both of Fujisawa; Suguru Sakaguchi, Chigasaki, and Toshiharu Ishida, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

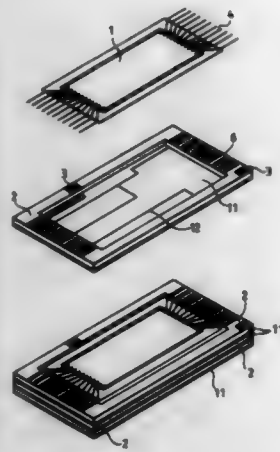
Filed Mar. 8, 1993, Ser. No. 27,478

Claims priority, application Japan, Mar. 9, 1992, 4-050372

Int. Cl.<sup>6</sup> H01L 25/00

U.S. Cl. 257-700

34 Claims



1. A multi-chip semiconductor device with reinforcement and chip parts comprising a plurality of semiconductor device layers which are stacked, wherein each of said semiconductor device layers has a tape carrier type semiconductor module and a frame having electrodes on the both side thereof and having at least one first hole or depression in which said tape carrier type semiconductor module is mounted, said electrodes and said tape carrier type semiconductor module being electrically connected, said frame further having at least one second hole or depression in which said chip parts are mounted, said chip parts being comprised of at least one of a capacitor and resistor, and wherein each of said semiconductor device layers has through holes for connecting said electrodes of respective ones of said semiconductor device layers, said electrodes having the same function with respect to each said tape carrier type semiconductor module.

5,440,172

**INTEGRAL HEAT SINK INTERFACE**

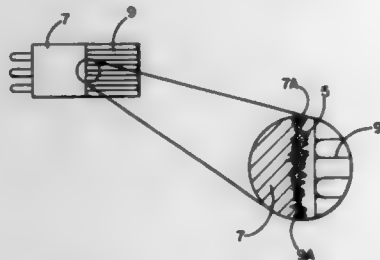
Thomas A. Sutrina, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 28, 1993, Ser. No. 83,430

Int. Cl.<sup>6</sup> H01L 23/02; H02B 1/04, 1/20

U.S. Cl. 257-712

2 Claims



1. An apparatus from which thermal energy is to be removed, comprising:  
a thermal energy generating device having a first surface from which thermal energy is to be removed, Said first surface having surface irregularities; a thermal energy dissipating device having a second surface to which thermal energy is to be transferred, said second surface having surface irregularities, said second surface compressively

attached to said first surface of said thermal energy generating device defining an interface having air gaps of a measurable thickness therebetween; and  
a xylene polymer layer interposed between said first surface of said thermal energy generating device and said second surface of said thermal energy dissipating device filling said air gaps therebetween, Said xylene polymer layer deposited on at least one of said compressively attached surfaces of said thermal energy generating device and said thermal energy dissipating device to a thickness between 0.1 micron and eight times said measurable thickness of said air gaps, said xylene polymer layer decreasing the thermal resistance of Said interface between said first surface of said thermal energy generating device and said second surface of said thermal energy dissipating device.

5,440,173

**HIGH-TEMPERATURE ELECTRICAL CONTACT FOR MAKING CONTACT TO CERAMIC MATERIALS AND IMPROVED CIRCUIT ELEMENT USING THE SAME**

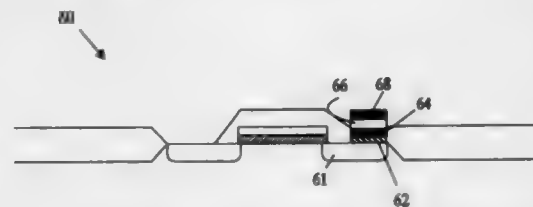
Joseph T. Evans, Jr., and Jeff A. Bullington, both of Albuquerque, N. Mex., assignors to Radiant Technologies, Albuquerque, N. Mex.

Filed Sep. 17, 1993, Ser. No. 123,289

Int. Cl.<sup>6</sup> H01L 29/43

U.S. Cl. 257-751

4 Claims



1. A contact structure for connecting a circuit element to a crystalline silicon substrate, said structure comprising:  
a barrier layer of a titanium compound chosen from the group consisting of TiN and TiW bonded to said silicon substrate; and  
a layer of platinum bonded to said bonded barrier layer, wherein said barrier layer is a single crystal.

5,440,174

**PLURALITY OF PASSIVE ELEMENTS IN A SEMICONDUCTOR INTEGRATED CIRCUIT AND SEMICONDUCTOR INTEGRATED CIRCUIT IN WHICH PASSIVE ELEMENTS ARE ARRANGED**

Mitsuru Nishitsuji, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

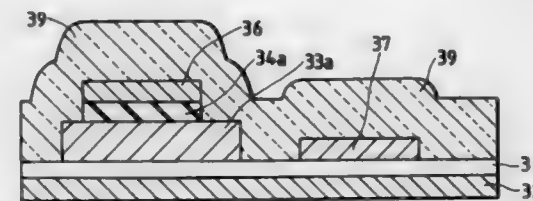
Filed Jun. 9, 1993, Ser. No. 73,907

Claims priority, application Japan, Oct. 20, 1992, 4-281392

Int. Cl.<sup>6</sup> H01L 23/48, 29/40, 27/02, 29/68

U.S. Cl. 257-770

7 Claims



1. A semiconductor integrated circuit, comprising:  
a semiconductor substrate;  
a first metal layer mounted on the semiconductor substrate;  
an insulating film which consists of a Ti-oxide and is mounted on the first metal layer, the Ti-oxide having a high relative dielectric constant;

5,440,176

**OCEAN CURRENT POWER GENERATOR**

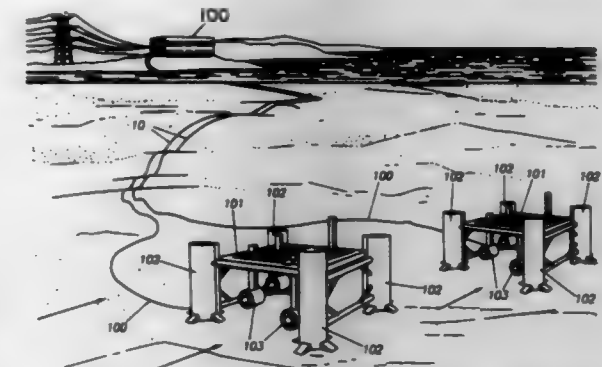
Michael L. Haining, 6731 Ashmore, Houston, Tex. 77069

Filed Oct. 18, 1994, Ser. No. 324,978

Int. Cl.<sup>6</sup> F03B 13/10

U.S. Cl. 290-54

6 Claims



1. A subsea hydroelectric generating plant comprising a tension leg platform supported on the ocean floor and a plurality of water turbines driving electric generators independently supported by said platform such that each turbine may be independently raised or lowered, moved laterally and rotated in response to the movement of the ocean current.

5,440,175

**WATERWHEEL-DRIVEN GENERATING UNIT**

Howard A. Mayo, Jr., 2051 Log Cabin Rd., York, Pa. 17404, and Kenneth R. Broome, 15 Fawn Dr., Reading, Pa. 19607

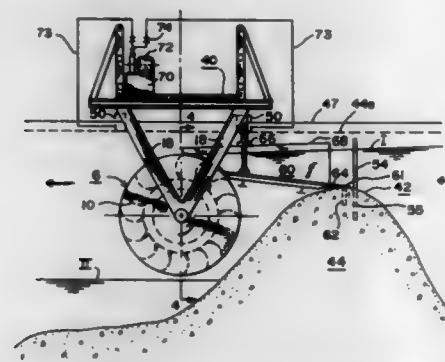
Continuation-in-part of Ser. No. 86,315, Jul. 6, 1993, abandoned.

This application Jun. 3, 1994, Ser. No. 254,063

Int. Cl.<sup>6</sup> F03B 13/00, 7/00

U.S. Cl. 290-54

9 Claims



1. An electric power-generating mechanism adapted to be mounted across a waterway adjacent a dam therein and comprising in combination, a vertically adjustable support means including a platform sized to extend across said waterway adjacent the downstream side of the dam, and support members depending from said platform in spaced-relationship in order to suspend a waterwheel unit, said waterwheel unit including a waterwheel wherein the length of said water wheel is substantially greater than the diameter thereof, and said waterwheel being composed of an impervious cylinder and circular end plates respectively fixed to the opposite ends of said cylinder in order to form a watertight enclosure, a plurality of buckets spaced evenly around the circumference of said cylinder and fixed at one edge thereto, an electric generator unit mounted axially within said cylinder and comprising a rotor disposed axially within a stator and drive means operably connecting said waterwheel to said rotor, and securing means fixing said stator to said support means to prevent rotation thereof, an elongated chute adapted to be affixed at the upstream edge thereof to said dam adjacent the dam crest and the opposite downstream edge of said chute clearing the circular path defined by the outer edges of said buckets when said waterwheel is rotating and being supported by an adjustable chute support means extending from said support means and connected to said chute in spaced relation to the upstream edge of said chute and operable to vary the relation of the downstream edge of said chute relative to said circular path of the outer edges of said buckets in a manner to maximize the energy of the water delivered to said waterwheel to generate electric power.

5,440,177

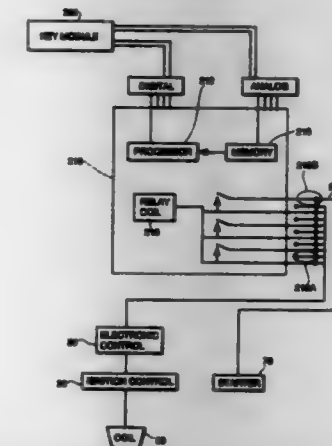
**INTEGRATED AUTO-THEFT PREVENTION SYSTEM**  
Howard T. Bellin, New York, and Robert P. Dingwall, Stratford, both of N.Y., assignors to Motor Vehicle Protection Systems, Inc., New York, N.Y.

Filed May 10, 1993, Ser. No. 60,026

Int. Cl.<sup>6</sup> B60R 25/04

U.S. Cl. 307-10.5

11 Claims



1. In combination in a system for preventing unauthorized operation of a motor vehicle comprising:  
a. key module means for receiving a key containing coded values corresponding to a timing offset in a distributor means in said motor vehicle, said offset in either digital or analog format and extracting these coded values for decoding;  
b. System Controller means for receiving coded values from said key module means and processing said values to allow an output of a properly timed distributor timing signal pursuant to receipt of said values that correspond to an authorized use of the vehicle;  
wherein said system controller means receives a timing signal from said distributor offset by a known amount and said received coded values are used in said controller means to modulate and correct said offset if authorized.



5,440,178

## STATIC TEST MODE NOISE FILTER

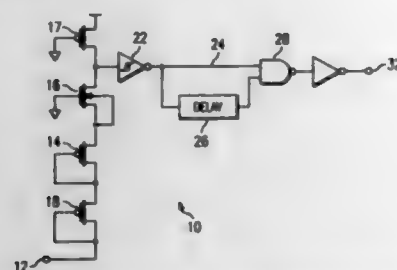
David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Nov. 30, 1993, Ser. No. 160,608

Int. Cl.<sup>6</sup> H03K 9/08, 17/16

U.S. Cl. 327-34

30 Claims



1. Circuitry to delay static entry into a test mode, comprising:

an integrated circuit pin;  
a super voltage which is applied to the integrated circuit pin when static entry into a test mode is desired; and  
delay circuitry which allows static entry into the test mode after a predetermined delay time if the super voltage applied to the integrated circuit pin stays below a predetermined threshold voltage level for the duration of the predetermined delay time and which allows immediate exit from the test mode, bypassing the predetermined delay time, when the super voltage on the integrated circuit pin rises above the predetermined threshold voltage, causing the delay circuitry to be reset such that subsequent static entry into the test mode occurs only after the super voltage applied to the integrated circuit pin stays below the predetermined threshold voltage for the duration of the predetermined delay time;

wherein the delay circuitry comprises a plurality of transistors connected in series between a load device connected to a first power supply and the integrated circuit pin; a detector element, which has an output signal, connected to the load device; a delay element, which has an output signal and introduces a delay equal to the predetermined delay time, connected to the output signal of the detector element; a logic gate which has a first input signal equal to the output signal of the detector element, a second input signal equal to the output signal of the delay element, and a test mode output signal.

5,440,179

## UPS WITH BI-DIRECTIONAL POWER FLOW

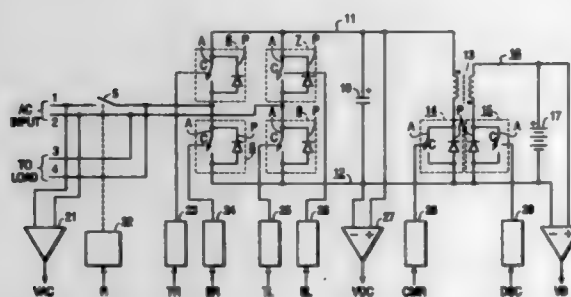
Alex J. Severinsky, 10904 Pebble Run Dr., Silver Spring, Md. 20902

Filed Apr. 26, 1993, Ser. No. 51,777

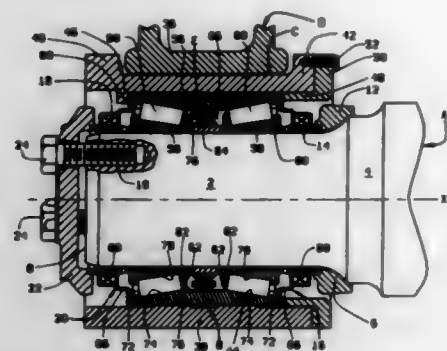
Int. Cl.<sup>6</sup> H02J 7/02, 9/06

U.S. Cl. 307-66

11 Claims



respect to one of the races and a rotor which is fixed in position with respect to the other race, all such that when



the bearing is in operation with the rotor rotating relative to the stator, the generator will produce electrical energy.

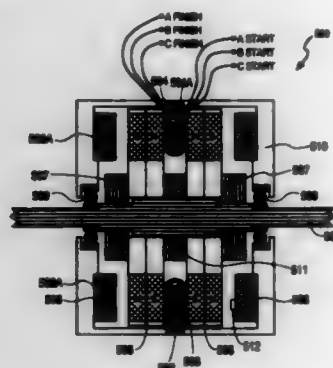
5,440,185

**COMPOSITE MAGNET BRUSHLESS DC MOTOR**  
Elmer C. Allwine, Jr., 450 Harvard Ave., #9C, Santa Clara, Calif. 95051

Continuation-in-part of Ser. No. 784,207, Oct. 28, 1991, Pat. No. 5,258,735. This application Oct. 9, 1992, Ser. No. 958,987  
Int. Cl.<sup>6</sup> H02K 21/12

U.S. Cl. 310-156

30 Claims



1. A brushless DC motor comprising:

- a multi-pole composite magnet having a first section and a second section, each section having a plurality of apertures extending completely through said section and a plurality of protrusions, wherein said apertures of said first section mate with said protrusions of said second section and said apertures of said second section mate with said protrusions of said first section, wherein said first section and said second section are magnetized in opposite axial directions;
- at least one stator member placed in operative relation to said multi-pole composite magnet;
- means for positioning said composite magnet and said at least one stator member on a common axis;
- a sensing device for determining a position of said composite magnet relative to said at least one stator member; and
- means for providing a magnetic configuration on said stator member, wherein said sensing device provides feedback signals to said means for providing said magnetic configuration on said stator member.

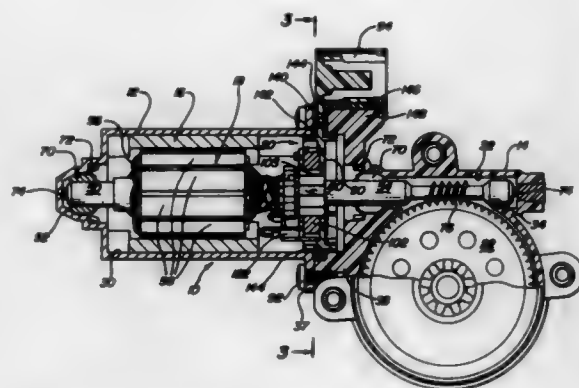
5,440,186

**MOTOR WITH ISOLATED BRUSH CARD ASSEMBLY**  
Eric A. Forsell, Sterling Heights, and Jeffrey L. Mackay, LaSalle, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Sep. 13, 1993, Ser. No. 121,025  
Int. Cl.<sup>6</sup> H02K 5/14, 13/00, 15/12, 5/10

U.S. Cl. 310-239

16 Claims



1. A motor comprising:

- a first housing having a bore extending longitudinally there-within defined by an inside surface thereof;
- a second housing;
- a magnetic stator being mounted internal to a predetermined longitudinal portion of said first housing congruent with said bore therewithin;
- an electromagnetic armature being mounted upon an armature shaft centrally extending therethrough and such that said armature shaft protrudes from each end thereof, said armature further having a plurality of wire windings thereabout for creating an electromagnetic field there-around;
- a commutator being longitudinally adjacent to said armature and surrounding said armature shaft thereabout;
- a brush card assembly having a support member with an aperture therethrough defined by an inner edge thereof, said support member retaining a pair of electrically conductive brushes thereon such that said brushes are proximate with said inner edge about said aperture therein, said support member having an interface portion thereof, said interface portion of said brush card assembly further having an inner lip member therein being at least partially encapsulated by an elastomeric material thereabout such that said inner lip member of said brush card assembly and said first housing have said elastomeric material therebetween, said elastomeric material separating said support member of said brush card assembly from said first and second housings disposed thereagainst; and
- said armature, said commutator and said armature shaft being concentrically juxtapositioned within said bore of said first housing such that said armature and armature shaft are rotatably journaled therewithin, said armature being in longitudinal registry with said stator therearound, said armature and said armature shaft being concentrically juxtapositioned within said bore of said first housing such that said armature and armature shaft are rotatably journaled therewithin, said armature being in longitudinal registry with said stator therearound;
- said armature shaft extending through said aperture within said brush card assembly such that said commutator is displaced between said pair of brushes thereabout, said pair of brushes supplying electrical current to said commutator therewithin.

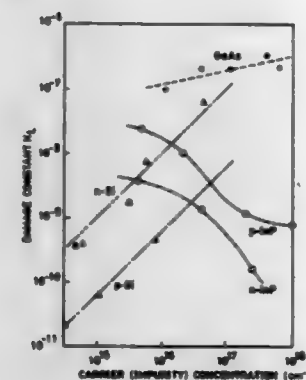
5,440,187

**LONG LIFE RADIOISOTOPE-POWERED, VOLTAIC-JUNCTION BATTERY USING RADIATION RESISTANT MATERIALS**

Roger G. Little, 228 Dudley Rd., Bedford, Mass. 01730, and Edward A. Burke, 11 Indian Hill Rd., Woburn, Mass. 01801  
Continuation-in-part of Ser. No. 672,872, Mar. 18, 1991, Pat. No. 5,260,621. This application Nov. 1, 1993, Ser. No. 146,217  
Int. Cl.<sup>6</sup> G21H 1/00; H01L 31/06, 21/20

U.S. Cl. 310-303

16 Claims



1. An electric battery comprising:

- (a) a nuclear source of relatively high energy radiation fluence;
- (b) a semiconductor junction characterized by a curve for said fluence relating minority carrier diffusion length and a damage constant and;
- (c) an enclosure having a sufficiently low thermal impedance for dissipation of sufficient heat from the nuclear source to permit predetermined degradation of said minority carrier diffusion length initially and predetermined maintenance of said minority carrier diffusion length thereafter;
- (d) said nuclear source being a radionuclide selected from the class consisting of alpha, gamma and beta emitters;
- (e) said curve being substantially logarithmic.

5,440,188

**PIEZOELECTRIC CRYSTAL ELEMENT**

Peter W. Krempf, Graz/Ragnitz, and Wolfgang Walln fer, Graz, both of Austria, assignors to AVL Gesellschaft f r Verbrennungskraftmaschinen und Messtechnik mbH Prof. Dr. Dr. h.c. Hans List, Graz, Austria

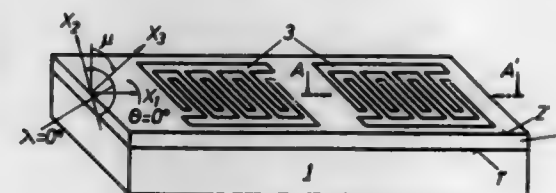
Filed Jul. 15, 1994, Ser. No. 276,353

Claims priority, application Austria, Jul. 20, 1993, 1442/93; Aug. 5, 1993, 1564/93

Int. Cl.<sup>6</sup> H01L 41/04

U.S. Cl. 310-313 A

16 Claims



1. Piezoelectric crystal element for surface acoustic wave applications, comprising a quartz substrate having at least one substantially planar quartz surface, wherein said planar quartz surface has an epitaxially grown layer of a quartz-isomorphous crystal with the total molecular formula  $ABO_4$ , A standing for Al or Ga, and B for P or As, and wherein said quartz surface and said epitaxial layer have approximately the same crystallographic orientation.

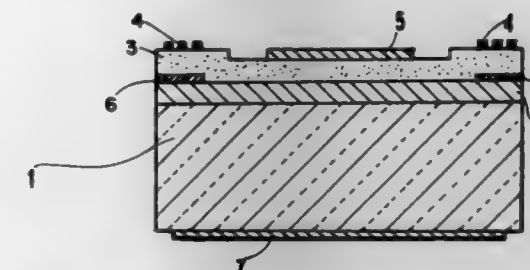
5,440,189

**SURFACE ACOUSTIC WAVE DEVICE**

Hideaki Nakahata, and Naoki Funimori, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan  
Continuation-in-part of Ser. No. 767,624, Sep. 30, 1991, Pat. No. 5,221,870. This application Mar. 24, 1993, Ser. No. 36,259  
Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310-313 R

3 Claims



1. A surface acoustic wave device comprising:

- a diamond or diamond-like carbon substrate;
- a piezoelectric layer deposited on the diamond or diamond-like carbon substrate;
- interdigital transducers formed on opposite ends of a first surface of said piezoelectric layer;
- a first electrode formed on a middle part of said first surface;
- a semiconductor film deposited on said first surface, thereby covering said interdigital transducers and said first electrode;
- a diamond or diamond-like carbon film deposited on the semiconductor film, on a surface thereof opposite the piezoelectric layer;
- a second electrode formed on a surface of said diamond or diamond-like carbon film opposite said semiconductor film;
- wherein one of said interdigital transducers generates a surface acoustic wave, the surface acoustic wave propagates in the piezoelectric layer and the diamond or diamond-like carbon substrate;
- wherein another of said interdigital transducers converts said surface acoustic wave into electric signals, and
- wherein AC voltage is applied to the first and second electrodes in order to amplify the surface acoustic wave through the interaction between carriers produced by the AC voltage and the surface acoustic wave.

5,440,190

**ULTRASONIC MOTOR**

Hiroyuki Imabayashi, Sagamihara; Takao Fujimura, Kodaira, and Toshimichi Iijima, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1993, Ser. No. 125,682

Claims priority, application Japan, Sep. 25, 1992, 4-256803; Jan. 27, 1993, 5-012022

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310-323

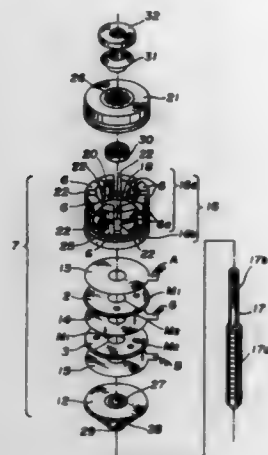
22 Claims

1. An ultrasonic motor comprising:

- a vibrator for generating ultrasonic vibration;
- an electro-mechanical energy conversion element provided at node positions of the ultrasonic vibration, for generating ultrasonic vibration on said vibrator, said vibrator having a first face thereof engaging said energy conversion element and driving a free end remote from said end face, selectively rotatably driven in either of two opposing directions by electric energy applied to said electro-mechanical energy conversion element;
- said vibrator further including a plurality of displacement enlarging vibration pieces arranged in spaced, parallel fashion and extending substantially parallel to said central axis away from said energy conversion element, said vibration pieces each having an inner and an outer periph-



ery, one of which is provided with grooves, which are arranged respectively at node positions of the ultrasonic vibration, each displacement enlarging vibration piece having a taper; and



an element to be driven being urged against end faces of said displacement enlarging vibration pieces remote from said first face by urging means and moved in a predetermined direction, said end faces collectively defining said driving free end and being inclined relative to a central axis of the vibrator during rotation of the vibration.

5,440,191

## ULTRASONIC MOTOR

Tadao Takagi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

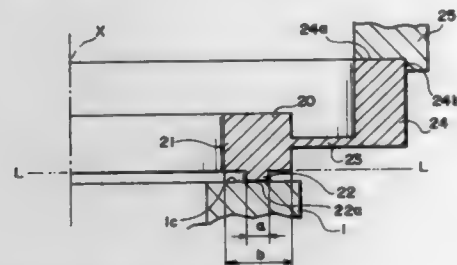
Filed Oct. 27, 1993, Ser. No. 141,618

Claims priority, application Japan, Oct. 28, 1992, 4-289164

Int. Cl.<sup>6</sup> H02N 2/00

U.S. Cl. 310—323

10 Claims



1. An ultrasonic motor comprising:  
a stator in which traveling waves are excited by a piezoelectric element, and  
a moving member which is in pressure contact with said stator and which is driven by said traveling waves in said stator, wherein:  
said moving member comprises a base portion and a slider portion provided on the side of said base portion facing said stator and formed with a contact surface against said stator;  
said contact surface is so formed that the width in the transverse direction perpendicular to the direction of propagation of said traveling waves of the contact between said contact surface and said stator is substantially less than the width in said transverse direction of said moving member base portion;  
said moving member base portion and said moving member slider portion are formed as a one-piece, molded unitary body by a molding process using a composite resin material;  
said composite resin material includes 40 wt % to 60 wt % thermoplastic resin, 15 wt % to 30 wt % potassium tita-

nate whiskers, 15 wt % to 35 wt % carbon fibers, and 5 wt % to 15 wt % polytetrafluorethylene.

5,440,192

## ULTRASONIC MOTOR

Masao Kasuga, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

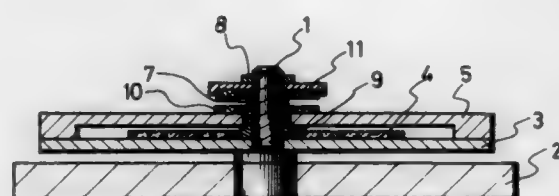
Continuation of Ser. No. 140,272, Oct. 20, 1993, abandoned, which is a continuation of Ser. No. 41,273, Mar. 30, 1993, abandoned, which is a continuation of Ser. No. 766,828, Sep. 26, 1991, abandoned, which is a continuation of Ser. No. 201,053, Jun. 1, 1988, abandoned. This application Apr. 25, 1994, Ser. No. 232,873

Claims priority, application Japan, Jun. 4, 1987, 140402; Aug. 10, 1987, 199498

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310—323

21 Claims



1. An ultrasonic motor comprising: a base; a support shaft fixed to the base, the support shaft having a stepped configuration comprised of at least first and second axially disposed portions of different diameters, the first portion having a larger diameter than the second portion and being fixed to the base; a stator comprising a vibrating body and an electrostrictive body, the vibrating body having a center hole through which extends the second portion of the support shaft and the vibrating body being fixed to the second portion of the support shaft and being in contact with a part of the first portion of the support shaft, and the electrostrictive body being secured to one side of the vibrating body for exciting the same to vibrate and having a center hole through which extends the support shaft; a rotor having a center hole through which extends the support shaft and being mounted on the support shaft so as to be rotationally driven around the support shaft by the stator when the electrostrictive body is excited; and pressure regulating means for biasing the rotor into pressure contact with the stator.

5,440,193

## METHOD AND APPARATUS FOR STRUCTURAL, ACTUATION AND SENSING IN A DESIRED DIRECTION

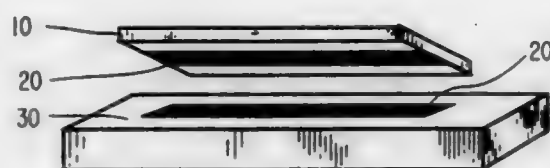
Ronald M. Barrett, Auburn, Ala., assignor to University of Maryland, College Park, Md.

Continuation-in-part of Ser. No. 790,074, Nov. 12, 1991, abandoned, which is a continuation of Ser. No. 485,599, Feb. 27, 1990, abandoned. This application Apr. 7, 1993, Ser. No. 43,988

Int. Cl.<sup>6</sup> B29C 65/52; H01L 41/053

U.S. Cl. 340—328

20 Claims



1. An actuator system, comprising:  
a substrate having a bonding area flanked by opposed non-bonding areas;  
at least one isotropic actuator element having transverse and

longitudinal axes, and having a width and length wherein the length is longer than the width, said at least one actuator element having a bonding area flanked by opposed non-bonding areas;

a bonding agent attaching said bonding area of said actuator element directly to said bonding area of said substrate with the non-bonding areas of said actuating element facing opposed non-bonding areas of said substrate, whereby the stiffness of the actuator element differs in the transverse and longitudinal axes of said actuator element; and  
means for actuating said actuator element to thereby impart a torsional deflection in said substrate.

5,440,194

## PIEZOELECTRIC ACTUATORS

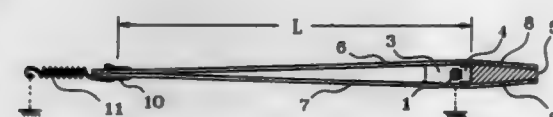
Henry R. Beurrier, 817 Old Chester Rd., Far Hills, N.J. 07931

Filed May 13, 1994, Ser. No. 242,618

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310—328

8 Claims



1. A piezoelectric actuator comprising a plurality of first lengths of piezoelectric material, said actuator also including a plurality of second lengths of piezoelectric material, each of said first and second lengths of piezoelectric material having a major axis, said plurality of first and second lengths being aligned along said major axis, said actuator also including means for connecting said lengths in a manner to maintain corresponding lengths of said plurality of said first and second lengths of piezoelectric material in fixed spatial communication, means for biasing each of said lengths wherein each length of corresponding first and second lengths of piezoelectric material is arranged to change length complementary to the other length when exercising voltages are applied to said lengths by said biasing means in a manner such that the movements produced by each of said lengths and its corresponding other length is additive along said major axis.

5,440,195

## PIEZOELECTRIC CERAMIC TRANSFORMER

Osamu Ohnishi, and Takeshi Inoue, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

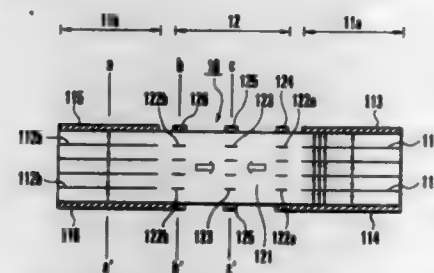
Filed Jan. 28, 1994, Ser. No. 187,501

Claims priority, application Japan, Jan. 28, 1993, 5-012186

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310—359

12 Claims



1. A piezoelectric ceramic transformer comprising:  
a piezoelectric plate made of a piezoelectric ceramic material and having a long plate-like structure;  
a pair of driving sections, arranged at two end portions of said piezoelectric plate and formed by alternately stacking a plurality of piezoelectric ceramic layers polarized in a direction of thickness of said piezoelectric plate and first

internal electrodes, for causing longitudinal vibration by a driving voltage applied to first and second input terminals; and

a power generating section, arranged at a central portion of said piezoelectric plate in a lengthwise direction thereof and polarized in the lengthwise direction of said piezoelectric plate, for generating an output voltage at a first output terminal by the longitudinal vibration transmitted from said driving sections.

5,440,196

## DUAL-ENVELOPE HIGH-PRESSURE DISCHARGE LAMP CONSTRUCTION, AND METHOD OF ITS MANUFACTURE

Karl-Heinz Gleixner, München, Germany, assignor to Patent-Treuhand-Gesellschaft F. Elektrische Glühlampen MBH, Munich, Germany

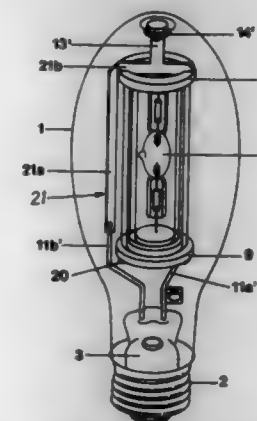
Filed Aug. 3, 1993, Ser. No. 101,180

Claims priority, application Germany, Sep. 15, 1992, 4230815

Int. Cl.<sup>6</sup> H01J 61/34

U.S. Cl. 313—25

15 Claims



1. A single-ended high-pressure discharge lamp having an essentially rotation-symmetrical outer bulb (1) defining a lamp axis (I—I), said outer bulb (1) having an end portion remote from the base, which end portion is formed with an inwardly extending projection (15);  
at least one base (2) located at an end region of the bulb;  
a melt-sealed lamp mount (3) to which said base (2) is secured;  
a double-ended discharge vessel (4) having two sealed ends located essentially axially symmetrically within the outer bulb (1);  
electrodes (5) located in said discharge vessel, and an ionizable fill in the discharge vessel;  
a first current supply lead (7a) extending from a first sealed end of the discharge vessel;  
a second current supply lead (7b) extending from a second sealed end of the discharge vessel;  
a holder means (10, 10') for holding the discharge vessel in position in the bulb, said holder means including current connectors (11a, 11b; 11a', 11b') electrically connected to the at least one base, wherein, in accordance with the invention, the holder means (10, 10') comprises  
first and second punched sheet-metal elements (12a, 12b; 20, 21), said punched sheet-metal elements defining surface planes, the first and second punched sheet-metal elements being electrically separate from each other,  
the first punched sheet-metal element (12a, 20) being electrically connected to the first current supply lead (7a) and a first current connector (11a, 11a'),  
the second punched sheet-metal element (12b, 21) being

electrically connected to the second current supply lead (7b) and a second current connector (11b, 11b'), both punched sheet-metal elements being located essentially in a single plane;

wherein a theoretical line which is perpendicular to said surface planes of the sheet-metal elements (12a, 12b; 20, 21) extends at a right angle with respect to the lamp axis (1-1);

a projecting tab or blade (13, 13') formed on the second punched sheet-metal element (12b; 21) and extending therefrom;

a holder portion (14, 14'), shaped in ring form, formed on said tab or blade, and clampingly surrounding said inwardly extending projection (15) of the outer bulb (1);

a transparent, hollow cylindrical protective body (8) located within the outer bulb (1), spaced from, and surrounding the discharge vessel (4) over its entire length coaxially with respect thereto; and

two spaced centering elements (9) positioned in the lamp and engaged, respectively, by the punched sheet-metal elements (12a, 12b; 20, 21) of the holder means (10, 10'), said punched sheet-metal elements pressing the centering elements (9) against the end faces of the cylindrical protective body (8).

5,440,197

# BACKLIGHTING APPARATUS FOR UNIFORMLY ILLUMINATING A DISPLAY PANEL

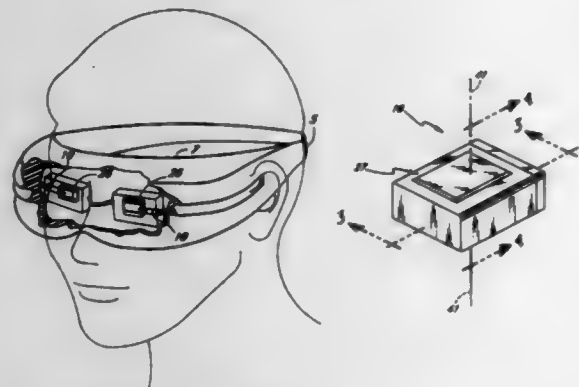
Philip L. Gleckman, Irvine, Calif., assignor to TIR Technologies, Inc., Costa Mesa, Calif.

Filed Oct. 5, 1993, Ser. No. 131,659

Int. Cl.<sup>6</sup> G02F 1/133

U.S. Cl. 313-110

21 Claims



1. An apparatus, comprising:
  - a display panel having a rear surface and a front surface, said display panel being at least partially transmissive such that at least a portion of illumination on said rear surface is transmitted to said front surface;
  - a light source for backlighting said display panel, said light source comprising:
    - a light bulb;
    - a housing having diffusive reflective interior surfaces forming a fluid-containing cavity, said cavity having a depth, said bulb mounted in said cavity with said interior surfaces of said cavity spaced therefrom, said housing having an aperture which opens into said cavity, said aperture juxtaposed with said rear surface of said display panel to illuminate said rear surface, said cavity having a diffusive reflective surface area and said aperture having an area, the ratio of said area of said aperture to the sum of (i) said area of said aperture and (ii) said surface area of said cavity being at least 0.05, said aperture having a bisector dimension, the ratio of said depth to said bisector dimension being at least 0.1;
  - a diffuser at said aperture, said diffuser positioned to dif-

fuse illumination which passes through said aperture from said cavity toward said display panel;

a brightness enhancing material disposed between said diffuser and said display panel, said material providing illumination within a maximal viewing angle and reflecting illumination outside said maximal viewing angle.

5,440,198

# SPARK PLUG HAVING A NOBLE METAL FIRING TIP BONDED TO A FRONT END OF A CENTER ELECTRODE

Takafumi Oshima, and Tsutomu Okayama, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

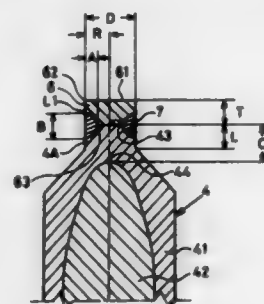
Filed Jun. 3, 1993, Ser. No. 70,800

Claims priority, application Japan, Jun. 17, 1992, 4-157877

Int. Cl.<sup>6</sup> H01T 21/02

U.S. Cl. 313-141

4 Claims



1. A spark plug comprising:
    - a nickel-alloyed center electrode having a front end arranged as a constricted end, said front end comprising a front end surface without a recess; and
    - a noble metal firing tip having a surface at one end bonded to said front end surface of said constricted end by laser beam welding at an interface between said constricted end and said noble metal firing tip for an entire circumferential length of each of said constricted end and said noble metal firing tip, wherein said noble metal firing tip has a same diameter as said constricted end and forms a spark gap with a ground electrode, and wherein a wedge-shaped welding solidification portion is formed at said interface; wherein a dimensional relationship between D, T, L, A, R and B is as follows:
      - $0.5 \text{ mm} \leq D \leq 1.5 \text{ mm}$ ,
      - $0.3 \text{ mm} \leq T \leq 0.6 \text{ mm}$ ,
      - $0.2 \text{ mm} \leq L \leq 0.5 \text{ mm}$ ,
      - $R/3 \leq A \leq R$ ,
      - $0.3 \text{ mm} \leq B \leq 0.8 \text{ mm}$ ,
- wherein
- (D) is a diameter of said noble metal firing tip,
  - (T) is a thickness of said noble metal firing tip,
  - (L) is a length of said constricted end of said center electrode,
  - (A) is a depth of said wedge-shaped welding solidification portion penetrated from an outer surface of both said constricted end and noble metal firing tip,
  - (R) is a radius of said noble metal firing tip, and
  - (B) is a width of said wedge-shaped welding solidification portion measured at said outer surface of both said constricted end and said noble metal firing tip.

5,440,199

# BASE FOR ELECTRODELESS DISCHARGE LAMP

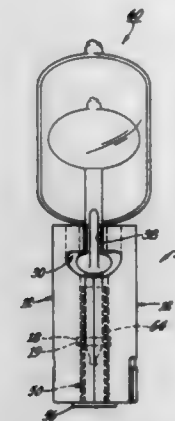
Raymond A. Heindl, Euclid; Mark E. Duffy, Shaker Hts.; Frederick Hetzel, North Royalton; David J. Marks, Lakewood; Lawrence T. Mazza, Mayfield Hts.; Curtis E. Scott, and Michael M. Secen, both of Mentor, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 989,430, Dec. 11, 1992, Pat. No. 5,282,756. This application Dec. 14, 1992, Ser. No. 990,204

Int. Cl.<sup>6</sup> H01J 5/48

U.S. Cl. 313-318.07

19 Claims



1. A lamp base for receiving a sealed end of a lamp envelope and a generally tubular stem portion extending outwardly from the sealed end, the lamp base comprising at least two electrically non-conductive members assembled into mating engagement defining a bore axially extending through a first end of said base and an opening cavity in second end of said base, said cavity configured for retaining a lamp therein and a hollow electrically conductive member disposed in the bore and adapted to receive the sealed end of the lamp envelope therein.

5,440,200

# CATHODOLUMINESCENT APPARATUS HAVING A LINEARLY FOCUSED BEAM

Ryuji Ozawa, Miyota, Japan, assignor to Miyota Kabushiki Kaisha, Nagano, Japan

PCT No. PCT/JP92/00259, § 371 Date Oct. 27, 1992, § 102(e) Date Oct. 27, 1993, PCT Pub. No. WO92/16013, PCT Pub. Date Sep. 17, 1992

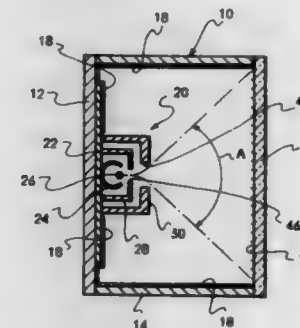
PCT Filed Mar. 4, 1992, Ser. No. 941,424

Claims priority, application Japan, Mar. 6, 1991, 3-65435; Apr. 16, 1991, 3-112377

Int. Cl.<sup>6</sup> H01J 29/70

U.S. Cl. 313-422

11 Claims



1. A cathodoluminescent apparatus, comprising:
  - a line electrode gun having a line cathode elongated in a first direction;
  - said line electron gun including an intermediate electrode for extracting electrons from said line cathode;
  - an anode for accelerating electrons extracted from said line

cathode, said anode having a extrate and an electrically conductive section formed thereon for accepting a voltage applied thereto for the acceleration;

said anode including a phosphor screen formed of phosphor particles on said electrically conductive section;

said intermediate electrode having a configuration permitting direct linear focusing of said extracted electrons upon said phosphor screen in a contiguous line parallel to said line cathode and extending a distance substantially equal to a length of said line cathode;

said intermediate electrode having portions for scanning said contiguous line in a single second direction perpendicular to said first direction; and

a container being capable of accommodating said line electron gun and said anode, said container having a light emitting face, through which visible light is capable of passing, said container being evacuated to a vacuum for cathodoluminescence.

5,440,201

# PLASMA ADDRESSING STRUCTURE WITH WIDE OR TRANSPARENT REFERENCE ELECTRODE

Paul C. Martin, Vancouver, Wash., and Thomas S. Buzak, Aloha, Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

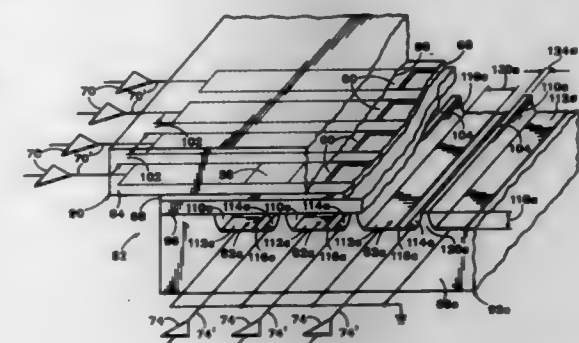
Continuation of Ser. No. 936,194, Aug. 26, 1992, abandoned.

This application Aug. 3, 1994, Ser. No. 285,586

Int. Cl.<sup>6</sup> H01J 17/49

U.S. Cl. 313-582

20 Claims



1. An addressing structure for a data element, comprising:
  - an ionizable gaseous medium held in communication with the data element by a closed channel having a length and a bottom surface on which a reference electrode is positioned; and
  - ionizing means providing a data strobe signal to a data strobe electrode positioned on the bottom surface of the channel adjacent to the reference electrode for selectively effecting ionization of the ionizable gaseous medium to provide an interruptible electrical connection between the data element and the reference electrode and thereby selectively address the data element, the reference electrode and the data strobe electrode extending along the length of the channel and having respective first and second widths transverse to the length, the first width being substantially greater than the second width.



5,440,202

**ELECTRON BEAM DEVICE HAVING A DIRECT CURRENT FEED WITH SWITCHING STAGES THEREIN**  
 Hans-Günter Mathews, Oberehrendingen, Switzerland, and  
 Wolfram Schminke, Laufenburg, Germany, assignors to  
 Thomcast AG, Turgi, Switzerland

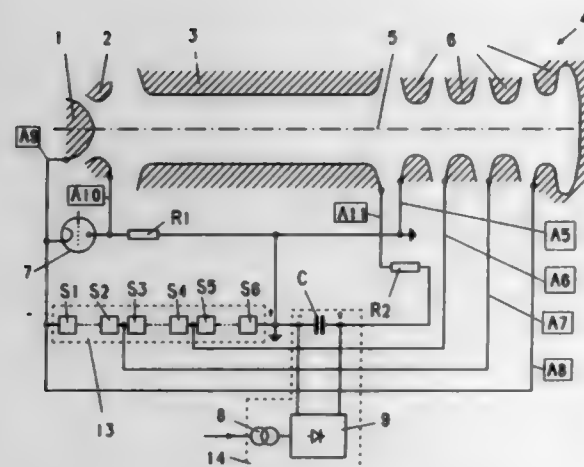
Filed Mar. 12, 1993, Ser. No. 30,889

Claims priority, application Germany, Mar. 28, 1992, 42 10 294.4

Int. Cl.<sup>6</sup> H01J 23/34

U.S. Cl. 315—3

10 Claims



1. An electron beam device, comprising:
  - a cathode, an anode, and a collector arranged successively along a beam axis within an evacuated space; and
  - a feed arrangement connected to and providing potentials for said cathode, said anode, and said collector, wherein:
    - said cathode is at a cathode potential and generates, in response thereto, a high-power electron beam propagating along said beam axis;
    - said anode is at an anode potential which is higher than said cathode potential and accelerates, in response thereto, electrons of said high-power electron beam;
    - said collector comprises several collector stages arranged successively along said beam axis, said collector stages having successively decreasing potentials, each successively decreasing potential being lower than said anode potential so as to decelerate, in response thereto, said electrons of said high-power electron beam;
    - said feed arrangement comprises a high-voltage direct-current supply with a negative and a positive output, said supply consisting of a plurality of identical switching stages, said plurality of switching stages having outputs which are respectively connected in series, and each of said plurality of identical switching stages being a controllable medium-voltage source which can be separately switched on and off via a stage controller; and
    - wherein said successively decreasing potentials of said collector stages are provided by connecting said collector stages to respective taps between said switching stages of said high-voltage direct-current supply, said anode potential is provided by connecting said anode to said positive output of said high-voltage direct-current supply, and said cathode potential is provided by connecting said cathode to said negative output of said high-voltage direct-current supply.

5,440,203

**ENERGY-VARIABLE RFQ LINAC**  
 Tetsuya Nakanishi, Amagasaki, Japan, assignor to Mitsubishi  
 Denki Kabushiki Kaisha, Tokyo, Japan

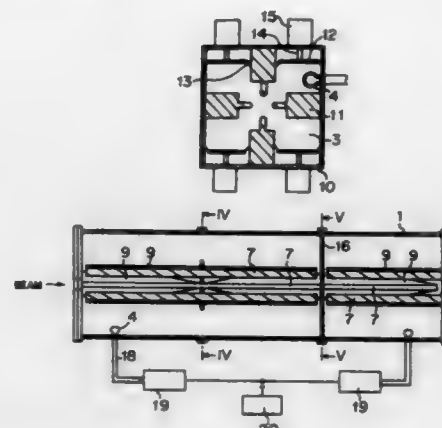
Filed Jul. 30, 1992, Ser. No. 922,625

Claims priority, application Japan, Aug. 2, 1991, 3-193964; May 29, 1992, 4-138407

Int. Cl.<sup>6</sup> H01J 25/10

U.S. Cl. 315—5.41

36 Claims



1. An energy-variable split coaxial RFQ linac wherein four electrodes thereof are inner conductors in a coaxial cavity, characterized in that a cavity thereof is partitioned by conductive plates, high-frequency powers are independently supplied to respective partitioned cavities and the high-frequency power supplied to the partitioned cavity at an exit side thereof is controlled thereby controlling energy of a beam emitted from the exit side.

5,440,204

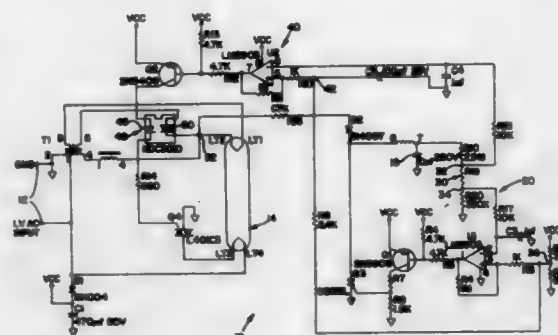
**GAS DISCHARGE LAMP LIGHTING SYSTEM WITH PHASE SYNCHRONIZED GATING OF D.C. ELECTRODE VOLTAGE**  
 James C. Shih, Arlington Heights, Ill., assignor to Intermatic Incorporated, Spring Grove, Ill.

Filed Jun. 14, 1993, Ser. No. 76,621

Int. Cl.<sup>6</sup> H05B 39/00

U.S. Cl. 315—94

10 Claims



1. A gas discharge lamp lighting system comprising:
  - a gas discharge lamp having two electrodes;
  - a voltage source for supplying an a.c. voltage across said electrodes;
  - a source of stored d.c. voltage; and
  - a circuit for gating said d.c. voltage to said electrodes phase synchronized with, and additive to, said a.c. voltage to provide a resultant voltage across said electrodes of a magnitude sufficient to light said lamp.

5,440,205

**FLUORESCENT LAMP STARTER HAVING A TRANSISTOR BASE CONTROL MEANS**  
 Tetsuya Tahara, Ibaragi; Kazushige Sugita, Suita; Kazuhiko Ito,  
 Hirakata, and Nobuhisa Yoshikawa, Sakai, all of Japan,  
 assignors to Matsushita Electric Industrial Co., Ltd., Kadoma,  
 Japan

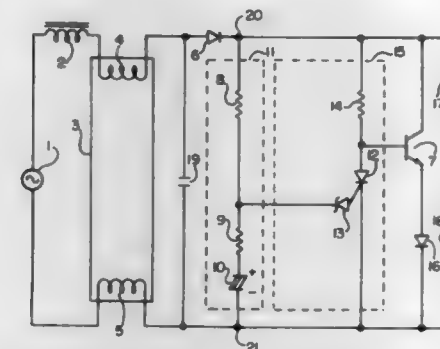
Filed Sep. 28, 1993, Ser. No. 128,851

Claims priority, application Japan, Sep. 29, 1992, 4-259373; Oct. 26, 1992, 4-287345

Int. Cl.<sup>6</sup> H05B 39/00

U.S. Cl. 315—94

8 Claims



1. A fluorescent lamp starter comprising:
  - a series circuit to be connected to a power source for supplying an AC voltage, including a ballast and a fluorescent lamp equipped with electrodes;
  - a transistor having a collector and an emitter connected through a diode between said electrodes on an opposite side of said fluorescent lamp in which said power source is not connected;
  - a control voltage supply means having a resistance means and a capacitor, which are operated by a voltage between said collector and said emitter of said transistor; and
  - a transistor base control means for switching said transistor by a total voltage of a part of a voltage generated in said resistance means of said control voltage supply means and a voltage generated in said capacitor thereof.

5,440,206

**PLASMA PROCESSING APPARATUS COMPRISING MEANS FOR GENERATING ROTATING MAGNETIC FIELD**  
 Kuroko Yoichi; Masami Kubota, both of Nakakoma; Hiroyuki  
 Yoshiki, Toyonaka, and Michio Taniguchi, Kobe, all of Japan,  
 assignors to Tokyo Electron Ltd. and Tokyo Electron  
 Yamanashi and Daihen Corporation, both of Japan

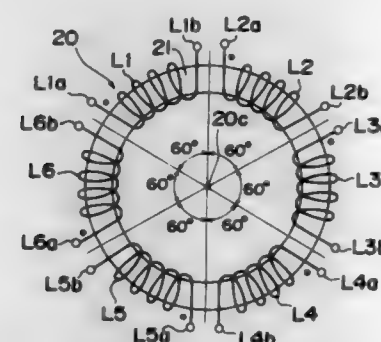
Filed Jun. 22, 1993, Ser. No. 81,023

Claims priority, application Japan, Jun. 26, 1992, 4-193164

Int. Cl.<sup>6</sup> H01J 7/24

U.S. Cl. 315—111.41

2 Claims



1. A plasma processing apparatus comprising:
  - a processing chamber;
  - plate-parallel electrodes, provided in said processing cham-

- ber, for generating a high-frequency electric field in response to a high-frequency voltage;
- power source means for generating a plurality of n-phase asymmetrical alternating-current currents including a plurality of n currents having a phase difference of  $\pi/n$  therebetween;
- a ring-shaped core provided in the periphery of said processing chamber, said core defining an axis and an axially extending, interior through opening, said core consisting of a plurality of 2n ring sections, and wherein each of said ring sections has an arcuate length and extends over a substantially equal angular portion of the core;
- a toroidal coil including a plurality of 2n split coils is wound onto the core so that each pair of split coils oppose each other; and
- electrical connection means for electrically connecting said power source means with said plurality of split coils of said toroidal coil so that two magnetic fields generated by said each pair of split coils opposing each other are directed in the same direction in parallel to each other in said processing chamber, and said plurality of currents flow respectively into said respective pairs of split coils opposing each other, thereby generating a rotating magnetic field in parallel to surfaces of said plane-parallel electrodes;
- wherein each of the split coils is wound around and extends substantially completely over the entire arcuate length of a respective one of the ring sections, and wherein the rotating magnetic field has a substantially constant magnetic flux density across the interior through opening defined by the core.

5,440,207

**REFERENCE LIGHT SOURCE DEVICE USING LASER**  
 Kazuo Otsuka, Kawasaki, Japan, assignor to Fujitsu Limited,  
 Kawasaki, Japan

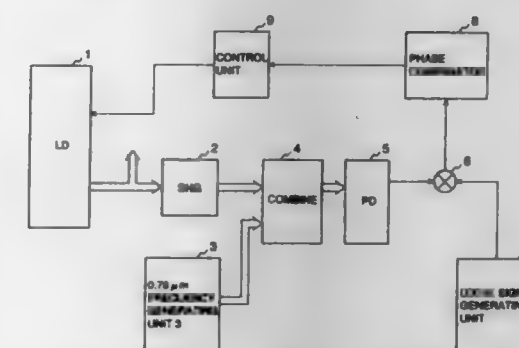
Filed Nov. 4, 1993, Ser. No. 148,820

Claims priority, application Japan, Nov. 5, 1992, 4-295544

Int. Cl.<sup>6</sup> H05B 37/02

U.S. Cl. 315—149

13 Claims



1. A reference light source device comprising:
  - a first laser diode emitting a reference light;
  - harmonic generating means for generating an nth harmonic of the reference light where n is an integer;
  - light generating means for generating a light signal having a waveform equal to that of said nth harmonic of the reference light;
  - photodetector means for combining the nth harmonic and said light signal and for generating a first electric signal corresponding to a beat signal obtained by combining the nth harmonic and the light signal;
  - local signal generating means for generating a local signal;
  - phase comparator means for generating a control signal corresponding to a phase difference between the first electric signal and the local signal; and
  - driving means for driving the first laser diode according to the control signal.

the control signal so that a frequency of the beat signal is equal to that of the local signal.

5,440,208

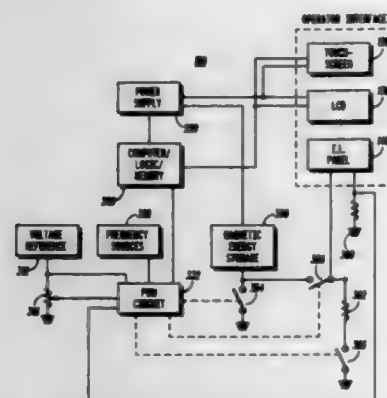
# DRIVER CIRCUIT FOR ELECTROLUMINESCENT PANEL

Robert G. Uskali, Schaumburg, Ill.; David B. Bell, Los Altos, Calif., and Wilson D. Pace, Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 29, 1993, Ser. No. 145,919  
Int. Cl.<sup>6</sup> G09G 3/10

U.S. Cl. 315-169.3

23 Claims



1. A driver circuit for converting and controlling power to an electroluminescent panel, comprising:

- a pulse-width modulation circuit for providing a modulated pulse train, said pulse-width modulation circuit further including an enable input and a regulating means for adjusting a pulse width;
- a panel drive frequency generator, electrically coupled to said pulse-width modulation circuit, for providing a panel drive frequency, and for providing a signal to said enable input for disabling said modulated pulse train;
- a means for storing magnetic energy, electrically coupled to a power source;
- a first switching means, electrically coupled to said means for storing magnetic energy and responsive to said pulse train, for controlling said storing magnetic energy;
- a second switching means, electrically coupled to said first switching means, said means for storing magnetic energy and said electroluminescent panel, for transferring energy from said means for storing magnetic energy to said electroluminescent panel;
- a resistor, electrically coupled to said electroluminescent panel, for setting an electroluminescent panel discharge time constant;
- a third switching means electrically coupled to said resistor and responsive to said panel drive frequency generator for draining energy from said electroluminescent panel through said resistor; and
- feedback means, coupled to said pulse-width modulation circuit and responsive to said panel drive frequency, for resetting the initial state of said pulse-width modulation circuit.

5,440,209

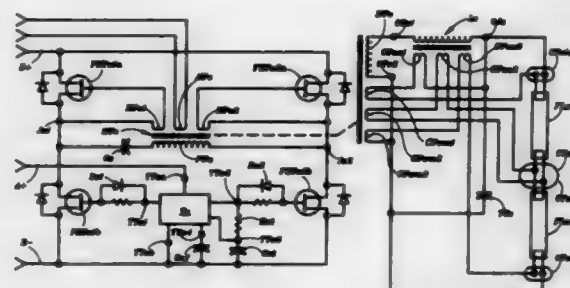
# DRIVEN FULL-BRIDGE INVERTER BALLAST

Ole K. Nilssen, 408 Caesar Dr., Barrington, Ill. 60010  
Continuation-in-part of Ser. No. 63,075, May 10, 1993, which is a continuation-in-part of Ser. No. 20,696, Feb. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 840,528, Feb. 25, 1992, Pat. No. 5,189,342, which is a continuation of Ser. No. 646,497, Jan. 28, 1991, which is a continuation of Ser. No. 107,795, Oct. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 658,423, Oct. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 555,426, Nov. 23, 1983, abandoned, which is a continuation of Ser. No. 178,107, Aug. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 973,741, Dec. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 890,586, Mar. 20, 1978, Pat. No. 4,184,128. This application Sep. 3, 1993, Ser. No. 115,586

Int. Cl.<sup>6</sup> H05B 41/29

U.S. Cl. 315-219

27 Claims



1. An arrangement comprising:

- a DC source providing a DC supply voltage at a pair of DC supply terminals;
- a drive source providing a primary drive signal at a pair of drive source terminals;
- an inverter circuit having a pair of DC input terminals connected with the DC supply terminals and being operable to provide an inverter output voltage at a pair of inverter output terminals; the inverter circuit being further characterized by having a first and a second switching transistor with a first and a second pair of control input terminals, respectively; the first pair of control input terminals being connected with the drive signal output terminals, thereby to be provided with the primary drive signal; the drive signal causing the first switching transistor to be alternately switched ON and OFF in a periodic manner; the second pair of control input terminals being connected in circuit with the inverter output terminals, thereby to obtain a secondary drive signal therefrom; and
- a gas discharge lamp connected in circuit with the inverter output terminals.

5,440,210

# INDIRECTLY SENSING ACCELERATOR BEAM CURRENTS FOR LIMITING MAXIMUM BEAM CURRENT MAGNITUDE

John M. Bogaty, Lombard; Benny E. Clift, Park Forest, and Lowell M. Bollinger, Downers Grove, all of Ill., assignors to University of Chicago, Chicago, Ill.

Filed Apr. 16, 1993, Ser. No. 48,652

Int. Cl.<sup>6</sup> H01J 29/52

U.S. Cl. 315-383

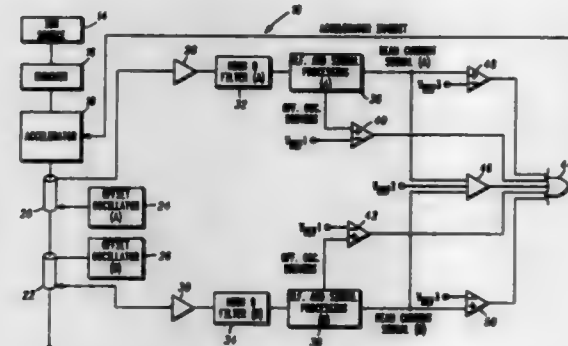
18 Claims

14. A beam current limiter system for limiting beam current magnitude in a bunched charged particle accelerator so that the beam current is inhibited if the beam current exceeds a predetermined limit, said beam current limiter comprising:

- first and second capacitive pickup electrodes for independently developing separate alternating current beam magnitude signals indicative of the beam current sensed by each said electrode;

first and second offset oscillators for developing and injecting into each of said first and second pickup electrodes, respectively, an alternating current offset signal having a frequency displaced, by a predetermined amount, from the bunching frequency of the accelerator or some preselected harmonic thereof;

first and second signal processing means associated, respectively, with said first and second pickup electrodes and said first and second offset oscillators and responsive to said alternating current beam magnitude signals and said alternating current offset signals for producing, with respect to each of said first and second electrodes, a first variable direct current signal indicative of the magnitude of said offset signal and a second variable direct current signal indicative of the beam current magnitude sensed by the respective ones of said first and second electrodes;



first comparators means for comparing the first variable direct current signals generated by said first and second signal processing means to a known reference to develop an inhibiting signal if the first variable direct current signal developed by either said first or second signal processing means does not exceed said first reference;

second comparator means for comparing said second variable DC signals of said first and second signal processing means against each other to develop an inhibit signal if the absolute difference between said second variable DC signals of said first and second signal processing means exceeds a second predetermined threshold; and

third comparator means for independently comparing said second variable DC signals of said first and second signal processing means against a third predetermined threshold to develop an inhibit signal if the second variable DC signal of either said first or second signal processing means exceeds said third pre-established threshold.

5,440,211

# ELECTRON ACCELERATOR HAVING A COAXIAL CAVITY

Yves Jongen, Louvain-La-Neuve, Belgium, assignor to Ion Beam Applications Societe Anonyme, Louvain-La-Neuve, Belgium  
PCT No. PCT/BE92/00023, § 371 Date Dec. 20, 1993, § 102(e) Date Dec. 20, 1993, PCT Pub. No. WO92/22190, PCT Pub. Date Dec. 10, 1992

PCT Filed May 27, 1992, Ser. No. 142,448

Claims priority, application Belgium, May 29, 1991, 09100516

Int. Cl.<sup>6</sup> H05H 7/00

U.S. Cl. 315-500

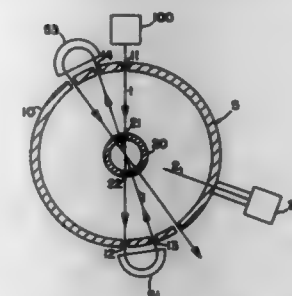
7 Claims

1. An electron accelerator comprising:

- a first source for generating a first beam of electrons to be accelerated;
- a cavity defined by an outer cylindrical conductor and an inner cylindrical conductor, said conductors being coaxial and being joined by flanges at their opposite ends, said cavity having a mid-plane disposed substantially equidistantly from said flanges, said mid-plane being oriented perpendicular with respect to the axis of said conductors, said first electron beam being injected into said cavity at

said mid-plane along a first diameter of said outer conductor;

a second source for generating a second beam of electrons,



said second electron beam being decelerated when it passes through said cavity to thereby provide an electromagnetic field necessary for accelerating said first electron beam.

5,440,212

# CONTROL APPARATUS FOR VIBRATION DRIVEN MOTOR

Hajime Fukui, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

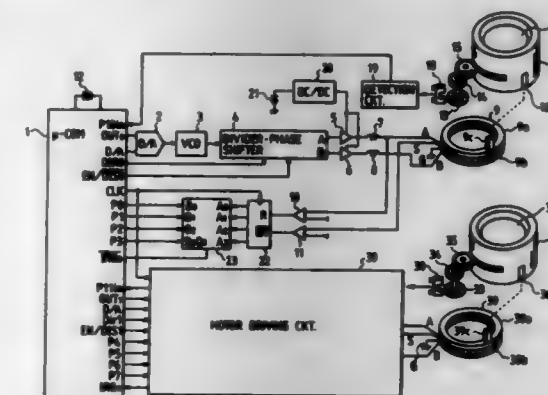
Filed Dec. 21, 1993, Ser. No. 170,838

Claims priority, application Japan, Dec. 24, 1992, 4-344347

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 318-116

9 Claims



1. A control apparatus for controlling a plurality of vibration driven actuators, comprising:

- a control circuit for sequentially and repeatedly performing an operation control process for each of a plurality of simultaneously driven vibration driven actuators;
- a plurality of detection circuits for detecting respective operation states of the plurality of vibration driven actuators, and for generating respective output signals corresponding to the respective operation states of the plurality of vibration driven actuators; and
- interrupt processing means responsive to the respective output signals of said plurality of detection circuits, for causing said control circuit to perform with priority an operation control process for a respective one of the plurality of vibration driven actuators in accordance with a respective output signal from a respective detection circuit.



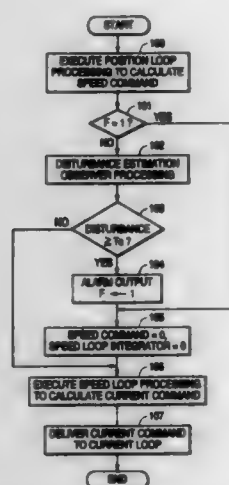
5,440,213

## COLLISION DETECTING METHOD USING AN OBSERVER

Soichi Arita; Tetsuaki Kato, and Osamu Yoshida, all of Oshino, Japan, assignors to Fanuc, Ltd., Yamanashi, Japan  
 Division of Ser. No. 46,896, Apr. 15, 1993, Pat. No. 5,304,906, which is a continuation of Ser. No. 752,648, Aug. 23, 1991, abandoned. This application Jan. 4, 1994, Ser. No. 177,342  
 Claims priority, application Japan, Dec. 26, 1989, 1-334967  
 Int. Cl.<sup>6</sup> G05B 5/00

U.S. Cl. 318—568.11

5 Claims



1. A collision detecting method executed in a data processor for use in a machine in which a driven-body is driven by means of a servomotor controlled by a servo system, comprising the steps of:

- estimating a disturbance torque acting on the servo system using an observer means and a multiplier means based on the servomotor velocity information;
- comparing the disturbance torque estimated in said step a) with a threshold value and determining whether or not the estimated disturbance torque exceeds the threshold value;
- detecting a collision of the driven-body with an obstacle when the estimated disturbance torque exceeds the threshold value of step b); and
- stopping the servomotor for driving the driven-body when the collision is detected in said step c) for preventing further collisions.

5,440,214

## QUIET DRIVE CONTROL AND INTERFACE APPARATUS

Bradford D. Peeters, Costa Mesa, Calif., assignor to Admotion Corporation, Irvine, Calif.

Filed Nov. 15, 1993, Ser. No. 153,128

Int. Cl.<sup>6</sup> H02P 8/00; G09F 11/10

U.S. Cl. 318—685

4 Claims

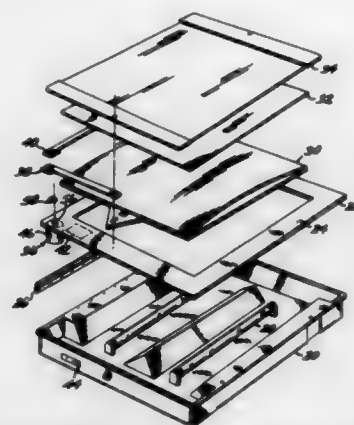
1. A drive control and interface apparatus for exchanging the display of images in an advertising display comprising:

- an image display device for selectively displaying a plurality of sequential images;
- a drive controller having a microprocessor for quietly changing said image in the display of said image display device;
- a stepper motor having a rotor connected in circuit with said drive controller and responsive to said drive controller to quietly rotate said rotor;
- coupling means for connecting the image display device to said rotor;
- a drive control program having a stepper motor drive routine operated by said microprocessor in said drive controller for controlling said stepper motor to cause said rotor to quietly rotate said rotor connected to said display device

by said coupling means to thereby advance said image display to the next sequential image in the display.

4. A method of quietly operating a stepper motor which includes:

- providing a motor driver to generate input current for said stepper motor;
- providing a microprocessor directly connected to said motor driver;
- providing memory linked to said microprocessor;



programming straight line code in said memory for generating predetermined timing for said microprocessor to discretely approximate sinusoidal waveforms; modifying the frequencies of said discretely approximated sinusoidal waveforms during transition between transient and stable operation of said motor; and modifying the magnitude of said discretely approximated sinusoidal waveforms during transition between the transient and stable operation of said motor.

5,440,215

## ELECTRICAL POWER TOOL HAVING A MOTOR CONTROL CIRCUIT FOR INCREASING THE EFFECTIVE TORQUE OUTPUT OF THE POWER TOOL

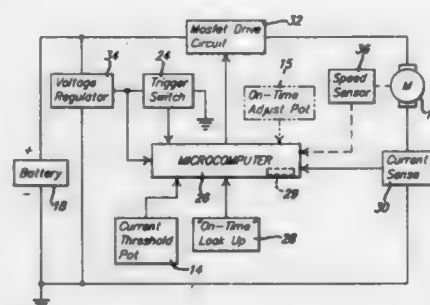
Alan A. Gilmore, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Jul. 6, 1993, Ser. No. 87,932

Int. Cl.<sup>6</sup> H02P 7/00

U.S. Cl. 318—432

38 Claims



1. A power tool having a tool holder, gear means coupled to said tool holder, operator actuable input means, and an electric motor for driving said tool holder via said gear means, said gear means having associated therewith a degree of looseness that must be taken up before torque from said motor is transferred to said tool holder and which further results in said gear means relaxing after power to said motor is interrupted; the improvement comprising:

- current sensing means for sensing a current flow through the motor of the power tool; and
- control means responsive to actuation of said input means

for controlling the power supplied to the motor, and further responsive to said current sensing means for detecting when the current through the motor has exceeded a predetermined current level and thereupon, with said input means actuated, repetitively interrupting and reapplying power to the motor such that the off-time intervals are of sufficient duration to enable the gear means to at least partially relax.

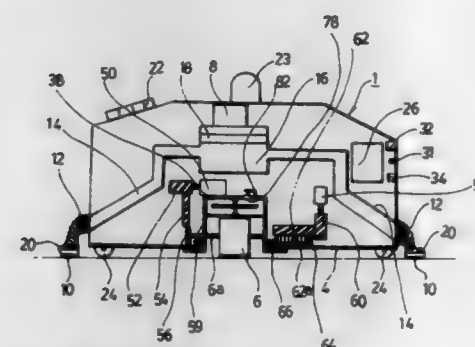
5,440,216

## ROBOT CLEANER

Tae-Sig Kim, Suwon-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea  
 Filed Jun. 8, 1993, Ser. No. 73,398  
 Int. Cl.<sup>6</sup> G05D 1/02

U.S. Cl. 318—587

48 Claims



1. A robot cleaner comprising:
  - a cleaner body;
  - suction means provided in the cleaner body for sucking dirt on a floor;
  - a navigation sensor provided at a top of the cleaner body for sensing a distance and a direction of an obstacle and for outputting a distance sensing signal and a direction sensing signal;
  - driving means provided at a bottom of the cleaner body for moving the cleaner body in a moving direction;
  - control means for determining a cleaning area and a moving direction of the cleaner body in response to the distance sensing signal and the direction sensing signal from the navigation sensor and for outputting a control signal for moving the cleaner body in the moving direction and a control signal for driving the suction means; and
  - sensing means provided at a lower portion of the cleaner body and adapted to sense dirt and output a dirt sensing signal to which said control means responds for generating a control signal to drive the suction means.

5,440,217

## DRIVE MECHANISM FOR AUTOMATED FLOW MEASURING DEVICE

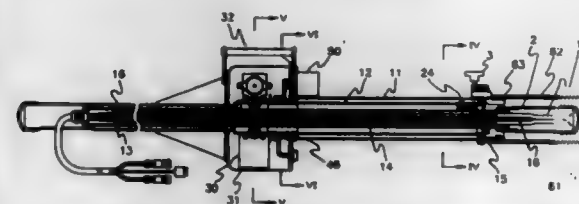
John E. Traina, Glenhew, Pa., assignor to United Sciences, Inc., Gibsonia, Pa.

Filed May 4, 1994, Ser. No. 238,262

Int. Cl.<sup>6</sup> G01F 1/00; G01N 1/22

U.S. Cl. 318—644

7 Claims



1. A drive system for a probe of the type comprising in a first tubular housing contained within a second tubular housing which first tubular housing is advanced into and retracted from

a conduit to take measurements of a fluid within the conduit and which second tubular housing is movably connected to an outer housing which can be connected to the conduit, comprising:

- a friction drive roller which engages the first tubular housing in a manner so that movement of the friction drive roller in one direction will cause the first tubular housing to advance and movement of the friction drive roller in an opposite direction will cause the first tubular housing to retract;
- a stepper motor connected to the friction drive roller and mounted on the second tubular housing;
- a rotational drive motor;
- a timing belt which extends from the rotational drive motor and encircles the second tubular housing for rotational movement of the second tubular housing and the stepper motor attached thereto; and
- at least one roller assembly attached to the second tubular housing and engaging the first tubular housing to guide movement of the first tubular housing relative to the second tubular housing.

5,440,218

## REVERSIBLE SWITCHED RELUCTANCE MOTOR OPERATING WITHOUT A SHAFT POSITION SENSOR

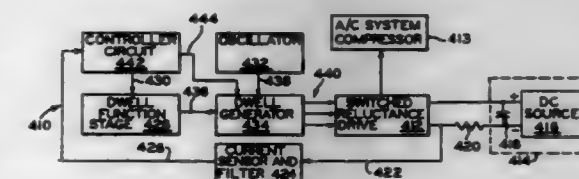
John L. Oldenkamp, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jul. 13, 1994, Ser. No. 274,488

Int. Cl.<sup>6</sup> H02P 7/00

U.S. Cl. 318—701

29 Claims



1. A reversible motor comprising:
  - a stationary assembly and a rotatable assembly in magnetic coupling relation thereto, said stationary assembly including windings adapted to be commutated in at least one preselected sequence so that the rotatable assembly rotates at a desired speed during steady state operation of the motor;
  - a DC link for supplying a current to the windings;
  - a converter for commutating the windings with the current supplied to the windings by the DC link in response to firing pulses;
  - a controller for providing a control signal having a variable parameter representative of the desired speed and direction of rotation of the rotatable assembly;
  - a timing generator responsive to the speed and direction parameter of the control signal for generating a timing signal defining a rate dependent on said parameter, said controller varying the speed and direction parameter to cause the timing generator to vary the defined rate of the timing signal;
  - a current sensor for sensing the current supplied by the DC link and for producing a current signal having a parameter representative of said current; and
  - a dwell generator for providing the firing pulses to the converter at a frequency which is a function of the defined rate of the timing signal;
- wherein the dwell generator varies the duration of each of the firing pulses as a function of the speed and direction parameter of the control signal and of the current parameter of the current signal;
- wherein the dwell generator varies the frequency of the firing pulses as a function of the defined rate of the timing signal; and
- wherein the converter commutates each of the windings for

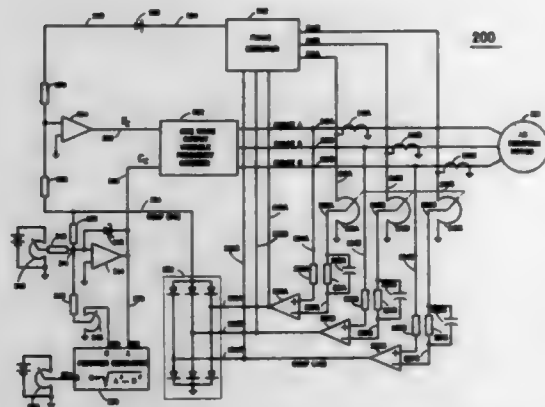
a period of time and at a rate dependent on the duration and frequency of the firing pulses, whereby the speed and direction of rotation of the rotatable assembly are controlled by suitably varying the speed and direction parameter of the control signal.

**5,440,219**  
**INDUCTION MOTOR SPEED CONTROL HAVING IMPROVED SENSING OF MOTOR OPERATIVE CONDITIONS**

Alan W. Wilkerson, c/o The Gemini Company, W61 N14280  
Taunton Ave., P.O. Box 191, Cedarburg, Wis. 53012  
Filed May 21, 1993, Ser. No. 65,604  
Int. Cl.<sup>6</sup> H02P 1/42

U.S. Cl. 318-802

36 Claims



1. A control for controlling the speed of the rotor of an AC induction motor and avoiding regenerative operation of the motor; said motor having a stator winding electromagnetically coupled to the rotor, the stator winding having input terminals by which the motor is coupled to an AC power means; the AC power means providing a stator winding current having an operating frequency to the stator winding of the motor, the magnitude of the stator winding current and its operating frequency being determined by current command and frequency command signals, respectively, for the AC power means; there being a synchronous speed of the motor corresponding to the operating frequency of the stator winding current, said control comprising:

means for providing a signal corresponding to the desired speed of said motor;

means for providing a signal corresponding to the CEMF developed in the stator winding as a result of the flow of the magnetizing current component of the stator winding current through the stator winding, said CEMF signal comprising a frequency command signal for the AC power means for varying the operating frequency of the stator winding current in direct proportion to the magnitude of the CEMF signal, so that the magnetizing current component of the stator winding current, and thus the stator flux, may be maintained at a constant value at all operating frequencies;

regulating means having input means receiving said desired speed signal as a reference signal and said CEMF signal as a feedback signal, said regulating means having an output providing a signal for the AC power source that comprises the current command signal for establishing the magnitude of the stator winding current;

means for ascertaining the load current component of the stator winding current and providing a signal proportional to the magnitude thereof, said load current component signal being applied to said input means of said regulating means in a manner additive to said desired speed signal;

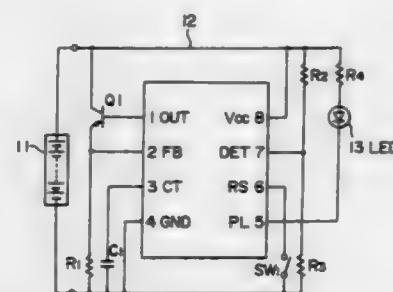
means for determining whether the phase displacement between the CEMF and the stator winding current is less than, or greater than, a predetermined phase displacement

amount, said predetermined phase displacement amount being the phase displacement existing between the CEMF and the stator winding current when the speed of the rotor is at the synchronous speed of the motor; and means for allowing the frequency command signal for the AC power means to be determined solely by the magnitude of the CEMF signal when the phase displacement between the CEMF and the stator winding current is less than the predetermined phase displacement amount and for increasing the frequency command signal for the AC power means when the phase displacement between the CEMF and the stator winding current is greater than the predetermined phase displacement amount, thereby increasing the operating frequency of the stator winding current and avoiding regenerative operation of the motor.

**5,440,220**  
**BATTERY DISCHARGE CONTROL CIRCUIT**  
Syojiro Sato; Koji Umetsu, and Masayoshi Sasaki, all of Miyagi, Japan, assignors to Sony Corporation, Japan  
Continuation of Ser. No. 935,973, Aug. 27, 1992, abandoned.  
This application Aug. 2, 1994, Ser. No. 284,269  
Claims priority, application Japan, Sep. 9, 1991, 3-227992  
Int. Cl.<sup>6</sup> H02J 7/00

U.S. Cl. 320-13

12 Claims



1. A battery discharge control circuit, comprising:  
a timer for generating a timing signal a predetermined time after a secondary battery has been loaded into a battery discharger;  
detecting means for detecting a terminal voltage of said secondary battery;  
a control signal generating circuit which receives an output of the detecting means and an output of the timer, and generates a discharge control signal to discharge said secondary battery when said output of the detecting means indicates said terminal voltage is greater than or equal to a set discharge reference voltage and said output from the timer indicates a predetermined time has elapsed since the secondary battery has been loaded into said battery discharger.

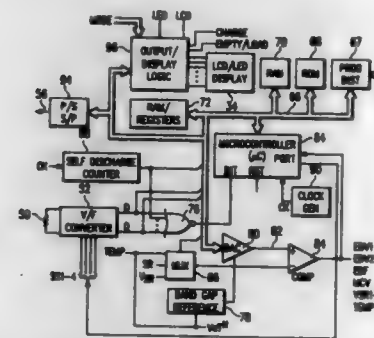
**5,440,221**  
**METHOD AND APPARATUS FOR MONITORING BATTERY CAPACITY WITH CHARGE CONTROL**  
John E. Landau, Dallas; Wallace E. Matthews, Richardson, and David L. Freeman, Plano, all of Tex., assignors to Benchmark Microelectronics, Inc., Dallas, Tex.  
Filed Jul. 8, 1992, Ser. No. 910,688  
Int. Cl.<sup>6</sup> H01M 10/44, 10/46

U.S. Cl. 320-22

15 Claims

1. A battery charge controller for controlling the operation of delivering charge to a battery from a charger, comprising:  
a charging device operating at a defined charge rate to selectively determine the rate of the charging operation of the battery from the charger;  
a battery capacity indicator for providing a charge state of the battery corresponding to the amount of charge stored in the battery relative to a capacity value for the battery,

the capacity value indicative of the total charge that can be stored in the battery;  
a charge control circuit for determining said defined charge rate, said charge control circuit operable to vary said defined charge rate as a function of said charge state in accordance with predetermined criteria, said predetermined criteria requiring said defined charge rate to be at a first charge rate when said charge state is less than a value substantially equal to said capacity value, and requires said defined charge rate to be at a second and lower charge rate after said charge state has reached a value not substantially less than said capacity value, said charge control circuit operating at said second charge rate for a predetermined amount of time during which said charge state has reached a value not substantially less than said capacity value; and  
a capacity determining circuit for determining said capacity value, said capacity determining circuit having:  
a register for storing a charge state value indicative of said charge state,  
a charge monitor for measuring charge input to the battery, said charge monitor incrementing said charge state value when charge is delivered to the battery,  
said incrementing operation of said charge monitor inhibited when said charge state value is substantially equal to said capacity value such that said charge state does not increase substantially above said capacity value,  
a capacity determining device for determining said capacity value by measuring a discharge operation of the battery



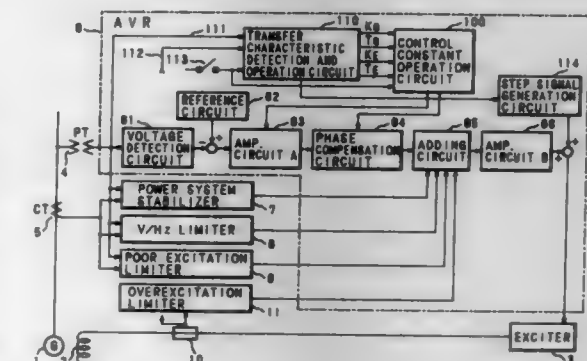
from a predetermined charge state to a fully discharged state, and  
said charge control circuit when operating at said second charge rate for said predetermined amount of time operable to increase said predetermined charge state such that a new capacity value can be generated by said capacity determining device upon a later discharge operation to a fully discharged state.  
9. A method for controlling the operation of delivering charge to a battery from a charger, comprising the steps of:  
providing a charge control circuit to vary the rate at which charge is input to the battery;  
determining a charge state of the battery relative to a capacity value for the battery, the charge state corresponding to the amount of charge stored in the battery and the capacity value indicative of the total charge that can be stored in the battery;  
varying the charge rate of the charge control circuit to a defined charge rate, the defined charge rate being a function of the charge state of the battery that varies in accordance with predetermined criteria, the defined charge rate wherein the charge rate is disposed at a first charge rate when the charge state is less than the capacity value and then disposes the charge rate at a second and lower charge rate when the charge state is determined to be substantially not less than the capacity value, the second charge state operated at for a predetermined amount of time that the charge state is determined to be substantially not less than the capacity value; and

determining the capacity value, comprising the steps of:  
providing a register for storing a charge state value that indicates the charge state,  
monitoring the charge provided to the battery from the charger and incrementing the charge state value in the register during a charging operation, the step of incrementing inhibited when the charge state value is substantially equal to the capacity value,  
measuring a discharge operation of the battery from a predetermined charge state to a fully discharged state to provide the capacity value, and  
the step of operating the charge control circuit at the second charge rate for the predetermined amount of time operable to increase the predetermined charge state such that a fully discharging operation at a later time will vary the capacity value to a new capacity value.

**5,440,222**  
**EXCITATION CONTROL APPARATUS FOR SYNCHRONOUS MACHINE**  
Seiichi Tanaka, and Megumi Fujikawa, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1992, Ser. No. 910,240  
Claims priority, application Japan, Jul. 15, 1991, 3-200118;  
Aug. 26, 1991, 3-213590  
Int. Cl.<sup>6</sup> H02H 7/06; H02P 9/00, 11/00  
U.S. Cl. 322-25

13 Claims



1. An excitation control apparatus for a synchronous machine, comprising:  
an exciter; and  
an automatic voltage regulator means for controlling the output voltage from the synchronous machine so as to coincide with a desired control value by controlling a current output from the exciter to the synchronous machine, the automatic voltage regulator means including:  
a transfer characteristic circuit means for directing and operating respective constants of transfer characteristics of the exciter and the synchronous machine by detecting the output current of the exciter and the output voltage of the synchronous machine; and  
a control constant operation circuit means for operating a control constant for automatic voltage regulation from the constants of the transfer characteristics of the exciter and synchronous machine, and from constants for defining the control specification.



5,440,223

# SWITCHING POWER CIRCUIT WITH REDUNDANT STRUCTURE

Kiyonobu Hayasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

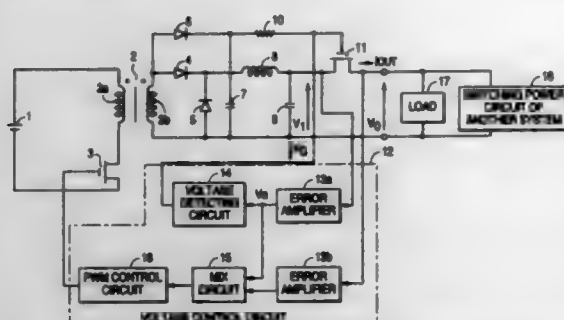
Filed Aug. 30, 1994, Ser. No. 298,432

Claims priority, application Japan, Aug. 30, 1993, 5-235911

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 323-282

2 Claims



1. A switching power circuit with a redundant structure, comprising:

- a back-current obstructing element provided at an output side of said switching power circuit;
- a primary error amplifier connected to an output side of said back-current obstructing element to control a voltage at an output side of said back-current obstructing element;
- a secondary error amplifier connected to an internal side of said back-current obstructing element to control a voltage at an internal side of said back-current obstructing element;
- a field effect transistor being used as said back-current obstructing element so that a source electrode and a drain electrode are connected in a forward direction with respect to an output current; and
- a voltage detecting circuit for detecting an output voltage of said secondary error amplifier to produce an output signal for controlling a gate voltage of said field effect transistor.

5,440,224

# REFERENCE VOLTAGE GENERATING CIRCUIT FORMED OF BIPOLAR TRANSISTORS

Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

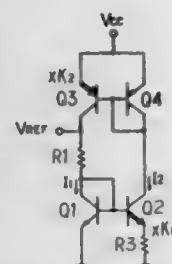
Continuation of Ser. No. 9,631, Jan. 27, 1993, abandoned. This application Nov. 16, 1994, Ser. No. 342,006

Claims priority, application Japan, Jan. 29, 1992, 4-038521

Int. Cl.<sup>6</sup> G05F 3/16

U.S. Cl. 323-313

3 Claims



1. A reference voltage generating circuit comprising:
- a first bipolar transistor;
  - a second bipolar transistor whose emitter area is  $K_1$  times as large as that of said first transistor, where  $K_1 > 1$ ;
  - a first resistor connected to an emitter of said second transistor, said emitter of said second transistor being connected to an emitter of said first transistor through said first resistor;
  - a constant current source for driving said first transistor and

said second transistor, said constant current source being a current mirror circuit comprising a third bipolar transistor and a fourth bipolar transistor;

a collector of said first transistor being connected to a collector of said third transistor through a second resistor;

said collector of said first transistor being connected directly to a base of said first transistor and directly to a base of said second transistor;

emitters of said third and fourth transistors being coupled together;

bases of said third and fourth transistors being coupled together;

said base and a collector of said fourth transistor being coupled together;

a collector of said second transistor being connected to said collector of said fourth transistor;

an emitter area of said third transistor being  $K_2$  times as large as that of said fourth transistor for driving said first transistor at a driving current  $K_2$  times as large as that of said second transistor, where  $K_2 > 1$ ; and

an output being derived from a connecting point of said second resistor and said collector of said third transistor.

5,440,225

# CORE FOR COIL DEVICE SUCH AS POWER TRANSFORMERS, CHOKE COILS USED IN SWITCHING POWER SUPPLY

Hideki Kojima, Tsurugashima, Japan, assignor to Toko Kabushiki Kaisha, Tokyo, Japan

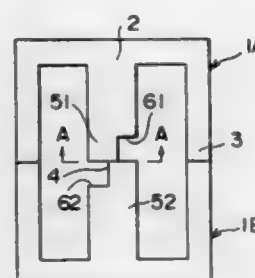
Filed Feb. 24, 1993, Ser. No. 21,867

Claims priority, application Japan, Feb. 24, 1992, 4-017251 U

Int. Cl.<sup>6</sup> H01F 40/04

U.S. Cl. 323-359

13 Claims



1. A core for a switching power supply coil device comprising:

- a first core segment including a plurality of spaced legs having respective distal ends and a center leg having a longitudinal central axis and a distal end defined by an indented portion and a projecting portion;
  - a second core segment including a plurality of spaced legs having respective distal ends and a center leg having a longitudinal central axis and a distal end defined by an indented portion and a projecting portion;
- wherein said first and second core segments are constructed and arranged to oppose each other such that said respective distal ends of said plurality of spaced legs of said first core segment correspond to and closely contact said respective distal ends of said plurality of spaced legs of said second core segment; and
- wherein said first and second core segments are constructed and arranged to oppose each other such that said projecting portion of said first core segment partially contacts said projecting portion of said second core segment, said indented portion of said first core segment opposes and is spaced from said projecting portion of said second core segment, and said indented portion of said second core segment opposes and is spaced from said projecting portion of said first core segment.

5,440,226

# PROCESS AND APPARATUS USING MAGNETIC FIELD MEASUREMENTS FOR MEASURING AN ELECTRIC FIELD IN A CONDUCTIVE MEDIUM

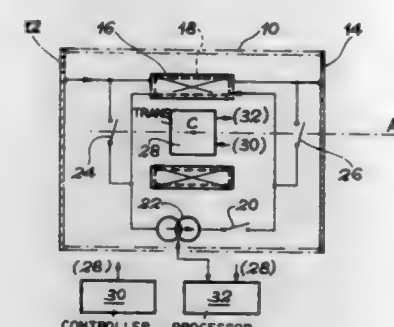
Roland Blanpain, Entre-Deux-Guiers, and Francis Robach, Biviers, both of France, assignors to Commissariat à l'Energie Atomique, France

Filed Oct. 12, 1993, Ser. No. 135,306

Int. Cl.<sup>6</sup> G01R 29/12, 19/00, 15/00; G01V 3/08

U.S. Cl. 324-72

9 Claims



2. Apparatus for measuring an electric field in a conductive medium, said apparatus comprising an insulating enclosure (10), means (12,14) for channeling a current density propagating in the medium and which are integral with the enclosure (10), at least one first coil (16, 16a) in the enclosure and connected to the means (12,14) for channeling a current density to receive current therefrom, said coil having a known electric/magnetic transfer rate, at least one first magnetometric transducer (28,28a) located within said first coil (16) for measuring the magnetic field induced by current in said first coil, means (30,30a) for exciting said magnetometric transducer (28, 28a) and analysis and processing means (32) including storage means and connected to the magnetometric transducer (28) in order to at least determine an electric field.

5,440,227

# MULTI-CHANNEL ELECTROMAGNETICALLY TRANSPARENT VOLTAGE WAVEFORM MONITOR LINK

Wesley A. Rogers, Grosse Pointe Park, Mich., assignor to Electronic Development Inc., Grosse Pointe Park, Mich.

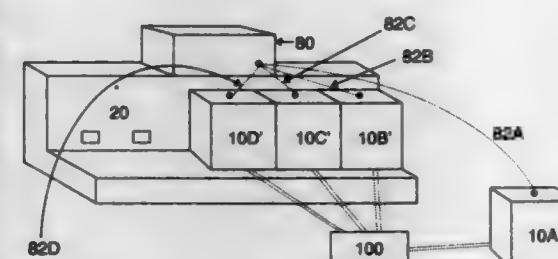
Division of Ser. No. 862,621, Apr. 2, 1992, Pat. No. 5,311,116.

This application Dec. 17, 1993, Ser. No. 169,703

Int. Cl.<sup>6</sup> G01R 31/02

U.S. Cl. 324-72.5

34 Claims



1. Apparatus for use in monitoring the effect of a radiation field on a plurality of test points of a device under test comprising:

- a plurality of transmitters, each of the transmitters converting a respective first sensed voltage signal from one of said test points to a corresponding output optical signal;
- a power supply for providing power to said plurality of transmitters; and
- a base, wherein each of the transmitters is releasably mounted to the base.

5,440,228

# SIMULTANEOUS SIGNALS IFM RECEIVER USING PLURAL DELAY LINE CORRELATORS

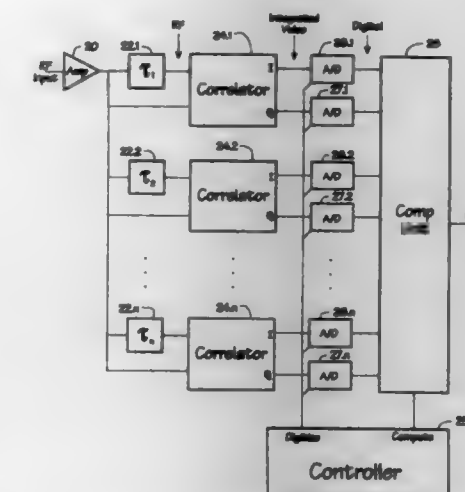
Ralph O. Schmidt, 19964 Mallory Ct., Saratoga, Calif. 95070-4437

Filed Mar. 9, 1994, Ser. No. 208,538

Int. Cl.<sup>6</sup> G01R 23/00

U.S. Cl. 324-76.12

7 Claims



1. A system for detecting a plurality of RF signals and measuring a frequency of each one of said plurality of RF signals applied simultaneously to a first terminal of said system, said system comprising:

- a plurality of delay line correlator means for generating a plurality of video signals from said plurality of RF signals, one video signal for one correlator means, respectively;
- each one of said plurality of delay line correlator means having a delay line, a phase discriminator and a first integrator and a second integrator;
- each said delay line having an input terminal adapted for connection to said first terminal of said system and said delay line having an output terminal connected to an input terminal of said phase discriminator, said phase discriminator having another input terminal connected to said input terminal of said system and said phase discriminator having one output terminal connected to a first terminal of said first integrator and another output terminal connected to an input terminal of said second integrator such that an in-phase component signal and a quadrature-phase component signal of said respective video signal is generated at an output terminal of said first integrator and said second integrator respectively;
- a plurality of A/D converter means for converting each one of said plurality of in-phase and quadrature-phase component signals to a digitized in-phase component signal and a digitized quadrature-phase component signal respectively, one converter for each said first integrator and one converter for each said second integrator;
- said digitized in-phase and quadrature-phase component signals expressed with  $b$  digital bits;
- each said A/D converter having an input terminal connected to an output terminal of said respective integrator, each said converter having a plurality of bits  $b$ , for representing said component voltage signal;
- means operably connected to said A/D converters and in operable combination with delay times selected for said delay lines for computing and displaying from said plurality of digitized in-phase and quadrature phase component signals a plurality of frequency values, one frequency value for each one of said plurality of RF signals applied to said input terminal of said system.

5,440,229

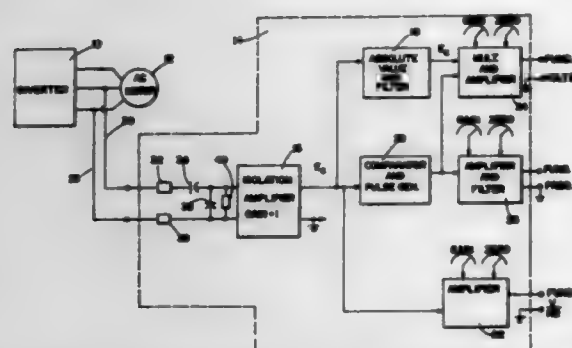
## FUNDAMENTAL VOLTMETER

Robert G. Schieman, Bogart, Ga., assignor to Reliance Electric Industrial Company, Cleveland, Ohio  
Continuation of Ser. No. 82,353, Jun. 24, 1993, abandoned, which is a continuation-in-part of Ser. No. 836,386, Feb. 18, 1992, abandoned. This application Oct. 20, 1994, Ser. No. 326,754

Int. Cl.<sup>6</sup> G01R 19/18

U.S. Cl. 324—76.44

8 Claims



1. Apparatus for measuring various parameters that define the output produced by an inverter comprising means for producing a signal substantially proportional to the fundamental voltage of the output of the inverter divided by the fundamental frequency of the output of the inverter, means for producing a pulse representative of the period of the fundamental frequency of the output of the inverter, said pulse producing means being responsive to said signal produced by said signal producing means, and means for producing a signal substantially proportional to the fundamental voltage of the output of the inverter, said fundamental voltage signal producing means being responsive to said pulse produced by said pulse producing means.

5,440,230

## COMBINATORIAL SIGNATURE FOR COMPONENT IDENTIFICATION

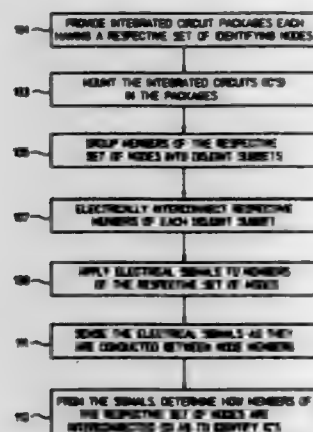
Bruce L. Heftinger, 2481 Richard Ct., Mountain View, Calif. 94043

Filed Apr. 2, 1993, Ser. No. 42,297

Int. Cl.<sup>6</sup> G01R 27/02

U.S. Cl. 324—158.1

12 Claims



1. A method for identifying a range of different integrated circuits comprising the steps of:  
providing a plurality of packages;  
mounting a respective one of the integrated circuits in each package;  
providing a plurality of sets of identifying electrical nodes,

each set of nodes being coupled with a respective one of the packages;  
grouping each set of nodes into disjoint subsets so that at least one of the sets of nodes is grouped into at least three disjoint subsets; and  
providing a plurality of circuit pathways, wherein each circuit pathway electrically interconnects the nodes of a respective one of the disjoint subsets, so as to identify the range of different integrated circuits.

5,440,231

## METHOD AND APPARATUS FOR COUPLING A SEMICONDUCTOR DEVICE WITH A TESTER

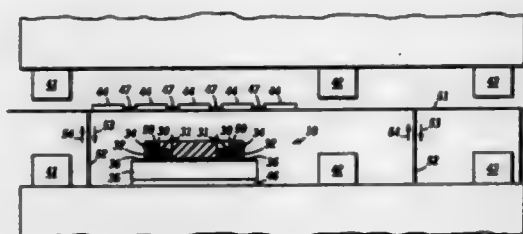
Maureen Sugai, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 19, 1993, Ser. No. 47,901

Int. Cl.<sup>6</sup> G01R 31/02, 1/073

U.S. Cl. 324—158.1

6 Claims



1. A method of coupling a non-singulated packaged semiconductor device with a tester for testing the non-singulated packaged semiconductor device, comprising the steps of:  
providing the non-singulated packaged semiconductor device having at least one leadframe lead and the tester, wherein the tester is coupled to a trim and form apparatus having a transport track and includes a loadboard having conductive traces formed thereon;  
providing a contactor assembly, the contactor assembly comprising a case which has a top side and a bottom side and at least one contactor lead, the at least one contactor lead having a first end projecting from the top side and a second end projecting from the bottom side;  
providing a housing which has at least one side having a recess, the recess having a mouth and a backwall, wherein at least two upper cantilever structures are laterally spaced apart from each other and extend from an upper portion of the backwall towards the mouth, and at least two lower cantilever structures are laterally spaced apart from each other and extend from a lower portion of the backwall towards the mouth;  
mating the contactor assembly to the housing, wherein the first end of the at least one contactor lead is between the at least two upper cantilever structures and the second end of the at least one contactor lead is between the at least two lower cantilever structures;  
mounting the housing to the tester, wherein the second end of the at least one contactor lead contacts a corresponding conductive trace on the tester loadboard;  
transporting the non-singulated packaged semiconductor device to the contactor assembly by means of the transport track;  
placing the non-singulated packaged semiconductor device in contact with the contactor assembly, wherein the at least one leadframe lead contacts the first end of the at least one contactor lead thereby coupling the non-singulated packaged semiconductor device with the tester;  
testing the non-singulated packaged semiconductor device; separating the non-singulated packaged semiconductor device from the contactor assembly; and  
transporting the non-singulated packaged semiconductor device away from the contactor assembly by means of the

transport track, wherein the contactor assembly becomes available to contact another non-singulated packaged semiconductor device.

5,440,232

## SYSTEM FOR MONITORING AND ANALYZING FIELD ENERGY EXPOSURE

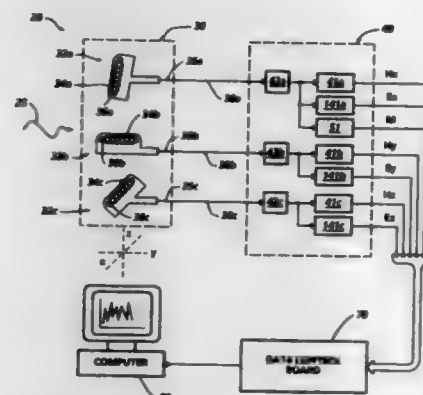
John F. Scarzello, Columbia; Adam C. Feaga, Clarksville, and Daniel S. Lenko, Monrovia, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 6, 1993, Ser. No. 186,711

Int. Cl.<sup>6</sup> G01R 33/02

U.S. Cl. 324—247

3 Claims



1. Apparatus for monitoring and analyzing exposure to ambient energy, including: sensor means for measurement of the ambient energy along plural axes, amplifier means connected to the sensor means for processing said measurement of the ambient energy as electrical signals generated along said axes within different frequency ranges respectively corresponding to exposure of the sensor means within a field of the ambient energy, bandpass filter means connected to the amplifier means for simultaneously channeling the electrical signals processed by the amplifier means within the different frequency ranges; and data processing means connected to the bandpass filter means for correlating the processed electrical signals simultaneously channeled by the bandpass filter means into exposure data respectively corresponding to the different frequency ranges associated with said field of the ambient energy, said amplifier means comprising two series connected low pass amplifying filters through which the electrical signals from the sensor means is processed, said bandpass filter means comprising: two high pass filter stages through which the processed electrical signals within two of the different frequency ranges are respectively channeled to the data processing means from the amplifier means, a third high pass filter stage connected to the data processing means and a low pass filter stage connected in series between said third high pass filter stage and the amplifier means through which the processed electric signals within a third of the different frequency ranges is channeled to the data processing means.

5,440,233

ATOMIC LAYERED MATERIALS AND TEMPERATURE CONTROL FOR GIANT MAGNETORESISTIVE SENSOR  
Rodney T. Hodgson, Ossining; Paul M. Marcus, Briarcliff Manor, and Victor L. Morazzi, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1993, Ser. No. 56,003

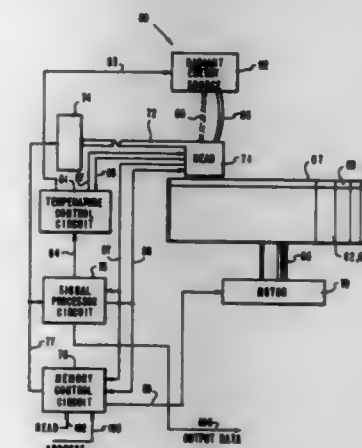
Int. Cl.<sup>6</sup> G01R 33/02; G11B 5/39, 5/12; H01L 43/00

U.S. Cl. 324—252

31 Claims

1. An apparatus for detecting a magnetic field comprising: a material having a critical field  $H_{cr}$  consisting of at least one

type of magnetic atom or ion and at least one type of nonmagnetic atom or ion, said magnetic atoms or ions being regularly arrayed in a crystal interspersed with said nonmagnetic atoms or ions, said magnetic atoms or ions of said material at a predetermined temperature being antiferromagnetically aligned with all nearest neighbor magnetic atoms or ions at first times when said magnetic field to be detected being below the critical field  $H_{cr}$  adjacent said material,



said magnetic atoms or ions of said material at said predetermined temperature being changed to ferromagnetic order at second times when said magnetic field to be detected being increased above a predetermined value whereby the magnetic field in said material being greater than the critical field  $H_{cr}$   
first means for controlling the temperature of said material within a predetermined range, and  
second means for determining whether said material is ferromagnetically ordered.

5,440,234

## FAULT DETECTING CIRCUIT INCORPORATED IN SEMICONDUCTOR SENSOR AND EFFECTIVE AGAINST ANY FAULT HAVING INFLUENCE ON OUTPUT VOLTAGE OF A CIRCUIT COMPONENT OF THE SENSOR

Yuji Kondo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

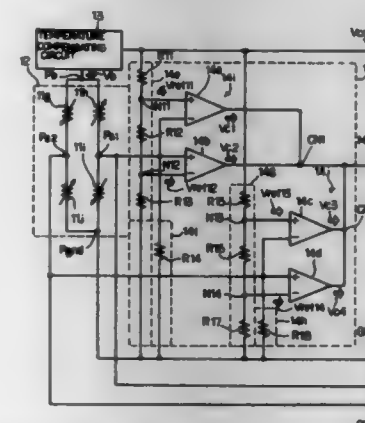
Filed Oct. 7, 1993, Ser. No. 134,029

Claims priority, application Japan, Oct. 7, 1992, 4-268294

Int. Cl.<sup>6</sup> G01R 31/08

U.S. Cl. 324—526

4 Claims



1. A semiconductor sensor comprising:  
a) a sensor unit fabricated on a semiconductor body having



impurity regions formed in deformable semiconductor portions of said semiconductor body and respectively providing piezo resistor elements connected in such a manner as to form a Wheatstone bridge circuit coupled between first and second sources of power voltage, said Wheatstone bridge circuit having a first output node between two of said piezo resistor elements and a second output node between other two of said piezo resistor elements; and

b) a fault detecting circuit including:

b-1) a first comparator having a first inverted node, a first non-inverted node and an output node, said first inverted node being connected with said first output node of said Wheatstone bridge circuit, said first comparator shifting a first output signal to be outputted from the output node thereof from a high level to a low level when the voltage level at said first non-inverted node becomes higher than that at said first inverted node,

b-2) a second comparator having a second inverted node, a second non-inverted node and an output node, said second non-inverted node being connected with said first output node of said Wheatstone bridge circuit, said second comparator shifting a second output signal to be outputted from the output node thereof from the high level to the low level when the voltage level at said second inverted node, the output node of said first comparator being connected with the output node of said second comparator,

b-3) a third comparator having a third inverted node, a third non-inverted node and an output node, said third inverted node being connected with said second output node of said Wheatstone bridge circuit, said third comparator shifting a third output signal to be outputted from the output node thereof from a high level to a low level when the voltage level at said third non-inverted node becomes higher than that at said third inverted node,

b-4) a fourth comparator having a fourth inverted node, a fourth non-inverted node and an output node, said fourth non-inverted node being connected with said second output node of said Wheatstone bridge circuit, said fourth comparator shifting a fourth output signal to be outputted from the output node thereof from the high level to the low level when the voltage level at said fourth inverted node, the output node of said third comparator being connected with the output node of said fourth comparator, said output nodes of said first to fourth comparators being connected with a monitor node,

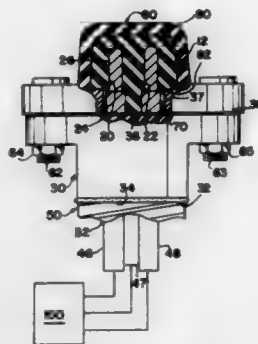
b-5) a first reference voltage generator for producing first and second reference voltage signals respectively supplied to said first non-inverted node of said first comparator and said second inverted node of said second comparator,

b-6) a first highly resistive element coupled between said first output node of said Wheatstone bridge circuit and one of said first and second sources of power voltage,

b-7) a second reference voltage generator for producing third and fourth reference voltage signals respectively supplied to said third non-inverted node of said third comparator and said fourth inverted node of said fourth comparator, and

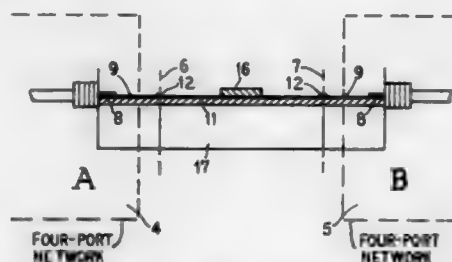
b-8) a second highly resistive element coupled between said second output node of said Wheatstone bridge circuit and said one of said first and second sources of power voltage.

**5,440,235**  
**SUBMERSIBLE PUMP CABLE TEST METHOD**  
Frederick J. Oko, Seymour, Conn., assignor to Hubbell Incorporated, Orange, Conn.  
Division of Ser. No. 11,800, Feb. 1, 1993, Pat. No. 5,338,213.  
This application Mar. 3, 1994, Ser. No. 205,164  
Int. Cl.<sup>6</sup> G01R 31/04; H01R 13/44  
U.S. Cl. 324—538 6 Claims



1. A method of electrically testing a submersible pump cable, comprising the steps of:  
mounting an insulating resilient plug on a pothead connector of the cable having a neck and contacts extending from an end face of the connector such that the contacts of the connector are received within laterally spaced bores extending axially through a connector engaging portion and only partially through a head portion of the plug, that the connector engaging portion snugly couples and seals the plug within the neck, and that the bores snugly couple and seal the contacts to prevent flashover between each contact and other conductive parts of the connector;  
connecting the cable to a test set; and  
performing electrical tests on the cable.

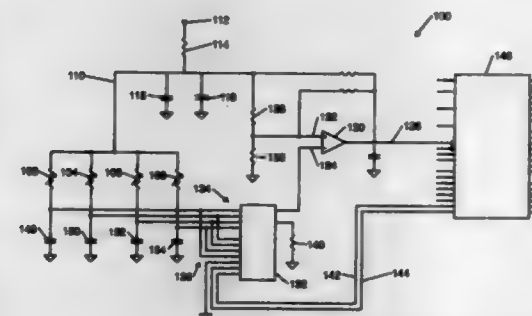
**5,440,236**  
**CALIBRATING A NETWORK ANALYZER BY MAKING MULTIPLE MEASUREMENTS ON A COMMON TRANSMISSION LINE WITH A MOVABLE DISCONTINUITY**  
Burkhard Schiek, Bochum, and Holger Heuermann, Witten, both of Germany, assignors to Rohde & Schwarz GmbH & Co. KG, Munich, Germany  
Filed Apr. 28, 1993, Ser. No. 55,259  
Claims priority, application Germany, May 2, 1992, 42 14 660.7  
Int. Cl.<sup>6</sup> G01R 27/02  
U.S. Cl. 324—601 12 Claims



1. A method for calibrating a network analyzer which has two test ports connectable via lines to an object under test, comprising the steps of: measuring in a first calibrating measurement transmission and reflection parameters on a line of unknown propagation constant which is connected in reflection-free fashion between said two test ports; and with said same line performing three further calibrating measurements on three calibration standards which are realized by discontinuities, that have symmetry of reflection and that are recipro-

cal, inserted in said line at three different positions along said line, said line being always connected to said two test ports during the first and the three further calibrating measurements that thereby provide the complex transmission and reflection factors  $S_{11}$ ,  $S_{22}$ ,  $S_{21}$  and  $S_{12}$ .

**5,440,237**  
**ELECTRONIC FORCE SENSING WITH SENSOR NORMALIZATION**  
Daniel R. Brown, Beaver Creek, and Philip D. Biehl, Tigard, both of Oreg., assignors to InControl Solutions, Inc., Clackamas, Oreg.  
Filed Jun. 1, 1993, Ser. No. 69,717  
Int. Cl.<sup>6</sup> G04F 10/00; G01L 7/04  
U.S. Cl. 324—601 13 Claims

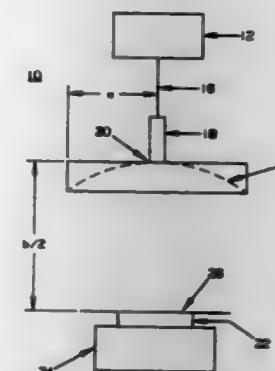


1. A method of acquiring data from an individual electronic sensor of a specific type during external stimulus of the individual sensor to correct in-use for variations in sensitivity among sensors of the specific type, the method comprising:  
providing a general characteristic transfer function indicative of the sensors of a specific type;  
reading a baseline response of the specific sensor in an absence of external stimulus that is indicative of its transfer characteristics;  
while an external stimulus is applied to the sensor, reading an activated response value exhibited by the sensor;  
determining a specific transfer function for the individual sensor by applying the baseline response to the general characteristic transfer function; and  
applying the specific transfer function to the activated response value to determine an indication of the magnitude of the applied external stimulus, thereby correcting in-use for variations in sensitivity among sensors of the specific type.

**5,440,238**  
**SURFACE PROPERTY DETECTION APPARATUS AND METHOD**  
Jon S. Martens, Albuquerque, N. Mex.; David S. Ginley, Evergreen, Colo.; Vincent M. Hietala, Placitas, and Neil R. Sorensen, Albuquerque, both of N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.  
Continuation-in-part of Ser. No. 789,225, Nov. 7, 1991, Pat. No. 5,239,269. This application Sep. 21, 1992, Ser. No. 948,535  
Int. Cl.<sup>6</sup> G01N 22/00  
U.S. Cl. 324—636 3 Claims

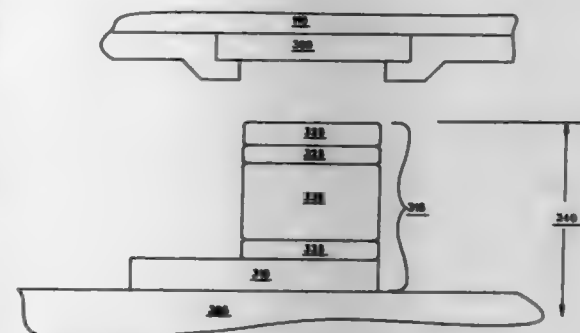
1. A method for detecting corrosion on the surface of a remote conductive sample, the method comprising the steps of:  
forming a modified confocal resonator comprising a reflecting surface spaced from the sample;  
generating electromagnetic radiation at the resonant frequency of the resonator in the frequency range of  $10^9$  to  $10^{12}$  Hz;  
detecting changes in the complex permittivity of the surface

of the remote conductive sample from the electromagnetic radiation; and



detecting the corrosion as a function of the change in complex permittivity,

**5,440,239**  
**TRANSFERABLE SOLDER BUMPS FOR INTERCONNECT AND ASSEMBLY OF MCM SUBSTRATES**  
Pierino I. Zappella, Garden Grove, and William R. Fewer, Diamond Bar, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.  
Filed Apr. 25, 1994, Ser. No. 232,969  
Int. Cl.<sup>6</sup> G01R 1/04; C25D 5/02; H01C 23/48, 29/44  
U.S. Cl. 324—757 20 Claims



1. A semiconductor test device comprising:  
(a) a substrate;  
(b) an interface contact module connected to the substrate wherein the interface contact module comprises  
(1) an electrical contact pad on the substrate;  
(2) a protected conductor surface on said electrical contact pad,  
(3) a reflowable solder module on said protected conductor surface, and  
(4) an electrical contact pad on said reflowable solder module.

5,440,340

**Z-AXIS INTERCONNECT FOR DISCRETE DIE BURN-IN FOR NONPACKAGED DIE**

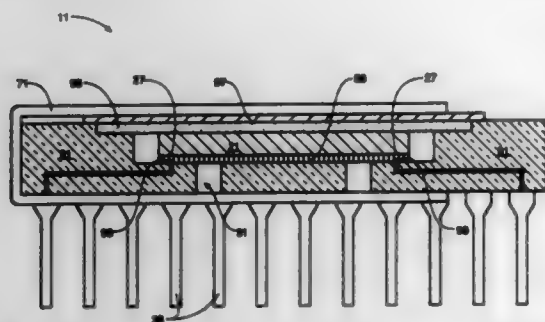
Alan G. Wood, Boise; Warren M. Farworth, Nampa, and David R. Hembree, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 709,858, Jun. 4, 1991, abandoned. This application Nov. 5, 1991, Ser. No. 788,065. The portion of the term of this patent subsequent to Apr. 12, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G01R 31/02

U.S. Cl. 324—765

20 Claims



18. Discrete testing apparatus for testing a semiconductor integrated circuit in device die form, comprising:

- a first plate;
  - a die-receiving cavity in the first plate for receiving a semiconductor die;
  - a second plate mating with the first plate;
  - one of the first and second plates having a plurality of ohmic contacts thereon;
  - the plurality of ohmic contacts being positioned so that when the die is positioned in the die-receiving cavity, the ohmic contacts are in alignment with contact locations on the die, the ohmic contacts thereby establishing an electrical connection with the die at the contact locations;
  - a pad which is electrically conductive in a z-axis, normal to a plane of the pad, and which provides electrical isolation across the plane of the pad, the pad being positioned over the die between the die and the plurality of ohmic contacts;
  - electrical connector terminals in electrical communication with the ohmic contacts, the electrical connector terminals being mounted to the one of said plates;
  - an elastomeric strip, mounted within the die receiving cavity cooperating with said pad to bias the die in the die receiving cavity with the ohmic contacts after the first and second plates have been mated, and to apply sufficient pressure between said pad and said contact locations on the die to establish ohmic contact between said pad and said contact locations on the die
- said elastomeric strip formed of a material that exerts an electrostatic attraction on the die.

5,440,241

**METHOD FOR TESTING, BURNING-IN, AND MANUFACTURING WAFER SCALE INTEGRATED CIRCUITS AND A PACKAGED WAFER ASSEMBLY PRODUCED THEREBY**

Jerrold L. King, Boise; Jerry M. Brooks, Caldwell; Warren M. Farworth, Nampa, and George P. McGill, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Mar. 6, 1992, Ser. No. 847,621

Int. Cl.<sup>6</sup> G01R 1/00

U.S. Cl. 324—765

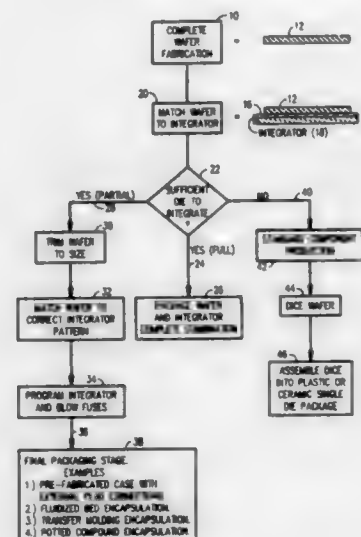
5 Claims

1. A method for testing and burning-in dice on a silicon wafer and for packaging the wafer, which comprises the steps of:

- forming die contacts on said dice for receiving test and burn-in signals,
- forming a mating substrate out of a material having a

temperature coefficient of expansion matching that of said silicon wafer, and having an interconnect pattern with contacts in a geometrical configuration matching the geometrical configuration of said die contacts on said dice,

- bringing said substrate contacts into physical and electrical connection with said die contacts,
- applying test and burn-in signals to said die contacts by way of said substrate contacts,



- maintaining said mating substrate and silicon wafer permanently in place after testing and burn-in of said silicon wafer,
- packaging said mating substrate and silicon wafer into a packaged assembly by encapsulation of said substrate and wafer with an encapsulating material, and
- using said wafer in memory applications with said mating substrate supporting said silicon wafer and electrically connecting said die contacts to external circuitry for providing read/write and control operations.

5,440,242

**CMOS PULL-UP INPUT NETWORK**

Antonio Imbruglia, Catania, and Giovanni Benenati, San Giovanni la Punta, both of Italy, assignors to Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno, Catania, Italy

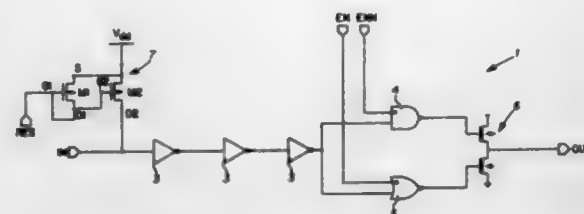
Filed May 26, 1993, Ser. No. 67,226

Claims priority, application European Pat. Off., May 27, 1992, 92830269

Int. Cl.<sup>6</sup> H03K 17/16

U.S. Cl. 326—33

32 Claims



1. A CMOS logic circuit having inputs biased to a predetermined logic level and comprising at least one signal input and logic gates for handling said signal, and a circuit portion connected to said signal input and including a transistor, coupled between the signal input and a voltage supply terminal, that is biased to operate in a linear mode, the transistor being configured to bias the signal input to the predetermined logic level.

5,440,243

**APPARATUS AND METHOD FOR ALLOWING A DYNAMIC LOGIC GATE TO OPERATION STATICALLY USING SUBTHRESHOLD CONDUCTION PRECHARGING**

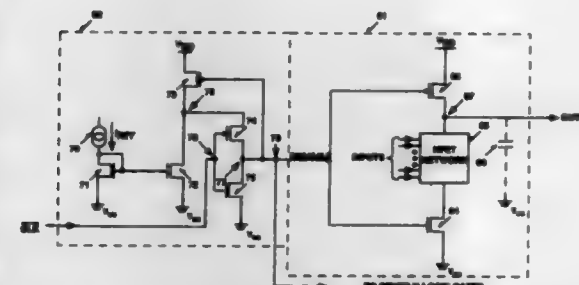
Richard F. Lyon, Los Altos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 124,820, Sep. 21, 1993, abandoned. This application Aug. 24, 1994, Ser. No. 295,157

Int. Cl.<sup>6</sup> H03K 19/003

U.S. Cl. 326—33

31 Claims



1. The combination of a clock driver circuit and a dynamic logic circuit having an output, wherein

- the logic circuit includes a precharge transistor that charges the output of the logic circuit to a first voltage level; and
- the clock driver circuit provides a clock signal that provides a second voltage level and a third voltage level; wherein
  - the second voltage level turns on the precharge transistor; and
  - the third voltage level is less than one threshold different from the first voltage level and causes the precharge transistor to operate in the subthreshold conduction region.

5,440,244

**METHOD AND APPARATUS FOR CONTROLLING A MIXED VOLTAGE INTERFACE IN A MULTIVOLTAGE SYSTEM**

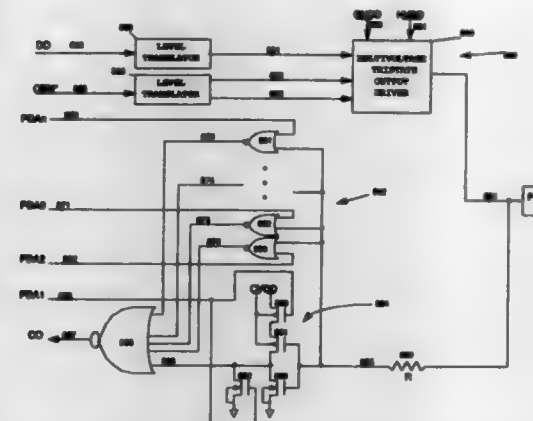
Bryan M. Richter, Fremont; Stephen A. Smith, Palo Alto; Mike Assar, Morgan Hill; Abdul Q. Kashmiri; Jerry L. Clark, both of Fremont, and Dave M. Singhal, San Jose, all of Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 16,574, Feb. 10, 1993, Pat. No. 5,300,835. This application Nov. 8, 1993, Ser. No. 149,061

Int. Cl.<sup>6</sup> H03K 19/0175

U.S. Cl. 326—37

17 Claims



1. A receiver for receiving signals along an input line, said receiver being within an integrated circuit having core cir-

cuitry operating at a core voltage power level, said receiver comprising:

- a first NOR gate having a first input connected to said input line and a second input connected to a first gate enable line, said first NOR gate having a triggering level set to a first triggering level;
  - a second NOR gate having a first input connected to said input line and a second input connected to a second gate enable line, said second NOR gate having a triggering level set to a second triggering level;
  - a third NOR gate having first and second inputs connected to outputs of said first and second NOR gates respectively, and an output connected to an output line connected to the core circuitry of the integrated circuit; said first, second and third NOR gates being powered at said core voltage power level; and
- means for transmitting a NOR gate enable signal to one of said first and second NOR gates along a respective gate enable line for enabling one of said first and second NOR gates.

5,440,245

**LOGIC MODULE WITH CONFIGURABLE COMBINATIONAL AND SEQUENTIAL BLOCKS**

Douglas C. Galbraith, Fremont; Abbas El Gamal, and Jonathan W. Greene, both of Palo Alto, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

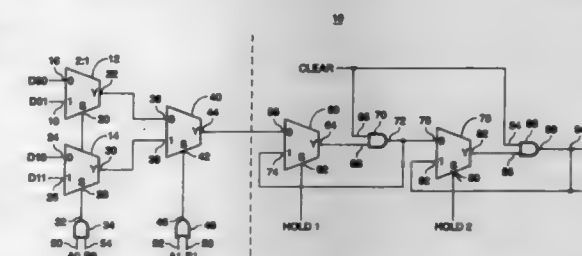
Continuation of Ser. No. 773,353, Oct. 7, 1991, Pat. No. 5,198,705, which is a continuation of Ser. No. 522,232, May 11, 1990, Pat. No. 5,055,718. This application Mar. 9, 1993, Ser. No. 28,789

The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> H03K 19/177

U.S. Cl. 326—38

11 Claims



1. A universal combinatorial logic module comprising:
  - a first multiplexer having a first input, a second input, a select input and an output;
  - a second multiplexer having a first input, a second input, a select input and an output;
  - a third multiplexer having a first input connected to said output of said first multiplexer, a second input connected to said output of second multiplexer, a select input and an output;
  - a first single logic level gate having a first input and a second input and an output, said output of said first single logic level gate connected to said select input of said first multiplexer; and
  - a second single logic level gate having a first input, a second input and an output, said output of said second single level logic gate connected to said select input of said third multiplexer.



5,440,246

# PROGRAMMABLE CIRCUIT WITH FUSIBLE LATCH

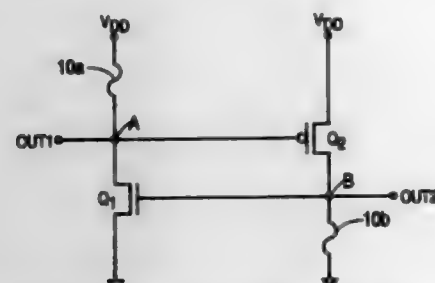
Michael A. Murray, Li-Chun Li, both of Los Gatos, and Hsing T. Tsan, Cupertino, all of Calif., assignors to Mosel Vitelic, Incorporated, San Jose, Calif.

Filed Mar. 22, 1994, Ser. No. 216,208

Int. Cl.<sup>6</sup> H03K 19/096

U.S. Cl. 326—38

3 Claims



1. A programmable logical latch circuit for controlling another circuit, comprising:

- a first output lead and a second output lead;
  - a first fuse having a first terminal coupled to a supply voltage terminal and a second terminal coupled to said first output lead;
  - a first transistor of a first conductivity type having a first terminal coupled to said first output lead, a second terminal coupled to ground, and a gate coupled to said second output lead;
  - a second fuse having a first terminal coupled to said second output lead and a second terminal coupled to ground; and
  - a second transistor of a second conductivity type; having a first terminal coupled to said supply voltage terminal, a second terminal coupled to said second output lead, and a gate coupled to said first output lead;
- wherein said logical latch circuit, without any additional circuitry being required, is capable of assuming a first state if both said first and second fuses are intact and of assuming a second state if both said first and second fuses are opened.

5,440,247

# FAST CMOS LOGIC WITH PROGRAMMABLE LOGIC CONTROL

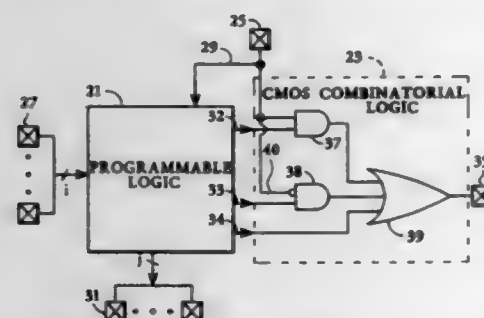
Cecil H. Kaplinsky, 140 Melville Ave., Palo Alto, Calif. 94301

Filed May 26, 1993, Ser. No. 66,555

Int. Cl.<sup>6</sup> H03K 17/173

U.S. Cl. 326—39

1 Claim



1. A two-stage logic circuit comprising
- a programmable first logic circuit stage having a set of inputs and outputs, said first logic circuit stage being configurable by programming to carry out a specified logic function in response to input signals received by said set of inputs and to provide output signals representing a result of said specified logic function on said outputs of said first logic circuit stage;
  - a fixed combinatorial second logic circuit stage having a first

set of inputs connected to at least some of said outputs of said first logic circuit stage, at least one other direct input in a second set of inputs bypassing said first logic circuit stage and connected directly to said second logic circuit stage, and at least one output, said second logic circuit stage including at least two groups of logic gates arranged in sequence and connected together and to said first set of inputs and also to said at least one other input in a fixed manner by hardwiring to implement a specified combinatorial logic function that is representable in sum-of-products form and to provide a result of said function on said at least one output of said second logic circuit stage, wherein said output signals provided on said outputs of said programmable first logic circuit stage to said first set of inputs of said second logic circuit stage control logic operations of said fixed combinatorial second logic circuit stage upon signals received by said at least one other input connected directly to said second logic circuit stage, and wherein said at least one other input of said second logic circuit stage also forms at least one input to said first logic circuit stage.

5,440,248

# POWER-SAVER DIFFERENTIAL INPUT BUFFER

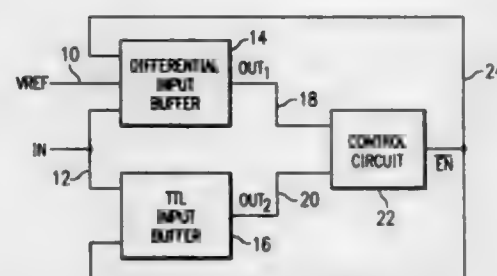
Brian L. Brown, Missouri City, and David R. Brown, Sugarland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 31, 1994, Ser. No. 189,222

Int. Cl.<sup>6</sup> H03K 19/094

U.S. Cl. 326—71

19 Claims



1. An input circuit for a semiconductor device, the circuit comprising:

- a first input buffer, coupled to receive a control signal, an input signal, and a reference signal, for producing a first output signal in response to the control signal and a difference between the input signal and the reference signal;
- a second input buffer, coupled to receive the control signal and the input signal, for producing a second output signal in response to the control signal and the input signal; and
- a control circuit, for producing the control signal, in response to a predetermined output state of at least one of the first or second output signals.

5,440,249

# VOLTAGE LEVEL TRANSLATOR CIRCUIT WITH CASCODED OUTPUT TRANSISTORS

Douglas W. Schucker, Mesa, and Walter C. Seelbach, Fountain Hills, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 3, 1994, Ser. No. 237,570

Int. Cl.<sup>6</sup> H03K 19/0185

U.S. Cl. 326—81

9 Claims

1. A voltage level translator circuit, comprising:
- a first transistor having a gate, a drain and a source, said gate being coupled for receiving a first input signal referenced between first and second operating potentials, said source being coupled for receiving said first operating potential;
  - a second transistor having a gate, a drain and a source, said source being coupled to said drain of said first transistor,

5,440,250

# CLOCK-GENERATING CIRCUIT FOR CLOCK-CONTROLLED LOGIC CIRCUITS

Michael Albert, Freiburg i. Br., Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Germany

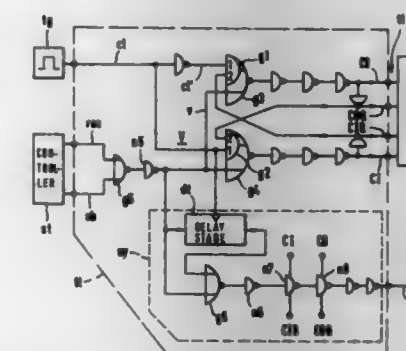
Filed May 26, 1994, Ser. No. 249,861

Claims priority, application Germany, Jun. 26, 1993, 43 21 315.4

Int. Cl.<sup>6</sup> H03K 19/096

U.S. Cl. 326—97

20 Claims

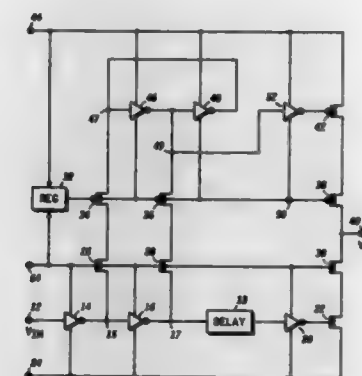


said gate being coupled for receiving said second operating potential;

- a third transistor having a gate, a drain and a source, said drain being coupled to said drain of said second transistor at an output of the voltage translator circuit, said gate being coupled for receiving a third operating potential;
- a fourth transistor having a gate, a drain and a source, said drain being coupled to said source of said third transistor, said source being coupled for receiving a fourth operating potential;

circuit means for translating said first input signal to a second input signal referenced between said third and fourth operating potentials, said second input signal being applied to said gate of said fourth transistor, said circuit means further including,

- (a) a first inverter having an input coupled for receiving said first input signal and having an output at a first node,
- (b) a fifth transistor having a gate, a drain and a source, said gate being coupled for receiving said second operating potential, said source being coupled to said first node,
- (c) a second inverter having an input coupled to said output of said first inverter and having an output at a second node,
- (d) a sixth transistor having a gate, a drain and a source, said gate being coupled for receiving said second oper-



1. In a clock-generating circuit for delivering clock signals to a logic circuit coupled to said clock-generating circuit via clock-signal lines, said logic circuit including decoupling stages which undesirably conduct shunt currents in the absence of said clock signals, the improvement therewith comprising:

- an interlock circuit adapted to receive at least one input signal, wherein said interlock circuit is coupled to said clock-signal lines and responsive to said at least one input signal, for suspending said delivery of said clock signals and for forcing said clock-signal lines into a state causing said decoupling stages to be placed into a shunt-current-free operating state during the absence of said clock signals.

5,440,251

# PHASE DIFFERENTIAL MEASUREMENT CIRCUIT

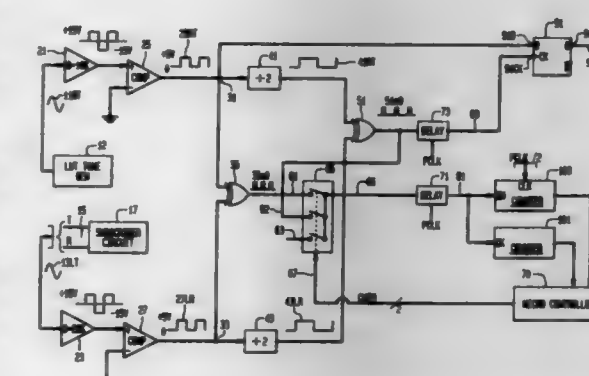
Alex Knight, Danville, Ind., and Richard L. Walsworth, Westlake Village, Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Feb. 9, 1994, Ser. No. 193,817

Int. Cl.<sup>6</sup> G01R 25/00

U.S. Cl. 327—3

4 Claims



1. A circuit for measuring the phase difference between first and second signals comprising:
- first and second conditioning circuits which format said first and second signals into first and second square wave signals;
  - first and second divider circuits to which said first and second square wave signals are applied, and which produce

ating potentials, said source being coupled to said second node,

- (e) a voltage regulator circuit receiving said second and fourth operating potentials for providing said third operating potential,
  - (f) a seventh transistor having a gate, a drain and a source, said gate being coupled for receiving said third operating potential, said drain being coupled to said drain of said fifth transistors, said source being coupled to a third node,
  - (g) an eighth transistor having a gates, a drain and a source, said gate being coupled for receiving said third operating potential, said drain being coupled to said drain of said sixth transistor, said source being coupled to a fourth node,
  - (h) a third inverter having an input coupled to said third node and having an output coupled to said fourth node,
  - (i) a fourth inverter having an input coupled to said fourth node and having an output coupled to said third node, and
  - (j) a fifth inverter having an input coupled to said fourth node and having an output coupled to said gate of said fourth transistors;
- delay circuit having an input coupled to said second node and having an output; and
- a sixth inverter having an input coupled to said output of said delay circuit and having an output coupled to said gate of said first transistor.

third and fourth square wave signals having a frequency which is a fraction of the frequency of said first and second square wave signals;  
 a first exclusive-OR circuit having first and second inputs to which said third and fourth square wave signals are applied, and an output;  
 a delay circuit coupled to the output of said first exclusive-OR circuit and being operative to provide a delayed output of said first exclusive-OR circuit; and  
 a lead/lag flip-flop having a data input coupled to receive said first square wave signal, a clock input coupled to the delayed output of said first exclusive-OR circuit, and an output which provides a logical level output signal representative of whether the phase of said first square wave signal leads or lags the phase of said second square wave signal by less than a prescribed phase delay.

5,440,252

# STATE MACHINE WITH HYSTERESIS FOR DETECTING FREQUENCY OF AN INPUT SIGNAL

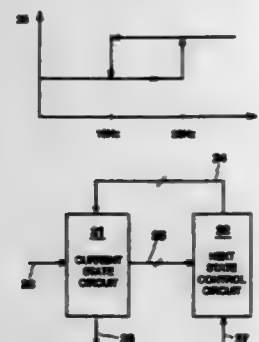
Kun-Ming Lee, Taoyuan, Taiwan, assignor to Acer Peripherals, Inc., Taoyuan, Taiwan

Filed Sep. 13, 1993, Ser. No. 120,972

Int. Cl.<sup>6</sup> H03B 7/06

U.S. Cl. 327-47

14 Claims



1. A state machine with hysteresis for detecting a frequency of an input signal, comprising:
  - a current state circuit, in response to a clock signal and a control signal, for generating a current state signal and a frequency detection signal, said current state signal having a plurality of bits;
  - a next state control circuit, in response to said current state signal and said input signal, for generating said control signal, such that a hysteresis is observed with regard to the relation of said frequency detection signal with respect to the frequency of said input signal.

5,440,253

# SEMICONDUCTOR INTEGRATED COMPARATOR CIRCUIT

Yoshihiro Araya, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1993, Ser. No. 105,809

Claims priority, application Japan, Aug. 26, 1992, 4-227279

Int. Cl.<sup>6</sup> H03K 5/22

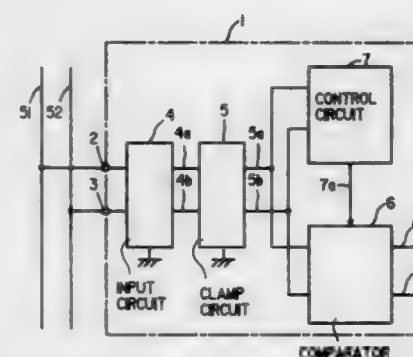
U.S. Cl. 327-69

24 Claims

1. A semiconductor integrated circuit device which is connected to first and second transmission lines for receiving dc voltages of first and second potentials from said first and second transmission lines, respectively, and signals which are superimposed on said dc voltages, said semiconductor integrated circuit device performing detection regarding said dc voltages, said semiconductor integrated circuit device comprising:
  - first input terminal and a second input terminal respectively connected to said first transmission line and said second transmission line;
  - a comparison circuit formed on a semiconductor substrate,

said comparison circuit comprising: a control signal input terminal for receiving a control signal; a first input terminal and a second input terminal respectively coupled to said first and said second input terminals of said semiconductor integrated circuit device to receive potentials which are obtained in accordance with said first and second potentials which are inputted to said first and said second input terminals of said semiconductor integrated circuit device; and an output terminal, said comparison circuit comparing said first potential with said second potential based on a potential difference between its first and its second input terminals and outputting from its output terminal a result of comparison under the control of said control signal;

- a control circuit formed on said semiconductor substrate, said control circuit comprising: a control signal output terminal connected to said control signal input terminal of



said comparison circuit; and a first input terminal and a second input terminal respectively coupled to said first and second input terminals of said semiconductor integrated circuit device to receive potentials which are obtained in accordance with said first and said second potentials which are inputted to said first and said second input terminals of said semiconductor integrated circuit device, said control circuit outputting from its control signal output terminal a first control signal which calls for outputting of said result of comparison from said comparison circuit when a potential difference between its first and said second input terminals is equal to or larger than a predetermined positive level, said control circuit outputting from its control signal output terminal a second control signal which prohibits outputting of said result of comparison from said comparison circuit when said potential difference between its first and its second input terminals is smaller than said predetermined positive level.

5,440,254

# ACCURATE LOW VOLTAGE DETECT CIRCUIT

James T. Smedley, Tracy, Calif., assignor to Exar Corporation, San Jose, Calif.

Filed Oct. 20, 1992, Ser. No. 963,867

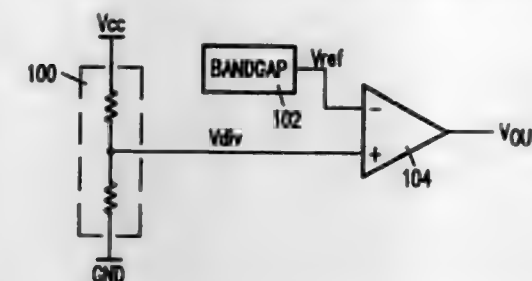
Int. Cl.<sup>6</sup> H03K 5/153

U.S. Cl. 327-79

11 Claims

1. A low voltage detect circuit for accurately detecting a turn-on voltage at a power supply terminal comprising:
  - a bandgap circuit, coupled to the power supply terminal, for generating a stable and constant reference voltage at an output;
  - voltage divider means, coupled between the power supply terminal and a ground terminal, for generating a divided power supply voltage at an output; and
  - comparator means, having a first input coupled to said bandgap circuit output, and a second input coupled to said voltage divider means output, for comparing a voltage

level at said first and second inputs, and asserting an output of the low voltage detect circuit when said divided



power supply voltage is greater than said reference voltage, indicating power-on.

5,440,255

# CIRCUIT FOR THE DETECTION OF A HIGH THRESHOLD OF A SUPPLY VOLTAGE

Richard Fournel, Trets, France, assignor to SGS-Thomson Microelectronics, S.A., Gentilly, France

Continuation of Ser. No. 857,732, Mar. 26, 1992, abandoned.

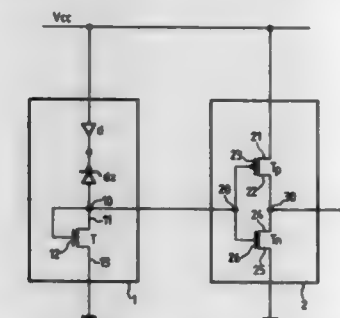
This application May 4, 1994, Ser. No. 237,728

Claims priority, application France, Mar. 28, 1991, 91 03766

Int. Cl.<sup>6</sup> H03K 5/153; H03L 7/00

U.S. Cl. 327-81

9 Claims



1. A circuit for detecting a high voltage limit for a monitored supply voltage, comprising:
  - a first power terminal which carries said monitored supply voltage,
  - a second power terminal,
  - a zener diode having a first terminal thereof connected to said first power terminal and a second terminal thereof connected to an output node, and
  - a resistive element having a first terminal thereof connected to said output node and a second terminal thereof connected to said second power terminal, wherein the voltage at said output node changes when said monitored supply voltage exceeds said high voltage limit; and
  - a logic gate which is powered directly from said first and second power terminals and connected to said output node and configured to be switched when the voltage at said output node changes as said monitored supply voltage exceeds said high voltage limit; wherein said zener diode has a threshold voltage which is higher than a nominal voltage of said monitored supply voltage but less than the voltage of said high voltage limit.

5,440,256

# DUAL MODE TRACK AND HOLD DRIVERS FOR ACTIVE LCD'S

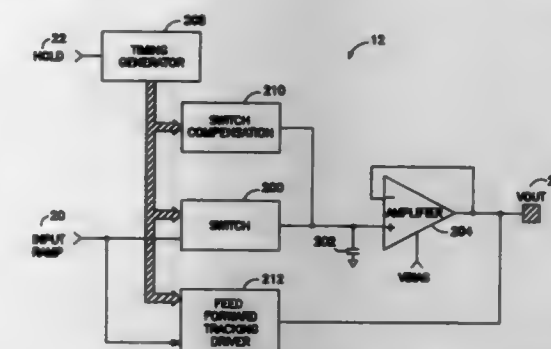
Richard A. Erhart, Chandler, and DeWitt Ong, Tempe, both of Ariz., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 17, 1992, Ser. No. 977,320

Int. Cl.<sup>6</sup> H03K 5/159

U.S. Cl. 327-94

5 Claims



1. A monolithic signal processing system for tracking a variable input signal and holding a signal value representing said variable input signal at a predetermined time, said signal processing system comprising:

- (a) switching means coupled to said variable input signal for sampling said variable input signal, said switching means shifting between a first state and a second state in response to a second input signal;
- (b) capacitor means responsively coupled to said switching means, said capacitor holding said signal value during said second state;
- (c) buffering means coupled to said capacitor means for generating a reproduction of said signal value; and
- (d) tracking means responsively coupled to said switching means and said variable input signal, said tracking means coupling said variable input signal to said generated signal during said first state and decoupling said variable input signal from said generated signal during said second state.

5,440,257

# EDGE-DETECTING PULSE GENERATOR

Shoichi Kawashima, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

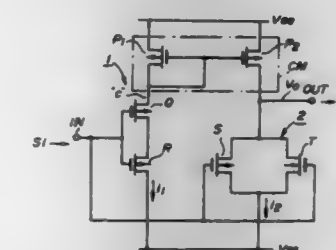
Continuation of Ser. No. 822,281, Jan. 21, 1992, abandoned. This application Nov. 2, 1993, Ser. No. 144,502

Claims priority, application Japan, Jan. 21, 1991, 3-05358

Int. Cl.<sup>6</sup> H03K 3/00, 17/16

U.S. Cl. 327-100

13 Claims



1. A pulse generator comprising:
  - a first current control circuit;
  - a first transistor having a source coupled to a first power supply line via said first current control circuit, a drain and a gate;
  - a second transistor having a gate connected to the gate of said first transistor, a drain connected to the drain of said first transistor, and a source connected to a second power supply line;



supply line, said second transistor having a conduction type different from that of said first transistor; an input terminal connected to the gates of the first and second transistors, an input signal being applied to the input terminal; and an output terminal directly connected to the first current control circuit, an output pulse indicative of a transient change in the input signal being output via the output terminal, said first current control circuit including a current-mirror circuit, said current-mirror circuit including

- a third transistor having a source connected to the first power supply line, a drain connected to the source of said first transistor and a gate connected to the source of said first transistor; and
- a fourth transistor having a source connected to the first power supply line, a drain connected to the output terminal, and a gate connected to the gate of said third transistor; and
- a second current control circuit connected between the drain of said fourth transistor and the second power supply line, said second current control circuit including: a fifth transistor having a source connected to the drain of said fourth transistor, a drain connected to the second power supply line, and a gate connected to the input terminal; and
- a sixth transistor having a drain connected to the drain of said fourth transistor, a source connected to the second power supply line, and a gate connected to said first input terminal.

5,440,358

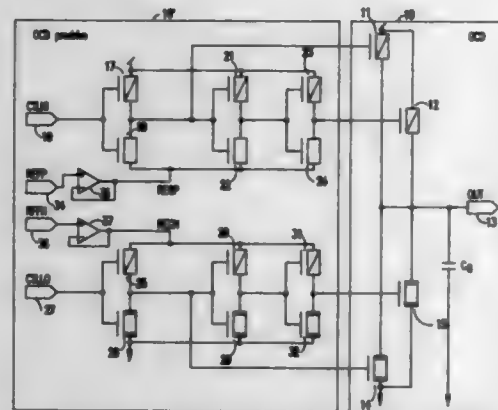
# OFF-CHIP DRIVER WITH VOLTAGE REGULATED PREDRIVE

Duane E. Galbi, Jericho; Russell J. Houghton, Essex Junction; Michael Killian, Burlington, and Adam B. Wilson, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 8, 1994, Ser. No. 193,317  
Int. Cl.<sup>6</sup> H03K 3/01

U.S. Cl. 327-112

12 Claims



1. An off chip driver for an integrated circuit having an off chip driver threshold voltage comprising: an off chip driver circuit having first and second push-pull stages which comprise P-channel and N-channel FETs connected to charge and discharge an output load capacitance; first and second driver stages respectively connected to said P-channel and N-channel FETs; first and second voltage regulators to regulate high and low voltage supplies to the first and second driver stages such that at an external supply voltage above the off chip driver threshold voltage, the first driver stage is supplied with a voltage that is constant with respect to the external supply

voltage and the second driver stage is supplied with a voltage that is constant with respect to ground thereby reducing di/dt noise in said off chip driver; and the first and second voltage regulators providing a constant overdrive voltage and constant gate slew rate over a specified external supply voltage range.

5,440,259

# FREQUENCY STABILIZING CIRCUIT FOR A $\pi/4$ SHIFT QPSK SIGNAL RECEIVERS

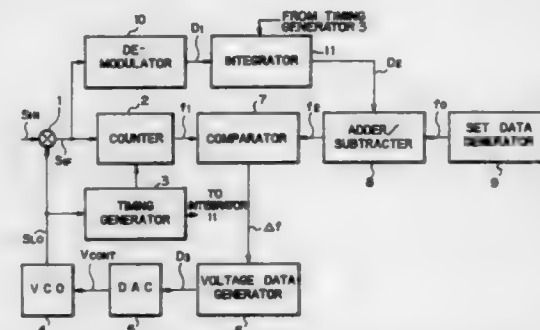
Ryouji Yokomura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 27, 1993, Ser. No. 97,017

Claims priority, application Japan, Jul. 30, 1992, 4-202806  
Int. Cl.<sup>6</sup> H03D 3/04; H03L 7/18

U.S. Cl. 327-160

1 Claim



1. A circuit for stabilizing a frequency of a  $\pi/4$  shift Quadrature Phase Shift Keying (QPSK) signal receiver, comprising: a Voltage Controlled Oscillator (VCO) for outputting an oscillation signal whose frequency changes in response to an analog control voltage applied to said VCO; a mixer having one input connected to said oscillation signal and another input connected to an input  $\pi/4$  shift QPSK signal, said mixer changing a frequency of said input shift  $\pi/4$  shift QPSK signal; a counter for measuring the frequency of the  $\pi/4$  shift QPSK signal output from said mixer; a timing generator having an input connected to said oscillation signal for generating, on the basis of the oscillation signal from said VCO, an output timing signal indicative of an interval during which said counter is to measure the frequency; a set data generator for generating a frequency signal having a predetermined set frequency; a comparator for comparing the frequency measured by said counter and the set frequency of said set data generator to thereby output a resulting frequency deviation signal; a voltage data generator having an input connected to said frequency deviation signal for changing voltage data depending on the frequency deviation signal; a digital-to-analog converter for converting a digital output of said voltage data generator to said analog control voltage; a demodulator connected to an output of said mixer for demodulating the  $\pi/4$  shift QPSK signal from said mixer; an integrator having one input connected to an output of said demodulator and another input connected to said timing generator, said integrator integrating phase shifts output from said demodulator over said interval generated by said timing generator; and an adder/subtractor interposed between said set data generator and said comparator and responsive to said integrator for selectively increasing or decreasing the set frequency of the frequency signal output from said set data generator depending on a cumulative phase shift produced by said integrator and input to said adder/subtractor.

5,440,260

# VARIABLE DELAY CIRCUIT

Yokichi Hayashi, Ohra; Hiroshi Tsukahara; Katsumi Ochiai, both of Gyoda; Masahiro Yamada, Ashikaga, and Naoyoshi Watanabe, Gyoda, all of Japan, assignors to Advantest Corporation, Tokyo, Japan

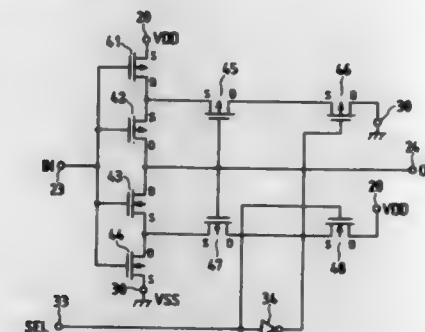
Division of Ser. No. 924,520, Aug. 4, 1992, abandoned. This application Jun. 2, 1994, Ser. No. 253,216

Claims priority, application Japan, Aug. 14, 1991, 3-204365; Nov. 8, 1991, 3-293230; Nov. 8, 1991, 3-293231; Nov. 8, 1991, 3-293232; Nov. 8, 1991, 3-293233; Nov. 29, 1991, 3-098755 U

Int. Cl.<sup>6</sup> H03K 5/13, 19/091

U.S. Cl. 327-278

2 Claims



1. A fine variable delay circuit comprising: a CMOS transistor having two series-connected FETs of different conductivity types, said two FETs having their gates connected together to a signal input terminal and having their drains connected together to a signal output terminal; a first FET connected between one of said two FETs of said CMOS transistor and one end of a power supply and having the same conductivity type as that of said one FET; a second FET connected between the other FET of said CMOS transistor and the other end of said power supply and having the same conductivity type as that of said other FET, said first and second FETs having their gates connected to said signal input terminal; a third FET connected between the connection point of said CMOS transistor and said first FET and the other end of said power supply and having the same conductivity type as that of said first FET, said third FET having its gate connected to said output end of said CMOS transistor; a fourth FET connected between the connection point of said CMOS transistor and said second FET and said one end of said power supply and having the same conductivity as that of said second FET, said fourth FET having its gate connected to said output end of said CMOS transistor; a first switch connected in series to said third FET; a second switch connected in series to said fourth FET; and delay setting means responsive to a select signal to control said gates of said third and fourth FETs, thereby setting a delay.

5,440,261

# ELECTRONIC DEVICE WITH LOW CURRENT CONSUMPTION

Charles Rydel, Paris, France, assignor to Valeo Electronique, Cretell Cedex, France

Filed Mar. 16, 1994, Ser. No. 214,791

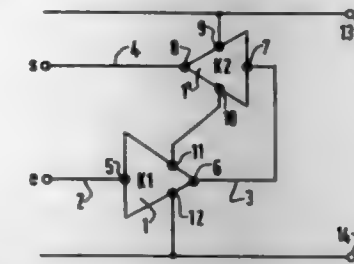
Claims priority, application France, Mar. 19, 1993, 93 03192  
Int. Cl.<sup>6</sup> H03K 5/08, 19/084

U.S. Cl. 327-333

8 Claims

1. An electronic device comprising a subsequent output stage for generating a subsequent stage output signal, at least one preceding stage for generating a preceding stage output signal, each stage having a respective signal input terminal, a respective signal output terminal for said individual stage

generated signals, and voltage supply terminals, the device further including supply terminals of the device, wherein said voltage supply terminals of said stages are connected in series



between said device supply terminals, said signal input and output terminals of at least one of said stages being coupled thereto in cascade.

5,440,262

# HIGH-EFFICIENCY RING/MWL GENERATOR

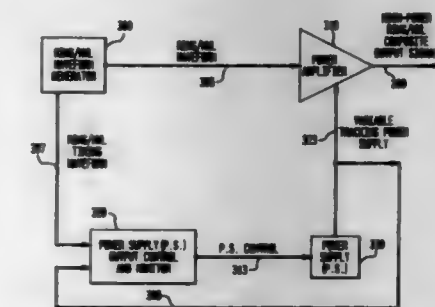
Jack G. S. Lum, Sunnyvale, and Peter Pong, San Jose, both of Calif., assignors to Rolm Company, Santa Clara, Calif.

Filed Aug. 24, 1993, Ser. No. 111,098

Int. Cl.<sup>6</sup> G05F 1/10

U.S. Cl. 327-544

10 Claims



1. A power wave form generator for producing a power waveform which comprises: means for generating a low-level analog signal representing the power waveform; means for generating a timing and control signal indicative of various portions of the low-level analog signal; means, responsive to the timing and control signal, for altering the output of a power supply; and means, responsive to the low-level analog signal and the output of the power supply, for amplifying the low-level analog signal to produce the power waveform.

5,440,263

# VOLTAGE THRESHOLD DETECTION CIRCUIT WITH VERY LOW POWER CONSUMPTION

Richard P. Fournel, Trets, and Laurent Sourgen, Aix-en-Provence, both of France, assignors to SGS-Thomson Microelectronics, S.A., Genthilly, France

Filed Apr. 27, 1993, Ser. No. 53,892

Claims priority, application France, Apr. 30, 1992, 92 05425  
Int. Cl.<sup>6</sup> G05F 1/00

U.S. Cl. 327-546

60 Claims

1. An integrated circuit, comprising: a connection for receiving a power-supply voltage; connections for receiving first and second clock signals; a voltage-detection circuit, powered from said power-supply voltage, having an input node, and connected to provide an output at an output node in a first state when and only when the voltage of said input node passes a predetermined limit voltage; and a charge-transfer circuit, interposed between said power-





controlling the oscillation frequency of the local oscillator when the frequency error signal has been proved to be valid by the first and the second validity signals.

5,440,269

# DIGITAL FM DEMODULATOR HAVING AN ADDRESS CIRCUIT FOR A LOOKUP TABLE

Deog-won Hwang, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

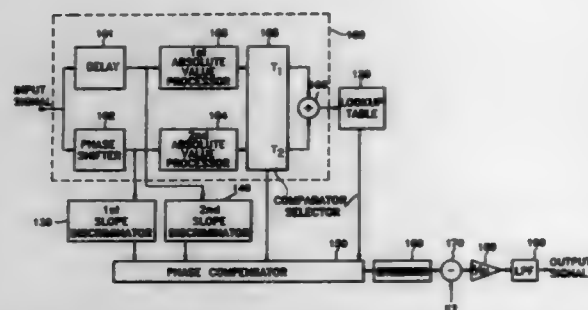
Filed Sep. 8, 1994, Ser. No. 302,212

Claims priority, application Rep. of Korea, Sep. 8, 1993, 93-18014

Int. Cl.<sup>6</sup> H03D 3/02

U.S. Cl. 329-318

15 Claims



13. In a frequency demodulator for restoring a signal which has been frequency-modulated, the frequency demodulator receiving a frequency modulated signal and having a differentiator for differentiating a phase compensated signal, a subtractor for subtracting a carrier-frequency component from a differentiated phase compensated signal so as to cancel the carrier component from the differentiated phase compensated signal and a multiplier for multiplying the subtractor output signal by a reciprocal of a frequency-deviation-determining component to thereby cancel the frequency-deviation-determining component and generate a demodulated signal, a frequency demodulating method comprising the steps of:

- generating a delayed signal and a phase-shifted signal in response to a received said modulated signal;
- comparing first and second values representing said delayed and said phase-shifted signals, respectively, to thereby generate an address signal and a comparison signal;
- converting said address signal to a phase value;
- compensating said phase value in response to first and second slope signals representing said delayed and said phase-shifted signals, respectively, and said comparison signal to thereby generate said phase-compensated signal.

5,440,270

# LINEAR-PHASE FILTER HAVING HIGH GAIN SELECTIVITY

Nello G. Sevastopoulos, San Jose, and Philip T. Karantzalis, Fremont, both of Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

Filed Jul. 14, 1992, Ser. No. 914,205

Int. Cl.<sup>6</sup> H03F 1/32, 3/191

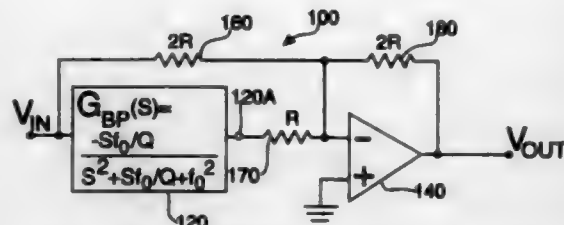
U.S. Cl. 330-107

51 Claims

1. A monolithically integrated filter circuit having an input for receiving an analog input signal  $V_{in}$  and having an output for producing a filtered analog output signal  $V_{out}$ , wherein said filter circuit has a gain, defined by the ratio of  $V_{out}$  to  $V_{in}$ , having a magnitude and a phase dependent upon frequency  $f$ , said filter circuit comprising:

- a first active circuit coupled between said input and output for providing said magnitude, such that the magnitude as a function of frequency includes a pass band in a first frequency range, a stop band in a second frequency range, and a 3 dB cut-off frequency in a transition region therebetween;

said first active circuit causing said magnitude to have a notch, at a notch frequency in the stop band, for improving gain selectivity of the filter circuit in the transition region; and



a second active circuit coupled between said input and output for adjusting the phase to reduce non-linearity in the change in phase as a function of frequency in the pass band, without substantially changing the magnitude.

5,440,271

# INTEGRATED CIRCUIT AMPLIFIER ARRANGEMENTS

Peter G. Laws, Swindon, England, assignor to Plessey Semiconductors Limited, United Kingdom

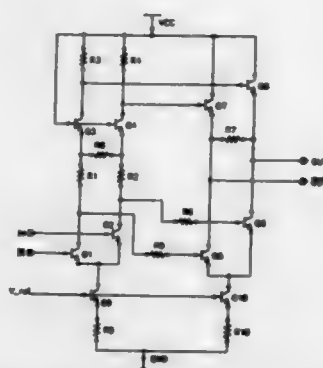
Filed Feb. 2, 1994, Ser. No. 191,281

Claims priority, application United Kingdom, Feb. 17, 1993, 9303138

Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 330-252

4 Claims



1. An integrated circuit amplifier arrangement, comprising: first and second bipolar transistors having their emitter electrodes connected together and to a bias current source to form a differential amplifier stage; third and fourth bipolar transistors having their emitter electrodes connected respectively to the collector electrodes of the first and second transistors by way of respective resistive load means; fifth and sixth bipolar transistors connected as emitter followers between collector circuits of said third and fourth transistors respectively and differential outputs of the amplifier arrangement; and seventh and eighth bipolar transistors having their collector electrodes connected to the emitter circuits of the fifth and sixth transistors respectively and having their base electrodes connected to the collector electrodes of the second and first transistors respectively.

5,440,272

# DIFFERENTIAL AMPLIFIER

Yukihisa Orioka, Tenri, and Junji Tanaka, Sakurai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

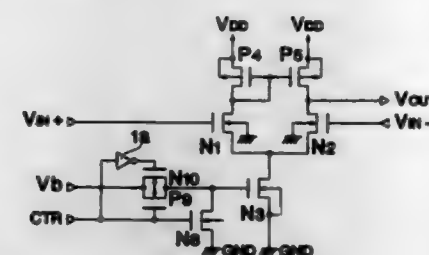
Filed Nov. 30, 1993, Ser. No. 158,985

Claims priority, application Japan, Nov. 30, 1992, 4-320108; Aug. 31, 1993, 5-216693

Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 330-253

19 Claims



11. A differential amplifier, comprising: a noninverting input transistor including a gate for receiving a first input signal; an inverting input transistor including a gate for receiving a second input signal; and an output buffer section which includes: an output transistor formed of a MOSFET having a gate connected to a drain of one of the noninverting input transistor and the inverting input transistor and a source connected to a first power source; and an output constant current transistor formed of a MOSFET having a drain connected to a drain of the output transistor, a source connected to a second power source, and a gate supplied with a constant bias voltage; said noninverting input transistor and said inverting input transistor being configured whereby a difference between the first input signal and the second input signal is amplified; and wherein the noninverting input transistor and the inverting input transistor are each formed of a depletion-type MOSFET.

5,440,273

# RAIL-TO-RAIL GAIN STAGE OF AN AMPLIFIER

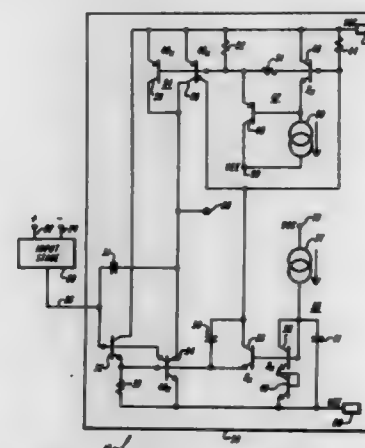
Alex Guseinov, Brighton, and Moshe Gerstenhaber, Newton, both of Mass., assignors to Analog Devices Inc., Norwood, Mass.

Filed Jun. 2, 1994, Ser. No. 252,677

Int. Cl.<sup>6</sup> H03F 3/30

U.S. Cl. 330-267

31 Claims



12. A gain stage for use in an amplifier which provides an output signal, said gain stage comprising: a first transistor having a base, an emitter and a collector, said base being coupled to an input signal applied to said

gain stage and said emitter being coupled to a first voltage source; a second transistor having a base, an emitter and a collector, said collector being coupled to the collector of said first transistor for providing said output signal, said emitter being coupled to a second voltage source; and a translinear bias voltage source coupled to both the base of said first transistor and the base of said second transistor, said bias voltage source operable for defining the collector current of said first transistor and for providing an amplified level shifted drive signal to said second transistor to force an equivalent collector current in said second transistor thereby allowing the output signal to swing substantially between the first and second voltage sources.

5,440,274

# PHASE DETECTOR CIRCUIT AND PLL CIRCUIT EQUIPPED THEREWITH

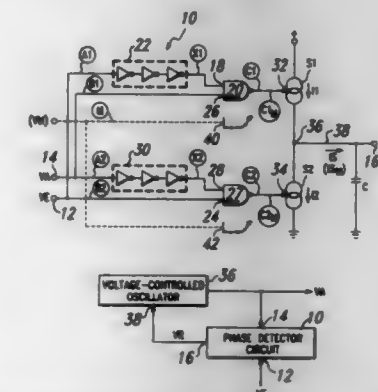
Erich Bayer, Ergolding, Germany, assignor to Texas Instruments Deutschland GmbH, Germany

Filed Nov. 24, 1992, Ser. No. 980,822

Int. Cl.<sup>6</sup> H03L 7/06

U.S. Cl. 331-1 A

4 Claims



1. A phase detector circuit for generating an analog output signal dependent upon the phase difference between two digital input signals, said phase detector circuit comprising: a first input terminal for receiving a first digital input signal; a second input terminal for receiving a second digital input signal independent of the first digital input signal as received by said first input terminal; first and second delay numbers respectively connected to said first and second input terminals for receiving the first digital input signal and the second digital input signal and providing first and second digital signals delayed by the same predetermined propagation time; first and second logic circuits having at least two inputs and an output; the first input of each of said logic circuits being respectively connected to the output of the one of said first and second delay numbers corresponding thereto; the second input of said first logic circuit being connected to said second input terminal; the second input of said second logic circuit being connected to said first input terminal; first and second constant current sources respectively connected to the outputs of said first and second logic circuits; said first and second constant current sources being connected together; a node; an output terminal; said node being disposed in the connection between said first and second constant current sources and being connected to said output terminal; a capacitor having one side connected between said node

and said output terminal and the other side connected to ground;

said first constant current source being responsive to the output signal of the first logic circuit to provide a constant charge current to said capacitor over the duration of said output signal of the first logic circuit;

said second constant current source being responsive to the output signal of the second logic circuit to cause a constant discharge current from said capacitor over the duration of said output signal of the second logic circuit and of a magnitude equal to the constant charge current provided by said first constant current source;

the constant charge current from said first constant current source and the constant discharge current from said capacitor producing a sum current supplied to said capacitor, the sum current supplied to said capacitor being dependent upon the relative durations of the output signals of said first and second logic circuits and being zero when the durations of said output signals are the same; and

the charge voltage of said capacitor being tappable as the analog output signal representative of the phase difference between the phases of the first and second digital input signals and being zero when the first and second digital input signals have phase identity.

5,440,275

# MARKER SWEEP LINEARIZATION SYSTEM AND METHOD

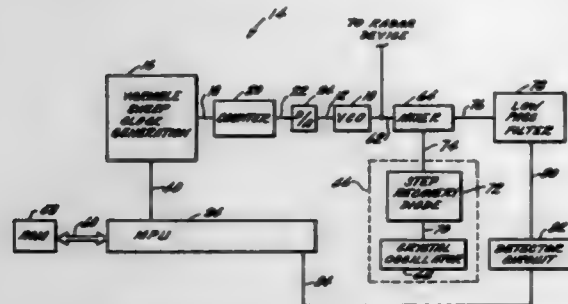
Tom Erb, and Thomas Springer, both of Austin, Tex., assignors to T.N. Technologies Inc., Round Rock, Tex.

Filed Jul. 29, 1994, Ser. No. 282,957

Int. Cl.<sup>6</sup> H03L 7/00, 7/12, 7/16, 7/20

U.S. Cl. 331-4

11 Claims



1. A circuit for linearizing the frequencies of an output signal of a voltage controlled oscillator with time, comprising:

adjustable sweep generator means for generating a control voltage signal, said control voltage signal having an amplitude which changes with respect to time, said control voltage signal being presented to an input of said voltage controlled oscillator;

comb generator means for generating a comb signal having a plurality of harmonic components;

signal mixing means for mixing said output signal of said voltage controlled oscillator with said comb signal to produce a chirp envelope centered about each of said harmonic components of said comb signal;

marker means for generating a marker signal having a plurality of markers, each of said markers being associated with a frequency in a corresponding said chirp envelope; and

means for generating a sweep control signal, in response to said marker signal, which maintains relatively constant spacing between each of said markers, said adjustable sweep generator means being responsive to said sweep control signal to control said amplitude of said control voltage signal.

## 5,440,276 VOLTAGE CONTROLLED OSCILLATING CIRCUIT FOR PREVENTING A LOAD PULLING

Jung H. Kim, Seoul, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Suwon, Rep. of Korea

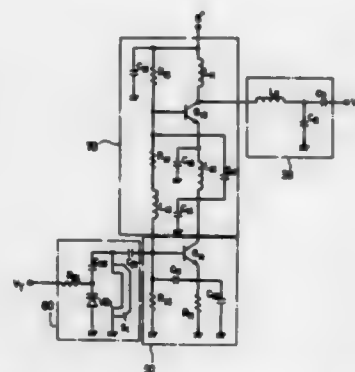
Filed Nov. 24, 1993, Ser. No. 157,707

Claims priority, application Rep. of Korea, Nov. 26, 1992, 92-22447

Int. Cl.<sup>6</sup> H03B 5/00

U.S. Cl. 331-117 FE

1 Claim



1. A voltage controlled oscillating circuit for preventing a load pulling comprising:

a microstrip resonance circuit with its resonance frequency determined by an external tuning voltage;

an oscillation amplifying circuit connected to said microstrip resonance circuit and including an oscillation amplifying transistor having the form of a common collector, with said oscillation amplifying circuit performing oscillations in accordance with resonance frequency signals generated by said microstrip resonance circuit;

a buffer amplifying circuit including a buffer amplifying transistor and connected to the oscillation amplifying circuit in the form of a cascode;

an oscillating signal inducing coil connected between a collector of said oscillation amplifying transistor and an emitter of said buffer amplifying transistor;

a coupling capacitor connected between the collector of said oscillation amplifying transistor and a base of said buffer amplifying transistor and supplying an oscillation signal appearing on the collector of the oscillation amplifying transistor through said oscillating signal inducing coil to the base of said buffer amplifying transistor.

5,440,277

## VCO BIAS CIRCUIT WITH LOW SUPPLY AND TEMPERATURE SENSITIVITY

John F. Ewen, and Mehmet Soyuer, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 2, 1994, Ser. No. 300,505

Int. Cl.<sup>6</sup> H03B 5/04, 5/24; H03K 3/011; H03L 1/00

U.S. Cl. 331-176

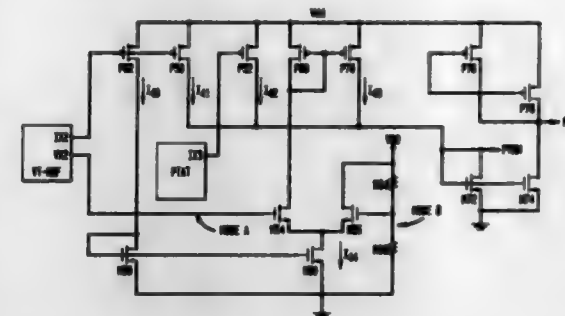
4 Claims

1. A biasing circuit, comprising:

means for generating a first bias current with a first temperature coefficient and a first supply coefficient of delay;

means for generating a second bias current with a second temperature coefficient and a second supply coefficient of delay;

means for generating a third current with a third supply coefficient and third temperature coefficient of delay;



means for summing the first, second and third bias currents to yield an output bias signal having a desired temperature coefficient and supply coefficient of delay.

5,440,278

## FERRITE SYSTEM FOR MODULATING, PHASE SHIFTING, OR ATTENUATING RADIO FREQUENCY ENERGY

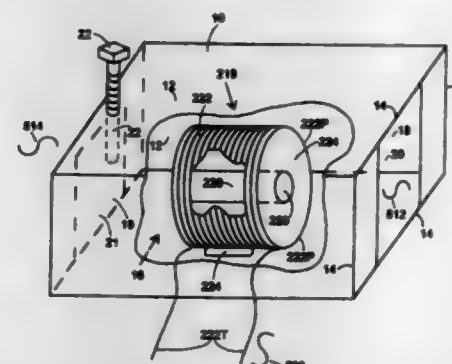
Darin Bartholomew, 1411 S. Algonquin Dr., Schaumburg, Ill. 60193-4846

Filed Mar. 25, 1994, Ser. No. 217,928

Int. Cl.<sup>6</sup> H03C 3/00; H01P 1/175

U.S. Cl. 332-103

30 Claims



1. A ferrite system for manipulating radio frequency energy, said manipulating including shifting the phase of the radio frequency energy, said ferrite system comprising:

a resonator, the resonator having a resonator cross section, a resonator interior, and resonator walls, the resonator cross section selected to permit simultaneous propagation of the radio frequency energy in a first mode and a second mode, the electric field of the first mode oriented substantially perpendicular to the electric field of the second mode;

first coupling means for coupling the radio frequency energy into said resonator interior, said first coupling means being associated with one of said resonator walls;

second coupling means for coupling the radio frequency energy from said resonator interior, said second coupling means being associated with one of said resonator walls;

a ferrite polarizer, the ferrite polarizer having ferrite material, a coil, and dielectric material, the ferrite material mainly or completely disposed in the resonator interior, the dielectric material securing the ferrite polarizer relative to the resonator; and

a protrusion located in the resonator interior, the protrusion being electrically conductive, said protrusion having dimensions and a shape selected to form a reactance over a predetermined frequency range of the radio frequency energy.

5,440,279

## ELECTROMAGNETIC RADIATION CONVERTER

Akira Kinoshita, Osaka, and Yukio Kashima, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

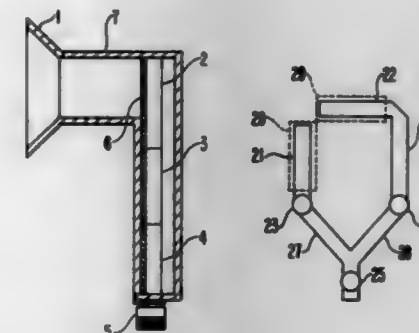
Filed Nov. 24, 1993, Ser. No. 156,819

Claims priority, application Japan, Nov. 24, 1992, 4-313064

Int. Cl.<sup>6</sup> H01P 5/07

U.S. Cl. 333-26

12 Claims



8. An electromagnetic radiation converter for receiving and converting microwave signals having circular or linear polarization, said converter comprising:

a waveguide for receiving said microwave signals, said waveguide capable of transmitting circularly or linearly polarized signals;

a first mode transducer for receiving and converting vertically polarized microwave signals into a corresponding signal on microwave strip line, said first mode transducer disposed in said waveguide;

a second mode transducer for receiving and converting horizontally polarized microwave signals into a corresponding signal on microwave strip line, said second mode transducer disposed adjacent said waveguide and positioned above a slit in a wall of said waveguide so as to receive horizontally polarized microwave signals; and

means for combining the outputs of said first and second mode transducers, said combining means being controllable so as to transmit the output of the first or second mode transducer;

wherein said first and second mode transducers are positioned in said waveguide such that the horizontal and vertical components of a circularly polarized signal are in phase at the outputs of said first and second mode transducers.

5,440,280

## DIGITAL MICROWAVE MULTI-BIT ATTENUATOR

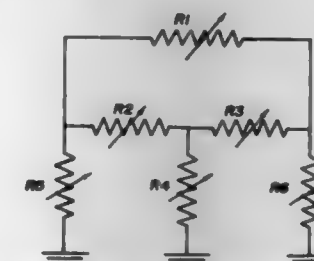
J. L. Martin Lord, North Vancouver, Canada, assignor to MPR Teltech Ltd., Canada

Filed Sep. 17, 1993, Ser. No. 122,361

Int. Cl.<sup>6</sup> H01P 1/22

U.S. Cl. 333-81 R

8 Claims



1. A wideband digital microwave attenuator circuit formed on a semiconductor substrate, comprising:



- (a) a resistive "T" network having a signal input terminal and a signal output terminal; and  
 (b) a resistive "Pi" network having a signal input terminal and signal output terminal such that only the signal input and signal output terminals of said "T" network are connected to the signal input and signal output terminals, respectively, of said "Pi" network, whereby to place said resistive "Pi" network in parallel with said resistive "T" network.

5,440,281

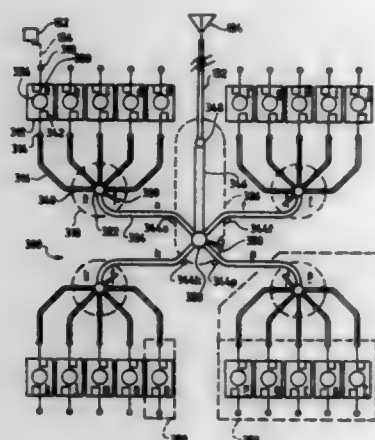
# MULTICHANNEL TRANSMITTER COMBINERS EMPLOYING CAVITIES HAVING LOW OUTPUT IMPEDANCE

Chia-Sam Wey; John M. Stronka, and Erik W. Lilieholm, all of Reno, Nev., assignors to Allen Telecom Group, Inc., Solon, Ohio

Filed Sep. 7, 1993, Ser. No. 118,121  
 Int. Cl.<sup>6</sup> H01P 5/12

U.S. Cl. 333—126

5 Claims



1. A combiner having a lower operating frequency limit and an upper operating frequency limit, said upper and lower limits defining a combiner operating range of frequencies, the combiner constructed and arranged to couple a plurality of transmitters, each operating at a different but closely adjacent frequency, to a single antenna, the combiner comprising:

a plurality of filter means, each having an input port for receiving radio frequency energy from one of a plurality of transmitters, and a resonant frequency corresponding to frequency of operation of one of said plurality of transmitters;

each of said filter means having an output port;  
 each of said filter means constructed and adjusted to have an output impedance such that:

at an operating frequency corresponding to either the lower operating frequency limit or the upper operating frequency limit:

- (i) the output admittance of said filter means when tuned to resonate at the operating frequency has a first real part and a first imaginary part;
- (ii) the output admittance of said filter means when resonating at the operating frequency is transformed through transmission lines, that are not an integral multiple of one-half wavelength at resonance, to have a second real part and a second imaginary part;
- (iii) the combined output admittances, at the operating frequency, of the remainder of said filter means have a third real part and a third imaginary part; and
- (iv) the second imaginary part is equal to the third imaginary part, but is opposite in sign;

impedance transformer means electrically connected to the output ports of each of said filter means, and said impedance transformer means having a single output port;

a radio-frequency energy output means for providing said energy to a single antenna; and  
 said output port of said impedance transformer means being electrically coupled to said radio frequency energy output means.

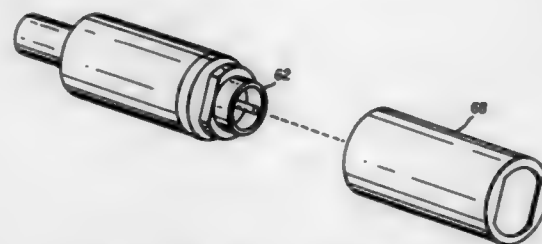
5,440,282

# FILTER STRUCTURE WITH ANTI-ROTATION KEYING Alan E. Devendorf, Baldwinsville, and Jerry Gould, Liverpool, both of N.Y., assignors to Eagle Comtronics, Inc., Syracuse, N.Y.

Filed Mar. 3, 1994, Ser. No. 205,406  
 Int. Cl.<sup>6</sup> H03H 7/01; H01R 13/66

U.S. Cl. 333—185

5 Claims



1. A coaxial filter structure comprising:  
 a circuit board assembly having a terminal extending therefrom, said circuit board assembly including filtering means and being located within a cylindrical filter housing;  
 an end cap including a connector portion which is coaxial with said terminal, said end cap being attached to one end of the filter housing;  
 a cylindrical outer sleeve including an open end and a receiving end, wherein the filter housing is located within the outer sleeve such that the connector portion of the end cap passes through an opening in the receiving end of the outer sleeve; and  
 anti-rotation means for preventing said outer sleeve from rotating with respect to said filter housing, said anti-rotation means comprising a base portion of said connector portion which is keyed to and rotatably locks against an inner periphery of the opening in the receiving end of the outer sleeve.

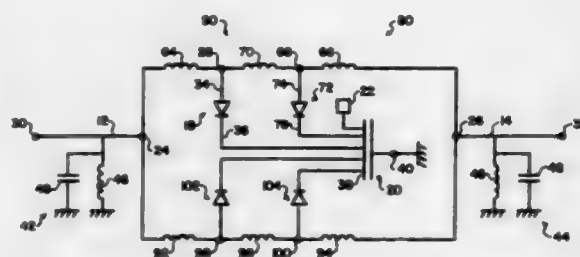
5,440,283

# INVERTED PIN DIODE SWITCH APPARATUS Kenneth J. Nendza, Austin, Tex., assignor to Sierra Microwave Technology, Georgetown, Tex.

Filed Jun. 14, 1994, Ser. No. 259,446  
 Int. Cl.<sup>6</sup> H01P 1/15

U.S. Cl. 333—262

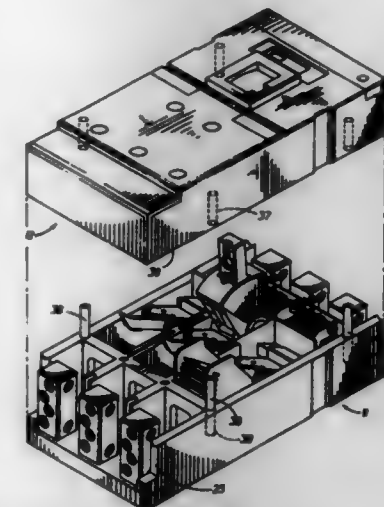
3 Claims



1. An inverted PIN diode switch apparatus comprising:  
 (a) an input port;  
 (b) an output port;  
 (c) a first transmission line segment having a first characteristic impedance and connected at a first end to the input port and at a second end to a first terminal;  
 (d) first inductive grounding means for fixing the first transmission line segment substantially at a DC ground voltage level;

- (e) a second transmission line segment having a second characteristic impedance and connected at a first end to the output port and at a second end to a second terminal;
  - (f) second inductive grounding means for fixing the second transmission line segment substantially at the DC ground voltage level;
  - (g) a capacitor having a first side and a second side, the capacitor grounded at the first side;
  - (h) at least four PIN diodes, each PIN diode having an anode and a cathode and each PIN diode cathode connected to a second side of the capacitor, wherein  
 (i) an anode of a first PIN diode connects to a third terminal;  
 (ii) an anode of a second PIN diode anode connects to a fourth terminal;  
 (iii) an anode of a third PIN diode connects to a fifth terminal;  
 (iv) an anode of a fourth PIN diode connects to a sixth terminal;
  - (i) a lumped element network comprising at least six inductive elements wherein  
 (i) a first inductive element connects at a first end to the first terminal and at a second end to the third terminal;  
 (ii) a second inductive element connects at a first end to the second terminal and at a second end to the fourth terminal;  
 (iii) a third inductive element connects at a first end to the third terminal and at a second end to the fourth terminal;  
 (iv) a fourth inductive element connects at a first end to the first terminal and at a second end to the fifth terminal;  
 (v) a fifth inductive element connects at a first end to the second terminal and at a second end to a sixth terminal;  
 (vi) a sixth inductive element connects at a first end to the fifth terminal and at a second end to the sixth terminal;
- wherein the inductive elements and the capacitor have values such that, at a design frequency when each of the PIN diodes is not forward biased, the input impedance of the lumped element network at the first terminal is substantially equal to the first characteristic impedance and the input impedance of the lumped element network at the second terminal is substantially equal to the second characteristic impedance; and  
 PIN diode biasing means for selectively biasing each of the PIN diode cathodes at a negative DC voltage to forward bias each of the PIN diodes.

said pins and said cavities corresponding to particular circuit breaker ampere ratings to thereby allow attach-



ment of selected covers to selected cases corresponding to selected circuit breaker ampere ratings.

5,440,285

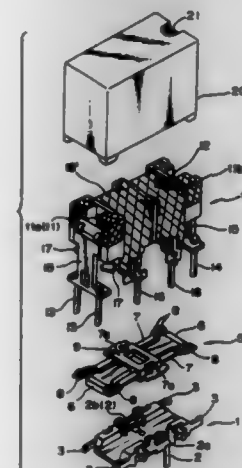
# CLOSED TYPE ELECTROMAGNETIC RELAY Yoichi Nakashiki; Ryuzichi Sato; Kazumi Sato; Masayuki Noda, and Ikuro Takegahara, all of Kyoto, Japan, assignors to Omron Corporation, Kyoto, Japan PCT No. PCT/JP92/00519, § 371 Date Oct. 20, 1993, § 102(e) Date Oct. 20, 1993, PCT Pub. No. WO92/19001, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 22, 1992, Ser. No. 133,197  
 Claims priority, application Japan, Apr. 22, 1991, 3-090453; May 1, 1991, 3-100119

Int. Cl.<sup>6</sup> H01H 51/22

U.S. Cl. 335—78

2 Claims



1. A closed type electromagnetic relay comprising a contact opening/closing mechanism arranged in the vicinity of a coil block consisting of a coil wound around an iron core, wherein an insulating resin is molded in injection to the surface of said coil block so that a part of said coil block at the other side than said contact opening/closing mechanism is exposed to outside.

5,440,284

# INDUSTRIAL-RATED CIRCUIT BREAKER HAVING UNIVERSAL APPLICATION

David A. Ferallo, Farmington; Roger J. Morgan, Simsbury; James L. Rosen, West Hartford; Donna DeRosier, Bristol, and Roger N. Castonguay, Terryville, all of Conn., assignors to General Electric Company, New York, N.Y.  
 Division of Ser. No. 85,496, Jul. 2, 1993, Pat. No. 5,361,052.

This application Jun. 10, 1994, Ser. No. 258,317

Int. Cl.<sup>6</sup> H01H 9/02

U.S. Cl. 335—202

4 Claims

1. A universal circuit breaker comprising:  
 a molded plastic case and cover said case and cover each comprising a rectangular perimeter having a plurality of cavities formed therein;  
 a pair of separable contacts within said case;  
 an operating mechanism within the case arranged for separating said contacts and interrupting circuit current upon the occurrence of an overcurrent condition within a protected electric circuit;  
 a handle operator extending through said cover for manual operation of said operating mechanism to reset said operating mechanism after cessation of said overcurrent condition; and  
 a plurality of pins within said cavities in said case arranged for insertion within said cavities formed within said cover,

5,440,286

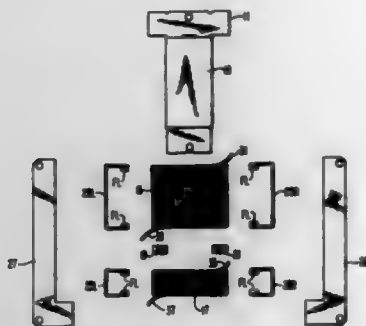
**ELECTRICAL TRANSFORMER STRUCTURE WITH COIL COVERS**

Henry Pikul; Joseph S. Drobo, both of Chicago, Ill.; John A. Larson, Portage, Wis., and Dale C. McClurg, Grayslake, Ill., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 853,891, Mar. 19, 1992, abandoned, which is a continuation of Ser. No. 675,226, Mar. 26, 1991, abandoned. This application Mar. 8, 1994, Ser. No. 236,692 Int. Cl.<sup>6</sup> H01F 27/30

U.S. Cl. 336—160

8 Claims



1. A transformer, comprising: a primary coil, a secondary coil, a laminated iron core having a leg inside said coils, an insulated paper surrounding a substantial length of the leg of said core, said coils having an external front, an external back and two external sides, plastic insulated covers fitted over the front, the back and both sides of each coil, each of said coils being free of an internal coil bobbin on which said coil is wound, two laminated iron bars adjacent said insulated covers and two laminated iron shunts between said primary coil and said secondary coil, said shunts completing the flux paths for said coils in conjunction with said iron core and said two iron bars and wherein each insulated cover comprises a snap-on type insulator, each plastic insulated cover being shaped like a U with two side legs and a flange forming one continuous piece on the inside of said U with at least one of said side legs by which flange each said cover is fitted tightly against the front, the back and both sides of its associated coil after each said cover is snapped on to its associated coil.

5,440,287

**CURRENT RESPONSIVE LATCHING APPARATUS FOR DISCONNECTING AND ISOLATING AN ELECTRICAL DEVICE**

Stephen P. Hassler, Muskego, Wis.; Stephen P. Johnson, Olean, N.Y., and John Lapp, Franklin, Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 946,961, Sep. 17, 1992, Pat. No. 5,274,349, and a continuation-in-part of Ser. No. 67,512, May 24, 1993, and a continuation-in-part of Ser. No. 65,439, May 24, 1993, Pat. No. 5,355,111. This application Dec. 27, 1993, Ser. No. 174,946

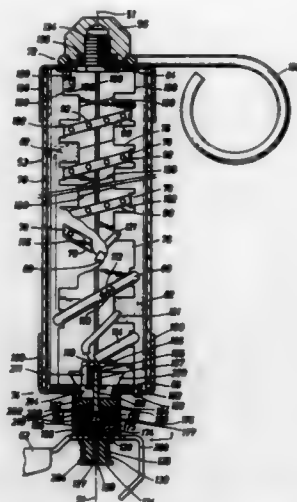
Int. Cl.<sup>6</sup> H01H 71/10, 71/20

U.S. Cl. 337—168

9 Claims

1. A dropout style fuseholder comprising: a fuse body including first and second conductive terminals on said body; a first current path between said first and second terminals, said first current path including at least one fusible element; a second current path between said first and second terminals, said first and second current paths electrically in parallel; a conductive washer in said fuse body, said washer having an aperture therethrough and being in electrical engagement with said second terminal; a support member disposed adjacent to said second terminal; a trigger wire extending from said fuse body and attached to

said support member, said trigger wire forming a portion of said second current path and being insulated from said second terminal;



wherein said trigger wire is disposed through said aperture in said washer, said trigger wire and said washer forming a spark gap therebetween.

5,440,288

**CONTROLLER FOR A BACKUP ALARM SYSTEM**

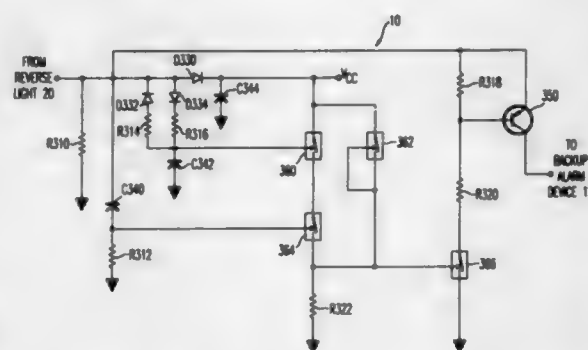
Mark Gottlieb, Annandale, and Harry Powell, Shipman, both of Va., assignors to Design Tech International, Inc., Springfield, Va.

Filed Aug. 5, 1994, Ser. No. 286,208

Int. Cl.<sup>6</sup> B60Q 1/22

U.S. Cl. 340—463

18 Claims





said transmitter, and means for fixing the relative positions of said telescopic first and second neck portions such that



the height of said sensor head may be adjusted along a vertical axis.

5,440,293

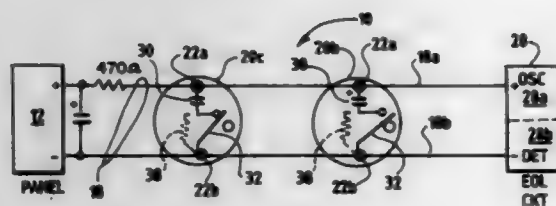
**DETECTOR SUPERVISION APPARATUS AND METHOD**  
Lee D. Tice, Bartlett, Ill., assignor to Pittway Corporation, St. Charles, Ill.

Filed May 29, 1992, Ser. No. 891,286

Int. Cl.<sup>6</sup> G08B 13/14

U.S. Cl. 340-568

10 Claims



1. A detector comprising:

a sensing head;

a base engagable with and removable from said head wherein said base carries at least first and second terminals, and wherein said head is coupled to said terminals when so engaged, said base further including an energy storage element coupled to at least one of said terminals, wherein removal of said head from said base electrically connects said energy storage element between said terminals; and

a spring member having first and second positions wherein said spring member is coupled to one of said terminals and moves, responsive to said head being removed from said base, from one of said positions to the other of said positions to generate an electrical signal indicative thereof; wherein said element includes a capacitor having first and second leads wherein one of said leads is coupled to one of said terminals and wherein said spring member is coupled to another of said terminals, said member being in said first position displaced from another of said leads when said head is engaged with said base, and wherein said member moves to said second position in contact with said other lead in response to said head being removed from said base.

5,440,294

**MAIL DELIVERY SIGNAL SYSTEM**

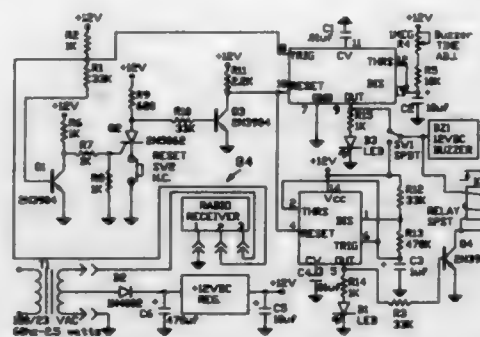
Ellen L. Mercier, and Carl E. Mercier, both of 36909 Lisbon Rd., Oconomowoc, Wis. 53066

Filed May 20, 1993, Ser. No. 63,643

Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340-569

11 Claims



1. A system for remotely sensing the delivery of mail to a mailbox having a door that opens and closes comprising a transmitter adapted for mounting on the mailbox, the transmitter including a contact switch element and transmitter circuit means coupled to the switch element for transmitting a prescribed signal in response to contact with the switch element,

an actuator adapted for mounting on the mailbox away from contact with the switch element when the door of the mailbox is closed, the actuator moving into contact with the switch element when the door of the mailbox is opened, and

a receiver adapted for placement at a location remote from the transmitter including

first receiver circuit means operable for generating a mail arrival output in response to receipt of the prescribed signal from the transmitter including a hold element that, following generation of the mail arrival output, maintains the generation of the mail arrival output regardless of continued receipt of the prescribed signal, until receipt of a prescribed termination command, the first receiver circuit means further including an input element that generates the termination command only in response to prescribed input from a user, whereby the mail arrival output indicates when the mailbox door has been opened, and

second receiver circuit means operable for generating a receiver locator output separate from the mail arrival output in response to receipt of the prescribed signal from the transmitter including a time delay element that automatically terminates the receiver locator output in the absence of receipt of the prescribed signal after a predetermined time period, whereby the receiver locator output indicates when the receiver is placed in the remote location for good reception of the prescribed signal.

5,440,295

**APPARATUS AND METHOD FOR PREVENTING UNAUTHORIZED REMOVAL OF A NEWBORN INFANT FROM A PREDETERMINED AREA**

Richard A. Ciecwiak, 482 Cobain Rd., Jackson, N.J. 08527, and John Cardello, 1615 Beverly Rd., Forked River, N.J. 08731

Filed May 2, 1994, Ser. No. 236,316

Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 340-573

25 Claims

1. An apparatus for preventing unauthorized removal of a newborn infant from a predetermined area comprising:

A. an umbilical cord clamping means comprising:

(i) an interconnecting member having a first attachment end and a second attachment end movable with respect

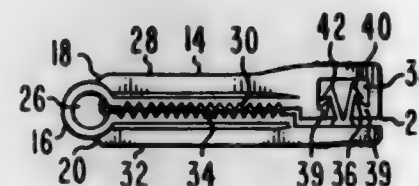
to one another, said interconnecting member adapted to retain said first attachment end and said second attachment end in steady state in an open position spatially separated from each other, said interconnecting member defining a securement opening extending there-through;

(2) a first arm means fixedly secured to said first attachment end of said interconnecting member, said first arm means including a first clamping section thereon;

(3) a second arm means fixedly secured to said second attachment end of said interconnecting member, said second arm means including a second clamping section thereon;

(4) a first engagement means on said first arm means;

(5) a second engagement means on said second arm means and being selectively engageable with respect to said first engagement means on said first engagement means to retain said first arm means and said second arm means in a closed position with said first clamping section and said second clamping section in a closed position adjacent to one another clamping an umbilical cord therebetween;



B. a transponder member being detachably secured to said interconnecting member of said umbilical cord clamping means, said transponder member comprising:

(1) a transponder housing means;

(2) an electronic transponder unit positioned within said transponder housing means;

(3) a transponder attachment means attached to said transponder housing means and extending outwardly therefrom, said transponder attachment means being detachably engageable with respect to said interconnecting member to selectively attach said transponder member and said electronic transponder unit with respect to said umbilical cord clamping means responsive to being in a closed position retaining an umbilical cord therewith, said transponder attachment means including a transponder stud member adapted to extend through said securement opening defined in said interconnecting member to facilitate securement of said transponder member with respect to said umbilical cord clamping means; and

C. an electronic sensing means positioned in at least one location adjacent the predetermined area and being capable of detecting the attempted removal of said electronic transponder unit from within the predetermined area.

5,440,296

**COIL ASSEMBLY FOR ELECTRONIC ARTICLE SURVEILLANCE SYSTEM**

John E. Nelson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 29, 1993, Ser. No. 55,689

Int. Cl.<sup>6</sup> G08B 13/14, 13/24; H01Q 21/00

U.S. Cl. 340-572

19 Claims

1. A coil assembly for an electronic article surveillance (EAS) system, the assembly comprising a field-producing coil which includes at least a pair of coil segments juxtaposed in substantially a coplanar orientation, each segment having

i) a pair of spaced apart arms;

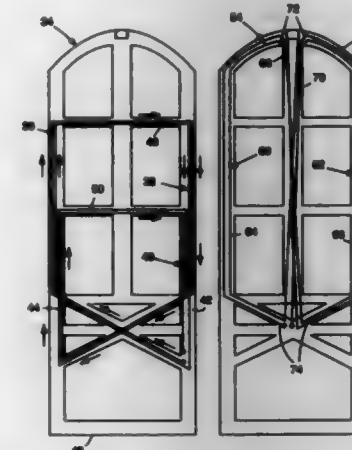
ii) a top section connecting upper ends of the arms; and

iii) a bottom, at least partially diagonal section connecting a

lower end of one of the arms to a lower end of one of the arms of the other segment;

wherein the bottom sections of each segment are at substantially the same level and are positioned at opposite diagonal angles with respect to each other,

and further wherein the segments are connected such that current applied thereto is additive in the top sections and



intensifies a resultant magnetic field in the upper half of the coil assembly and thus enhances the detectability of EAS markers located proximate thereto, and such that a magnetic field resulting from current in the diagonally positioned bottom sections at least partially cancels and thus minimizes interference from electromagnetically active objects proximate a surface on which the EAS system may be positioned.

5,440,297

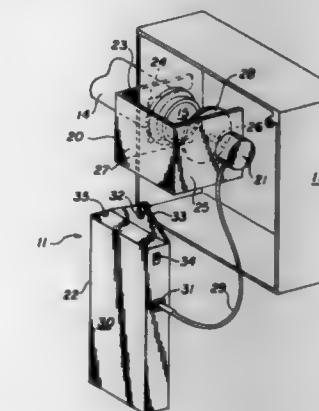
**ELECTRICIAN'S FISH TAPE LOCATOR SYSTEM**  
Robert I. Bright, 677 Yorkhaven, Cincinnati, Ohio 45246

Filed Dec. 27, 1993, Ser. No. 172,750

Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340-686

15 Claims



1. An electrician's fish tape locator system for the purpose of alerting the electrician that an end of a fish tape forced through a conduit has reached the conduit's terminus, comprising:

(a) a transmitter assembly for positioning at a terminus of the conduit, said assembly having a mounting means for attachment to the terminus of the conduit, a switch associated with the mounting means such that the fish tape end activates the switch as it exits the conduit terminus, and an electronic transmitter coupled to the switch so that a signal is transmitted in response to activation of the switch by the fish tape end; and

(b) a receiver for receiving the signal transmitted from the





information signal provided by the second coil to provide a corresponding data signal,

a movable part including

a third coil and a fourth coil,

first rectifier means connected to said third coil and second rectifier means connected to said fourth coil, each of said rectifier means having first and second inputs and first and second outputs,

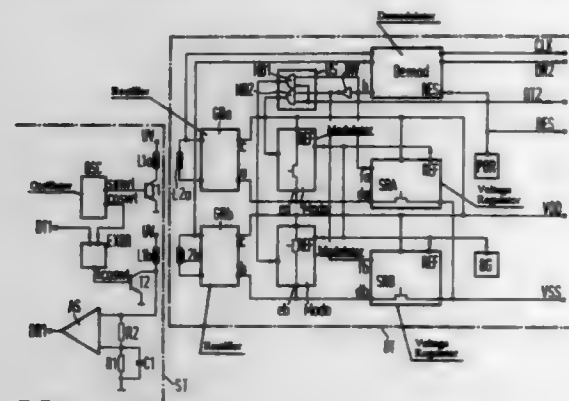
said first output of said first rectifier means being connected to said first output of said second rectifier means and forming a reference potential clamp,

a phase demodulator having a first demodulator input connected to said third coil, a second demodulator input connected to said fourth coil, and at least one control output for outputting a signal corresponding to the relative phase between the reference signal and the information signal,

first and second voltage regulators each having an input, an output, a control output and a reference potential connection, said outputs of said first and second voltage regulators being connected to one another and forming a supply voltage clamp,

first and second amplitude modulators each having a reference potential connection, an output and a control input,

reversing switch means having first and second inputs and first and second outputs for connecting a data signal present at one of said first and second inputs to one of



said outputs in dependence on a signal at the other of said first and second inputs,

said reference potential connections of said first and second voltage regulators and of said first and second modulators being connected to said reference potential clamp,

said second output of said first rectifier means being connected to said input of said first voltage regulator and to said output of said first amplitude modulator, said second output of said second rectifier means being connected to said input of said second voltage regulator and to said output of said second amplitude modulator, said control output of said phase demodulator being connected to said control input of said first voltage regulator,

an inverter connected between said control output of said phase demodulator and said control input of said second voltage regulator,

said control output of said phase demodulator being connected to said first input of said reversing switch means, said first output of said reversing switch means being connected to said control input of said first amplitude modulator, and said second output of said reversing switch means being connected to said control input of said second amplitude modulator, said second input of said reversing switch means being means for receiving a data signal, said stationary part and said movable part together forming coupling means for coupling

said first and third coils to form a coil pair and said second

and fourth coils to form a coil pair, and for deactivating said first amplitude modulator and said second voltage regulator, or

said first and fourth coils to form a coil pair and said second and third coils to form a coil pair, and for deactivating said second amplitude modulator and said first voltage regulator, and that

the apparatus is enabled to simultaneously transmit data from said stationary part to said movable part by phase modulation and from said movable part to said stationary part by amplitude modulation;

whereby energy is transmitted only with the coil pair including said first coil and data are received only with the coil pair including said second coil.

5,440,303

## DIRECTION DETECTING APPARATUS AND METHOD THEREOF

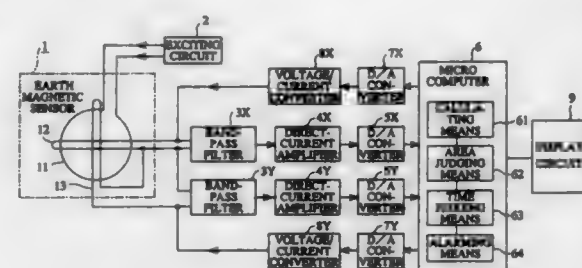
Hidehiko Kinoshita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1994, Ser. No. 181,409

Claims priority, application Japan, Feb. 23, 1993, 5-056354 Int. Cl.<sup>6</sup> G08G 1/00

U.S. Cl. 340-901

15 Claims



1. A direction detecting apparatus for detecting a direction of a movable body comprising:

an earth magnetic sensor, mounted on said movable body, for detecting earth magnetism, and a horizontal component of said earth magnetism by dividing said earth magnetism into two orthogonal components

calculating means, connected to said earth magnetism sensor, for generating, based on an output signal from said earth magnetic sensor, an angle signal indicative of an angle between a moving direction of said movable body and the horizontal component of the earth magnetism;

area judging means, connected to said calculating means, for judging whether output signals of said earth magnetism sensor provided to said calculating means are outside a judging area, defined at least by a circular perimeter having a radius larger than the radius of a reference circle, said reference circle being a locus of output signals of said earth magnetism sensor in a plane when said movable body is rotated one time within said plain, for determining whether said movable body is magnetized; and

prompting means, connected to said area judging means, for prompting a magnetization correction with regard to magnetization of said movable body when said signals provided to said calculating means are determined to be outside said judging area by said area judging means.

5,440,304

## INTEGRATED CIRCUIT HAVING A SHIFT STAGE COUNT CHANGING FUNCTION

Minoru Hirai, Kyoto, Japan, assignor to Rohm Co., Ltd., Japan

Filed Jun. 14, 1993, Ser. No. 76,463

Claims priority, application Japan, Jul. 27, 1992, 4-199510 Int. Cl.<sup>6</sup> H03M 9/00

U.S. Cl. 341-100

16 Claims

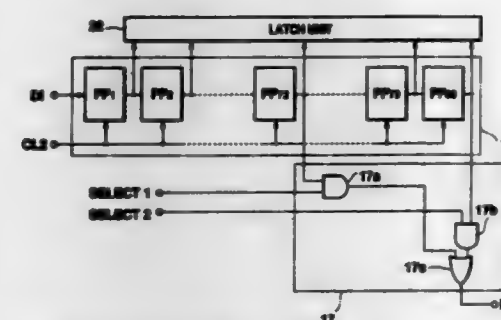
1. An integrated circuit comprising:

means for converting serial data into parallel data and for outputting the parallel data and overflow serial data;

means being responsive to said parallel data for driving a target to be driven; and

means for setting the number of shift stages of said conversion means;

wherein the conversion means outputs bits of the input serial data as the overflow serial data in order of exceeding the number of shift stages, said setting means being responsive



to a selection signal value supplied from an external device for setting the number of shift stages of said conversion means, said conversion means including a shift register for shifting the serial data a predetermined number of bits in response to a shift clock, and said setting means including gate selecting means being responsive to the selection signal for selecting only one of either an intermediate bit value or a last bit value of said shift register for outputting as overflow serial data.

5,440,305

## METHOD AND APPARATUS FOR CALIBRATION OF A MONOLITHIC VOLTAGE REFERENCE

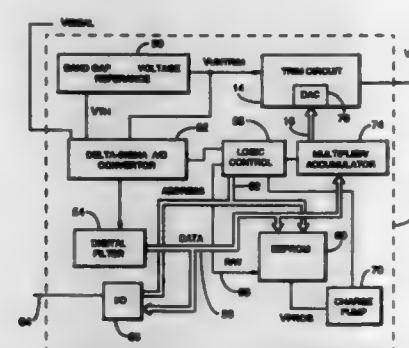
Bruce D. Signore, and Eric J. Swanson, both of Austin, Tex., assignors to Crystal Semiconductor Corporation, Austin, Tex.

Filed Aug. 31, 1992, Ser. No. 937,993

Int. Cl.<sup>6</sup> H03M 1/10

U.S. Cl. 341-120

30 Claims



1. A monolithic compensated voltage reference, comprising:

a reference voltage generator for generating an uncompensated analog voltage;

an analog environmental parameter measuring device co-located with said reference voltage generator for measuring predetermined environmental parameters associated with said reference voltage generator, and for generating an analog environmental signal corresponding to the measured environmental parameters;

an analog-to-digital converter for converting said analog environmental information to a digital environmental signal, said analog-to-digital converter operable to take the ratio of the output of said environmental parameter measuring device and an internal voltage reference that is co-located with said reference voltage generator;

a non-volatile memory for storing digital compensation

parameters associated with said digital environmental information;

a compensation processor for selecting said digital compensation parameters from said memory corresponding to said digital environmental information output by said analog-to-digital converter, said processor operable to process said selected digital compensation parameters in accordance with a predetermined compensation algorithm to output a digital compensation word that corresponds to analog environmental information; and

a compensation circuit for receiving said digital compensation word and compensating said uncompensated analog voltage in accordance with the value of said digital compensation word.

5,440,306

## SWITCHED CAPACITOR CIRCUIT HAVING REDUCED CAPACITANCE UNITS

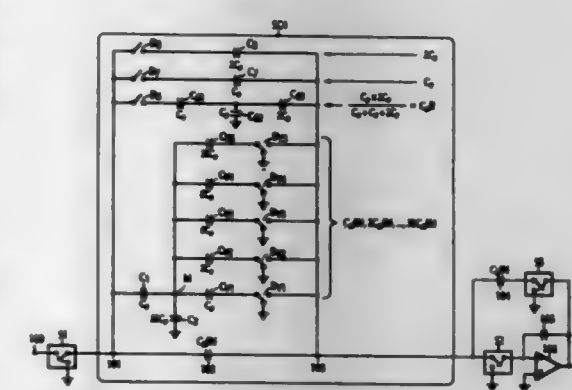
Satoshi Tatsumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 22, 1993, Ser. No. 156,812

Claims priority, application Japan, Nov. 20, 1992, 4-312416 Int. Cl.<sup>6</sup> H03M 1/80

U.S. Cl. 341-150

6 Claims



1. A switched capacitor circuit comprising:

a first capacitor connected between a first node and a second node;

a second capacitor connected between the first node and a third node;

a third capacitor connected between the third node and a reference potential;

m parallel circuits connected between the third node and the second node, the m parallel circuits including respective fourth capacitors and respective first switch means for coupling the fourth capacitors to the reference potential or to the second node depending on a corresponding one of m bits of an N-bit gain control signal, where m is an integer smaller than N;

n parallel circuits connected between the first and second nodes, the n parallel circuits including respective fifth capacitors and respective second switch means for coupling the first node to the fifth capacitors depending on a corresponding one of n bits of the N-bit gain control signal, where n is an integer equal to N-m;

third switch means for applying an input signal of the switched capacitor circuit to the first node in response to a first phase of a two-phase high frequency clock signal and coupling the first node to the reference potential in response to a second phase of the two-phase high frequency clock signal;

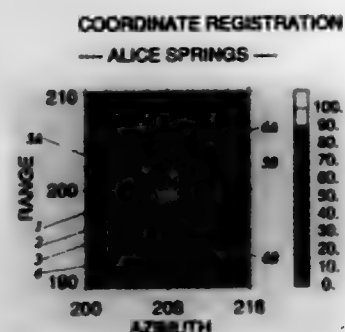
a sixth capacitor connected to the second node; and

fourth switch means for charging the sixth capacitor in response to said first phase and discharging energy from the sixth capacitor to an output terminal of the switched capacitor circuit in response to said second phase.





analyzing and comparing a return radar signal with a geographic map of the coverage area in the general region of the at least one geographic beacon; and



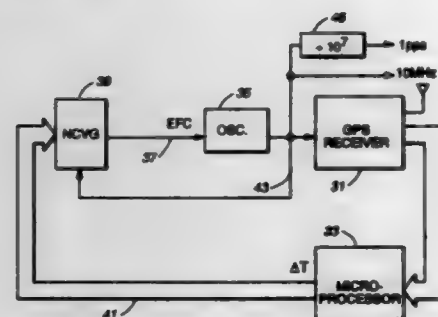
finding a best fit of the geographic map with the radar return signal to enable registration of co-ordinates of the return radar signal.

5,440,313

**GPS SYNCHRONIZED FREQUENCY/TIME SOURCE**  
Terry N. Osterdock, Los Gatos; David C. Westcott, San Jose, and Quyen D. Hua, Milpitas, all of Calif., assignors to Stellar GPS Corporation, San Jose, Calif.

Filed May 27, 1993, Ser. No. 67,947

Int. Cl.<sup>6</sup> H04B 7/185; G04B 18/00; H04L 7/04  
U.S. Cl. 342-352 7 Claims



1. A system comprising:

- a GPS receiver that receives and produces as output signals GPS information;
- a variable frequency oscillator having a frequency control input terminal and producing an output frequency signal coupled to the GPS receiver;
- data processing means, coupled to receive the output signals produced by the GPS receiver, for producing an error signal indicative of a difference in frequency between a GPS synchronized frequency and the output frequency signal of the variable frequency oscillator; and
- means responsive to said error signal for producing an electronic frequency control signal and for applying the electronic frequency control signal to said frequency control input as to cause said difference in frequency to be reduced.

**5,440,314**  
**DEVICE TO STABILIZE THE BEAM OF AN ELECTRONIC SCANNING ANTENNA RIGIDLY FIXED TO A MOVING BODY**

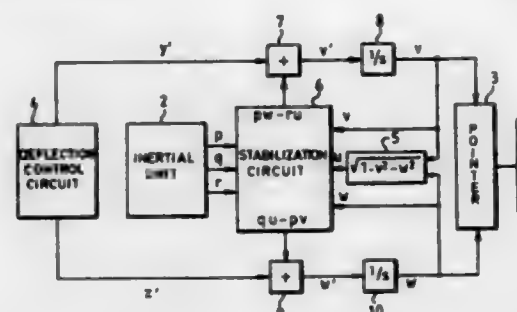
Rémy Tabourier, L'Hay les roses, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 7, 1994, Ser. No. 178,657

Claims priority, application France, Jan. 15, 1993, 93 00352  
Int. Cl.<sup>6</sup> H01Q 3/22

U.S. Cl. 342-371

6 Claims



1. A device to stabilize the aiming of the beam of an electronic scanning antenna that is rigidly fixed to a moving body, equipped with a pointer that operates on the basis of an orientation command constituted by direction cosines  $v$  and  $w$  of the direction of the beam of the antenna along pitch and yaw axes of a direct orthogonal frame of reference related to the moving body, the roll axis of which is colinear with the direction of orientation of the antenna, said antenna being controlled by a deflection control circuit for the deflection of the beam delivering components, along the pitch and yaw axes of the frame of reference related to the moving body, of an instructed value of modification of deflection of the beam that is independent of the rotational speed of the moving body, said moving body being equipped with an inertial unit giving the components  $p$ ,  $q$  and  $r$  of its inherent speed of rotation, along the roll, pitch and yaw axes of the frame of reference related to the moving body, said device to stabilize comprising:

- a determining circuit that determines the direction cosine  $u$ , along the roll axis of the frame of reference related to the moving body, of the direction of the beam on the basis of the other two direction cosines  $v$  and  $w$ , along the pitch and yaw axes of the frame of reference related to the moving body, of the direction of the beam that are applied to the pointer, by the implementation of the relationship:

$$\mu = \sqrt{1 - v^2 - w^2}$$

- a stabilization circuit receiving the components  $p$ ,  $q$ ,  $r$  of the inherent speed of rotation of the moving body delivered by the inertial unit, the direction cosines  $v$  and  $w$  applied to the pointer and the direction cosine  $u$  delivered by the determining circuit, and delivering a first component of stabilization  $pw - ru$  along the pitch axis of the frame of reference related to the moving body and a second component of stabilization  $qu - pv$  along the yaw axis of the frame of reference related to the moving body;
- a first summing integrator circuit adding and integrating a component, with reference to time, along the pitch axis of the frame of reference related to the moving body, of the instructed value of modification of deflection delivered by the deflection control circuit, and the first component of stabilization, along the pitch axis of the frame of reference related to the moving body, delivered by the stabilization circuit to obtain the direction cosine  $v$ , along the pitch axis of the frame of reference related to the moving body, of the direction of the beam, and
- a second summing integrator circuit adding and integrating a component, with reference to time, along the yaw axis of

the frame of reference related to the moving body, of the instructed value of modification of deflection delivered by the deflection control circuit, and the second component of stabilization, along the yaw axis of the frame of reference related to the moving body, delivered by the stabilization circuit to obtain the direction cosine  $w$ , along the yaw axis of the frame of reference related to the moving body, of the direction of the beam.

5,440,315

**ANTENNA APPARATUS FOR CAPACITIVELY COUPLING AN ANTENNA GROUND PLANE TO A MOVEABLE ANTENNA**

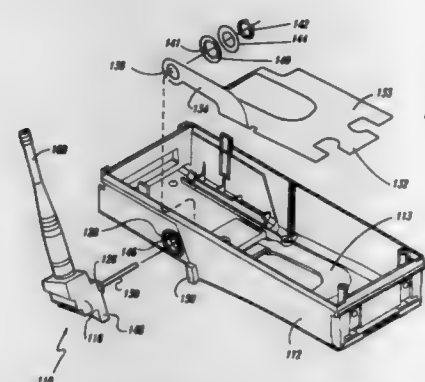
George C. Wright, Duval; David W. Gilpin, Everett, and Stanley W. Jones, deceased, late of Lopez, all of Wash. by Ivaly J.; Hoedemaker, administratrix, assignors to Interneer Corporation, Everett, Wash.

Filed Jan. 24, 1994, Ser. No. 185,717

Int. Cl.<sup>6</sup> H01Q 1/24

U.S. Cl. 343-702

21 Claims



13. An antenna assembly for a hand-held device having a housing, comprising:

- an elongated antenna having a first antenna conductors;
- a rotatable coupling member having a first end portion rigidly retaining the elongated antenna and having a second end portion rotatably received by the housing and extending into the housing, the coupling member and the rotatable as a unit between a first position and a second position, the coupling member having first and second coupling conductors extending between the first and end portions, respectively, the first and second coupling conductors being electrically coupled to the first and second antenna conductors respectively;
- an electrically conductive ground plane;
- an electrically conductive plate electrically coupled to the second coupling conductor and having a first face positioned adjacent to at least a portion of the ground plane;
- a non-conductive material positioned between the portion of the ground plane and the first face of the plate, the plate being capacitively coupled to the ground plane through the non-conductive material.

5,440,316

**BROADBAND ANTENNAS AND ELECTROMAGNETIC FIELD SIMULATORS**

Andrew S. Podgorski K1H 5G6, and Gary A. Gibson, both of Ottawa, Canada, assignors to Andrew Podgorski, Canada  
PCT No. PCT/CA92/00323, § 371 Date Jan. 27, 1994, § 102(e)  
Date Jan. 27, 1994, PCT Pub. No. WO93/03387, PCT Pub. Date Feb. 18, 1993

PCT Filed Jul. 30, 1992, Ser. No. 185,916

Claims priority, application Canada, Jul. 30, 1991, 2047999

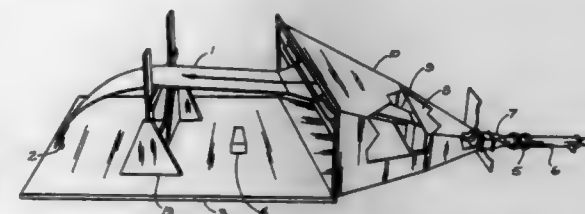
Int. Cl.<sup>6</sup> H01Q 13/02; G01R 29/08

U.S. Cl. 343-786

20 Claims

- 1. An antenna comprising:  
an open horn waveguide with an upper and a lower surface,

a mouth and a ground plane conductor forming a forward extension of the lower surface;  
a thin conducting plate positioned to form a septum between the upper and lower surfaces of the horn waveguide, said conducting plate being insulated from said horn waveguide; and



a conducting section of approximately the same width as the septum, coupled thereto and protecting from and beyond the mouth of the horn waveguide, said conducting section extending initially substantially parallel to the ground plane conductor and then curving downwardly to terminate adjacent to it;  
whereby the protecting conducting section functions as a radiating element.

5,440,317

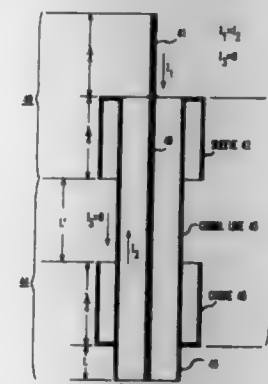
**ANTENNA ASSEMBLY FOR A PORTABLE TRANSCEIVER**

Amer Jalloul, East Brunswick, and John S. Mayo, Chatham, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.  
Filed May 17, 1993, Ser. No. 61,937

Int. Cl.<sup>6</sup> H01Q 1/24, 9/16

U.S. Cl. 343-791

9 Claims



1. A device for use with a hand-held transceiver, said device comprising:

- a hand-held transceiver sleeve dipole antenna having an inner conductor that extends beyond a dipole outer sleeve, where the dipole outer sleeve has an opening away from the extending inner conductor; and
- antenna radiation pattern enhancement means for positioning the hand-held transceiver sleeve dipole antenna, the radiation pattern enhancement means connected to said sleeve dipole antenna and having:  
inner conducting means connected to the inner conductor of the sleeve dipole antenna, for delivering energy to, and receiving energy from, said inner conductor of the dipole antenna,
- outer conducting means connected to the dipole outer sleeve, and
- an outer conductor sleeve connected to the outer conducting means and having a central axis and an opening towards the opening of the dipole outer sleeve;
- the inner conducting means and outer conducting means together comprising a single RF coaxial transmission line

for feeding the sleeve dipole antenna with electromagnetic energy; and means coupled to said antenna radiation pattern enhancement means, for attaching the antenna radiation pattern enhancement means to a hand-held transceiver and for delivering energy to, and receiving energy from, the inner conducting means and the outer conducting means of the antenna radiation pattern enhancement means.

5,440,318

# PANEL ANTENNA HAVING GROUPS OF DIPOLES FED WITH INSERTABLE DELAY LINES FOR ELECTRICAL BEAM TILTING AND A MECHANICALLY TILTABLE GROUND PLANE

Roger J. Batland, 47 John Sims Drive, Boddemondra, Wellington, New Zealand, and William E. Heinz, 47 Beasley Avenue, Wellington, New Zealand

Continuation of Ser. No. 747,867, Aug. 20, 1991, abandoned.

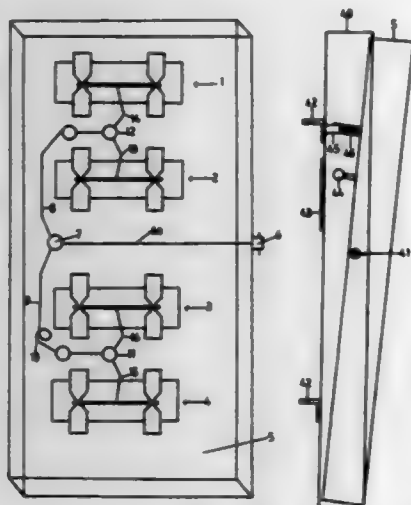
This application Nov. 2, 1993, Ser. No. 147,010

Claims priority, application New Zealand, Aug. 22, 1990, 235010

Int. Cl.<sup>6</sup> H01Q 3/20, 3/30, 21/12

U.S. Cl. 343—814

16 Claims



1. A microwave panel antenna for generating a beam, comprising:

- a plurality of dipoles, said dipoles mounted on a ground plane above and in spaced apart relationship therewith, said dipoles and said ground plane disposed within a housing;
- a means to electrically tilt the transmitted beam in a stepped manner by varying the phase of a signal input to a first group of said dipoles in relation to the phase of said signal input to a second group of said dipoles, wherein said electrical tilt means comprises a plurality of delay lines of different physical lengths, selected ones of which are mechanically inserted in series in the electrical path of said signal input to one of said groups of said dipoles to cause said varying of the phase of the signal input to said first group of dipoles, said delay lines being of lengths which cause the angles of electric beam tilting to equal approximate integer multiples of a coarse angle of beam tilt; and
- a means to mechanically tilt said ground plane with respect to said housing, said mechanical tilt means providing continuously adjustable fine tilting of said ground plane with respect to said housing throughout said coarse angle of beam tilt.

5,440,319

# INTEGRATED MICROWAVE ANTENNA/DOWNCONVERTER

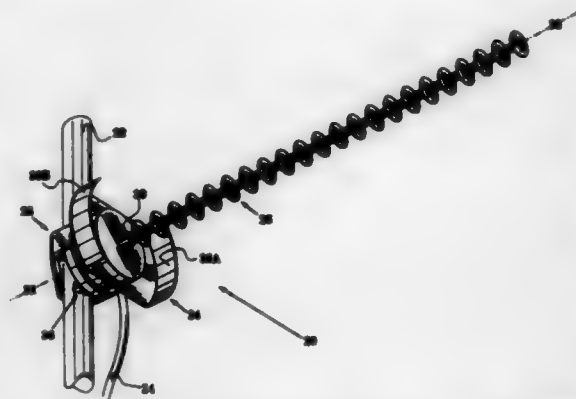
Joel J. Raymond, Port Hueneme, and Lawrence G. Crawford, Camarillo, both of Calif., assignors to California Amplifier, Camarillo, Calif.

Filed Oct. 1, 1993, Ser. No. 131,081

Int. Cl.<sup>6</sup> H01Q 1/12

U.S. Cl. 343—833

19 Claims



1. A microwave antenna suitable for use by subscription television subscribers for selectively receiving differently polarized microwave signals, comprising:

- a housing defining an axis and having first and second axially spaced exterior faces;
- a first arcuate side lobe suppression ear extending axially from said housing first face spaced radially outward from said axis;
- a second arcuate side lobe suppression ear extending axially from said housing first face spaced diametrically from said first ear; and
- a director comprising a plurality of axially spaced transversely oriented discs extending along said axis from said housing first face.

5,440,320

# ANTENNA REFLECTOR RECONFIGURABLE IN SERVICE

Olivier Lach, Les Mureaux, and Serge Schenck, Sartrouville, both of France, assignors to Aerospatiale Societe Nationale Industrielle, France

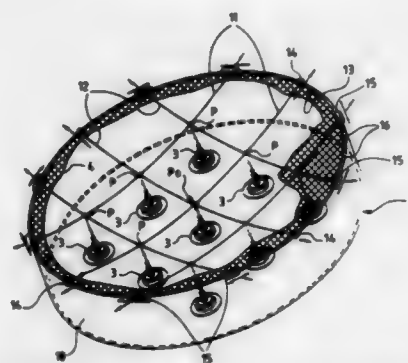
Continuation of Ser. No. 893,685, Jun. 5, 1992, abandoned. This application Aug. 18, 1994, Ser. No. 292,607

Claims priority, application France, Jun. 19, 1991, 91 07534

Int. Cl.<sup>6</sup> H01Q 15/14, 15/20

U.S. Cl. 343—915

42 Claims



1. A reconfigurable antenna reflector comprising:

- a rigid support structure;
- a reflective surface attached to said rigid support structure, said reflective surface having radio reflection properties,

said reflective surface further being elastically deformable with stiffness in bending; means for deforming said reflective surface mounted between said rigid support structure and said reflective surface, said deforming means being a plurality of piezoelectric linear actuators operating on predetermined points of said reflective surface; and means for pivotably connecting said deforming means to said rigid support structure.

5,440,321

# CURRENCY OPERATED MODULAR DISPLAY DEVICE AND METHOD

Edward K. Hine, Jr., Louisville, Colo., assignor to HS Industries, Inc., Louisville, Colo.

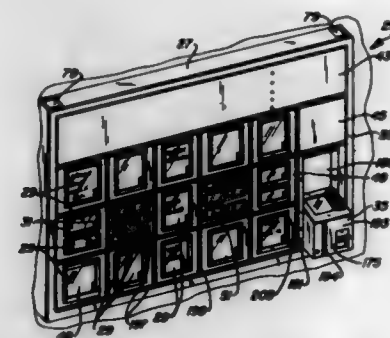
Continuation of Ser. No. 883,528, May 15, 1992, abandoned.

This application Jan. 21, 1994, Ser. No. 184,755

Int. Cl.<sup>6</sup> G09G 1/00

U.S. Cl. 345—1

27 Claims



1. A user operated, currency activated display device for displaying material selected by a user, said device comprising:

- a display area having a normally closed and secured user access for selective receipt thereof of the material for display; and
- control means operatively associated with said display area user access for, responsive to deposit of an amount of currency by the user corresponding to a user selected time period for display, opening said user access of said display area for placement by the user of the material therein and for preventing reopening of said user access thereafter by different users at least for said time period.

5,440,322

# PASSIVE MATRIX DISPLAY HAVING REDUCED IMAGE-DEGRADING CROSSTALK EFFECTS

Dennis W. Prince, Banks, and Benjamin R. Clifton, Oregon City, both of Oreg., assignors to In Focus Systems, Inc., Wilsonville, Oreg.

Filed Nov. 12, 1993, Ser. No. 152,424

Int. Cl.<sup>6</sup> G09G 3/04

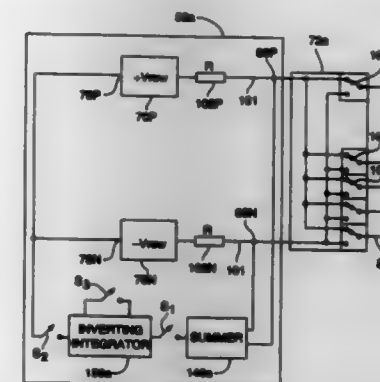
U.S. Cl. 345—58

24 Claims

1. An addressable rms-responding passive display, comprising:

- first electrode drive circuitry including a first electrode driver and multiple first electrode voltage sources that supply output voltages to the first electrode driver;
- first and second overlapping electrodes receiving respective first and second addressing signals, the first electrode driver providing the first addressing signals to the first electrodes;
- an array of pixels defined by overlapping areas of the first and second electrodes, each pixel having an optical state controlled by a pixel voltage determined by the first and second addressing signals; and
- a correction circuit for detecting at nodes in the first electrode drive circuitry associated with multiple output voltages, transient voltages in multiple first electrodes by voltage transitions in the second electrodes, summing the

transient voltages to determine a coupling crosstalk transient voltage, and applying a correction signal derived



from the coupling crosstalk transient voltage to correct the rms pixel voltage for the crosstalk voltage.

5,440,323

# DRIVE CIRCUIT FOR A DISPLAY APPARATUS HAVING SIGNAL VOLTAGE CIRCUITS SELECTIVELY CONTROLLED BY SELECTION SIGNAL

Hideo Okada, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

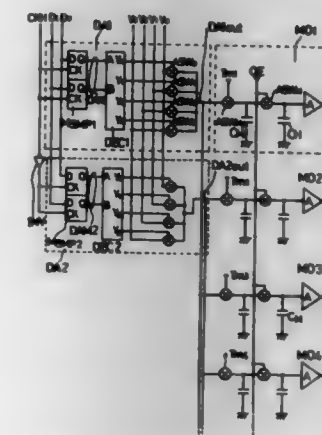
Filed Sep. 27, 1991, Ser. No. 767,340

Claims priority, application Japan, Sep. 28, 1990, 2-261472

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—100

14 Claims



1. A drive circuit for a display, comprising:

- a plurality N of signal lines for coupling video data to said display;
- voltage supplying means for supplying a plurality of signal voltages, the levels of said signal voltages being different;
- a plurality M of voltage selecting means connected to said voltage supplying means, each of said voltage selecting means for receiving a digital video signal and for providing as an output one of said plurality of signal voltages based on said received digital video signal;
- a signal voltage hold circuit for each of said plurality of signal lines, each of said signal voltage hold circuits comprising a signal voltage output coupled to a respective signal line, and a signal voltage input for receiving the output from a corresponding one of said plurality of voltage selecting means, said signal voltage hold circuit being capable of controllably providing said output received from said corresponding one of said plurality of voltage selecting means to said signal line by way of said signal voltage output; and



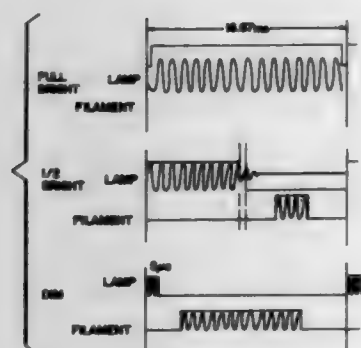
wherein the value of M is less than the value of N/2, and at least two of said signal voltage hold circuits are connected to the same corresponding voltage selecting means.

5,440,324

**BACKLIGHTING FOR LIQUID CRYSTAL DISPLAY**  
James E. Strickling, III, Duluth; Joseph W. Goode, III, Lawrenceville, and William R. Duan, Alpharetta, all of Ga., assignors to Avionic Displays Corporation, Atlanta, Ga.  
Filed Dec. 30, 1992, Ser. No. 990,526  
Int. Cl.<sup>6</sup> G02F 1/33

U.S. Cl. 345—102

9 Claims



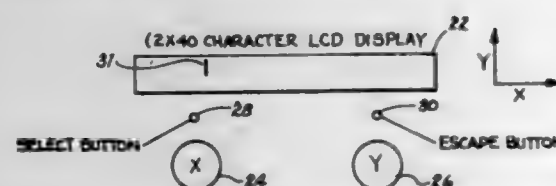
1. An apparatus, comprising:  
a chassis;  
a liquid crystal display screen in association with and external to said chassis;  
a backlighting module immediately adjacent said liquid crystal display and in a secured relationship with said chassis, said module including a housing and said housing having a cavity formed integral therewith; and  
at least one hot cathode fluorescent lamp secured within said cavity formed in said module, such that said lamp provides backlighting to said liquid crystal display while said lamp is concealed within said housing of said module from all other directions, wherein said lamp is driven by a synchronized burst modulation wave form.

5,440,325

**INTERFACE SYSTEM FOR USE WITH MICROPROCESSOR BASED CONTROL SYSTEMS AND METHOD THEREFOR**  
Karl W. Edmark, III, 14806 N. 74 St., Scottsdale, Ariz. 85260  
Continuation of Ser. No. 161,582, Dec. 6, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 363,962  
Int. Cl.<sup>6</sup> G09G 3/02

U.S. Cl. 345—145

4 Claims



1. A system for interfacing with a microprocessor based control system that presents at least one of a plurality of options for selection on a display comprising, in combination:  
first rotatable dial means for providing at least one of a first plurality of inputs to said microprocessor controlled display;  
second rotatable dial means coupled to said first rotatable dial means for providing at least one of a second plurality of inputs to said microprocessor controlled display;  
display means coupled to both said first rotatable dial means and to said second rotatable dial means for displaying one

of said options defined by the combination of at least one of said first plurality of inputs and at least one of said second plurality of inputs;

single selection means coupled to both said first rotatable dial means and to said second rotatable dial means for selecting any one of said options after preselecting a position for said first rotatable dial means and said second rotatable dial means;

dial function transformation means comprising at least one of said options for changing said first rotatable dial means to an X direction dial and for changing said second rotatable dial means to a Y direction dial for moving a pointer on said display means to another option displayed on said display means for selection by said single selection means;

rejection means coupled to both said first rotatable dial means and to said second rotatable dial means for rejecting said option;

said first rotatable dial means being coupled to a first rotary encoded shaft means for providing said first plurality of inputs and said second rotatable dial means being coupled to a second rotary encoded shaft means for providing said second plurality of inputs;

said first rotary encoded shaft means being coupled to a first quadrature decoder circuit means for determining the direction of rotation of a shaft of said first rotary encoded shaft means and said second rotary encoded shaft means being coupled to a second quadrature decoder circuit means for determining the direction of rotation of a shaft of said second rotary encoded shaft means;

said first quadrature decoder circuit means being coupled to a first binary counter circuit means for counting said first plurality of inputs and said second quadrature decoder circuit means being coupled to a second binary counter circuit means for counting said second plurality of inputs;

said first binary counter circuit means, said second binary counter circuit means, said single selection means, and said rejection means being coupled to a latch bank means for transferring data from each of said first binary counter circuit means, said second binary counter circuit means, said single selection means, and said rejection means via a microprocessor interface to said microprocessor, said microprocessor delivering data to a display driver means for driving said display means; and

printer means coupled to said microprocessor for providing hard copy output.

5,440,326

**GYROSCOPIC POINTER**

Thomas J. Quinn, Los Gatos, Calif., assignor to Gyration, Inc., Saratoga, Calif.  
Continuation of Ser. No. 497,127, Mar. 21, 1990, abandoned. This application Jan. 5, 1993, Ser. No. 651  
Int. Cl.<sup>6</sup> G09G 3/02

U.S. Cl. 345—156

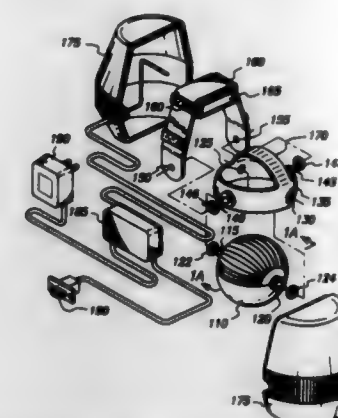
11 Claims

1. A graphical input device for providing a signal to control translational movement of a cursor on an interactive computer graphics display comprising:

a housing adapted for being held by one hand in free space;  
a first angular position gyroscope for providing a first signal responsive to the rotation of the housing about a first axis;  
a second angular position gyroscope for providing a second signal responsive to the rotation of the housing about a second axis not parallel to the first axis;

the first signal being responsive to the yaw of the housing for

controlling translation movement of the cursor along a horizontal Cartesian coordinate of the display; and



the second signal being responsive to the pitch of the housing for controlling translational movement of the cursor along a vertical Cartesian coordinate of the display.

5,440,327

**POLYCHROMATIC PEN FOR PEN PLOTTERS WITH COLOR MIXING AT MEDIA SURFACE**

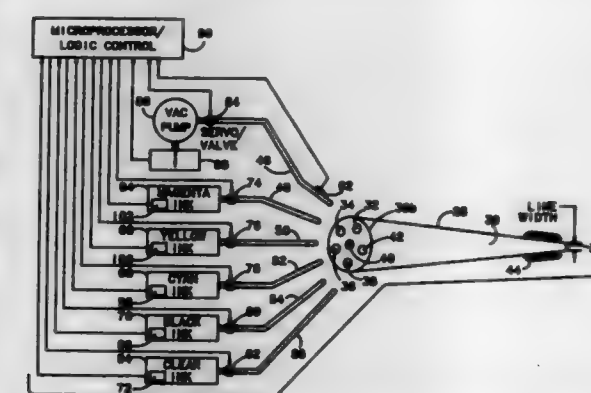
Wayne R. Stevens, Downey, Calif., assignor to CalComp Inc., Anaheim, Calif.

Filed Jul. 28, 1992, Ser. No. 922,679

Int. Cl.<sup>6</sup> G01D 15/16; C23C 14/00

U.S. Cl. 346—46

21 Claims



1. A multi-color pen cartridge for recording a color image on a recording medium in a recorder device, said color image characterized by a line width, said pen cartridge comprising:

a) tapered lumen tubular means for supporting ink flow comprising plural elongate lumens, said tapered lumen tubular means having a tip end and an opposite end, said tip end facing said recording medium and spanning a distance on said recording medium on an order of said line width, each one of said lumens having an opening at said tip end of said tapered lumen tubular means, each one of said lumens further having an input opening at said opposite end of said tapered lumen tubular means which is larger than the opening at said tip end;

b) a waste ink reservoir coupled to one of said lumens at the input opening thereof;

c) vacuum pump means coupled to said waste ink reservoir for removing excess ink from said recording medium through the one of said lumens coupled to said waste ink reservoir;

d) vacuum valve means for controlling ink flow from said recording medium to said waste ink reservoir.

e) a plurality of ink reservoirs, wherein remaining ones of

said lumens are each coupled to one of said plurality of ink reservoirs at the input opening; and,  
f) means for individually controlling ink flow from each one of said ink reservoirs to the one of said lumens connected thereto.

5,440,328

**SINGLE-PASS MULTI-COLOR THERMAL PRINTER**  
Edward A. Nardone; Paul S. Follett, both of Wakefield; Harry D. Schofield, Narragansett; Paul R. Caron, Tiverton, and

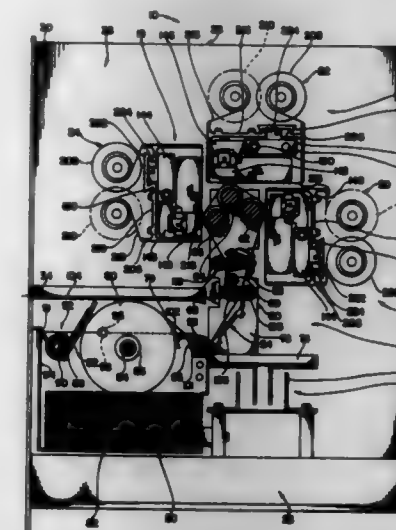
Chris S. Rothwell, North Kingstown, all of R.I., assignors to Atlantek, Inc., Wakefield, R.I.

Filed Oct. 5, 1992, Ser. No. 956,791

Int. Cl.<sup>6</sup> B41J 2/325

U.S. Cl. 347—173

11 Claims



1. A single-pass multi-color print engine comprising:  
a plurality of platen rollers including a first and last platen roller;

means for mounting said platen roller around an arc;

an uninterrupted length of receptor media received around said platen rollers, said platen rollers defining a substantially arcuate path for said receptor media;

a plurality of printheads each corresponding to a respective one of said platen rollers;

means for mounting each of said printheads in corresponding relation to said platen rollers so that each of said printheads makes biased tangential contact with said receptor media at the respective one of said platen rollers; and

a pair of driven nip rollers located downstream of said last platen roller for drawing said length of receptor media around said platen rollers from one of said printheads to a subsequent one of said printheads.

5,440,329

**SYSTEMS AND METHODS FOR THERMAL TRANSFER PRINTING**

Adam E. Meggitt, Beaverton; Thomas J. Brandt, Canby, and Stephen A. Zimmerman, Wilsonville, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Continuation-in-part of Ser. No. 962,367, Oct. 16, 1992, which is a continuation-in-part of Ser. No. 930,572, Aug. 17, 1992, which is a continuation-in-part of Ser. No. 762,537, Sep. 18, 1991, abandoned. This application Dec. 22, 1992, Ser. No. 994,803  
Int. Cl.<sup>6</sup> B41J 2/325

U.S. Cl. 347—212

29 Claims

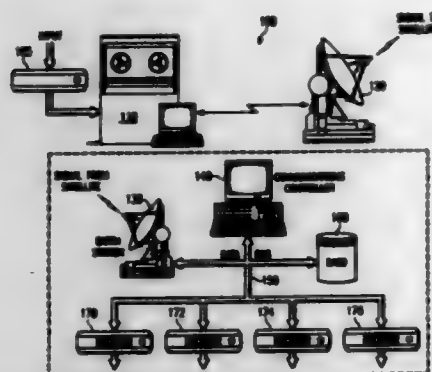
1. A method of printing a predetermined image on to a substrate, comprising the steps of:

(a) obtaining pixel data relating to whether a colorant is to be





receiving said data stream from said transmitting system, processing said data stream, storing said data stream in a second storage media, and, upon receipt of a request for replay at least one of said analog signal later transmitting a copy of said data stream from such storage media after decompressing said copy of said data stream; and



a decoder for receiving said data stream copy from said storage media, further decompressing said data stream copy and transforming said decompressed data stream copy into an analog signal for transmission to at least one presentation system for replay.

5,440,337

#### MULTI-CAMERA CLOSED CIRCUIT TELEVISION SYSTEM FOR AIRCRAFT

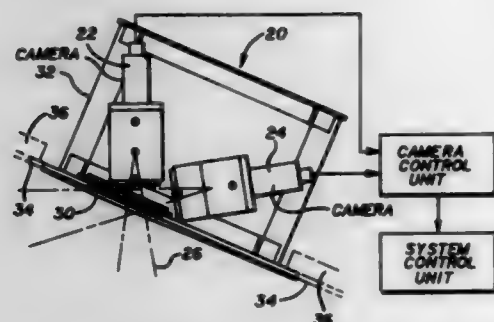
Thomas D. Henderson, and James M. McCann, both of San Marcos, Calif., assignors to Puritan-Bennett Corporation, Carlsbad, Calif.

Filed Nov. 12, 1993, Ser. No. 152,350

Int. Cl.<sup>6</sup> H04N 7/18

U.S. Cl. 348-144

1 Claim



1. An airborne closed circuit television system which comprises a first camera, said first camera equipped with a zoom lens, said first camera arranged to have a field of view essentially perpendicular downward from the aircraft's centerline, said first camera including said zoom lens and other associated optics, a focal plane sensor and an interface electronics unit to condition the output of the focal plane electronics for transmission to an external camera control unit;

a second camera arranged essentially parallel to the aircraft's center line and forward facing, said second camera also incorporating camera lens optics, a focal plane sensor and interface electronics;

a camera module unit structure which houses the two cameras in relation to one another, the system arranged to provide fields of view which narrowly avoid imaging the adjacent camera;

a window mounted within said camera module unit providing a field of view of the cameras, said window provided with means to heat said window;

means to heat at least one component of said cameras;

a remote camera control unit containing electronics to drive and process information from the camera; and  
a remote control unit in the flight deck of the aircraft which allows control of the functional aspects of the system by a member of the flight crew.

5,440,338

#### METHOD AND APPARATUS FOR IMPROVING DIMENSIONAL MEASUREMENTS MADE WITH VIDEO CAMERAS

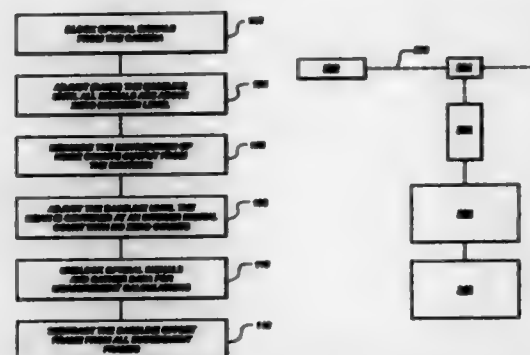
Carlos B. Roudy, Gregory E. Slobodskan, and Kurt Jensen, all of Logan, Utah, assignors to Spiricon, Inc., Logan, Utah

Filed May 11, 1993, Ser. No. 60,575

Int. Cl.<sup>6</sup> H04N 5/21, 17/00

U.S. Cl. 348-180

18 Claims



1. A method for improving the performance of video cameras used for making linear dimensional measurements in conjunction with a digitizer having a baseline, the dimensional measurements being made in accordance with a received optical signal, the method comprising the steps of:

adjusting the baseline of a signal output by a video camera such that all noise is represented by positive counts and the mean of the baseline is centered at a predetermined positive digital integer count to arrive at a baseline offset value; and

subtracting the baseline offset value from subsequent frames to correct for baseline error while maintaining both positive and negative signals from the subtraction process such that no received optical signal components are lost.

5,440,339

#### SYSTEM AND METHOD FOR TESTING INTENSITY RESPONSE OF A MEDICAL MONOCHROME VIDEO MONITOR

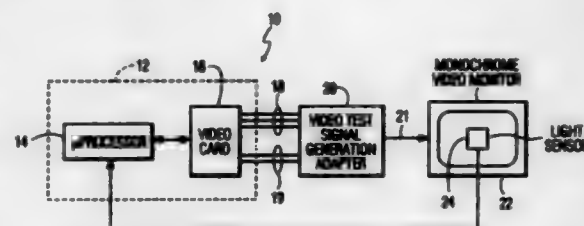
John R. Harrison, and George B. Stanesco, both of Scarborough, Canada, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1994, Ser. No. 227,212

Int. Cl.<sup>6</sup> H04N 17/02

U.S. Cl. 348-189

12 Claims



1. A system for producing an intensity test signal for a medical interlaced monochrome video monitor, comprising:

- means for controlling a computer video card of the type having red, green, and blue video outputs and horizontal and vertical sync outputs and generating video and sync

signals at a line rate substantially half the line rate of monochrome video monitors for which said system is designed for use, to output a video signal on one or more of said red, green and blue video outputs at a defined video intensity level, for a time sequenced series of different video intensity levels;

- means for connection to the one or more of said red, green, and blue video outputs of said video card on which said control means outputs a video signal for producing a single grey-scale video signal;

- means for receiving the sync signals of said video card and for adjusting the voltage level of said sync signals to about negative 300 mV;

- means for mixing said sync signals with said grey-scale video signal to produce an interlaced monochrome video monitor test signal.

5,440,340

#### DEVICE FOR MEASURING CHARACTERISTICS OF A COLOR CATHODE RAY TUBE

Katsutoshi Tsurutani, Osaka; Shinji Shimizu, Toyokawa; Tetsuo Ichikawa, Gamagori; Kazunari Mizuguchi, Toyokawa; Mitsuo Washino, Toyohashi, and Yoshihiko Kikukawa, Kishiwada, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

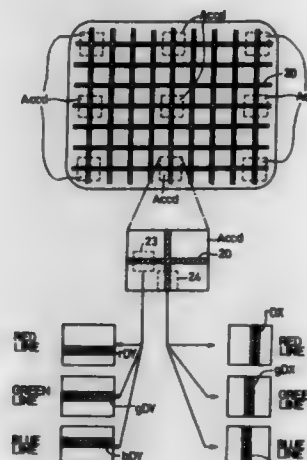
Filed Jun. 15, 1993, Ser. No. 77,784

Claims priority, application Japan, Jun. 19, 1992, 4-161313; Jul. 16, 1992, 4-189581; Mar. 8, 1993, 5-046964

Int. Cl.<sup>6</sup> H04N 17/04

U.S. Cl. 348-190

14 Claims



1. A device for measuring a characteristic of a color CRT having a display surface and a pickup region on the display surface, the device comprising:

image pickup means for receiving a light image from the pickup region to produce an electrical image signal, the pickup region having a specified area and consisting of a plurality of subregions for measurement;

an optical system having a focusing lens which provides a focused light image from the color CRT to the image pickup means;

divider means for dividing the electrical image signal into a plurality of image signal portions corresponding to the plurality of subregions;

selector means for selecting an image signal portion corresponding to a particular subregion;

controller means for controlling the focusing lens based on the selected image signal portion to focus on the particular subregion; and

calculator means for calculating a characteristic of the color CRT based on the selected image signal portion produced when the focusing lens is focused on the particular subregion.

#### 5,440,341 SIGNAL PROCESSING CIRCUIT FOR A SIMULTANEOUS ELECTRONIC ENDOSCOPE APPARATUS

Shigeo Suzuki, and Fujio Okada, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

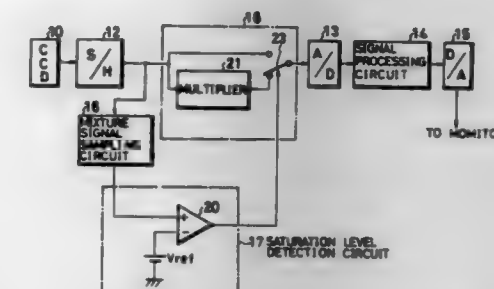
Filed May 18, 1994, Ser. No. 245,483

Claims priority, application Japan, May 20, 1993, 5-141566

Int. Cl.<sup>6</sup> H04N 9/64

U.S. Cl. 348-256

2 Claims



1. An electronic endoscope apparatus comprising:  
a simultaneous electronic endoscope apparatus having a color filter for each pixel  
an image pickup device circuit for forming a plurality of mixture signals by combining different pixel signals;  
a sampling circuit for sampling a predetermined mixture signal out of said plurality of mixture signals;  
a saturation state detection circuit for judging whether or not the predetermined signal is saturated;  
a gain control circuit for controlling the gain of the predetermined mixture signal so as to be amplified when the sampled signal is saturated, and  
wherein each of said mixture signals is formed by mixing upper and lower pixel signals in a charge coupled device, and said gain control circuit amplifies said predetermined mixture signal by a preset coefficient greater than 1 when the sampled signal is saturated.

5,440,342

#### LOGIC SYSTEM AND METHOD FOR CONTROLLING ANY ONE OF DIFFERENT CHARGE COUPLED DEVICE IMAGE SENSORS TO PROVIDE VIDEO IMAGE SIGNALS IN ACCORDANCE WITH A TELEVISION STANDARD

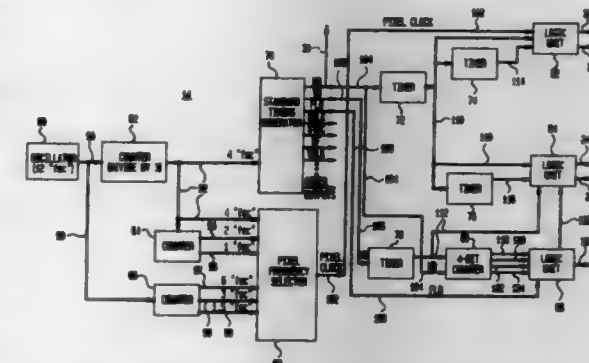
Ram Kannegundla, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 15, 1993, Ser. No. 5,323

Int. Cl.<sup>6</sup> H04N 7/01, 5/335

U.S. Cl. 348-294

10 Claims



1. A logic system for generating synchronizing (sync) and control signals in accordance with a television standard and for generating horizontal and vertical control signals as required

by a charge coupled device (CCD) image sensor, the logic system comprising:

drive means for providing a system signal having a frequency referenced to a standard television frequency sub-carrier (fsc);

timing generator means for generating standard sync and control signals in accordance with a television standard, the generator means being controlled by the drive means; pixel clock generating means for providing a pixel clock having repeating cycles each of which has a pre-determined number of pixel timing pulses in accordance with requirements of the CCD image sensor, the pixel clock generating means being controlled by the drive means; and

timing and logic means being driven by ones of the standard sync and control signals for generating horizontal and vertical control signals for the CCD image sensor such that the horizontal and vertical control signals are precisely referenced to the standard sync and control signals, such that the logic system is usable with any one of a number of different CCD image sensors to provide video signals in accordance with a television standard;

wherein the drive means is adapted to provide a signal having a frequency of a pre-determined multiple of the "fsc" to the timing generator means and provides a plurality of signals having frequencies of multiples of the "fsc" to the pixel clock generating means; and

wherein the pixel clock generating means is adapted to provide a pixel clock in accordance with a selected one of the plurality of signals from the drive means, the signal being selected in accordance with a number of pixel timing pulses required by the CCD image sensor to output a horizontal line of pixel image signals thereof.

5,440,343

# MOTION/STILL ELECTRONIC IMAGE SENSING APPARATUS

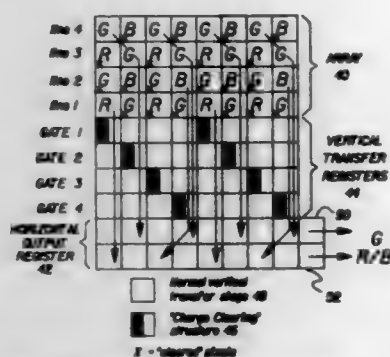
Kenneth A. Parulski; Eric G. Stevens, both of Rochester, and Robert H. Hibbard, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 28, 1994, Ser. No. 203,237

Int. Cl.<sup>6</sup> H04N 5/335

U.S. Cl. 348—316

12 Claims



1. An electronic image sensor comprising:

a row and column array of photosensitive pixels for generating image pixel signals in response to incident radiation; a horizontal output register; and vertical transfer means for transferring the image pixel signals generated by the photosensitive pixels to the horizontal output register;

wherein the vertical transfer means includes pixel dumping means for selectively preventing the image pixel signals generated in at least one of the columns of each row of the array of photosensitive pixels from being transferred to the horizontal output register;

wherein the vertical transfer means includes a row and column array of vertical transfer registers and the pixel dumping means includes a plurality of charge clearing structures in each row of vertical transfer registers; and wherein the charge clearing structures of each row of verti-

cal transfer registers are offset in different columns from the charge clearing structures of all other rows of vertical transfer registers.

5,440,344

# VIDEO ENCODER USING ADJACENT PIXEL DIFFERENCE FOR QUANTIZER CONTROL

Yoshinori Asamura; Takashi Itow; Tomohiro Ueda; Kenji Tsunashima, and Satoshi Kurahashi, all of Nagakakyō, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

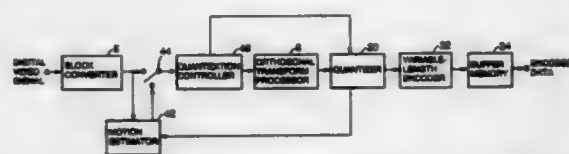
Filed Apr. 21, 1993, Ser. No. 48,732

Claims priority, application Japan, Apr. 28, 1992, 4-109405; May 29, 1992, 4-138663; Jun. 25, 1992, 4-167592; Sep. 2, 1992, 4-234540

Int. Cl.<sup>6</sup> H04N 7/30

U.S. Cl. 348—405

49 Claims



1. A method of compressively encoding a segment of a digital video signal to obtain a nominal amount of encoded data, comprising the steps of:

formatting the segment of the digital video signal into blocks corresponding to rectangular image areas;

calculating, separately for each block, a sum of absolute values of differences between horizontally and vertically adjacent pixels in the segment of said digital video signal; determining, from each said sum, a predicted amount of encoded data that would be generated from said segment at a standard quantization level, a separate predicted amount being determined from each separately calculated sum;

adding each of the separately determined predicted amounts for all blocks in said segment together, to thereby form a total predicted amount;

selecting, from prestored quantization levels, a segment quantization level that will yield an amount of encoded data substantially equal to said nominal amount of encoded data based on said total predicted amount of encoded data thereby forming a selected segment quantization level;

orthogonally transforming each separate block of said digital video signal to generate coefficients;

quantizing said coefficients according to said selected segment quantization level, thereby generating quantized coefficients;

encoding said quantized coefficients by a variable-length encoding method, thereby generating encoded data; and storing said generated encoded data in a buffer memory.

5,440,345

# HIGH EFFICIENT ENCODING/DECODING SYSTEM

Kenji Shimoda, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 16, 1993, Ser. No. 92,423

Claims priority, application Japan, Jul. 17, 1992, 4-191045; Feb. 12, 1993, 5-024562

Int. Cl.<sup>6</sup> H04N 7/50

U.S. Cl. 348—411

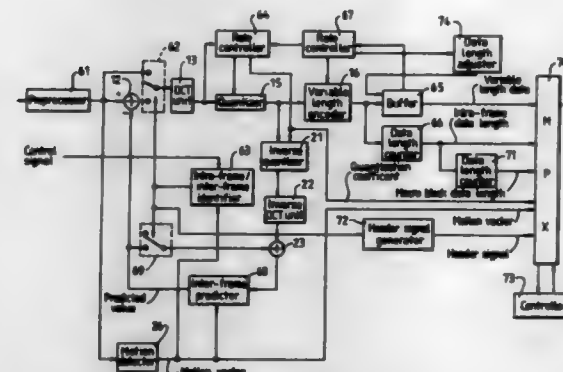
6 Claims

1. A high efficient encoding/decoding system comprising: an encoding assembly which converts input data received by said encoding assembly into compressed data, said encoding assembly grouping said input data into encoding units and generating sub-macro blocks and macro blocks from said encoding units of input data, said macro blocks in-

cluding macro block length data located at a head position thereof, said macro block length data indicating a length of said macro block, said macro blocks also including at least one of said sub-macro blocks therein,

wherein said encoder assembly generates said sub-macro blocks such that each of said sub-macro blocks includes one of

a) first output data including variable length data obtained by performing a variable length encoding on each of said encoding units of input data, header information associated with said variable length data, and sub-macro block length data indicating a length of said sub-macro block length data,



b) second output data including adjustment bit data for keeping a transmission rate constant and adjustment bit length data indicating a length of said adjustment bit data, and

c) third output data including a correction directing signal for directing a correcting operation, one of said first output data, said second output data and said third output data being generated based on selecting data included in said input data; and a transmission assembly that outputs said compressed data from said encoding/decoding system processor.

5,440,346

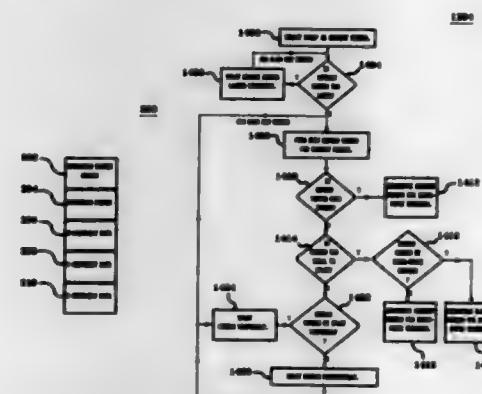
# MODE SELECTION FOR METHOD AND SYSTEM FOR ENCODING IMAGES

Adnan Alattar, Hillsboro, and Michael Keith, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif. Continuation-in-part of Ser. No. 78,931, Jun. 16, 1993, Pat. No. 5,351,085. This application Sep. 9, 1993, Ser. No. 119,438

Int. Cl.<sup>6</sup> H04N 7/13

U.S. Cl. 348—420

76 Claims



1. A method for encoding a region of an image, the region having a plurality of corresponding values, comprising the steps of:

(a) generating at least one similarity measure as a function of said values;

(b) selecting an encoding mode in accordance with said at least one similarity measure; and

(c) encoding said region in accordance with said selected encoding mode, wherein said values comprise a plurality of motion compensated difference values corresponding to said region and step (c) comprises the step of inter-frame encoding said region.

5,440,347

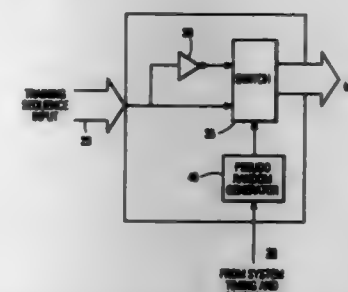
# METHOD AND APPARATUS FOR RANDOMIZING TRAINING SEQUENCES TO MINIMIZE INTERFERENCE IN DIGITAL TRANSMISSIONS

Zhi-Yuan Guan, Croton-on-Hudson, N.Y., assignor to Philips Electronics North America Corporation, New York, N.Y. Continuation-in-part of Ser. No. 60,181, May 7, 1993. This application Oct. 13, 1993, Ser. No. 136,425

Int. Cl.<sup>6</sup> H04N 7/00

U.S. Cl. 348—466

5 Claims



1. A method for forming a time multiplexed digital television signal comprising data portions and training signal portions, said method comprising the steps of:

a) forming a plurality of data portions from a source of information;

b) forming a plurality of digital training signal portions from a source of training signals, whereby selected ones of said training signals are chosen and inverted so as to form said digital training signal portions; and

c) time multiplexing said data portions and said digital training signal portions so as to form said time multiplexed digital signal.

5,440,348

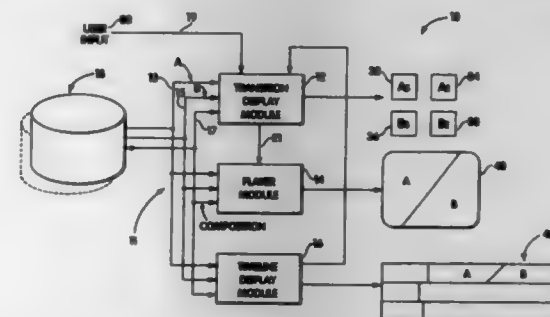
# METHOD AND USER INTERFACE FOR CREATING, SPECIFYING AND ADJUSTING MOTION PICTURE TRANSITIONS

Eric C. Peters, Carlisle, and Joseph H. Rice, Arlington, both of Mass., assignors to Avid Technology, Inc., Tewksbury, Mass. Filed Apr. 16, 1993, Ser. No. 49,028

Int. Cl.<sup>6</sup> H04N 5/262

U.S. Cl. 348—593

66 Claims



1. A transition editing method for editing a plural-frame transition between a first sequence of motion picture frames and a second sequence of motion picture frames, comprising: responding to a definition command to define the transition, simultaneously displaying four of the frames in separate



transition display areas, the four frames including the ones of the frames from the first and second sequences that are at the beginning of the transition, and the ones of the frames in the first and second sequences that are at the end of the transition, responding to a move command, and altering, in response to the move command, the position in their respective sequences from which two of the four frames are displayed in the step of simultaneously displaying to redefine the transition.

5,440,349

# COLOR SIGNAL DEMODULATION CIRCUIT AND METHOD THEREFOR

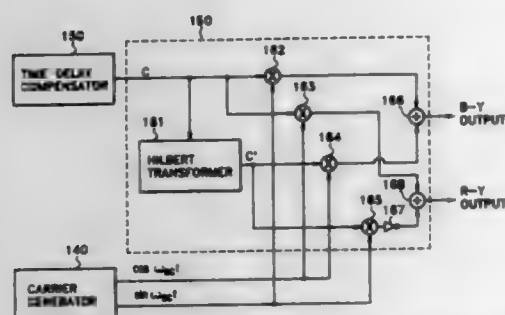
Young-gyun Ban, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea  
Filed Feb. 28, 1994, Ser. No. 202,426

Claims priority, application Rep. of Korea, Feb. 26, 1993, 93-2762

Int. Cl.<sup>6</sup> H04N 9/66

U.S. Cl. 348-638

11 Claims



1. A color signal demodulation circuit for demodulating an input modulated color signal using a carrier signal, said color signal demodulation circuit comprising:

a carrier generator for generating a first carrier signal having sine component and a second carrier signal having cosine component, said first and said second carrier signals being synchronized with a burst signal extracted from said color signal;

a phase delay phase delaying said input modulated color signal;

a first demodulator for demodulating a B-Y color difference signal of a baseband using a first result of multiplying said input modulated color signal with said first carrier signal and a second result of multiplying a delayed color signal output from the phase delay by said second carrier signal; and

a second demodulator for demodulating an R-Y color difference signal of the baseband using a third result of multiplying said input modulated color signal with said second carrier signal and a fourth result of multiplying said delayed color signal with said first carrier signal.

5,440,350

# METHOD AND APPARATUS FOR ENCODING SELECTED BLOCKS OF A RESIDUAL IMAGE SIGNAL

Stuart J. Golin, East Windsor, N.J., assignor to Intel Corporation, Santa Clara, Calif.

Filed May 28, 1993, Ser. No. 69,138

Int. Cl.<sup>6</sup> H04N 7/28

U.S. Cl. 348-699

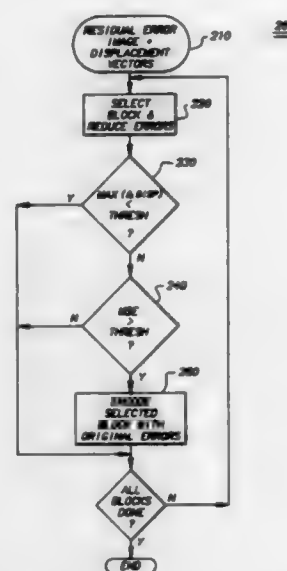
20 Claims

1. A method for partially encoding an image, comprising the steps of:

(a) dividing said image into a plurality of blocks;  
(b) selecting one block from said plurality of blocks and thereby forming a selected block;  
(c) determining whether said selected block is an exterior block; wherein a displacement vector is associated with

each block of said plurality of blocks and step (c) comprises the steps of:

(i) for each block that is a neighbor of said selected block, determining the difference between the displacement vector associated with said selected block and the displacement vector associated with said neighbor;  
(ii) selecting the maximum difference determined in step (i);  
(iii) comparing said maximum difference to a first threshold; and



(iv) if said maximum difference exceeds said threshold, then determining said selected block to be an exterior block;  
(d) encoding said selected block only if said selected block is determined to be an exterior block, otherwise ignoring said selected block; and  
(e) repeating steps (b)-(d) for each block of said plurality of blocks.

5,440,351

# TELEVISION WITH USER-SELECTABLE RADIO SOUND

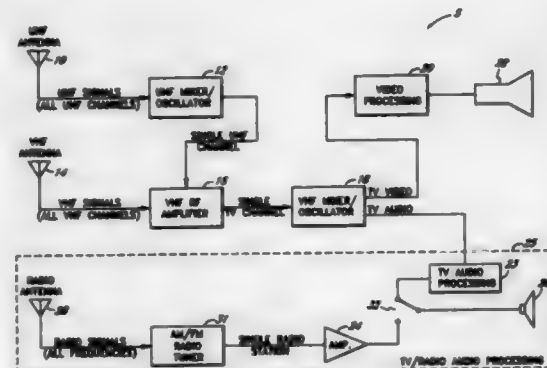
Ted Ichino, 7351 Artesia Blvd. #6, Buena Park, Calif. 90621

Continuation-in-part of Ser. No. 817,137, Jan. 6, 1992, abandoned. This application May 25, 1993, Ser. No. 68,620

Int. Cl.<sup>6</sup> H04N 5/60

U.S. Cl. 348-729

4 Claims



1. A television apparatus comprising a television tuner means capable of selecting, from a plurality of TV signals representative of television program channels received, one of

said TV signals; and further capable of separating the Video signal of the selected television channel from the Audio signal of the selected television channel; and still further capable, through Audio Processing means, of endowing said Audio signal with the capability of actuating a sound replication device;

an AM radio tuner means capable of selecting, from a plurality of AM radio signals received, one of said AM radio signals;

amplification means for amplifying the selected AM radio signal which is separate and independent from the Audio Processing of the television apparatus, and which endows said selected AM radio signal with the capability of actuating said sound replication device;

switching means for substituting said selected and amplified AM radio signal for the processed Audio signal of said selected television channel, whereby AM broadcasts can be substituted for the original television Audio program; control means for controlling said switching means, whereby a user can choose to listen to a selected AM broadcast or the original television Audio program while watching the television picture.

3. A television apparatus comprising a television tuner means capable of selecting, from a plurality of TV signals representative of television program channels received, one of said TV signals; and further capable of separating the Video signal of the selected television channel from the Audio signal of the selected television channel; and still further capable, through Audio Processing means, of endowing said Audio signal with the capability of actuating a sound replication device;

an AM/FM radio tuner means capable of selecting, from a plurality of AM and FM radio signal frequencies received, one of said frequencies from one of the AM and FM radio signals;

amplification means for amplifying the selected AM or FM radio signal which is separate and independent from the Audio Processing of the television apparatus, and which endows said selected AM or FM radio signal with the capability of actuating said sound replication device;

switching means for substituting said selected and amplified AM or FM radio signal for the processed Audio signal of said selected television channel, whereby selected AM or FM broadcasts can be substituted for the original television Audio program;

control means for controlling said switching means, whereby a user can choose to listen to a selected AM or FM radio broadcast or the original television Audio program while viewing the television picture.

5,440,352

# LASER-DRIVEN TELEVISION PROJECTION SYSTEM WITH ATTENDANT COLOR CORRECTION

Christhard Deter, and Dirk Loeffler, both of Gera, Germany, assignors to Schneider Rundfunkwerke Aktiengesellschaft, Tuerkheim, Germany

Filed Feb. 18, 1994, Ser. No. 198,484

Claims priority, application Germany, Mar. 4, 1993, 43 06 797.2; European Pat. Off., Dec. 30, 1993, 93121128

Int. Cl.<sup>6</sup> H04N 9/31, 9/74

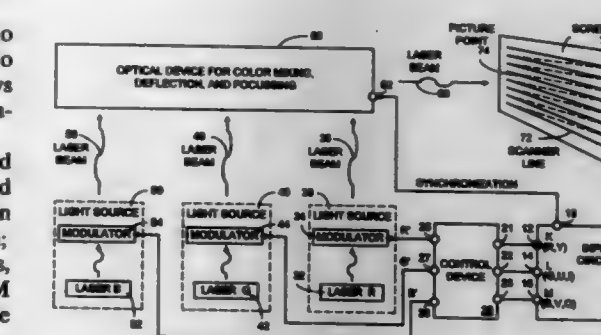
U.S. Cl. 348-750

10 Claims

1. In a process for generating color picture points of a television picture which are illuminated with light signals (RL', GL', BL') of different wavelengths and whose hues are fixed by means of color value signals (R, G, B) in a first base system which may be represented in a CIE diagram by corner points of a hue region which are defined by way of wavelengths of screen phosphors, in which process a second base system is derived in which the wavelengths of the light signals (RL', GL', BL') differ from those of the first base system and which shares a common range of hues with the first base system, and in which process light signals are generated from at least three signals (K, L, M) which are the color value signals (R, G, B) or contain said color value signals by way of a transformation

from said first base system into said second base system using a matrix, the improvement comprising the steps of:

determining the wavelengths of the light signals (RL', GL', BL') so that the shortest is 470 nm or less and so that the common range of hues contains at least those corner points of the range of hues of the first base system whose



wavelength is greater than the shortest wavelength determined by screen phosphors; and assuring that every hue produced by the matrix transformation within the common range of hues in the second base system is identical to the hue determined by the color value signals in the first base system.

5,440,353

# DISPLAY MONITOR INCLUDING MOIRE CANCELLATION CIRCUIT

Masao Yamazaki, Fujisawa, and Tetsuhiro Kitamura, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodama, Japan

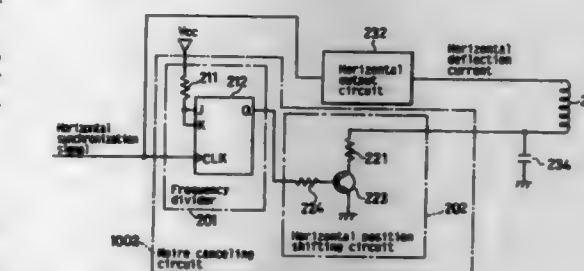
Filed Feb. 24, 1993, Ser. No. 22,038

Claims priority, application Japan, Feb. 25, 1992, 4-037486; Feb. 25, 1992, 4-037493; Feb. 25, 1992, 4-037496; Mar. 12, 1992, 4-053369

Int. Cl.<sup>6</sup> H04N 17/04

U.S. Cl. 348-806

8 Claims



1. A display monitor comprising:

a) a horizontal deflection circuit which includes:

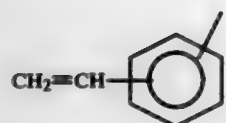
i) a horizontal synchronization signal processing circuit,  
ii) a horizontal output circuit, and  
iii) a horizontal deflection coil; and

b) a moire canceling circuit which includes:

i) a frequency divider which divides the horizontal synchronization signal to produce an output signal having a period which is twice as much as the horizontal period; and  
ii) a horizontal position shifting circuit for periodically supplying the horizontal deflection circuit with an additional current for the horizontal deflection coil in response to the output signal, the additional current having a parabolic waveform for shifting a display position of a set of scanning lines lengthwise with respect to another set of scanning lines which are displayed adjacent to the scanning lines of the first mentioned set for each of the horizontal periods.







and wherein  $(n+m)$  is an integer of 3 or more.

5,440,359

# LENSES AND SPECTACLES FOR REDUCING NYSTAGMIC OSCILLATIONS, AND A METHOD FOR ACHIEVING THIS PURPOSE

Raymonde Bloch-Malem, 11 Arlozorov Street, Jerusalem 92181, Israel

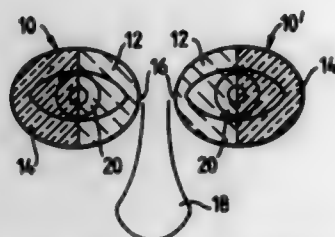
Filed Feb. 4, 1994, Ser. No. 191,639

Claims priority, application Israel, Feb. 28, 1993, 104884

Int. Cl.<sup>6</sup> G02C 7/04, 7/10, 7/02; A61B 3/00

U.S. Cl. 351—203

12 Claims



1. A tinted pair of lenses for overcoming the deleterious effects of nystagmic oscillations, particularly in persons suffering from dyslexia, said tinting varying along the lateral direction, extending in each lens over at least two zones, and being respectively uniform along each one of a predetermined number of imaginary vertical lines in each zone, a lighter tint being used in a first zone extending from the lens edge nearest to the nose of the wearer, when the lens is in use, to a position corresponding to the centre of the pupil, and a darker tint being used in a second zone extending over the remaining lens area.

5,440,360

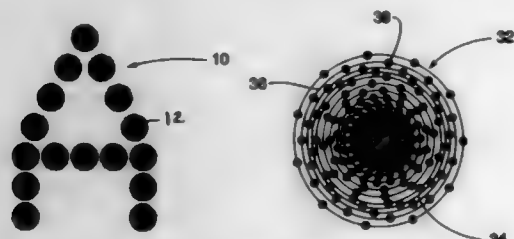
# REFLECTIVE STIMULUS FOR COMPUTER SCREEN SIMULATION FOR EYE EXAMINATIONS

Jonathan G. Torrey, and Cosmo Salibello, both of Portland, Oreg., assignors to Prio Corporation, Lake Oswego, Oreg. Continuation-in-part of Ser. No. 211, Jan. 4, 1993, Pat. No. 5,325,136, which is a continuation-in-part of Ser. No. 665,903, Mar. 7, 1991, Pat. No. 5,191,367, which is a continuation-in-part of Ser. No. 282,596, Dec. 12, 1988, Pat. No. 4,998,820. This application Nov. 5, 1993, Ser. No. 148,693

Int. Cl.<sup>6</sup> A61B 3/032, 3/02

U.S. Cl. 351—239

11 Claims



1. An optometric test card for reading by a patient during an eye examination comprising:  
an opaque, generally planar medium having a plurality of characters formed thereon for reading by the patient, each character formed by a plurality of pixel elements arranged in a predetermined pattern;  
each pixel element comprising an array of dots having a

center, the array having a maximum density of dots adjacent the center of the array and the dot density gradually decreasing as a function of distance from the center; and the dots being sized so that individual dots are not discernable by the patient at a viewing distance greater than approximately 15 inches (38 cm.) so that the edges of the characters appear fuzzy to the patient, thereby simulating the visual effect of a computer display screen.

5,440,361

# METHOD FOR FLATTENING ACETATE-BASED FILMS USING STEAM

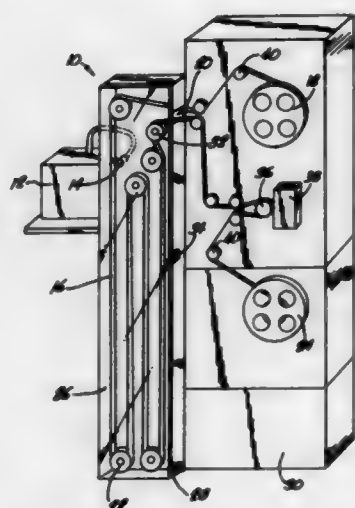
Ronald A. Moortgat, Chatsworth, Calif., assignor to The Walt Disney Company, Burbank, Calif.

Filed Sep. 3, 1993, Ser. No. 116,728

Int. Cl.<sup>6</sup> G03D 15/08

U.S. Cl. 352—56

22 Claims



1. A method for treating a physically distorted magnetic acetate-based film onto which a sound track has been recorded, comprising:  
placing the physically distorted film in a container and contacting the film with an effective amount of steam to soften the film so that the film becomes flatter.

5,440,362

# TRANSPARENCY DISPLAY SYSTEM

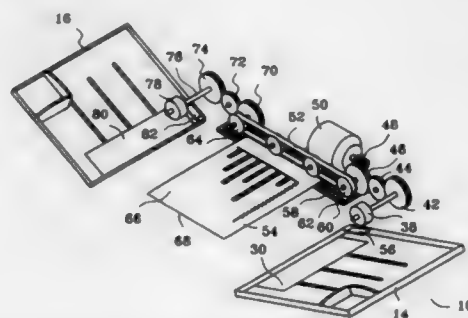
Jeffrey S. Jones, 1502 Enclave Pkwy. #114, Houston, Tex. 77077

Filed Apr. 22, 1994, Ser. No. 231,161

Int. Cl.<sup>6</sup> G03B 23/02

U.S. Cl. 353—103

17 Claims



1. A system for the display of transparencies comprising:  
a first transparency receiving tray;  
a second transparency receiving tray;  
a staging means connected at one end to said first transpar-

5,440,364

# FILM LOADER

Keita Takahashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

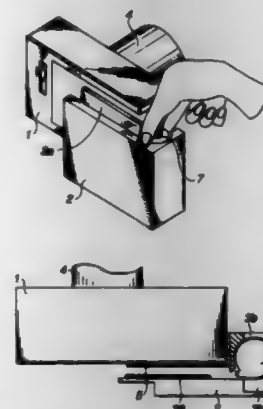
Continuation of Ser. No. 20,319, Feb. 19, 1993, abandoned. This application Oct. 6, 1994, Ser. No. 319,324

Claims priority, application Japan, Feb. 19, 1992, 4-032308

Int. Cl.<sup>6</sup> G03B 1/18

U.S. Cl. 354—173.1

48 Claims



1. A film loader, comprising:

- a Patrone housing that linearly moves freely between a storage position, at which the Patrone housing is stored in a camera body, and a projecting position, at which the Patrone housing projects outwardly and away from a side face of said camera body and is displaced a distance from said side face which is measured along a line perpendicular to an optical axis of the camera body enabling a Patrone to be inserted therein; and
- a leader housing that is formed as part of said Patrone housing, and linearly moves between a storage position, at which the leader housing is stored in said camera body, and a projecting position, at which the leader housing projects rearwardly from a rear face of said camera body and is displaced by a distance measured along a second line parallel to said optical axis for receiving a film leader extending from a Patrone.

5,440,363

# METHOD AND APPARATUS FOR SETTING CAMERA OPERATING MODE ACTIVITY

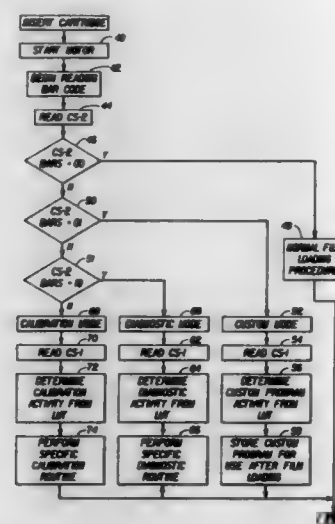
John H. Minnick, Rochester, and J. David Cocca, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 997,280, Dec. 23, 1992, abandoned. This application Nov. 30, 1993, Ser. No. 160,548

Int. Cl.<sup>6</sup> G03B 7/00

U.S. Cl. 354—21

8 Claims



reading one or more visible test indicia, located on the same photosensitive material bearing the images of photographed subjects, to determine predetermined characteristics of the test indicia, and means for determining whether or not the characteristics of the visible test indicia are within a predetermined range, the improvement comprising:

means for automatically creating a latent image of the test indicia on said photosensitive material;  
said processing means being adapted to process said photosensitive material to render said latent image of the test indicia visible, said visible test indicia including a plurality of images having different image densities from each other; and  
means for adjusting said processing means, if the characteristics of said visible test indicia are not within said predetermined range, to control one or more processing parameters of said processing means.

5,440,366

## MULTI-PAD FILM PROCESSING

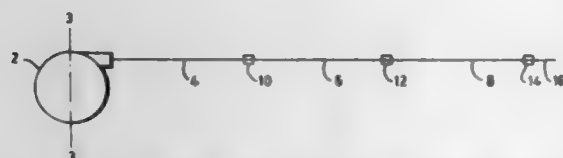
Wanda Reim, Lexington, and Vincent L. Cocco, Wakefield, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 22, 1994, Ser. No. 279,505

Int. Cl.<sup>6</sup> G03D 9/00

U.S. Cl. 354—301

9 Claims



1. A photographic film cartridge comprising a strip wrapped around a spool, said strip comprising a leader protruding from said cartridge, an image carrying segment, a leader barrier for physically and chemically separating said leader from said image carrying segment, a first reagent laden web to be joined for a first predetermined period of time with said image carrying segment during a first processing step for processing of the image carrying segment, a first barrier for physically and chemically separating said image carrying segment from said first reagent laden web, a second reagent laden web to be joined for a second predetermined period of time with said image carrying segment during a second processing step for further processing of the image carrying segment, a second barrier for physically and chemically separating said first reagent laden web from said second reagent laden web, said second reagent laden web being attached to said spool.

5,440,367

## FOCUS DETECTING APPARATUS PROVIDED WITH A PLURALITY OF DETECTION FIELDS

Yasuo Suda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 788,286, Nov. 5, 1991, abandoned. This application Feb. 16, 1994, Ser. No. 197,444

Claims priority, application Japan, Nov. 7, 1990, 2-302265; Nov. 7, 1990, 2-302266; Nov. 7, 1990, 2-302267

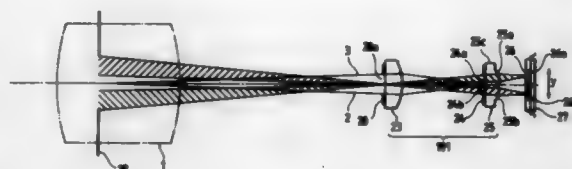
Int. Cl.<sup>6</sup> G03B 13/36

U.S. Cl. 354—402

13 Claims

1. A focus detecting apparatus comprising:  
optical means for forming, from a light beam passed through an objective lens, light intensity distributions whose relative positions vary in conformity with the focus adjusted state of the objective lens, wherein the variation of the angle of refraction of a portion of the light beam by said optical means along a direction in which the light intensity distributions vary differs from the variation of the angle of refraction along a direction perpendicular thereto;  
light receiving means for receiving the light intensity distributions

and forming a signal indicative of the focus adjusted state of the objective lens; and



masking means for regulating the light beam passed through the objective lens to effect detection relative to a desirable position in a scene which is not restricted to a predetermined position.

5,440,368

## CAMERAS

Nobuchika Momochi, Kanagawa, Japan, assignor to Sony Corporation, Japan

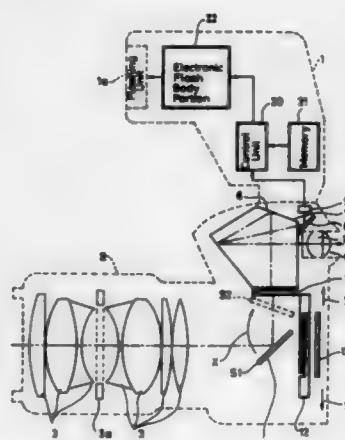
Filed Oct. 26, 1992, Ser. No. 966,512

Claims priority, application Japan, Oct. 31, 1991, 3-286779

Int. Cl.<sup>6</sup> G03B 15/05

U.S. Cl. 354—415

11 Claims



1. A camera having an electronic flash that is energized on the basis of a release signal, comprising:  
measuring means for measuring a first amount of light incident on said measuring means through a lens system and for outputting a first measured data indicative of said first amount of light, said measuring means measuring a second amount of light incident upon said measuring means during the emission of a first flash of light generated in response to said release signal and generating a second measured data signal;  
memory means, connected to said control means, for storing said first measured data;  
control means responsive to said release signal for generating a first control signal for causing said first flash of light to be emitted from said electronic flash during a first period of time, said control means generating a second control signal based upon a difference between said first measured data stored in said memory means and said second measured data signal, said second control signal causing said electronic flash to be re-energized to emit a second flash of light for a second period of time; and  
shutter means for routing light from said lens system to said measuring means during at least a portion of said first predetermined period of time, and for routing light to image acquisition means during at least a portion of said second predetermined period of time.

5,440,369

## COMPACT CAMERA WITH AUTOMATIC FOCAL LENGTH DEPENDENT EXPOSURE ADJUSTMENTS

Yasushi Tabata; Norio Numako, and Kosei Kosako, all of Tokyo, Japan, assignors to Asahi Kogaku Kabushiki Kaisha, Tokyo, Japan

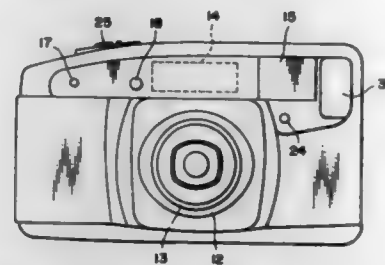
Filed Nov. 30, 1993, Ser. No. 159,207

Claims priority, application Japan, Nov. 30, 1992, 4-343357; Nov. 30, 1992, 3-343358; Nov. 30, 1992, 4-343359

Int. Cl.<sup>6</sup> G03B 7/08

U.S. Cl. 354—432

52 Claims



1. A compact camera comprising:  
a photographing optical system, the focal length of which is variable over a certain range;  
a photometric system having a plurality of segments, each segment outputting a brightness level, said photometric system separate from said photographing optical system; and  
control means to determine an exposure value, said control means using weighting coefficients to calculate a weighted average of said brightness levels outputted by said plurality of segments, said coefficients varying according to said focal length of said optical system, said average brightness level used to determine said exposure value.

5,440,370

## PHOTOGRAPHIC COPIER HAVING DIFFERENT MAGNIFICATIONS

Heinrich Hunniger, Rottelmisch, and Walter Drechsler, Gera, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

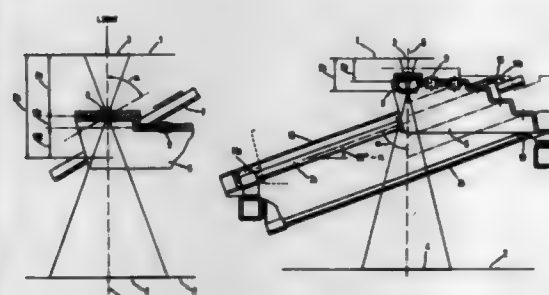
Filed Jun. 10, 1993, Ser. No. 75,161

Claims priority, application Germany, Jul. 27, 1992, 42 740.3

Int. Cl.<sup>6</sup> G03B 27/52

U.S. Cl. 355—55

9 Claims



1. A copier, comprising a guide having a substantially straight segment; a carrier on said guide movable along said segment; and a plurality of lenses on said carrier having substantially parallel optical axes, said segment being inclined to said axes at an angle different from 90 degrees;  
a copying station; and wherein said lenses have different magnifications and are arranged to be selectively positioned in said copying station;  
said copying station having a support for a master to be reproduced, said support defining a plane; and wherein

said segment extends through said station, said segment having a first end which is farther from said plane and a second end which is nearer said plane, and said carrier having a first end portion nearer said first end and a second end portion nearer said second end, said lenses having different magnifications and including at least one lens having a maximum magnification, and said one lens being disposed at said first end portion, said segment has a projection in a plane substantially normal to said axes, said lenses having different magnifications and being arranged so that the magnification decreases as considered in the direction of said projection, said lenses include a first lens having a first focal length and a second lens having a different second focal length, said segment being inclined so as to compensate for only a portion of the difference between said focal lengths.

5,440,371

## COPYING SYSTEM USING A CARD

Toru Okatani, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

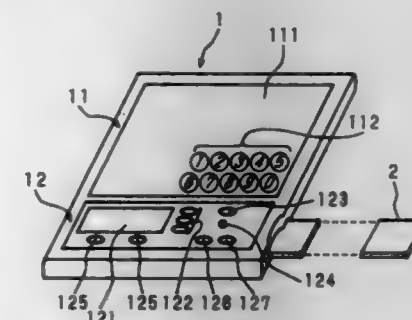
Filed Mar. 22, 1993, Ser. No. 35,235

Claims priority, application Japan, Mar. 26, 1992, 4-102180

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—203

2 Claims



1. A copying system, consisting of a copying machine and a copying condition setting device for setting copying conditions for the copying machine by means of wireless communication, comprising:  
transmitting means associated with the copying machine, for transmitting various kinds of information;  
receiving means associated with the copying condition setting device, for receiving the information transmitted from said transmitting means associated with the copying machine;  
transmitting means associated with the copying condition setting device, for transmitting various kinds of information in accordance with the information received by said receiving means associated with the copying condition setting device; and  
receiving means associated with the copying machine, for receiving the information transmitted from said transmitting means associated with the copying condition setting device;  
wherein said transmitting means associated with the copying machine transmits information for identifying the copying machine, and said receiving means associated with the copying condition setting device receives the transmitted information and thereby identifies the copying machine, whereupon said transmitting means associated with the copying condition setting device transmits information for identifying the copying condition setting device to the identified copying machine, and wherein, upon reception of the various kinds of information by said receiving means associated with the copying machine, said transmitting means associated with the copying machine is switched to a wider transmission range.



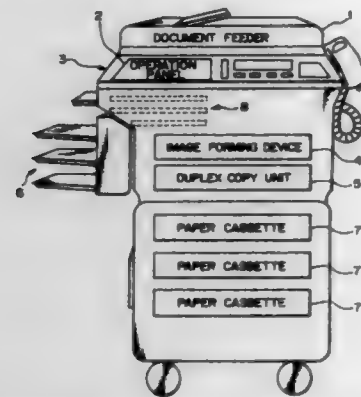
5,440,372

## DIGITAL COPIER SYSTEM

Norifumi Ito, Kawasaki, and Jun Doi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan  
 Filed May 23, 1994, Ser. No. 247,757  
 Claims priority, application Japan, Jun. 11, 1993, 5-140605  
 Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 355—204

2 Claims



1. In a multitask type digital copier system in which a plurality of applications, including copier, printer and facsimile applications, share and selectively use a plurality of resources, including an image reading device, an image forming device and a duplex copy unit, requests for using said duplex copy unit from a plurality of applications are subjected to exclusive control to thereby allow only one of said applications to use said duplex copy unit.

5,440,373

## COLOR IMAGE FORMING APPARATUS

Tsuyoshi Deki, Kawasaki; Minoru Suzuki, Yokohama; Koji Sakamoto; Koichi Noguchi, both of Tokyo; Hiroyuki Matsushiro, Yokohama; Eiichi Sasaki, Sagami; Noriyuki Kimura, Kawasaki; Takatsugu Fujishiro, and Chiyako Hattayama, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

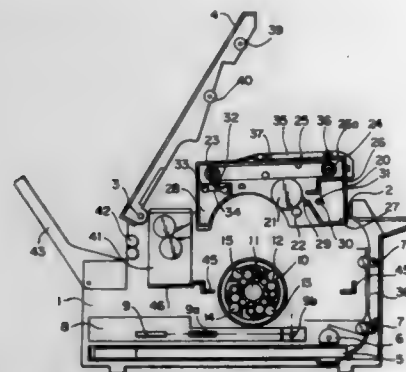
Continuation of Ser. No. 125,766, Sep. 24, 1993, abandoned. This application Sep. 12, 1994, Ser. No. 302,957

Claims priority, application Japan, Sep. 25, 1992, 4-256180

Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 355—210

11 Claims



1. An image forming apparatus comprising:  
 a body whose upper portion is openable;  
 a photoconductive element;  
 a charger adjacent to said photoconductive element; exposing means;  
 a developing device;  
 image transferring means located above said photoconductive element;  
 a photoconductive element cartridge for supporting both of said photoconductive element and said image transferring

means within said photoconductive element cartridge, a top portion of said photoconductive element cartridge comprising first transport rollers;

cleaning means; and  
 image fixing means;

said body having second transport rollers in the openable upper portion thereof which correspond to the first transport rollers on the top portion of the photoconductive element cartridge, said openable upper portion of said body uncovering a sheet transport path defined on the top portion of said photoconductive element cartridge when said upper portion is opened;

at least said image transferring means and said photoconductive element being removably supported by said body;  
 said image transferring means and said photoconductive element being each mounted and dismounted in an up-and-down direction of said apparatus, wherein when said upper portion of said body is opened, a space for mounting and dismounting said image transferring means and said photoconductive element is formed.

5,440,374

## CHARGING DEVICE, IMAGE FORMING APPARATUS AND PROCESS CARTRIDGE DETACHABLY MOUNTABLE TO IMAGE FORMING APPARATUS

Hiroki Kisu, Fujisawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

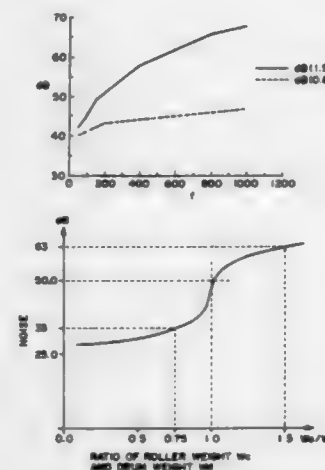
Continuation of Ser. No. 988,161, Dec. 9, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 312,184

Claims priority, application Japan, May 29, 1992, 4-164225

Int. Cl.<sup>6</sup> G03G 15/02

U.S. Cl. 355—219

21 Claims



1. A charging device for transferring an oscillating voltage from a voltage source, said charging device comprising:

a movable member to be charged;

a charging member contactable to said member to be charged to electrically charge said member to be charged, said charging member being configured to receive the oscillating voltage and to conduct the oscillating voltage to said member to be charged;

wherein  $W_c/W_d < 1.0$  is satisfied, where  $W_c$  is a weight of said charging member, and  $W_d$  is a weight of said member to be charged; and

wherein  $V_p > f/100$  (mm/sec) when said charging member conducts the oscillating voltage to said member to be charged,

where  $V_p$  (mm/sec) is a moving speed of the member to be charged, and  $f$  (Hz) is a frequency of the oscillating voltage.

5,440,375

## CORONA DISCHARGER DISPLACING MECHANISM AND GRID ELECTRODE POSITIONING MECHANISM

Shuji Fujisawa; Susumu Komaki; Shingo Sakato; Masami Taniguchi, and Hideki Takeda, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

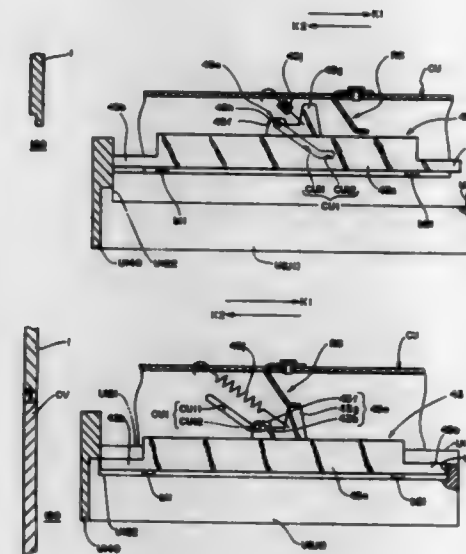
Filed Jan. 10, 1994, Ser. No. 179,547

Claims priority, application Japan, Jan. 11, 1993, 5-002743; Jan. 11, 1993, 5-002895

Int. Cl.<sup>6</sup> G03G 15/02

U.S. Cl. 355—221

23 Claims



1. A corona discharger displacing mechanism for an image forming apparatus, wherein the image forming apparatus includes a unit which forms at least a part of an image forming section for image formation which is replaceable through an insertion port in a main body of the image forming apparatus, and the image forming apparatus further includes a corona discharger set in a part of the unit, wherein the unit is provided for displacing the corona discharger between a retreat position where replacement of the unit is allowed and a set position where the unit is set, the corona discharger displacing mechanism comprising:

a setting operating member disposed on the unit for setting the corona discharger in the set position during an inserting operation of the unit;

wherein the unit includes a pair of supporting portions for carrying an image carrier in the image forming apparatus, and a unit cover for covering a hole formed in one supporting portion through which the image carrier may be replaced,

wherein the unit cover serves as the setting operating member.

5,440,376

## ELECTROPHOTOGRAPHIC APPARATUS

Hideaki Hagihara, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 7, 1993, Ser. No. 45,053

Claims priority, application Japan, Apr. 7, 1992, 4-085647; Apr. 7, 1992, 4-085648; Apr. 7, 1992, 4-085652

Int. Cl.<sup>6</sup> G03G 21/12

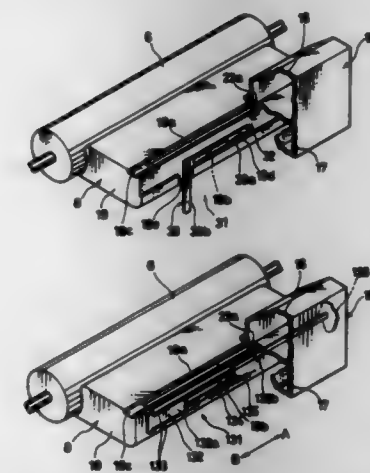
U.S. Cl. 355—245

36 Claims

1. An electrophotographic apparatus comprising:  
 transport path means for transporting a copy material;  
 an upper body which is moved upward around a supporting point to expose said transport path means;  
 developing means, disposed in said upper body, for developing an electrostatic latent image with a developer including toner and carrier, said carrier being gradually supplied to said developing means, and a deteriorated developer

which is not reused in said developing means being gradually discharged from a developer discharge opening formed in said developing means;

shutter means for closing said developer discharge opening by an upward movement of said upper body to expose said transport path means and for opening said developer discharge opening by a downward movement of said upper body to cover said transport path means and a lower body which is positioned so that it faces said upper body and that said transport path means is sandwiched between said lower and upper bodies, wherein said shutter means comprises a movable shutter



member for opening and closing said developer discharge opening and shutter driving means for moving said movable shutter member to lock said upper body with said lower body and to open said developer discharge opening when covering up said transport path means, and for moving said movable shutter member to unlock said upper and lower bodies and to close said developer discharge opening when exposing said transport path means said shutter driving means including a lock section for locking said upper body with said lower body and a driving section for moving said shutter member to open said developer discharge opening, said lock section and said driving section being formed as a single component.

5,440,377

## APPARATUS FOR CONTROLLING SPEED OF A DEVELOPING ROLLER AS IT ENGAGES A PHOTORECEPTOR

Tadashi Izawa; Ken Nonaka, and Masanaki Ikeda, all of Hachioji, Japan, assignors to Konica Corporation, Japan

Filed Oct. 15, 1993, Ser. No. 138,127

Claims priority, application Japan, Nov. 4, 1992, 4-295202

Int. Cl.<sup>6</sup> G03G 15/06

U.S. Cl. 355—245

4 Claims

1. An apparatus for forming a toner image around a rotatable endless photoreceptor, comprising:

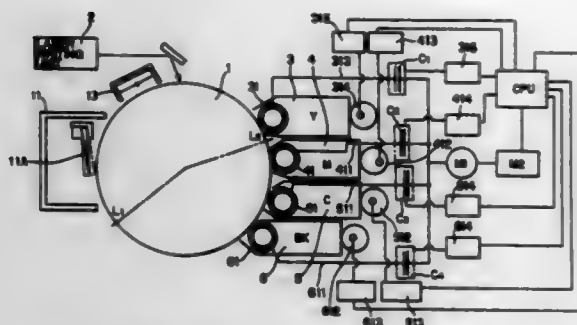
a charger for providing a surface of the photoreceptor with an electric charge;

an exposure device for exposing the photoreceptor with an image light so as to form a latent image;

a plurality of developing devices differing in color to develop the latent image into a color toner image, each of the developing devices including a cylindrical sleeve,

a spacing roller provided coaxially on the sleeve, wherein when a latent image is developed, the spacing roller is brought in contact with the photoreceptor so that a given distance is provided between the sleeve and the

photoreceptor and the sleeve is rotated at a rated speed by a driving motor,  
a clutch to engage or disengage the sleeve and the driving motor;



a controller to control the clutch and the driving motor so that when the clutch engages the sleeve and the driving motor, the driving motor is stopped or rotated at a speed lower than the rated speed.

5,440,378

#### DEVELOPING DEVICE ACCOMMODATING A TWO COMPONENT DEVELOPER AND METHOD OF USING SAME

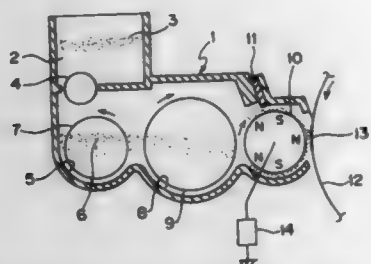
Masahiko Matsuura, Takatsuki, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 1, 1993, Ser. No. 130,443

Claims priority, application Japan, Oct. 6, 1992, 4-267226  
Int. Cl.<sup>6</sup> G03G 15/09

U.S. Cl. 355—251

18 Claims



1. A developing device for developing an electrostatic latent image formed on a photoreceptor, comprising:  
an accommodating portion which accommodates a two-component developer of a toner and a carrier;  
a rotatable developing roller confronting said photoreceptor and supplying the developer to said electrostatic latent image on the photoreceptor at a developing region where said developing roller confronts the photoreceptor while holding the developer thereon; and  
means for providing a developer packaged density (PD) in said developing region at 40–50 when the mean toner particle diameter is 3–5 μm, said developer packaged density (PD) being defined by the following equation:

$$PD = 100M / (\rho \cdot D_s)$$

wherein:

M is an amount of developer on the developing roller per unit of surface area (g/cm<sup>2</sup>)

ρ is the carrier's true specific gravity (g/cm<sup>3</sup>), and

D<sub>s</sub> is a spacing between the developing roller and the photoreceptor (cm).

#### 5,440,379 IMAGE TRANSFER DEVICE WITH CLEANER FOR ELECTROPHOTOGRAPHIC COPYING

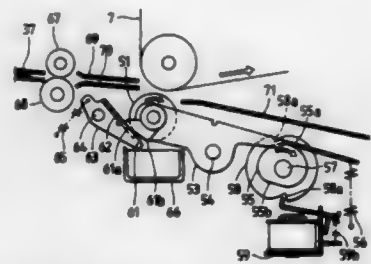
Tadashi Hayamizu, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 5, 1993, Ser. No. 131,582

Claims priority, application Japan, Oct. 6, 1992, 4-267073  
Int. Cl.<sup>6</sup> G03G 15/14

U.S. Cl. 355—271

17 Claims



1. An image-transferring apparatus comprising:  
an image transfer member on which a toner image is formed;  
a transfer cylindrical member arranged to hold a transfer paper along with said image transfer member to transfer the toner image formed on said image transfer member onto the transfer paper;  
a contact cleaner arranged to engage a surface of said transfer cylindrical member for cleaning the surface of said transfer cylindrical member; and  
a cleaner supporting member for supporting said contact cleaner and moving said contact cleaner to selectively establish engagement and disengagement with and from said transfer cylindrical member;  
wherein said contact cleaner includes a cleaning blade which is made of an elastic material.

5,440,380

#### IMAGING FORMING APPARATUS HAVING TRANSFER MATERIAL CARRYING MEMBER FOR CARRYING TRANSFER MATERIALS

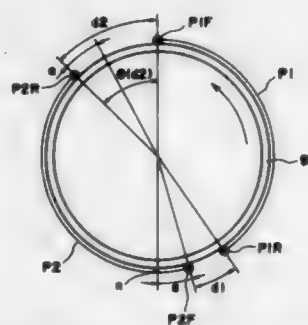
Kenji Takeda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1993, Ser. No. 134,668

Claims priority, application Japan, Oct. 13, 1992, 4-300475  
Int. Cl.<sup>6</sup> G03G 15/16, 15/01

U.S. Cl. 355—271

7 Claims



7. An image forming apparatus comprising:  
an image bearing member;  
a transfer material carrying member capable of carrying a plurality of transfer materials, wherein the transfer materials carried on said transfer material carrying member are capable of receiving an image from said image bearing member at a transfer position, and wherein the plurality of transfer materials provide therebetween a first interval and a second interval which is larger than the first interval;  
wherein said transfer material carrying member includes a carrying sheet and a supporting member for supporting

the carrying sheet, said supporting member extending in a direction substantially perpendicular to a movement direction of said transfer material carrying member, and wherein said supporting member is in the region of the transfer material carrying member of the second interval.

5,440,382

#### TRANSFER MATERIAL CARRYING CONTROLLING APPARATUS

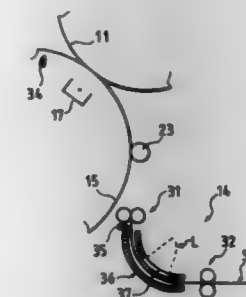
Yoshiharu Suga, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1993, Ser. No. 70,250

Claims priority, application Japan, Jun. 3, 1992, 4-142509  
Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—317

2 Claims



5,440,381

#### SHEET CONVEYANCE APPARATUS FOR AN IMAGE FORMING APPARATUS

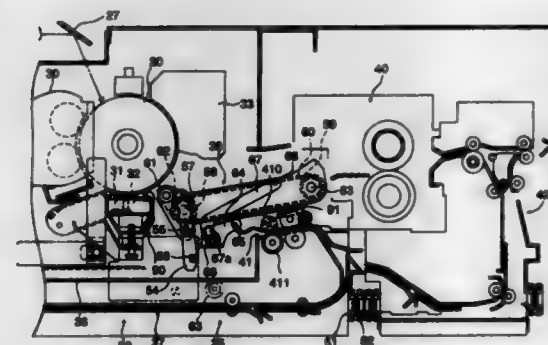
Chikatsu Suzuki, Shigetaka Kurosu, and Kazunobu Miura, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 21, 1993, Ser. No. 124,025

Claims priority, application Japan, Sep. 22, 1992, 4-278082  
Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 355—309

8 Claims



1. A sheet conveyance apparatus for conveying a recording sheet in a conveyance path of an image forming apparatus, the conveyance apparatus comprising:

photoreceptor means having a moving surface for holding a toner image;  
photoreceptor driving means for driving said moving surface of said photoreceptor means at a first linear speed;  
image forming means for forming said toner image on said moving surface;  
registration means, located prior to said image forming means in the conveyance path of the recording sheet, for correcting skew of the leading edge of the recording sheet at a registration section;  
transfer means for transferring said toner image from said moving surface onto the recording sheet at a transfer processing section;  
intermediate conveyance means for conveying said recording sheet from said transfer processing section, said intermediate conveyance means including  
a conveying member for conveying said recording sheet, and  
a conveying member driving means for driving said conveying member at a second linear speed, wherein said second linear speed of said conveying member is higher than said first linear speed;  
fixing means for fixing said toner image transferred onto the recording sheet at a fixing section; and  
conveyance unit means, having a unit body, for conveying said recording sheet from said intermediate conveyance means to said fixing section;  
wherein the conveyance path of the recording sheet between said registration section and said fixing section is substantially linear.

1. In an image generating device of a multiplex transfer system having a transfer device for transferring a developed image on an electrostatic latent image carrier to a transfer material held on a transfer material holder, and a transfer material carrying device for carrying a transfer material to said transfer material holder, the improvement wherein:

(a) said transfer material holder comprises a transfer drum having a transfer drum rotation position detecting sensor for detecting the rotation position of said transfer drum;  
(b) said transfer material carrying device comprises a main carrying roll for carrying a transfer material to said transfer drum and having an on-timing adjusting means for adjusting the driving timing of said main roll, a subsidiary carrying roll for transferring the transfer material to said main carrying roll so as to generate a loop of the transfer material, a transfer material detecting sensor adjacent said main carrying roll, and a jam judging timer for judging jam of transfer material based on a detection signal from said transfer material detecting sensor; and  
(c) there is further included a transfer material carrying control device having means for receiving signals from each of said transfer drum rotation position detecting sensor, said transfer material detecting sensor and said on-timing adjusting means, and means for adjusting the driving timing of said main carrying roll in response to said signal from said rotation position detecting sensor and changing the judging timing of said judging timer and the driving timing of said subsidiary carrying roll in accordance with an adjusted driving timing of said main carrying roll to thereby ensure the optimum quantity of the loop of transfer material.

5,440,383

#### PHASE DETECTION DEFLECTOMETER-TYPE OPTICAL DEVICE HAVING A LARGE MEASURING RANGE

Jean M. Bacchus, Saint-Priest-en-Jarez, and Eric Durand, Saint-Heand, both of France, assignors to Essilor International (Compagnie General D'Optique), Cretell, France

PCT No. PCT/FR93/00323, § 371 Date Nov. 30, 1993, § 102(e) Date Nov. 30, 1993, PCT Pub. No. WO93/20416, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 31, 1993, Ser. No. 150,127

Claims priority, application France, Apr. 1, 1992, 92 03937  
Int. Cl.<sup>6</sup> G01B 9/00

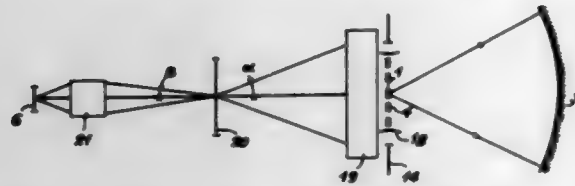
U.S. Cl. 356—124

3 Claims

1. In an optical device, of the deflectometer type, particularly with phase detection, comprising a light source, a surface to be tested, a semi-reflective surface between the light source and the surface to be tested to deflect light reflected by the



surface to be tested, a grating placed adjacent a focal region of said reflected light, and a CCD camera coupled to data processing means; the improvement which comprises, between the grating and the CCD camera, a primary objective (19) with a large entry pupil supplying an intermediate image, a ground



glass (20) adapted to receive said intermediate image, and a secondary optical system (21) through which the intermediate image passes which is formed on the ground glass (20) and which forms a final image on a detector (6) of the CCD camera.

5,440,384

#### METHODS OF INSPECTING WAFERS FOR MANUFACTURING LIGHT EMITTING ELEMENTS

Masato Yamada, Makoto Kawasaki, and Yutaka Tamura, all of Annaka, Japan, assignors to Shin-Etsu Handotai Kabushiki Kaisha, Tokyo, Japan

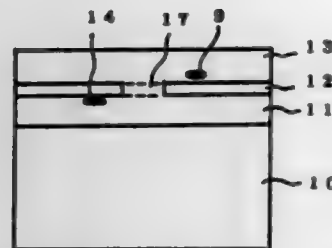
Filed Aug. 30, 1993, Ser. No. 113,189

Claims priority, application Japan, Sep. 10, 1992, 4-268222

Int. Cl.<sup>6</sup> G01N 21/88

U.S. Cl. 356—237

17 Claims



1. A method of inspecting a wafer to be used for manufacturing light emitting elements which have a double-hetero structure comprising an active layer and upper and lower clad layers sandwiching the active layer from upper and lower sides formed on a semiconductor substrate, comprising the steps of: applying an irradiation light containing a wavelength which is not absorbed by said upper clad layer but is absorbed by said active layer on said wafer; inspecting for defects by observing the secondary light from said wafer caused by the irradiation light; and wherein the defects occurring in said wafer for manufacturing light emitting elements are active layer deficient areas where said active layer is partially missing, and said secondary light is a reflection light occurring when said irradiation light goes through said active layer deficient areas and reaches and reflects from said semiconductor substrate surface.

5,440,385

#### INTEGRATED ISOTROPIC ILLUMINATION SOURCE FOR TRANSLUCENT ITEM INSPECTION

Howard Fein, Richmond Heights, and Terry L. Graves, Wadsworth, both of Ohio, assignors to Premco Technology, Inc., Solon, Ohio

Filed Feb. 5, 1993, Ser. No. 13,965

Int. Cl.<sup>6</sup> G01N 21/90

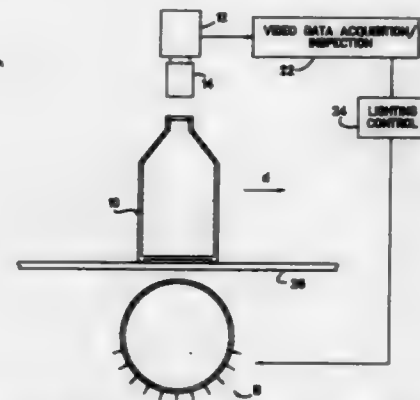
U.S. Cl. 356—240

20 Claims

1. A substantially isotropic video inspection illumination system comprising: a generally translucent ellipsoid like diffuser having an im-

perforate inner wall portion and an imperforate outer wall portion disposed radially outward from the inner wall portion, the diffuser including first and second hemi-ellipsoid like portions;

means adapted for receiving light, through the first hemi-ellipsoid like portion from an exterior portion thereof, into an interior of the diffuser contained by the inner wall portion;



means adapted for communicating isotropic light from an interior of the second hemi-ellipsoid like portion to an associated specimen for illumination thereof, such that the associated specimen is illuminated by diffuse, multi-directional light;

means for acquiring an image of each specimen after illumination thereof by the diffuse, multi-directional light; and means for determining acceptability of each specimen in accordance with an acquired image corresponding thereto.

5,440,386

#### METHOD AND DEVICE FOR CALIBRATING AN APPARATUS FOR MEASURING THE THICKNESS OF A SHEET OF MATERIAL

Jean-Jacques Campas, Colligny, France, assignor to Sollac (Société anonyme), Puteaux, France

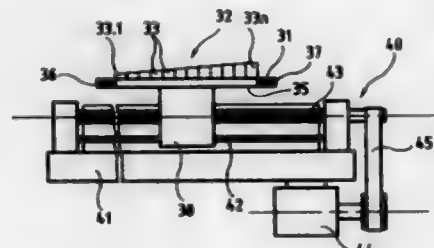
Filed Apr. 15, 1994, Ser. No. 228,346

Claims priority, application France, Apr. 26, 1993, 93 05053

Int. Cl.<sup>6</sup> G01J 1/02

U.S. Cl. 356—243

10 Claims



1. A method for calibrating an apparatus for measuring a transverse thickness profile of a flat product, said apparatus including a source of radiation, placed on one side of the product, and a row of elementary detectors which are juxtaposed and aligned along a direction of a profile to be measured and are placed on an opposite side of the product, in order to detect that part of the radiation not absorbed by the product, the method comprising the steps of first interposing, between the source and the detectors, standard shims having detectable characteristics and then determining a response of said detectors as a function of the characteristics of these shims, wherein: a set of different unitary shims of small dimensions, aligned along said direction, are moved between the source and the detectors along said direction, each shim having pre-

determined specific characteristics, this movement being performed so that each shim intercepts the radiation picked up by each detector, and

while said shims are moving, a plurality of readings of signals emitted by the detectors is taken so as to obtain, for each detector, a set of values of signals representing an intensity of the radiation absorbed by each shim, both a speed of movement of the set of shims and a time period between the readings being adjusted so that, for each detector, there is at least one reading of signals relating to each shim, wherein a position of a set of shims with respect to the row of detectors is determined, at a time of each reading, on a basis of the signals read from the row of detectors, and

a calibration curve of each detector is established by said set of values.

5,440,387

#### OPTICAL ELEMENT OF A PARALLAX FREE SIGHT

Per Montellin, Lund, and Lars Stenberg, Skellefteå, both of Sweden, assignors to Aimpoint AB, Sweden

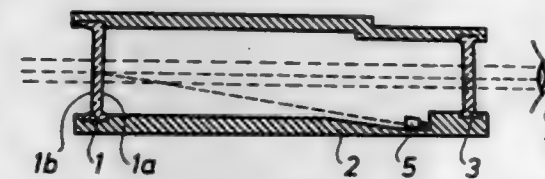
Filed Apr. 28, 1994, Ser. No. 234,868

Claims priority, application Sweden, Apr. 29, 1993, 9301472

Int. Cl.<sup>6</sup> G02B 27/34

U.S. Cl. 356—251

20 Claims



1. A concave-convex optical element useful in a parallax-free gun sight of the type having a light emitting means which is reflected from a concave surface of said optical element to provide an aiming light within said gun sight; said concave-convex optical element comprising, a concave surface on a one side of said optical element having a parabolically shaped configuration, a convex surface on an opposite side of said optical element such that an optical axis extends through said concave surface and said convex surface, said convex surface having a form which is one of elliptically shaped and hyperbolically shaped, and such that any external light beam passing into said optical element through said convex surface and parallel to said optical axis continues straight through said optical element and out through said concave surface with minimal deviation.

5,440,388

#### CHEMICAL ANALYSIS AND IMAGING BY DISCRETE FOURIER TRANSFORM SPECTROSCOPY

Jon W. Erickson, 3406 Rambow Dr., Palo Alto, Calif. 94306

Filed Aug. 2, 1993, Ser. No. 101,389

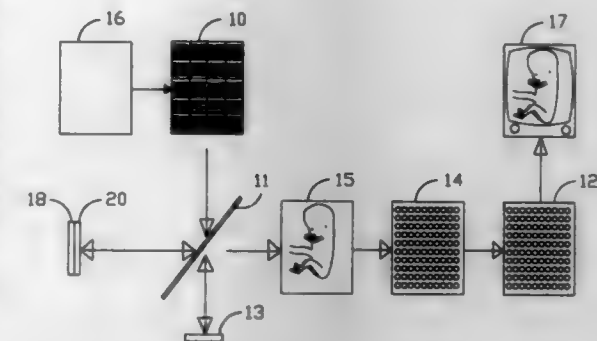
Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356—346

27 Claims

1. An optical sensor comprising: a plurality of monochromatic light sources, each of said monochromatic light sources producing light at a discrete wavelength, means for combining the light from said plurality of monochromatic light sources into at least one light beam, said at least one light beam comprising a plurality of discrete wavelengths of light, an interferometer means for modulating said at least one light beam from said light source, means for directing said at least one light beam through a sample, a detector having means for detecting each of said plurality of discrete wavelengths of light in said at least one light beam after said at least one light beam has passed through said sample, said detector producing a detector signal

indicative of the intensity of each of a plurality of discrete wavelengths of light in the detected light beam,



and a signal processing means for analyzing said detector signal.

5,440,389

#### OPTICAL SENSOR FOR ROTATIONAL MOVEMENTS HAVING AN OPTICAL RUNNING PERIOD ELEMENT

Pawel Drabarek, Ditzingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE92/00695, § 371 Date Feb. 17, 1994, § 102(e)

Date Feb. 17, 1994, PCT Pub. No. WO93/05364, PCT Pub.

Date Mar. 18, 1993

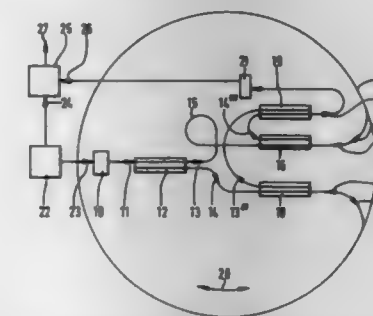
PCT Filed Aug. 20, 1992, Ser. No. 196,236

Claims priority, application Germany, Sep. 2, 1991, 41 29 095.2

Int. Cl.<sup>6</sup> G01C 19/72

U.S. Cl. 356—350

17 Claims



1. An optical sensor for detecting rotational movements, comprising:

a laser beam source for emitting a beam; a modulator for modulating a frequency of the beam of the laser beam source; means for splitting the beam emitted by the laser into first and second partial beams; an annular optical fiber arrangement having a first beam path extending in a first direction around the annular optical fiber arrangement and a second beam path extending in a second direction around the annular optical fiber arrangement, the first direction being opposite to the second direction, the first partial beam being coupled into the annular optical fiber arrangement in the first direction, and the second partial beam being coupled into the annular optical fiber arrangement in the second direction; a first beam coupler in a beam path of the first partial beam and a beam path of the second partial beam which is coupled out of the annular optical fiber arrangement after the second partial beam has passed through the annular optical fiber arrangement; a second beam coupler in a beam path of the second partial beam and a beam path of the first partial beam which is coupled out of the annular optical fiber arrangement after

- the first partial beam has passed through the annular optical fiber arrangement;
- a photodetector for receiving a first coupled-out partial beam and a second coupled-out partial beam and for generating an output signal, the first coupled-out partial beam being derived from the first partial beam coupled out of the annular optical fiber arrangement, and the second coupled-out partial beam being derived from the second partial beam coupled out of the annular optical fiber arrangement;
  - an optical running period element in the beam path of one of the first partial beam, the first coupled-out partial beam, the second partial beam, and the second coupled-out partial beam; and
  - a phase comparator for determining a phase difference between a signal related to the modulation of the frequency of the beam of the laser beam source and the output signal of the photodetector, and for determining a rate of rotation of the annular optical fiber arrangement based on a detected phase difference.

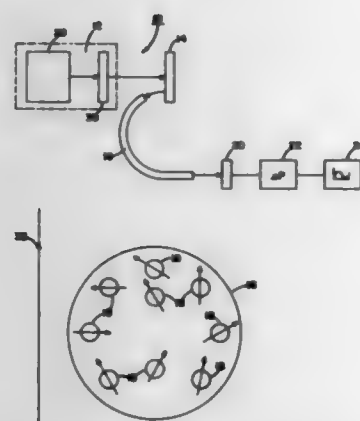
5,440,390

## OPTICAL FIBER POLARIMETER

Bruce Tirri, Brookfield, Conn., assignor to Hughes Aircraft Company, Los Angeles, Calif.  
Filed Jun. 14, 1993, Ser. No. 77,167  
Int. Cl.<sup>6</sup> G01N 21/21

U.S. Cl. 356—364

16 Claims



1. An optical fiber polarimeter, comprising:
  - a light source, said light source for projecting a light beam onto a workpiece to provide reflected or transmitted light from said workpiece;
  - a bundle of polarizing optical fibers, said bundle of polarizing optical fibers being disposed to receive said reflected or transmitted light, said polarizing optical fibers being disposed to have different polarization orientations with respect to a common reference; and
  - means for detecting light from each said optical fiber and for generating a signal in response to the intensity of the light from each said optical fiber;
- said means including a charge coupled device having an array of pixels wherein each one of said pixels is associated with only one of said optical fibers.

5,440,391

## METHOD AND DEVICE FOR DETERMINING A POSITION OF AT LEAST ONE LEAD OF AN ELECTRONIC COMPONENT

Gust Smeyers, Meise, and Luc Vanderheydt, Wilsede, both of Belgium, assignors to ICOS Vision Systems n.v., Belgium  
PCT No. PCT/BE91/00023, § 371 Date Nov. 22, 1991, § 102(e)  
Date Nov. 22, 1991, PCT Pub. No. WO91/15104, PCT Pub. Date Oct. 3, 1991

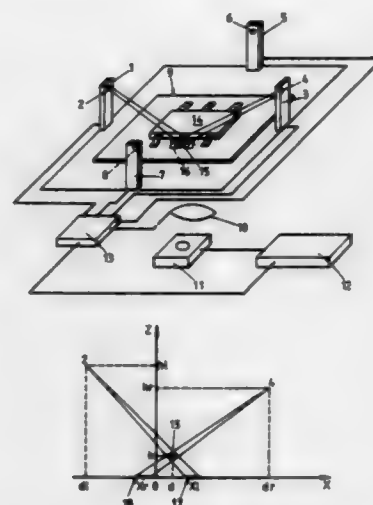
PCT Filed Mar. 22, 1991, Ser. No. 777,366

Claims priority, application Belgium, Mar. 23, 1990, 09000331

Int. Cl.<sup>6</sup> G01N 21/88

U.S. Cl. 356—375

16 Claims



1. A method for determining, with respect to a reference plane, a position of at least one lead of an electronic component, said method comprising:
  - illuminating said lead from a first position situated sideways and out of a component plane defined by said electronic component and thereby forming within an image plane a first shadow image of at least a part of said lead;
  - determining within said image plane coordinates of a first location of at least a first predetermined point situated within said first shadow image;
  - illuminating said lead from a second position different from said first position and situated sideways and out of said component plane and thereby forming within said image plane a second shadow image of at least a part of said lead;
  - determining within said image plane coordinates of a second location of at least a second predetermined point situated within said second shadow image; and
  - determining said position of said lead from said coordinates of said first and second location.

5,440,392

## METHOD AND SYSTEM FOR POINT BY POINT MEASUREMENT OF SPATIAL COORDINATES

Alf Pettersen, Gjøttum, and Øyvind Rotvold, Hvalstad, both of Norway, assignors to Metronor AS, Nesbru, Norway  
PCT No. PCT/NO92/00167, § 371 Date Apr. 11, 1994, § 102(e)  
Date Apr. 11, 1994, PCT Pub. No. WO93/07443, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 9, 1992, Ser. No. 211,734

Claims priority, application Norway, Oct. 11, 1991, 913994

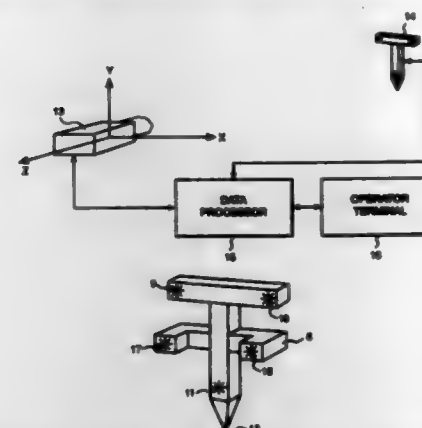
Int. Cl.<sup>6</sup> G01B 11/03

U.S. Cl. 356—375

7 Claims

1. A method for point-by-point measurement of spatial coordinates of each of a plurality of points on an object, comprising:
  - (a) positioning a single opto-electronic angle sensor designed to measure spatial direction to each of a plurality of point-

- sized light sources, such that its field of view or working area generally covers said object;
- (b) successively touching to each of said points a touch point of a touch probe having at least three point-sized light sources respectively disposed at known coordinates relative to a local probe coordinate system and a touch point disposed at a known location relative to said local probe



- coordinate system, while maintaining visibility of said touch probe to said angle sensor at each such touching;
- (c) simultaneously sensing, using said angle sensor, at each said touching, a spatial direction for each of said light sources and registering said spatial directions; and
  - (d) computing the position and orientation of said touch probe relative to said angle sensor at each said touching, from the spatial directions registered in step (c).

5,440,393

## PROCESS AND DEVICE FOR MEASURING THE DIMENSIONS OF A SPACE, IN PARTICULAR A BUCCAL CAVITY

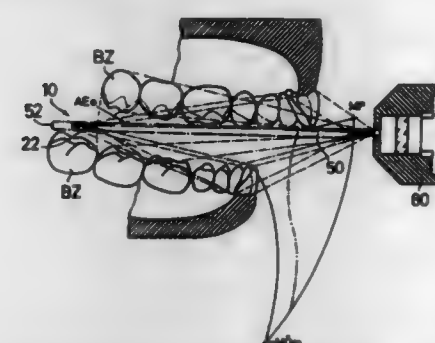
Heinz V. Wenz, Hanau, Germany, assignor to Com Dent GmbH, Berlin, Germany  
PCT No. PCT/EP90/00404, § 371 Date Nov. 13, 1992, § 102(e)  
Date Nov. 13, 1992, PCT Pub. No. WO91/13585, PCT Pub. Date Sep. 19, 1991

PCT Filed Mar. 13, 1990, Ser. No. 952,859

Int. Cl.<sup>6</sup> A61B 5/103; G01B 11/24

U.S. Cl. 356—376

30 Claims



1. A process for measuring the dimensions of a buccal cavity having upper and lower dentition, comprising the steps of:
  - inserting an optical measurement device at least in part into a buccal cavity, the optical measurement device including an optical radiation projection device having a radiation source and a recording device;
  - simultaneously projecting optical radiation from the radiation source with the optical radiation projection device onto portions of both the upper and lower dentition of the buccal cavity by deflecting the optical radiation from the optical radiation projection device with a deflection device; and
  - simultaneously transmitting radiation reflected from the

- portions of both the upper and lower dentition of the buccal cavity to the recording device with the deflection device;
- wherein said step of simultaneously projecting comprises projecting the optical radiation in the form of an interference generated strip.

5,440,394

## LENGTH-MEASURING DEVICE AND EXPOSURE APPARATUS

Noriyuki Nose, Atsugi; Kenji Saito, Yokohama, and Mitsunori Amemiya, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 874,831, Apr. 28, 1992, abandoned.

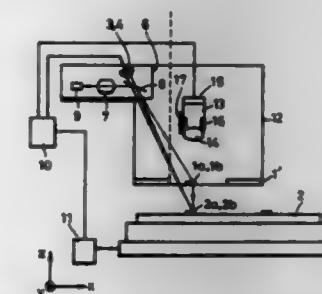
This application Feb. 9, 1994, Ser. No. 193,880

Claims priority, application Japan, May 1, 1991, 3-130451; Apr. 21, 1992, 4-128334

Int. Cl.<sup>6</sup> G01B 11/02, 11/26

U.S. Cl. 356—384

17 Claims



1. A length measuring device for performing length measurement on a first object which is an object to be detected, said first object having a plurality of alignment patterns thereon; said device comprising:
  - alignment detection means for detecting the relative positional relation between the first object and a second object having a plurality of reference alignment patterns used for aligning the first object therewith, said alignment detection means detecting an alignment condition between the alignment patterns of the first and second objects;
  - movement means for moving the first and second objects relative to each other;
  - measurement means for measuring the amount of movement of said movement means; and
  - length measurement means for performing measurement of the space between the plurality of alignment patterns formed on the first object, said length measurement means performing length measurement on the basis of successive alignment conditions detected by successive alignment condition detection operations of said alignment detection means between the plurality of reference alignment patterns on the second object and the plurality of alignment patterns on the first object, as well as the amount of movement of said movement means measured by said measurement means during the successive alignment condition detection operations of said alignment detection means.

5,440,395

## SHROUD CONTACT WEAR SENSOR IN A TURBO MACHINE

Harumi Makita, Komaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1994, Ser. No. 197,261

Claims priority, application Japan, Feb. 17, 1993, 5-028043

Int. Cl.<sup>6</sup> G01B 11/08

U.S. Cl. 356—384

5 Claims

1. In a turbo machine having a shroud disposed on the inner surface of a casing as opposed to the tip of rotor blades, said





# 5,440,401 IMAGE DATABASE INCORPORATING LOW RESOLUTION INDEX IMAGE DATA

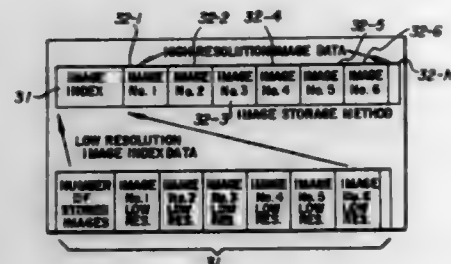
Kenneth A. Parulski, Rochester; Stephen H. Kristy, Fairport, and Donald E. O'Brien, Holcomb, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 14, 1990, Ser. No. 583,063

Int. Cl.<sup>6</sup> H04N 5/76

U.S. Cl. 358—342

16 Claims



1. A method of storing a plurality of digitized images comprising the steps of:

- providing each digitized image of said plurality of digitized images as a respective multi-spatial resolution digital image file, said multi-spatial resolution digital image file containing plural digital images corresponding to said each digitized image and having respectively different spatial resolutions, the plural digital images of a respective multi-spatial resolution digital image file containing a first digital image having a first spatial resolution and a second digital image having a second spatial resolution lower than said first spatial resolution;
- storing each multi-spatial resolution digital image file provided in step (a) at first respective storage locations of a digital data storage medium; and
- storing, in a second storage location of said digital data storage medium, which second storage location is separate from said first respective storage locations thereof, a separate image index file which contains a duplicate copy of each of the second digital images contained in said multi-spatial resolution image files.

# 5,440,402 METHOD AND APPARATUS FOR RECOGNIZING PASTER PORTION OF WEB

Tetsuya Okuda, and Shinichi Kojima, both of Ibaraki, Japan, assignors to Komori Corporation, Tokyo, Japan

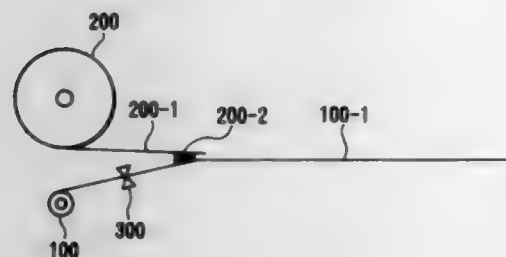
Filed Oct. 23, 1992, Ser. No. 965,752

Claims priority, application Japan, Oct. 31, 1991, 3-311408

Int. Cl.<sup>6</sup> B41F 33/18; B65H 26/02

U.S. Cl. 358—406

14 Claims



1. A method of recognizing a paster portion of a web, comprising the steps of:

- storing, as reference image data, each pixel data of a printed matter serving as a reference;
- inputting, as test image data, each pixel data of a printed matter serving as a test target printed on said web;
- comparing the reference image data with the test image data in units of pixels to detect defective pixels; and

recognizing said paster portion of said web on the basis of a generation pattern of the defective pixels.

- An apparatus for recognizing a paster portion of a web, comprising:
  - reference data storage means for storing, as reference image data, each pixel data of a printed matter serving as a reference;
  - test data inputting means for inputting, as test image data, each pixel data of a printed matter serving as a test target printed on said web;
  - defective pixel detecting means for comparing the reference image data with the test image data in units of pixels to detect defective pixels; and
  - paster portion recognizing means for recognizing said paster portion of said web on the basis of a generation pattern of the defective pixels.

# 5,440,403 IMAGE READING MEANS FOR READING A DOCUMENT INCLUDING A PLURALITY OF IMAGES AND SPACE

Yoshiyuki Hashimoto; Shinya Uchikawa, both of Machida, and Yoko Fujiwara, Zama, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

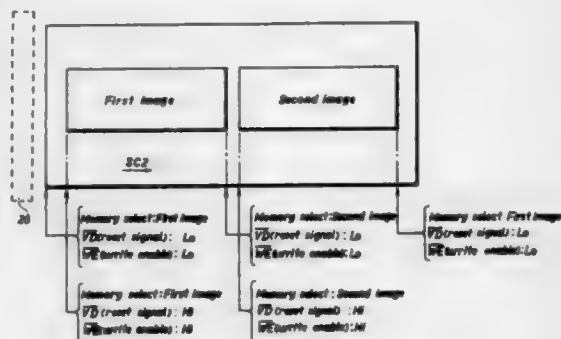
Filed Jul. 21, 1993, Ser. No. 94,318

Claims priority, application Japan, Jul. 24, 1992, 4-198797; Nov. 4, 1992, 4-295369; Nov. 4, 1992, 4-295370

Int. Cl.<sup>6</sup> H04N 1/21, 1/387

U.S. Cl. 358—444

31 Claims



- An image reading apparatus, comprising:
  - image reading means for reading by one scanning one single original document including a plurality of images and space, and outputting image data of the original document;
  - distinguishing means for distinguishing the plurality of images from the space in the original document on the basis of image data outputted by said image reading means;
  - memory means for storing only image data of the plurality of images distinguished by said distinguishing means among image data outputted from said image reading means; and
  - output means for outputting image data stored in said memory means in an order so that images represented by image data outputted by said output means are arranged in an order different from the order in which the plurality of images were arranged on the original document.
- An image reading apparatus comprising:
  - image reading means for reading a plurality of images recorded at prescribed positions on one single original document by one scanning;
  - memory means for storing said plurality of images read out by said image reading means;
  - output means for causing said plurality of images stored in said memory means to be output in an order different from the order in which they were arranged on said original document;
  - judging means for judging inclinations of the plurality of images read by said image reading means; and

# 5,440,405 METHOD AND SYSTEM FOR ERROR CORRECTION USING ASYNCHRONOUS DIGITAL FACSIMILE PROTOCOL

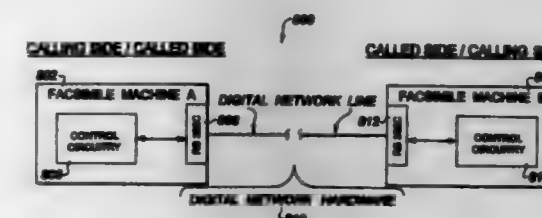
Allam Z. Ahmed, Santa Clara, Calif., assignor to Ricoh Company, Ltd., Tokyo, Japan and Ricoh Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 939,612, Sep. 2, 1992. This application Jul. 21, 1993, Ser. No. 95,292

Int. Cl.<sup>6</sup> H04N 1/32, 1/333

U.S. Cl. 358—435

16 Claims



- A method for operating a communication system, including a calling apparatus and a called apparatus, for transmitting data therebetween over an asynchronous digital network during a transmitting process in accordance with a protocol standard, wherein the calling apparatus and the called apparatus generate a plurality of command frames and at least one data frame during the transmitting process, the method comprising the sequential steps of:

- exchanging, between the calling apparatus and the called apparatus, a plurality of preliminary command frames representative of handshake protocol information including error correction method ECM capabilities;
- initiating an error correcting operation;
- transmitting a data set, including at least one data frame having associated data frame identification information, between the calling apparatus and the called apparatus; and
- verifying receipt of the data set.

- A communication system, including a calling apparatus and a called apparatus, for transmitting data therebetween over an asynchronous digital network during a transmitting process in accordance with a protocol standard, wherein the calling apparatus and the called apparatus generate a plurality of command frames and at least one data frame during the transmitting process, the system comprising:

- handshake means for exchanging a plurality of preliminary command frames, including error correction method ECM capabilities data, between the calling apparatus and the called apparatus;
- means for initiating an error correction operation;
- a transmitter for transmitting a data set, including at least one data frame having associated data frame identification information, between the calling apparatus and the called apparatus; and
- verification means for verifying receipt of the data set.

# 5,440,406 IMAGE PROCESSING DEVICE FOR REPRODUCING IMAGES IN SPATIAL ORDER

Hajime Sugino, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1994, Ser. No. 227,517

Claims priority, application Japan, Apr. 16, 1993, 5-112359

Int. Cl.<sup>6</sup> H04N 1/04, 1/191, 1/21

U.S. Cl. 358—444

4 Claims

- An image processing device comprising:
  - memory means for storing pixel data values inputted from outside;
  - write address producing means for producing write addresses for pixel data values to said memory means in synchronism with an input timing of the pixel data values;

correcting means for correcting inclinations of said plurality of images so as to be outputted by said output means in an upright state.

- A microfilm image reading system, comprising:
  - an image reader which reads out by one scanning a pair of images photographed and arranged in parallel relative to a first direction of a duplex type microfilm;
  - distinguishing means for distinguishing the pair of images on the basis of image data outputted by said image reader;
  - a memory which stores the pair of images distinguished by said distinguishing means; and
  - output means for outputting the pair of images stored in said memory so that images outputted by said output means are arranged in a direction perpendicular to the direction in which the pair of images were arranged on the microfilm.

# 5,440,404 IMAGE SIGNAL COMPRESSION APPARATUS AND METHOD USING VARIABLE LENGTH ENCODING

Ichiro Okamoto, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

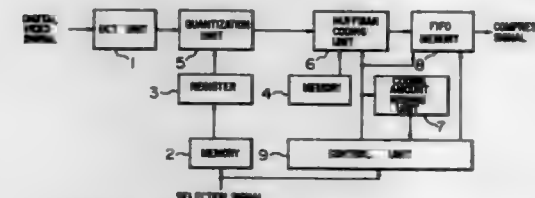
Filed Jan. 13, 1994, Ser. No. 181,175

Claims priority, application Japan, Jan. 18, 1993, 5-005583

Int. Cl.<sup>6</sup> H04N 1/41

U.S. Cl. 358—432

20 Claims

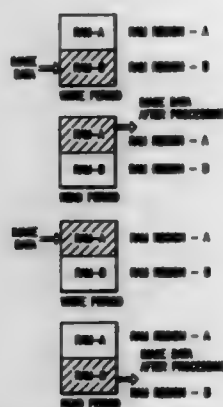


- An image signal compression apparatus for obtaining compression codes of a digitally encoded image signal per a predetermined data amount, said apparatus comprising:

- discrete cosine transform means for obtaining discrete cosine coefficients by processing the digitally encoded image signal per unit of said predetermined data amount in a discrete cosine transform fashion;
- first memory means for storing therein a plurality of quantization tables having quantization accuracies different from each other;
- second memory means for storing therein a variable length code table;
- quantization means for quantizing said discrete cosine coefficients with reference to a selected one of said plurality of quantization tables;
- variable length encoding means for obtaining variable length encoded data by processing said discrete cosine coefficients quantized by said quantization means in a variable length coding fashion with reference to said variable length code table stored in said second memory means;
- means for obtaining total amount data indicative of a total amount of said variable length encoded data corresponding to said predetermined data amount of the digitally encoded image signal;
- third memory means for temporarily storing therein said variable length encoded data, said total amount data and table identification data indicative of said selected one of said plurality of quantization tables; and
- means for reading out said table identification data, said total amount data and said variable length encoded data from said third memory means in a predetermined order as said compression codes.



a line start signal generator which produces a pulse each time inputting of pixel data values from photosensitive elements in a line is started;  
memory region specifying means for specifying an upper half region or a lower half region of a whole memory region of said memory means for the pixel data values each time the pulse is outputted from said line start signal generator; and



read address producing means for producing a read address to be inputted to said memory means in order to read pixel data values from a region of said memory means not specified by said memory region specifying means during one period of the input timing of the pixel data values for said memory means.

5,440,407

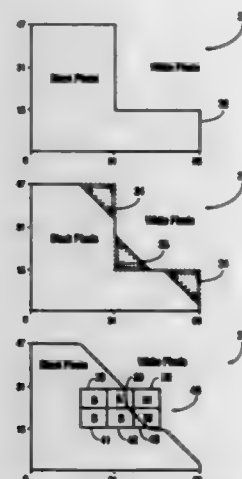
**PIXEL CORRECTION AND SMOOTHING METHOD**  
Mark A. Overton, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 11, 1994, Ser. No. 212,445

Int. Cl.<sup>6</sup> H04N 1/40

U.S. Cl. 358-447

12 Claims



1. A method for generating a corrected output pixel pattern for use in improving the quality of an original pixel pattern having horizontal rows and vertical columns of pixels, said method comprising the steps of:  
receiving a block of pixels from an original pixel pattern, said block of pixels comprising  $x$  rows and  $y$  columns of pixels, said block of pixels comprising one or more target pixels and their surrounding neighboring pixels;  
indexing an output pixel pattern stored in a memory containing a plurality of output pixel patterns, said output pixel pattern being indexed using said block of pixels as an index for said memory, said output pixel pattern for replacing

only said one or more target pixels in said block of pixels; and  
outputting said output pixel pattern for subsequent display on a medium,  
said output pixel pattern comprising one of a plurality of output pixel patterns stored in said memory, said output pixel patterns being created by creating a plurality of output pixel patterns, for storage in said memory, for a plurality of possible pixel patterns in said block of pixels, said step of creating comprising the steps of:  
generating a first block of pixels comprising  $x$  rows and  $y$  columns of pixels in a particular pattern;  
replicating each of said pixels in said first block of pixels to expand said first block of pixels by a factor  $z$  in a vertical direction and to expand said first block of pixels by a factor  $g$  in a horizontal direction to form a high resolution bit map having  $x$  times  $z$  rows and  $y$  times  $g$  columns;  
smoothing a resulting pixel pattern in said high resolution bit map;  
segmenting a middle portion of said high resolution bit map into a plurality of pixel areas, each of said pixel areas corresponding to an output pixel;  
calculating a number of pixels of a first type in each of said pixel areas;  
comparing said number of pixels of said first type in each of said pixel areas to a threshold number; and  
outputting one pixel per pixel area, to form a first output pixel pattern, based upon said comparison of said number of pixels of said first type with said threshold number.

5,440,408

**IMAGE DATA PROCESSING APPARATUS HAVING A DIGITAL COPYING FUNCTION AND A FACSIMILE FUNCTION AND INCLUDING MEANS FOR DISTINGUISHING A FACSIMILE RECEPTION SHEET FROM A COPY SHEET**

Kan Tomita, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

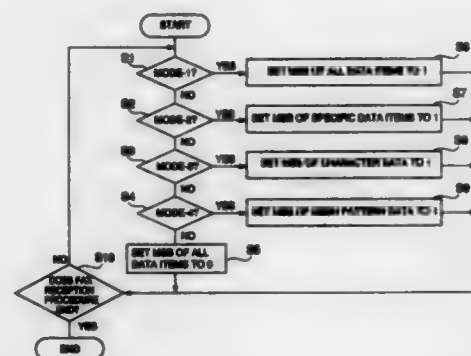
Filed Dec. 14, 1993, Ser. No. 165,907

Claims priority, application Japan, Dec. 15, 1992, 4-334472; Feb. 24, 1993, 5-034981

Int. Cl.<sup>6</sup> H04N 1/32, 1/00/1/46

U.S. Cl. 358-468

13 Claims



1. An image data processing apparatus with a digital copying function and a facsimile function, said apparatus comprising:  
printing means responsive to image signals for printing an image in a plain sheet in one of black and a different color based on a selection signal relating to each of the image signals;  
facsimile means for transmitting facsimile data to a receiving station via a communication line, and for receiving facsimile data from a transmitting station via the communication line;  
image signal means for converting the facsimile data received by said facsimile means into image data, and for

processing the image data to produce image signals indicating a facsimile reception image;  
reading means for reading a copy image from a document by optically scanning the document, and for producing image signals indicating the copy image; and  
color setting means coupled to said image signal means and said reading means for setting a selection signal relating to each of image signals of a given pattern to a first value that indicates the color if said color setting means receives the image signals produced by said image signal means, and for supplying the image signals produced by the image signal means and the respective selection signals to said printing means, and for setting a selection signal relating to each of the image signals produced by said reading means to a second value that indicates black if said color setting means receives the image signals produced by the reading means, and for supplying the image signals produced by the reading means and the respective selection signals to said printing means, wherein said color setting means sets a selection signal relating to each of image signals of a set of characters to the first value and sets a selection signal relating to each of the image signals indicating the facsimile reception image to the second value if said color setting means receives the image signals produced by said image signal means, wherein said color setting means comprises means for allowing said printing means to print the facsimile reception image in black in preference to an image of the set of characters if the facsimile reception image and the image of the set of characters overlap each other in the sheet.

5,440,409

**IMAGE FORMING APPARATUS WITH AN UNAPPROVED COPY PREVENTING MEANS**

Masashi Sugano; Yoshio Yamazaki; Masaaki Ikeda, and Tada-shi Izawa, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

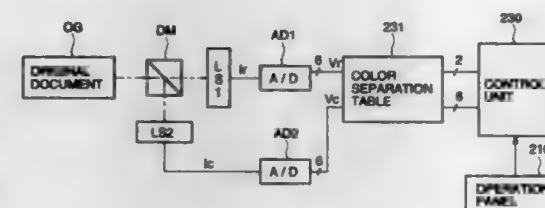
Filed Jun. 24, 1994, Ser. No. 265,650

Claims priority, application Japan, Jul. 1, 1993, 5-163581

Int. Cl.<sup>6</sup> H04N 1/00, 1/44

U.S. Cl. 358-501

13 Claims



1. An image forming apparatus with an unapproved copy preventor, comprising:  
a document support for supporting an original document, said original document comprising data provided on a sheet of material formed of a single material, said sheet of material having a background color, said background color having predetermined wavelength components;  
an irradiator for irradiating said original document with an irradiating light beam;  
a detector for detecting the predetermined wavelength components in a reflected light reflected from said original document which is irradiated with said irradiating light beam;  
said detector generating detection signals based on a detection of said predetermined wavelength components in said reflected light; and  
an evaluation circuit for determining whether said original document is a document which prohibits a production of an unapproved copy thereof based on said detection signals.

5,440,410

**CONTROL SYSTEM FOR TRANSMITTING AND RECORDING IMAGE DATA IN ACCORDANCE WITH A PREDETERMINED RECORDING WIDTH OR TYPE OF RECORDING MEDIUM**

Kiyohisa Sugishima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

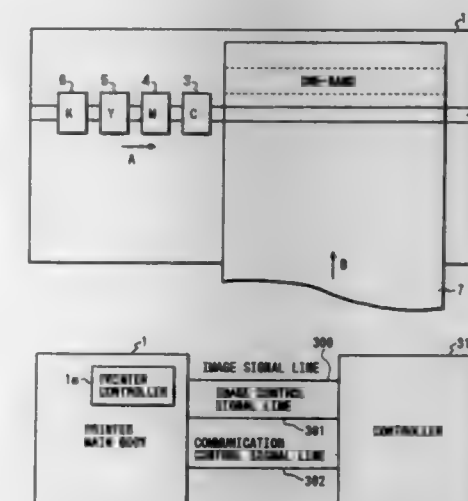
Continuation of Ser. No. 261,021, Jan. 16, 1994, abandoned, which is a continuation of Ser. No. 164,838, Dec. 9, 1993, abandoned, which is a continuation of Ser. No. 765,944, Sep. 26, 1991, abandoned. This application Oct. 11, 1994, Ser. No. 320,556

Claims priority, application Japan, Sep. 27, 1990, 2-255299; Jan. 11, 1991, 3-002242

Int. Cl.<sup>6</sup> H04N 1/21, 1/034, 1/333

U.S. Cl. 358-502

81 Claims



18. A recording apparatus for recording on a recording medium an image in accordance with image data outputted from a data output device by using a recording head having a plurality of recording elements, said apparatus comprising:  
main scan means for executing a main scan of the recording head to thereby record on the recording medium an image of predetermined recording width corresponding to the plurality of recording elements;  
sub-scan means for executing a sub-scan by a distance corresponding to the predetermined recording width after completion of the main scan;  
sending means for sending to the data output device information on an amount of image data required for recording an image of the predetermined recording width, in response to a request signal from the data output device; and  
process means for obtaining image data corresponding to the predetermined recording width from image data of which amount is based on the information, outputted from the data output device, wherein the recording head is driven in accordance with the image data obtained by said process means.

26. A data output device for outputting image data to a recording apparatus which records an image of a predetermined recording width on a recording medium by executing a main scan of at least one recording head having a plurality of recording elements, said data output device comprising:  
request signal output means for outputting to the recording apparatus a request signal for requesting information on an amount of image data required for recording the image of the predetermined recording width; and  
image data output means for outputting to the recording apparatus image data of which amount is based on the information sent from the recording apparatus in response to the request signal.

5,440,411

**OPTICAL SCAN TYPE DISPLAY DEVICE WITH OPTICAL FIBER MELTED ONTO A SUBSTRATE**  
Sayuri Fujiwara; Akitsugu Hatano, both of Nara, and Yoshihiro Isumi, Kashiwara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

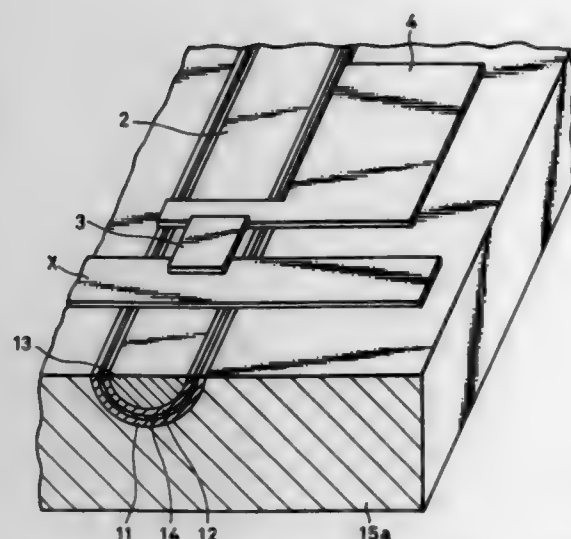
Filed Jul. 7, 1993, Ser. No. 88,588

Claims priority, application Japan, Jul. 9, 1992, 4-182281; Dec. 11, 1992, 4-331988; Jan. 18, 1993, 5-147719

Int. Cl.<sup>6</sup> G02F 1/1335, 1/1343, 1/135

U.S. Cl. 359—42

19 Claims



1. An optical scan type display device which is so arranged that a liquid crystal material is sealed between two substrates and said liquid crystal material serves as a display medium, said optical scan type display device comprising:

- a plurality of optical waveguides disposed on one of said substrates and arranged in parallel with each other;
- a plurality of signal wires disposed on one of said substrates and arranged in parallel with each other in such a direction that said plurality of signal wires cross with said plurality of optical waveguides, respectively;
- a plurality of pixel electrodes, each formed in a respective area defined by said plurality of optical waveguides and said plurality of signal wires; and
- a plurality of light switching elements, each disposed at a respective location where one of said plurality of optical waveguides intersects one of said plurality of signal wires, each of said plurality of light switching elements being adapted to perform a switching function in response to a signal light transmitted through a respective one of said optical waveguides,

said plurality of pixel electrodes being arranged in a manner that each of said pixel electrodes is selectively driven in response to a signal applied through one of said plurality of signal wires and one of said light switching elements, said plurality of optical waveguides being formed on said one of two substrates by using an optical fiber, at least an optical switching portion of a surface of one of two substrates being arranged to be flat after forming said optical waveguide, and each optical waveguide being formed by melting an optical fiber onto said one of said two substrates.

5,440,412

**DRIVING METHOD FOR A FERROELECTRIC OPTICAL MODULATION DEVICE**

Akihiro Mouri, Kokubunji; Tsutomu Toyono, Yokohama; Shuzo Kaneko, Tokyo; Yutaka Inaba, Kawaguchi, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 666,893, Mar. 8, 1991, Pat. No. 5,255,110, which is a division of Ser. No. 455,299, Dec. 22, 1989, Pat. No. 5,018,841, which is a division of Ser. No. 266,169, Nov. 2, 1988, Pat. No. 5,132,818, which is a division of Ser. No. 942,716, Dec. 17, 1986, Pat. No. 4,836,656. This application Mar. 19, 1993, Ser. No. 34,401

Claims priority, application Japan, Dec. 25, 1985, 60-295304; Dec. 25, 1985, 60-295305; Dec. 25, 1985, 60-295308; Jan. 7, 1986, 61-001186

Int. Cl.<sup>6</sup> G02F 1/13; G09G 3/36

U.S. Cl. 359—56

8 Claims



1. A driving method for an optical modulation device comprising scanning electrodes, signal electrodes disposed intersecting the scanning electrodes so as to form a pixel at each intersection of the scanning electrodes and signal electrodes, and an optical modulation material disposed between the scanning electrodes and the signal electrodes, said driving method comprising, in a writing period for writing in all or prescribed pixels of the pixels on a selected scanning electrode of said scanning electrodes, the steps of:

applying a first voltage of one polarity, having an amplitude exceeding a first threshold voltage of the optical modulation material, to said all or prescribed pixels in a first phase; and

applying a voltage of the other polarity, having an amplitude exceeding a second threshold voltage of the optical modulation material, to a selected pixel in a second phase, and applying a voltage not exceeding the threshold voltages of the optical modulation material to the other pixels, respectively of said all or prescribed pixels,

wherein the maximum duration of continual application of a voltage of the same polarity to a pixel on a scanning electrode, excluding periods of application of a zero voltage, is 2.5 times the duration of the first phase in said writing period,

wherein said selected scanning electrode is supplied with a scanning selection signal comprising a voltage of one polarity and a voltage of another polarity,

wherein signal electrodes associated with said all or prescribed pixels on the selected scanning electrode are selectively supplied with a voltage signal of a polarity opposite to said voltage of another polarity or a voltage signal of a polarity identical to said voltage of another polarity in phase with said voltage of another polarity of the scanning selection signal and are supplied with voltage signals

which are placed before and after the voltage signal of an opposite polarity or the voltage signal of an identical polarity or the voltage signal of an identical polarity, wherein the polarities of the voltages and voltage signals are defined with respect to a voltage applied to a non-selected scanning electrode.

5,440,413

**LIQUID CRYSTAL DISPLAY DEVICE WITH 2 ADJACENT BIAXIAL RETARDATION PLATES HAVING  $n_y < n_z < n_x$**

Zenta Kikuchi, Hamura, and Takashi Miyashita, Hachioji, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

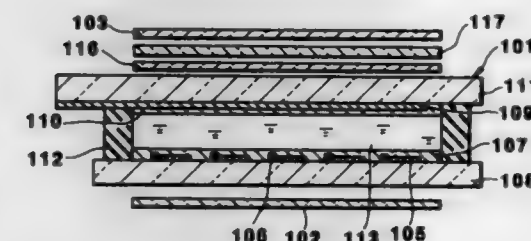
Filed Sep. 22, 1992, Ser. No. 950,886

Claims priority, application Japan, Sep. 30, 1991, 3-278455; Jul. 3, 1992, 4-177083; Jul. 22, 1992, 4-215735

Int. Cl.<sup>6</sup> G02F 1/335

U.S. Cl. 359—73

8 Claims



1. A liquid crystal display device of a twisted nematic type, comprising:

- a pair of substrates having opposing surfaces on which electrodes and aligning films covering said electrodes are respectively formed, said aligning films having undergone aligning treatment in predetermined directions;
- a liquid crystal material existing between said pair of substrates and having molecules twisted at an angle of about 90° from one substrate to the other substrate of said pair of substrates;
- a polarizer having a polarizing axis and arranged on an incident side of a liquid crystal cell, the liquid crystal cell being composed of said pair of substrates and said liquid crystal material;
- an analyzer having a polarizing axis and arranged on an exit side of said liquid crystal cell; and
- two biaxial retardation plates arranged on one side of said liquid crystal cell between said polarizer and said analyzer and having a refractive index  $n_y$  in an extending direction of said retardation plate, a refractive index  $n_z$  in a direction perpendicular to the extending direction, and a refractive index  $n_x$  in a direction of thickness, which satisfy  $n_y < n_z < n_x$ , the directions being perpendicular to each other, each of said retardation plates having a phase delay axis, and wherein:

a relationship between said polarizing axis of said polarizer and a direction of the aligning treatment of an adjacent one of the aligning films is one of the following:

- (a) perpendicular to each other, and
- (b) parallel with each other;

a relationship between said polarizing axis of said analyzer and a direction of the aligning treatment of the other of the aligning films is one of the following:

- (a) perpendicular to each other, and
- (b) parallel with each other;

a relationship between the phase delay axis of each of said biaxial retardation plates and the polarizing axis of an adjacent one of said polarizer and analyzer is one of the following:

- (a) perpendicular to each other, and
- (b) parallel with each other;

a product  $\Delta n \cdot d$  of a refractive index anisotropy  $\Delta n$  and a

thickness  $d$  of each of said biaxial retardation plates falls within a range of approximately 200 to 600 nm; and a product of  $\Delta n \cdot d$  of a refractive index anisotropy  $\Delta n$  and a thickness  $d$  of said liquid crystal material falls within a range of approximately 350 to 700 nm.

5,440,414

**ADAPTIVE POLARIZATION DIVERSITY DETECTION SCHEME FOR COHERENT COMMUNICATIONS AND INTERFEROMETRIC FIBER SENSORS**

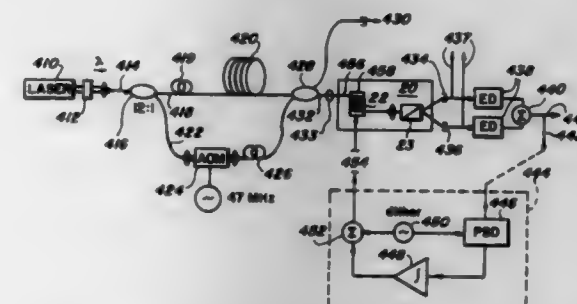
Alan D. Kersey, Springfield, Va., and Michael J. Marrone, Severna Park, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1990, Ser. No. 473,807

Int. Cl.<sup>6</sup> G02B 5/30

U.S. Cl. 359—122

4 Claims



1. The optical system for resolving power from any two optical signals having different polarization states into a pair of preselected orthogonal polarization states; said system comprising:

- a beam splitter;
- a single active adjustable birefringent element in optical series with said beam splitter;
- adjustment means for selectively setting said single active birefringent element to any one of a plurality of birefringence values; and
- means responsive to said optical signals of the different polarization states, for controlling said adjustment means to set said single active birefringent element to a preselected one of said birefringence values effective to cause said single active birefringent element and said beam splitter to cooperate to split substantially a same fraction of power from each output optical signals into one of said pair of preselected orthogonal polarization states.

5,440,415

**OPTICAL SUCCESSIVE MODULATION-MULIPLEXING FOR FIBER OPTICAL NETWORK**

Mohamed M. Mekawi, Denville, and Yan-Chi Shi, Whippany, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Aug. 4, 1993, Ser. No. 101,881

Int. Cl.<sup>6</sup> H04J 14/02

U.S. Cl. 359—126

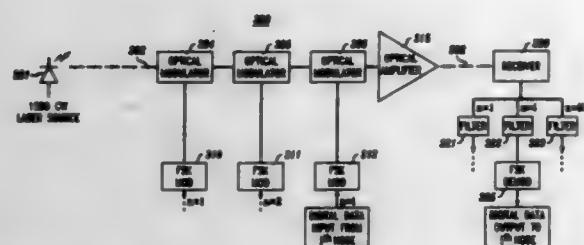
22 Claims

1. A multiple-access network communication system of the type which employs continuous-wave electromagnetic energy as a carrier, the multiple-access network communication system comprising:

- a single source of continuous-wave electromagnetic energy for forming the carrier;
- conduit means for defining a carrier path along which the carrier is propagated;
- a plurality of data access nodes arranged sequentially along said carrier path for accessing the carrier, each of said plurality of data access nodes having associated therewith a respective:



splitter means for dividing the carrier into first and second carrier portions, said first portion of the carrier being propagated along said carrier path and said second portion being extracted from said carrier path; modulator means for modulating said first portion of the carrier in response to a respectively associated data stream, each of said modulator means in said plurality of data access nodes having a respectively associated sub-carrier frequency; and



receiver means for detecting said second portion of the carrier modulated in response to said data streams associated with others of said plurality of data access nodes; and

optical coupling means for coupling said single source of continuous-wave electromagnetic energy to said conduit means, whereby the carrier is propagated through said splitter means and said modulator means associated with each of said plurality of data access nodes along said carrier path.

5,440,416

#### OPTICAL NETWORK COMPRISING A COMPACT WAVELENGTH-DIVIDING COMPONENT

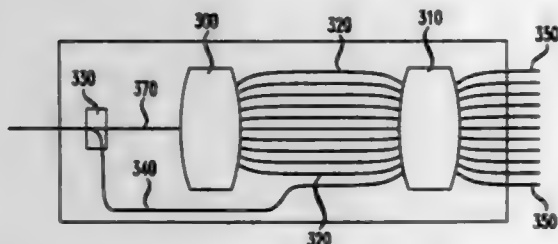
Leonard G. Cohen, Berkeley Heights; Charles H. Henry, Skillman; Rudolf F. Kazarinov, Martinsville, and Henry H. Yaffe, Fanwood, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Feb. 24, 1993, Ser. No. 21,698

Int. Cl.<sup>6</sup> H04J 14/02

U.S. Cl. 359—127

6 Claims



5. An optical communication network, which comprises:
- a primary transmitter for sending primary optical signals having at least one primary wavelength from a central location to plural remote locations;
  - a secondary transmitter for sending secondary optical signals, having plural secondary wavelengths, from the central location to the remote locations, each of the remote locations corresponding to one of the secondary wavelengths;
  - a plurality of optical fibers, each having an upstream end and a downstream end;
  - input means for optically coupling the upstream ends to the primary and secondary transmitters; and
  - output means for optically coupling the downstream end of each of the optical fibers to a receiver situated at one of the remote locations, wherein:
  - the input coupling means comprise a Mach-Zehnder interferometer having: first and second transmissive regions; a plurality of waveguides of different lengths, to be denoted "A waveguides," extending between and optically cou-

pled to the first and second transmissive regions; and a plurality of waveguides, to be denoted "B waveguides," each optically coupled at one end to the second transmissive region and at the other end to a respective one of the optical fibers;

#### CHARACTERIZED IN THAT

- the input coupling means further comprise an optical waveguide, to be referred to as the bypass waveguide, having an input end optically coupled to the primary transmitter and an output end optically coupled to the second transmissive region such that primary signals are distributed into the B waveguides but are not substantially distributed into the A waveguides; and
- the input coupling means further comprise means for optically coupling the secondary transmitter to the first transmissive region, whereby at least some secondary signals are selectively directed into particular B waveguides according to wavelength.

5,440,417

#### SYSTEM FOR SPECTRUM-SLICED FIBER AMPLIFIER LIGHT FOR MULTI-CHANNEL WAVELENGTH-DIVISION-MULTIPLEXED APPLICATIONS

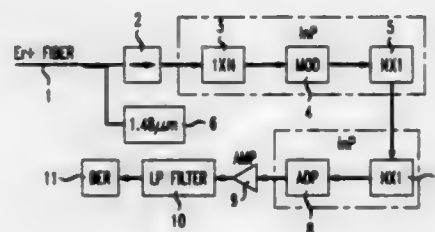
Yun C. Chung; Jae S. Lee, both of Monmouth, and David J. DiGiovanni, Union, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Oct. 4, 1993, Ser. No. 130,962

Int. Cl.<sup>6</sup> H04J 14/02

U.S. Cl. 359—134

20 Claims



1. A system for producing a light for use with a multi-channel wavelength-division-multiplexed (WDM) system comprising:

- a fiber amplifier providing amplified spontaneous emission (ASE) light;
- a laser for pumping said fiber amplifier; and,
- a WDM demultiplexer for receiving and splitting said ASE light, said demultiplexer being connected to an array of modulators, said array of modulators being connected to a WDM multiplexer for combining said ASE light back into an optical fiber, thereby producing a spectrum-sliced light for a multiple number of WDM channels.

5,440,418

#### METHOD AND APPARATUS FOR ALARM SURVEILLANCE FOR AN OPTICAL TRANSMISSION SYSTEM

Katsuhiko Iihimura; Hiroshi Takamoto, and Shusui Aoki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1993, Ser. No. 80,113

Claims priority, application Japan, Jul. 15, 1992, 4-189214

Int. Cl.<sup>6</sup> H04B 10/08

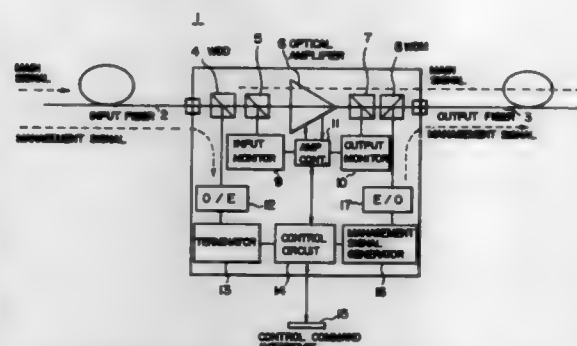
U.S. Cl. 359—177

7 Claims

1. A method for operating a first optical repeater apparatus disposed between an input optical fiber and an output optical fiber, the first optical repeater apparatus including a first optical amplifier means for amplifying a main signal received on the input fiber and transmitting the amplified main signal on

the output fiber, the first optical amplifier means having a status, the first optical repeater apparatus additionally including first managing means for generating management information, the first managing means having a status, said method comprising the steps of:

- receiving a management signal on the input fiber from a second optical repeater apparatus;



- examining the status of the first managing means;
- examining the status of the first optical amplifier means if the status of the first managing means is normal, and;
- forwarding the management signal received in step (a) by emitting the received management signal on the output fiber if the status of the first managing means is normal and the status of the first optical amplifier means is normal.

5,440,419

#### READ-WRITE HEAD FOR AN OPTICAL TAPE RECORDER

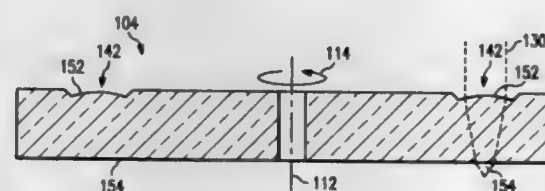
John D. Boardman, Garland; Scott M. Hamilton, Rockwall, and Jeffrey P. Welch, Plano, all of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 873,029, Apr. 24, 1992, Pat. No. 5,216,534. This application Apr. 21, 1993, Ser. No. 49,377

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359—210

13 Claims



1. A rotating lens wheel for the read-write head of an optical recording apparatus, comprising:

- a disk-shaped substrate mounted for rotational movement; and
- a plurality of circumferentially positioned lenses mounted to the disk-shaped substrate wherein each lens comprises a plano-convex singlet having a planar surface and an opposed convex powered surface, the powered surface having an aspheric figure defined according to lens parameters selected as a function of wavelength for operation of the lens over a chosen wavelength range.

5,440,420

#### OPTICAL AMPLIFIER

Tsunao Mori, and Kazuo Koya, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1994, Ser. No. 186,294

Claims priority, application Japan, Jan. 27, 1993, 5-011941

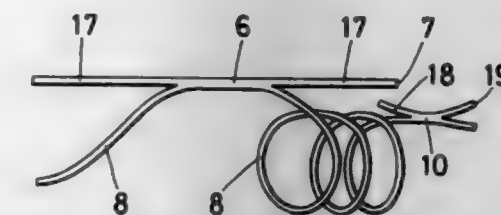
Int. Cl.<sup>6</sup> H01S 3/30

U.S. Cl. 359—341

5 Claims

1. An optical amplifier which serves as a part of an optical communication system, comprising an optical fiber for amplification having a length sufficient for stimulated emission

through excitation by an excitation laser beam and sufficient for amplifying a transmitted laser beam; and optical fiber for transmission; and an optical wavelength division multiplexer formed by partially fusing, under drawing conditions, the optical fiber for amplification and the optical fiber for transmission at a portion in the proximity to the light-incident end of



the fiber for amplification; and an optical filter arranged at a position in the proximity to the light-outgoing end of the optical fiber for amplification, which is formed by partially fusing, under drawing conditions, the optical fiber for amplification with an optical fiber having a propagation constant identical to that observed for the optical fiber for amplification as determined at a predetermined wave length.

5,440,421

#### THREE-DIMENSIONAL PERIODIC DIELECTRIC STRUCTURES HAVING PHOTONIC BANDGAPS

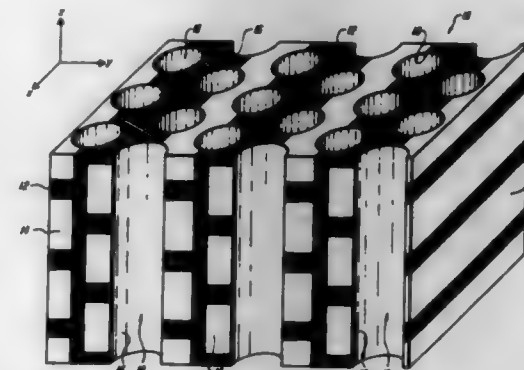
Shanhuai Fan, Cambridge; Pierre R. Villeneuve, Arlington, both of Mass.; Robert D. Meade, Morris Township, N.J., and John D. Joannopoulos, Belmont, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 10, 1994, Ser. No. 240,916

Int. Cl.<sup>6</sup> H01L 33/00

U.S. Cl. 359—344

20 Claims



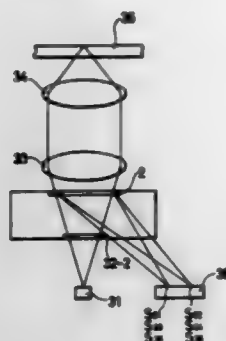
1. A method of fabricating a periodic dielectric structure having a three-dimensional photonic bandgap, said method comprising the steps of:

- providing a substrate;
- applying a layer of a first material having a first dielectric constant on said substrate;
- forming a plurality of parallel grooves along a first axis lying in the plane of said layer;
- filling said plurality of grooves with a second material having a second dielectric constant;
- applying a further layer of said first material to overlie the previous layer of first material and filled grooves;
- repeating steps (c)–(e) a predetermined number of times to form a multi-layered structure; and
- forming a plurality of parallel channels through said multi-layered structure in a second axis orthogonal to the plane of the layers, said channels being adapted to comprise a third material having a third dielectric constant, thereby resulting in said structure having three-dimensional periodicity.





sively alternately formed, each of the flat lands positioned between adjacent grooves, the diffraction gratings having the same groove depth, groove width and groove tilt angle, the tilt angle being the inclined surface of the



groove with respect to the plane which intersects the bottom of the groove and is parallel with the land surface, the diffraction gratings having different pitches, the different pitches formed by having a different land width for each diffraction grating.

5,440,428

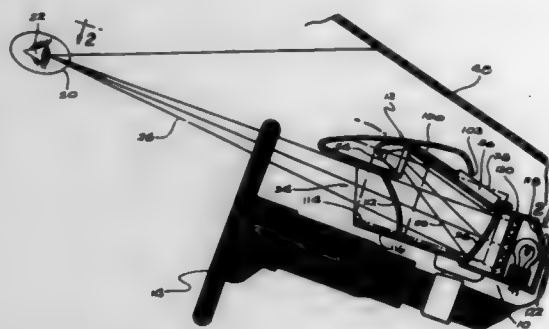
# **AUTOMOTIVE INSTRUMENT 3-D VIRTUAL IMAGE DISPLAY**

Ronald G. Hegg, Carlbad, and Mao-Jin Chern, Rancho Palos Verdes, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 30, 1993, Ser. No. 130,066  
Int. Cl.<sup>6</sup> G02B 27/10

U.S. Cl. 359—630

100 Claims



1. A display system for a vehicle having a display panel mounted within view of an operator's position, said display system comprising a first image source mounted in said vehicle for providing a first image display, a narrow band optical element disposed between said first image source and said operator's position for creating a first color virtual image of said first image display at a first spatial location visible from said operator's position, and a second image source for providing a second image display outside the bandwidth of said narrow band optical element, said second image source being positioned relative to said narrow band optical element to produce a second color image at a second spatial location visible from said operator's position, wherein said narrow band optical element creates said first color virtual image at a location beyond said display panel, wherein said narrow band optical element comprises an aspheric optical element, and further wherein said aspheric optical element comprises an aspheric optical surface shaped to reduce aberrations in said first color virtual image.

## **PROJECTION LENS SYSTEM FOR REAR TYPE PROJECTION TELEVISION**

Dong-ha Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

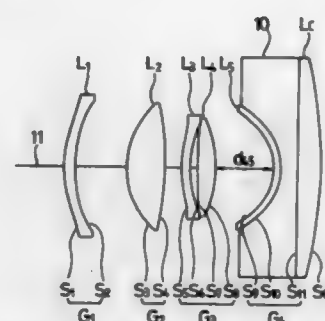
Filed Oct. 28, 1993, Ser. No. 141,945

Claims priority, application Rep. of Korea, Oct. 28, 1992, 92-19860

Int. Cl.<sup>6</sup> G02B 3/02

U.S. Cl. 359—649

20 Claims



1. A projection lens system, for use in a rear type projection television, including a plurality of lenses which are sequentially arranged along an optical axis perpendicular to a CRT screen, said projection lens system comprising:

- a first lens unit comprising at least one lens having a meniscus form and a weak positive or weak negative optical power;
- a second lens unit comprising one lens with a strong positive optical power and a bi-convex form;
- a third lens unit comprising at least one lens having a weak positive or negative optical power and comprising a further lens having a strong positive optical power; and
- a fourth lens unit having a strong negative optical power, said fourth lens unit comprising a lens of meniscus form and of a convex shape on at least a surface directed toward the CRT screen and further comprising a coolant for cooling a fluorescent surface of the CRT screen.

5,440,430

## **FIVE-ELEMENT TELESCOPIC ZOOMING LENS**

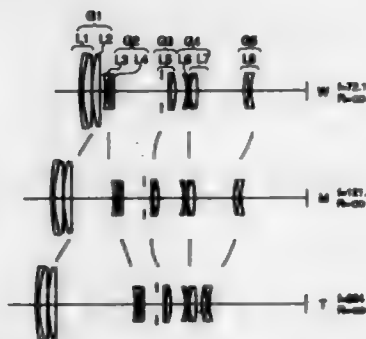
Haruo Sato, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 958,172, Oct. 8, 1992, abandoned. This application Jul. 20, 1993, Ser. No. 93,728

Claims priority, application Japan, Oct. 15, 1991, 3-266547  
Int. Cl.<sup>6</sup> G02B 15/14

U.S. Cl. 359—683

10 Claims



1. An optical system comprising, in order from the object side;

- a first lens group having a positive refractive power;
- a second lens group having a negative refractive power;
- a third lens group having a positive refractive power;
- a fourth lens group having a positive refractive power; and

a fifth lens group having a negative refractive power; wherein when a magnification factor is to be changed from a wide angle end to a telephoto end, an on-axis air gap between the first lens group and the second lens group is increased while an on-axis air gap between the second lens group and the third lens group is reduced and an on-axis air gap between the fourth lens group and the fifth lens group is reduced, and the third lens group is nonlinearly moved and a drive distance of the third lens group measured from the wide angle end meets the following condition:

$$0 < X_{3T} - X_{3M} \leq |X_{3M}| \quad (1)$$

where

$f_W$ : focal distance of the entire system at the wide angle end,

$f_T$ : focal distance of the entire system at the telephoto end,  
 $f_M = (f_W \cdot f_T)^{1/2}$ : focal distance of the entire system at an intermediate focal distance,

$X_{3M}$ : drive distance of the third lens group at the intermediate focal distance  $f_M$  measured from the wide angle end,

$X_{3T}$ : drive distance of the third lens group at the telephoto end measured from the wide angle end, with a direction toward the object being negative.

5,440,431

## **OPTICAL APPARATUS HAVING A ZOOM LENS SYSTEM**

Jong-kyo Jeong, Kyeongsangnam-do, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Rep. of Korea

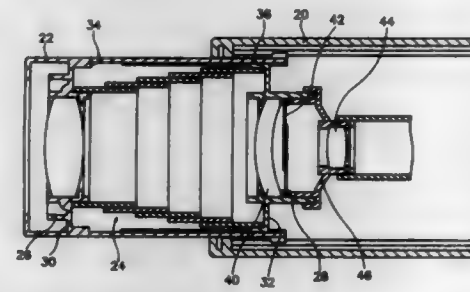
Filed Sep. 20, 1993, Ser. No. 124,397

Claims priority, application Rep. of Korea, Apr. 26, 1993, 93-7008

Int. Cl.<sup>6</sup> G02B 15/14, 27/00

U.S. Cl. 359—704

13 Claims



1. An optical apparatus comprising

a first lens group;

a second lens group disposed on a common longitudinal axis with said first lens group;

means for moving said first lens group relative to said second lens group between a retracted position position with said lens groups in close relation and an extended zooming position in which said both lens groups are spaced apart from each other; and

a helically wound strip defining a light intercepting means between said lens groups to prevent incident light from passing therethrough into a space between said lens groups, said helically wound strip being extendable from a collapsed condition with said lens groups in said retracted position into an expanded condition with said lens groups in said extended position.

5,440,432

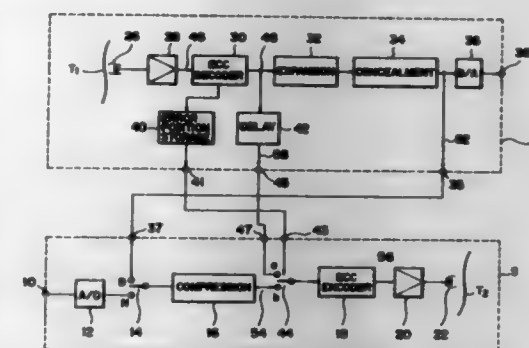
## **DUBBING SYSTEM FOR DIGITAL INFORMATION**

Akio Aoki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 113,188, Aug. 30, 1993, abandoned, which is a continuation of Ser. No. 658,402, Feb. 20, 1991, Pat. No. 5,267,094. This application Mar. 14, 1994, Ser. No. 209,378  
Claims priority, application Japan, Feb. 20, 1990, 2-40236  
Int. Cl.<sup>6</sup> G11B 5/00, 5/86

U.S. Cl. 360—32

18 Claims



1. An information processing apparatus, comprising:

- (a) input means for inputting a compressed information code train, said compressed information code train having been compressed in information amount by compression encoding and adding an error correction check code;
- (b) error correction means for correcting a code error in said compressed information code train by using said error correction check code;
- (c) decoding means for performing decoding corresponding to said compression encoding on said compressed information code train outputted from said error correction means;
- (d) producing means for producing a produced code corresponding to an information code which is included in an information code train outputted from said decoding means and is uncorrectable by said error correction means;
- (e) a first output terminal for outputting said compressed information code train inputted to said decoding means;
- (f) a second output terminal for outputting an information code train including the produced outputted from said producing means; and
- (g) a third output terminal for converting said information code train including the produced code outputted from said producing means into analog data and outputting said analog data.

5,440,433

## **CIRCUIT AND METHOD FOR ADJUSTING A DATA DETECTING LEVEL OF A DISK DRIVING APPARATUS**

Jong-Yun Yun, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Sep. 27, 1993, Ser. No. 126,718

Claims priority, application Rep. of Korea, Nov. 27, 1992, 22634/1992

Int. Cl.<sup>6</sup> G11B 5/09

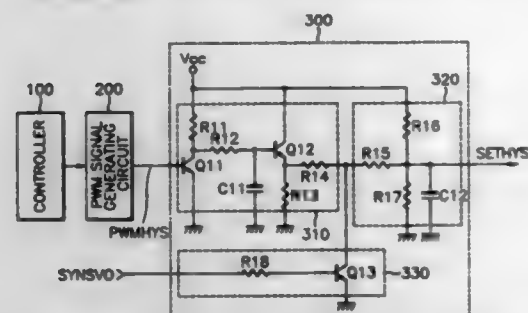
U.S. Cl. 360—46

17 Claims

1. A circuit for generating an adjusted data detecting level in a disk driving apparatus in which a signal picked up from a disk is compared with the adjusted data detecting level for detecting data included in the picked up signal, said circuit comprising: level controlling means for generating a pulse width modulation signal having a duty cycle corresponding to a predetermined level control value, wherein said level controlling means comprises:

- maximum level determining means for performing a read test while a level control value is incremented by a given stage from an initial level control value in response to a test mode, and designating the level control value less

than that generating a data error by one stage as a maximum level value;  
minimum level determining means for performing said read test while said level control value is decremented by said given stage from said initial level control value, and designating the level control value greater than that generating a data error by one stage as a minimum level value; and



control value determining means for designating an average value of said maximum and minimum level values as said predetermined level control value; and  
level determining means for detecting a voltage level of said pulse width modulation signal generated from said level controlling means and for adjusting said data detecting level by a level corresponding to the detected voltage level to generate said adjusted data detecting level.

5,440,434

#### REPRODUCED WAVEFORM EQUALIZING CIRCUIT FOR THIN-FILM MAGNETIC HEAD

Masahide Kanegae, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan  
PCT No. PCT/JP92/01694, § 371 Date May 3, 1993, § 102(e) Date May 3, 1993, PCT Pub. No. WO93/14493, PCT Pub. Date Jul. 22, 1992

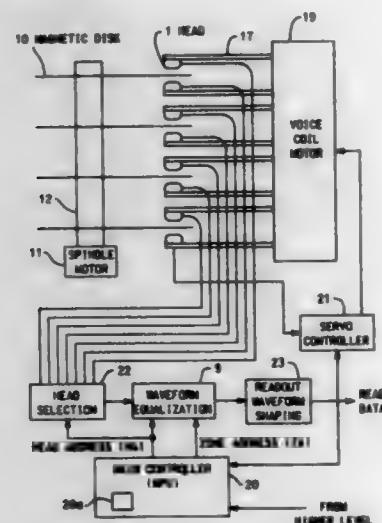
PCT Filed Dec. 25, 1992, Ser. No. 50,170

Claims priority, application Japan, Jan. 10, 1992, 4-003064; Mar. 31, 1992, 4-076445

Int. Cl. G11B 5/09, 15/12

U.S. Cl. 360-65

15 Claims



1. A reproduced waveform equalizing circuit for thin-film magnetic heads comprising:

- a delay circuit for delaying a readout signal, read by a thin-film magnetic head selected by a head select signal, by a predetermined time;
- a delay amount changing circuit for giving said readout signal a delay time shorter than a delay time given by said delay circuit;
- an operation circuit, connected to said delay circuit and said delay amount changing circuit, for outputting a wave-

form-equalized signal acquired by eliminating a negative edge of said readout signal from a first delay signal delayed by said predetermined time and a second delay signal delayed by a time shorter than said predetermined time; and

- a delay amount determining circuit for determining a delay time given by said delay amount changing circuit from both said head select signal and a head position signal of said thin-film magnetic head,
- a delay amount of said delay amount changing circuit being controlled by a delay amount indicating signal from said delay amount determining circuit.

5,440,435

#### CARTRIDGE MANIPULATION AND REFERENCE SYSTEM FOR MAGNETIC TAPE RECORDER

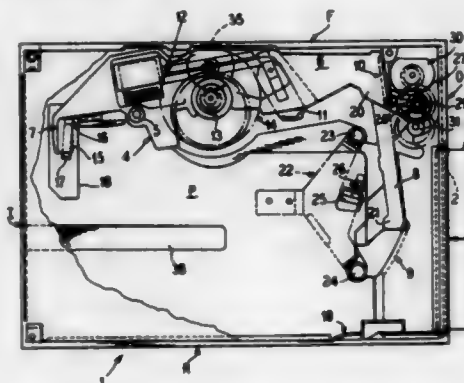
Petter Busengdal, and Jan E. Dilling, both of Oslo, Norway, assignors to Tandberg Data Storage A/S, Oslo

Filed Jul. 8, 1993, Ser. No. 88,748

Int. Cl. G11B 15/00, 15/60

U.S. Cl. 360-96.5

8 Claims



1. In a magnetic tape recorder for receiving an endwise loaded rectangular tape cassette having a pair of opposed sides and a pair of opposed ends which are shorter than said sides, said tape cassette enclosing a length of magnetic tape and having an opening in one of said sides proximate one of said ends for providing access to said length of tape, said magnetic tape recorder having a magnetic head for reading/writing data on said magnetic tape when said magnetic head is in operative engagement with said magnetic tape, an electric motor, and a capstan drive train connectable with said electric motor for activating a tape drive in said tape cassette to conduct said length of magnetic tape across said magnetic head, and further comprising:

- a unitary bridge carrying said magnetic head and said capstan drive train, and means for moving said bridge along three orthogonally spaced axes between a lowered standby position, where said bridge is spaced from said tape cassette, and a raised running position, where said bridge engages said tape cassette, connects said capstan drive train between said electric motor and said tape drive, and operatively engages said magnetic head with said magnetic tape.

5,440,436

#### REMOVABLE CARTRIDGE DISK DRIVE WITH A 1.8 INCH FORM FACTOR

Syed H. Ifthar, Fremont; Herbert E. Thompson, Los Gatos; Teong-Hoe Kay, San Jose, and Albert J. Guerini, Gilroy, all of Calif., assignors to SyQuest Technology, Inc., Fremont, Calif.

Filed Nov. 13, 1992, Ser. No. 977,262

Int. Cl. G11B 17/022, 23/03

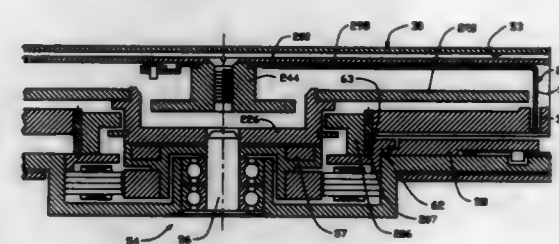
U.S. Cl. 360-99.12

1 Claim

1. A disk drive having a stationary motor adapted for receiving a removable cartridge which contains a disk for storing data, the disk mounted on a hub, the cartridge including a tang and a mechanism to raise and lower the hub and disk relative

to the cartridge when the tang is rotated so that the hub can engage the motor of the disk drive, the disk drive comprising: handle positioned adjacent to the motor, which handle rotates in a first direction to urge the hub toward the motor and in a second direction to unseat the hub from the motor;

said handle having a cartridge seating tab, the cartridge seating tab engaging the tang when the handle is rotated in the first direction to rotate the tang to lower the hub toward the motor; and



said handle having a cartridge unseating tab, the cartridge unseating tab engaging the tang when the handle is rotated in the second direction to rotate the tang to cause the hub to unseat from the motor.

5,440,437

#### MAGNETIC HEAD ARM HAVING THERMAL COMPENSATION MEMBER FOR CORRECTING TRACKING ERROR

Yotaro Sanada; Noriaki Ishimatsu; Makoto Watanabe, all of Tokyo, and Seiji Yamashita, Ibaragi, all of Japan, assignors to NEC Corporation, Tokyo, Japan

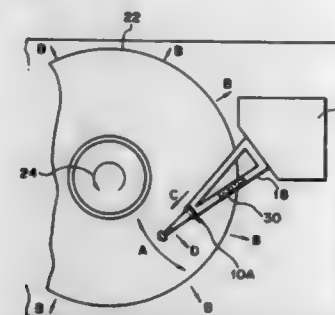
Continuation of Ser. No. 765,748, Sep. 26, 1991, abandoned. This application May 24, 1994, Ser. No. 248,464

Claims priority, application Japan, Sep. 26, 1990, 2-255608

Int. Cl. G11B 5/48, 17/00

U.S. Cl. 360-104

18 Claims



1. A structure of a magnetic head for a magnetic disk drive, comprising:

- a slider comprising an electromagnetic transducer for recording and reproducing data out of a magnetic disk;
  - a gimbal spring retaining said slider;
  - a pressing spring to one end of which said gimbal spring is affixed;
  - an arm affixed to the other end of said pressing spring; and
  - a correcting member constituting at least a single portion of said arm and having a different coefficient of thermal expansion from said arm,
- wherein said arm comprises a first arm, a second arm and a base arm, which arms are combined to form a triangular shape,
- wherein said correcting member forms a part of either said first arm or said second arm, and
- wherein said correcting member, said first arm and said second arm being continuously maintained at ambient temperature.

5,440,438

#### DISC DRIVE APPARATUS

Hitoshi Saito, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

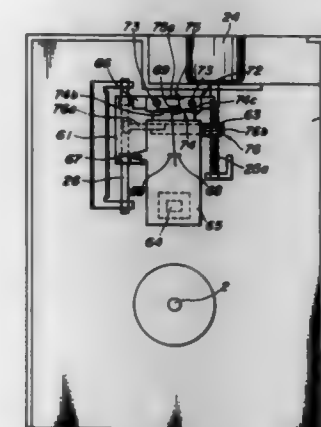
Filed Mar. 30, 1994, Ser. No. 220,300

Claims priority, application Japan, Mar. 31, 1993, 5-074398; Mar. 31, 1993, 5-074399

Int. Cl. G11B 5/55

U.S. Cl. 360-106

17 Claims



1. A disc drive apparatus comprising:

- a head carriage having a first read/write magnetic head mounted thereon;
- a motor;
- an output axle attached to said motor which is rotated in a bi-directional rotation in response to the drive of the motor;
- a contactor which is integrally formed with said head carriage and which is in contact with said output axle so that said contactor receives a translational force from said output axle, said head carriage being advanced and retracted by said translational force;
- a guide axle, mounted on said head carriage, penetrated through an axle hole formed by said head carriage open in a direction of advancement and retraction of said head carriage, said guide axle juxtaposed to said output axle; and
- a unitary plate spring having a first spring portion and a second spring portion, said first spring portion so constructed as to press against said guide axle to exert pressure between an inner peripheral surface of said axle hole and an outer peripheral surface of the guide axle, said second spring portion so constructed as to press against said output axle to create pressure between said contactor and said output axle.

5,440,439

#### CASSETTE SCREW BOSSES HAVING RIBBED SURFACES

G. Phillip Rambosek, Shafer, and Bradley J. Johanson, Hutchinson, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 877,478, May 1, 1992, abandoned. This application Feb. 24, 1994, Ser. No. 201,073

Int. Cl. G11B 23/02

U.S. Cl. 360-132

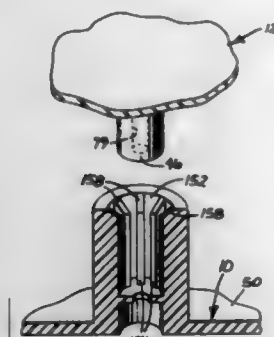
11 Claims

1. A cassette housing comprising:

- a base; and
- a cover mounted on the base; and
- means for locating the base with respect to the cover and for assisting fastening the base to the cover, wherein the locating and the fastening assisting means comprises a plurality of bosses mounted on the base and an equal number of bosses mounted on the cover, wherein the cover bosses correspond in location to respective base



bosses, wherein one of the base bosses and cover bosses are receiving bosses, and the other of the base bosses and cover bosses are received within respective receiving bosses, wherein the cover is connected to the base by connection between the base bosses and cover bosses, and wherein each receiving boss has an inner surface defining a plurality of ribs, wherein when the boss that is received by the receiving boss is centered within the receiving boss the boss and the receiving boss do not sufficiently contact each other along their adjacent respective outer and inner



surfaces to deform any ribs, and wherein there is a slight clearance without frictional interference between each cover boss and its corresponding base boss when the bosses are mated to provide sufficient support for the bosses and to reduce shearing failure and breakage of the cassette during impacts on the cassette wherein when the boss that is received by the receiving boss is centered within the receiving boss the boss and the receiving boss do not sufficiently contact each other along their adjacent respective outer and inner surfaces to deform either boss.

5,440,440

# HIGH CURRENT SOLID STATE AC RELAY WITH LOW EMI EMISSION

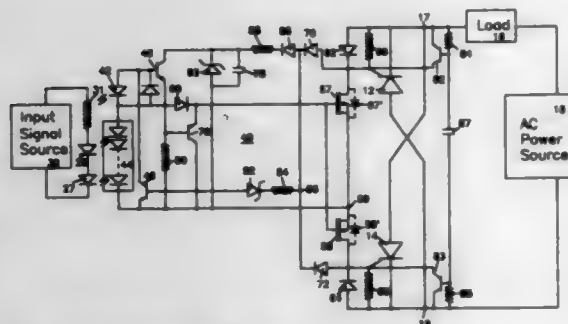
Tian T. Du, Buena Park, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 3, 1994, Ser. No. 191,801

Int. Cl.<sup>6</sup> H02H 3/20

U.S. Cl. 361-18

17 Claims



1. A solid state relay comprising:
  - a pair of silicon controlled rectifiers (SCRs) connected in inverse parallel relationship across a pair of output terminals adapted to be connected in series with a source of AC power and a load,
  - each SCR having an anode connected to one of the pair of output terminals, a cathode connected to another of the pair of output terminals, and a gate terminal;
  - bidirectional semiconductor switching means for providing a single current path connecting the gate terminals of each of the pair of SCRs;
  - means for transferring current in one direction from each of the output terminals to each of the gate terminals;
  - a source of input signals;
  - means for applying signals from the source of input signals to

rapidly enable the bidirectional semiconductor switching means to provide a current path to the gate terminals of the SCRs and to maintain the bidirectional semiconductor switching means in the on condition as long as an input signal is furnished by the source of input signals; and means for monitoring the voltage across the output terminals and allowing the operation of the means for applying signals from the source of input signals to rapidly enable the bidirectional semiconductor switching means only during a period in which the voltage across the output terminals is less than a preselected value.

5,440,441

# APPARATUS FOR PROTECTING, MONITORING, AND MANAGING AN AC/DC ELECTRICAL LINE OR A TELECOMMUNICATION LINE USING A MICROPROCESSOR

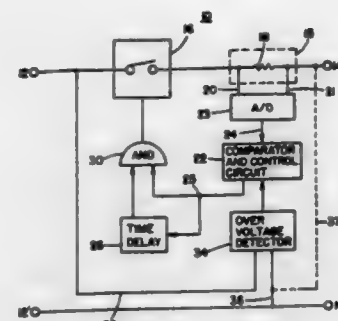
Om Ahuja, 5627 Innsbruck, Bellaire (Houston), Tex. 77401-2619

Continuation-in-part of Ser. No. 8,674, Jan. 25, 1993, which is a continuation-in-part of Ser. No. 684,167, Apr. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 833,360, Feb. 25, 1986, which is a continuation-in-part of Ser. No. 664,472, Oct. 10, 1984, abandoned. This application Oct. 18, 1993, Ser. No. 138,742

Int. Cl.<sup>6</sup> H02H 3/00

U.S. Cl. 361-62

31 Claims



1. An apparatus for protecting, monitoring and managing at least one AC/DC electrical line or a telecommunication line comprising:
  - (a) at least one switch means serially connected to at least one of said line for enabling, disabling or interrupting the flow of an electrical current or a signal through said line in response to a control signal;
  - (b) at least one means for monitoring at least two variables:
    - a first variable signal, associated with said line, or said switch means, or a first predetermined value of a first predetermined parameter,
    - and a second variable signal, associated with said line, or said switch means, or a second predetermined value of a second predetermined parameter;
 wherein said monitoring means generates said control signal, thereby enabling or disabling said flow through said line, when at least one of said variables or one of said predetermined values drops below or exceeds above its respective predetermined value.

5,440,442

# APPARATUS AND METHOD TO DETERMINE CAPACITANCE REQUIRED TO OPTIMIZE POWER FACTOR

Gregory G. Taylor, 610 Moonpenny Cir., Port Orange, Fla. 32127

Filed Mar. 1, 1993, Ser. No. 24,240

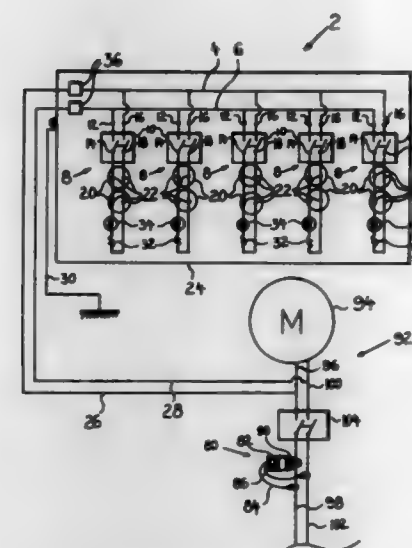
Int. Cl.<sup>6</sup> G05F 1/70

U.S. Cl. 361-93

14 Claims

1. A single phase KVAR sizing unit comprising:
  - a first single phase bus;

- a second single phase bus;
- a plurality of single phase capacitor circuits, each said single phase capacitor circuit comprising:
  - a two pole, two position ganged switch comprising a first single phase bus-side terminal electrically connected to said first single phase bus and interruptably connected to a first single phase capacitor-side terminal, and a second single phase bus-side terminal electrically connected to said second single phase bus and interruptably connected to a second single phase capacitor-side terminal;
- a plurality of capacitors, each said capacitor having two capacitor terminals, each said capacitor having one of its said capacitor terminals electrically connected to said first single phase capacitor-side terminal and the other of its said capacitor terminals electrically connected to said second single phase capacitor-side terminal;



- an enclosure containing said first single phase bus, said second single phase bus and said single phase capacitor circuits;
- a first single phase lead electrically connected to said first single phase bus, a second single phase lead electrically connected to said second single phase bus, and a ground lead electrically attached to said enclosure;
- an overload protection device electrically connected between said first single phase bus and said first single phase lead whereby said first single phase bus may be electrically isolated from said first single phase lead in the presence of an electrical overload in said first single phase lead; and
- an overload protection device electrically connected between said second single phase bus and said second single phase lead whereby said second single phase bus may be electrically isolated from said second single phase lead in the presence of an electrical overload in said second single phase lead.

5,440,443

# CONTROL DEVICE AND METHODS OF MAKING AND OPERATING THE SAME

Brian J. Kadwell, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 25, 1993, Ser. No. 22,132

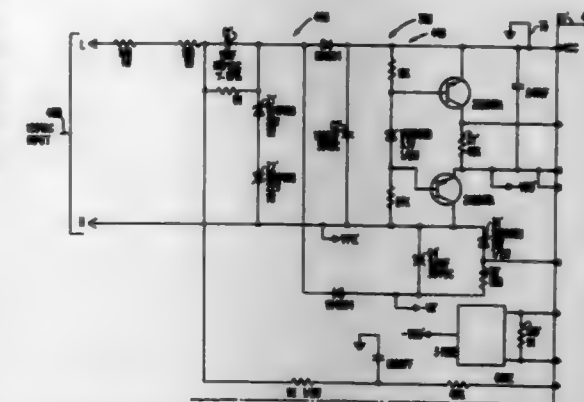
Int. Cl.<sup>6</sup> H01H 47/04

U.S. Cl. 361-155

7 Claims

1. In a control device comprising a microcomputer unit, a relay unit having coil means and contact means that is operated to one condition thereof when a direct current flows through said coil means, said relay unit having a certain voltage rating,

a power supply unit for being interconnected to a high voltage alternating current power supply means that has a certain frequency, and circuit means operatively interconnecting said units together, said power supply unit comprising a transformerless capacitor arrangement for creating a first low voltage direct current from said power supply means to power said microcomputer unit, the improvement wherein said transformerless capacitor arrangement comprises two capacitors ar-



ranged for creating a second low voltage direct current from said power supply means for powering said coil means of said relay unit, said two capacitors being arranged for creating said second low voltage direct current from said power supply means for powering said coil means with an initial pull-in voltage that is less than said certain voltage rating and for then automatically reducing that initial pull-in voltage across said coil means to a predetermined lower holding voltage.

5,440,444

# MULTI-PATH STATIC CONTROL GARMENT

Kay L. Adams, P.O. Box 188036, Carlsbad, Calif. 92009

Filed Feb. 4, 1994, Ser. No. 191,625

Int. Cl.<sup>6</sup> H05F 3/02

U.S. Cl. 361-220

11 Claims



4. A multi-path static control garment comprising:
  - a body section,
  - first and second sleeve sections connected to said body section,
  - first electrically conductive body contact means on said first sleeve section,
  - second electrically conductive body contact means on said second sleeve section,
  - first and second mutually insulated electrical grounding means mounted on said body section,
  - first electrically conductive connecting means electrically interconnecting said first electrically conductive body contact means with said first grounding means, and
  - second electrically conductive connecting means interconnecting said second electrically conductive body contact means with said second grounding means, said second electrically conductive connecting means being electri-

cally insulated from said first electrically conductive connecting means, whereby two mutually independent and mutually isolated grounding paths are provided from said first and second sleeve sections, respectively.

5,440,445

# HIGH-ENERGY IGNITION GENERATOR IN PARTICULAR FOR A GAS TURBINE

Patrick G. A. Ballard, Rueil-Malmaison, France, assignor to Eyquem, Nanterre Cedex, France

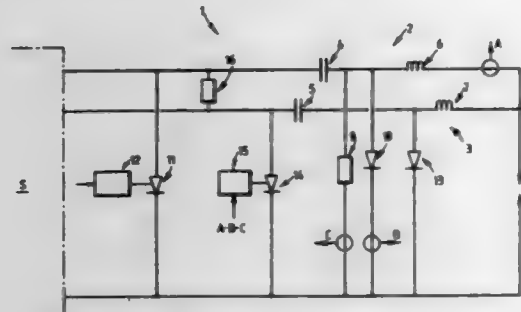
Filed Sep. 3, 1993, Ser. No. 115,709

Claims priority, application France, Sep. 4, 1992, 92 10603

Int. Cl.<sup>6</sup> F23Q 3/00

U.S. Cl. 361—257

6 Claims



1. A high-energy ignition generator comprising: an energy source; an igniter having electrodes; a low-energy circuit, operatively coupled to said energy source and said igniter, for igniting said igniter so as to generate sparks between said electrodes of said igniter; a high-energy circuit, operatively coupled to said energy source and said igniter, for characterizing an energy of the sparks generated between said electrodes of said igniter; spark detection means for detecting a presence of a spark between said electrodes of said igniter; a control circuit, operatively coupled to said high-energy circuit and said spark detection means, for enabling an operation of said high-energy circuit only upon detection of the presence of a spark between said electrodes of said igniter by said spark detection means.

5,440,446

# ACRYLATE COATING MATERIAL

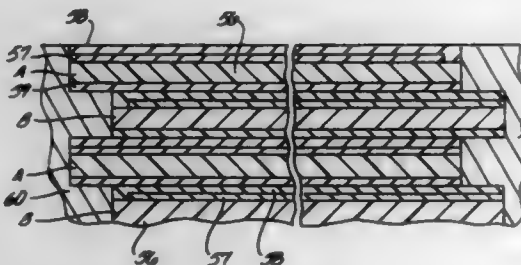
David G. Shaw, Eric Dawson, Daniel Cline, and Marc Langlois, all of Tucson, Ariz., assignors to Catalina Coatings, Inc., Tucson, Ariz.

Filed Oct. 4, 1993, Ser. No. 131,328

Int. Cl.<sup>6</sup> H01G 2/12, 4/14, 4/20; B32B 15/08

U.S. Cl. 361—301.5

12 Claims



1. A wound capacitor comprising: at least one thermoplastic dielectric sheet wound into a cylinder; a metallized conductive layer deposited on at least one face of the dielectric sheet;

a layer crosslinked acrylate in direct contact with the metallized layer; and an electrical contact made to the conductive layer at an end of the cylinder by Schooping.

5,440,447

# HIGH TEMPERATURE FEED-THROUGH SYSTEM AND METHOD FOR MAKING SAME

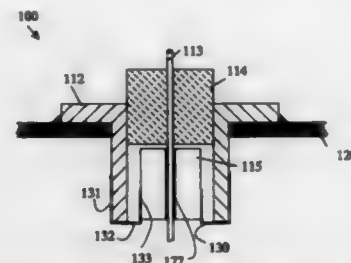
Thomas W. Shipman, Rochester; David J. Bealka, East Free-town, and Timothy J. Brown, Mattapoisett, all of Mass., assignors to The Morgan Crucible Company, plc, Windsor, England

Filed Jul. 2, 1993, Ser. No. 87,988

Int. Cl.<sup>6</sup> H01G 2/04, 4/236

U.S. Cl. 361—302

14 Claims



1. An electronic feed-through system comprising: an electrically conductive structure adapted to be attached to a second structure at a first location on said conductive structure, said conductive structure having an electrically conducting member connected to said first location, wherein a portion of said conductive structure is subjected to heat during said attachment; an electronic component electrically connected to said conducting member and placed in proximate spaced relation to said conducting member so as to define a void between said electronic component and said conducting member; and bridge means for electrically connecting said electronic component to said conducting member and maintaining said component in said spaced relation with said conducting member, said bridge means having a thermal resistance greater than the thermal resistance of said conducting member.

5,440,448

# ELECTRONIC SYSTEM WITH COMPACT CARD EJECTOR

Gregory N. Stewart, and Christian G. Okonsky, both of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

Continuation of Ser. No. 903,074, Jun. 22, 1992, abandoned.

This application May 25, 1994, Ser. No. 248,831

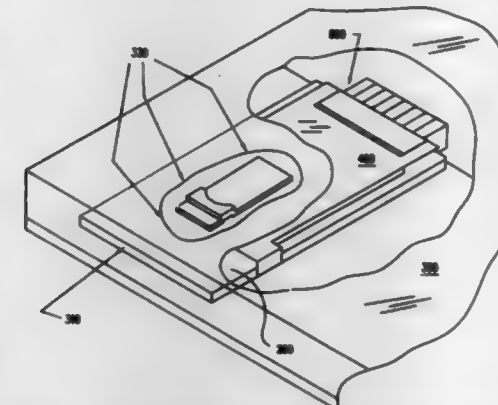
Int. Cl.<sup>6</sup> G06F 1/16; H01R 13/62; H05K 7/10

U.S. Cl. 361—684

4 Claims

1. A computer system, comprising: a housing having, in at least one position thereof, a generally flattened shape, with first and second exterior surfaces which are substantially parallel to each other and a third exterior surface which is substantially perpendicular to said first and second exterior surfaces; at least one central processing unit (CPU) mounted within said housing; a card interface slot located on said third exterior surface and in proximity to, but not on, said first and second exterior surfaces of said housing, and dimensioned for accepting a card having a substantially rectangular broad surface and having connectors thereon in substantially predetermined locations; a card connector comprising a header configured to accommodate an electrical interface to said connectors of said card when said card is inserted in said card interface slot;

at least one ejector including a body portion and a pair of arms extending from said body portion, wherein said pair of arms are positioned to bear on said card adjacent to the connectors of said card, and wherein said pair of arms are spaced on opposite sides of said card connector during times in which said card is positioned in said slot, and wherein said body portion of said ejector extends adjacently along said broad surface of said card during times in which said card is positioned in said slot, and wherein said



- ejector is enclosed between said first and second exterior surfaces of said housing such that said body portion of said ejector is slidably movable along an interior surface of a wall forming said second exterior surface of said housing; a recess formed in said second exterior surface of said housing; and a slider slidably positioned in said recess and mechanically connected to said ejector, wherein a user can push said slider to eject said card from said slot.

5,440,449

# WIRELESS COMMUNICATION CONNECTOR AND MODULE FOR NOTEBOOK PERSONAL COMPUTERS

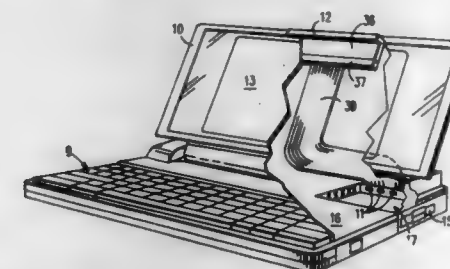
David C. Scheer, Pollock Pines, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 26, 1994, Ser. No. 188,139

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/10

U.S. Cl. 361—686

11 Claims



1. For use with a computer which includes, a display screen housing having a top edge, a back edge, two side edges, and a hinged edge, said hinged edge connecting said display screen housing to a body portion of said computer; an internal printed circuit means within said computer; an apparatus for interfacing with said internal printed circuit means comprising: module means located at said top edge of said display screen housing; said module being shaped to conform to said shape of said display screen housing; upper leg means of said module means for providing support along said top edge said display screen housing;

a back leg means of said module means for providing support along said back edge of said display screen housing; and, projection means of said module means providing a projection into said display screen housing; said projection means being constructed so as to mate with said internal printed circuit means.

5,440,450

# HOUSING COOLING SYSTEM

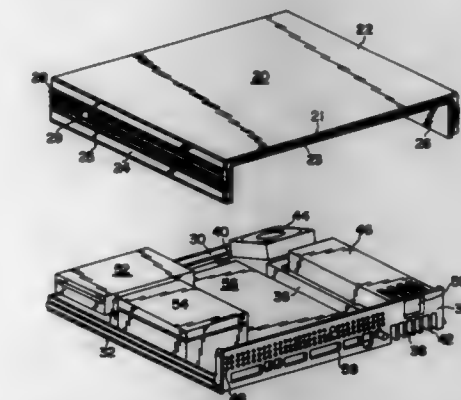
Tim O. Lau, Milpitas; Alexander Huang, Menlo Park, and Douglas P. Lo, San Jose, all of Calif., assignors to NeXT, Inc., Redwood City, Calif.

Continuation of Ser. No. 582,625, Sep. 14, 1990, abandoned. This application May 23, 1994, Ser. No. 247,493

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361—695

10 Claims



1. An apparatus for dissipating heat from an enclosure comprising: an open-sided heat transfer channel recessed into and integrally formed with a first side of an enclosure and having an open side external to said enclosure, said open-sided heat transfer channel comprising: a first opening disposed for receiving a cooling fluid within said enclosure and from outside said channel; and a second opening for exhausting said cooling fluid from said channel; wherein said channel forms a closed-sided heat transfer passage when the open side of said channel is disposed to a surface; and heat transfer means for transferring heat from a heat generating source within said enclosure to said cooling fluid within said channel, said heat transfer means comprising: a heat absorption surface comprising a metal plate connected to said heat generating source, said heat absorption surface within said enclosure disposed substantially adjacent to and in thermal communication with said heat transfer channel and said heat generating source; and, a heat dissipation surface comprising at least one fin extending within said heat transfer channel, said heat dissipation surface in thermal communication with said heat absorption surface disposed within said heat transfer channel; an electric fan for moving said cooling fluid through said heat transfer channel, said fan mounted at an acute angle to a longitudinal axis of said heat transfer channel, said heat transfer channel having a substantially longitudinal shape.



5,440,451

## MEMORY ASSEMBLY

Hirokazu Saito, and Takeshi Iijima, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

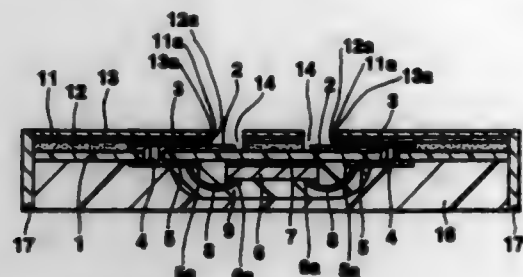
Filed Dec. 8, 1993, Ser. No. 163,428

Claims priority, application Japan, Dec. 29, 1992, 4-360097

Int. Cl.<sup>6</sup> H05K 7/02; H01L 23/28, 23/02

U.S. Cl. 361-760

13 Claims



1. A memory assembly, comprising:
  - a memory device having a plurality of electrodes;
  - a wiring board having wiring patterns, the wiring patterns having a plurality of electrodes electrically connected to the electrodes of said memory device, each of the wiring patterns having a connecting terminal which is electrically connectable to a data processing device outside the memory assembly, the connecting terminal being formed on a single surface of said wiring board;
  - an insulating board mounted to said surface of said wiring board and having an opening therein which exposes the connecting terminal to the atmosphere; and
  - an electrically conductive board mounted to a surface of said insulating board opposite to a wiring board side surface of said insulating board, said electrically conductive board having an opening therein which exposes the connecting terminal to the atmosphere.

5,440,452

## SURFACE MOUNT COMPONENTS AND SEMIFINISHED PRODUCTS THEREOF

Akira Kitahara, 585-4, Kamojima, Oe-gun, Tokushima, Japan, assignor to Akira Kitahara, Tokushima, Japan

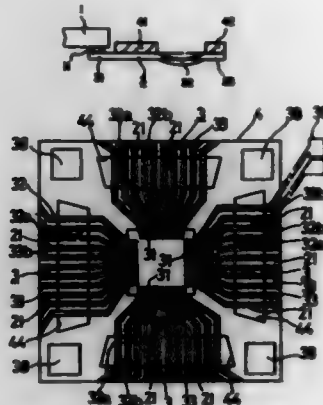
Filed May 12, 1993, Ser. No. 59,547

Claims priority, application Japan, May 12, 1992, 4-118727; Jan. 24, 1992, 4-165634; Dec. 11, 1992, 4-331579

Int. Cl.<sup>6</sup> H01R 9/00

U.S. Cl. 361-773

7 Claims



1. A surface mount component comprising a chip body having an integrated circuit incorporated therein, and a plurality of leads extending outward from the chip body, said plurality of leads being interconnected and reinforced by an insulating support having a base and a plurality of frames positioned around said base, said frames being interconnected to said base

by bridges, the frames interconnecting outer ends of said leads, said base adjacent outer ends of said leads having windows, each of the leads being provided in said windows with an electrical connector portion for joining to a wiring board, said insulating support being integrally joined to said chip body, said electrical connector portion of each lead being bondable to the wiring board by an electro-conductive bonding layer without separation from said insulating support member when said component is mounted on a surface of a wiring board.

5,440,453

## EXTENDED ARCHITECTURE FOR FPGA

Laurance H. Cooke, San Jose, and Matthew D. Penny, Modesto, both of Calif., assignors to Crosspoint Solutions, Inc., Santa Clara, Calif.

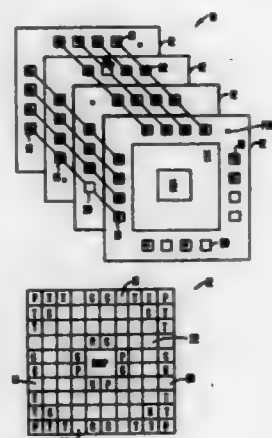
Continuation of Ser. No. 809,745, Dec. 18, 1991, abandoned.

This application Nov. 12, 1993, Ser. No. 152,267

Int. Cl.<sup>6</sup> H01R 23/68

U.S. Cl. 361-790

32 Claims



1. In an electronic system including at least one integrated electronic circuit partitionable into a plurality of sub-circuits, a packaging system comprising:
  - means for partitioning said integrated electronic circuit into at least two sub-circuits each having a plurality of signal bonding pads and a plurality of power bonding pads;
  - a plurality of electronic packaging means for mounting said sub-circuits so that each of said sub-circuits is mounted into a corresponding one of said packaging means, each of said packaging means having a plurality of input and output pins, each of said packaging means being axially aligned with respect to each other, each pin having two complementary ends, each end of said pins capable of mating with another complementary end of another pin of another axially aligned packaging means forming conductive paths between said sub-circuits, at least one conductive path being broken between a predetermined pair of sub-circuits, thereby isolating the predetermined pair of sub-circuits from each other on said broken path;
  - a first interconnection means for coupling said signal and power bonding pads to said pins in each packaging means; whereby said plurality of packages are interconnected such that said sub-circuits form said electronic circuit.

5,440,454

## ELECTRICAL CONNECTING DEVICE AND METHOD FOR MAKING SAME

Kaoru Hashimoto; Tatsuo Chiyonobu; Kyoichiro Kawano, and Kouji Watanabe, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

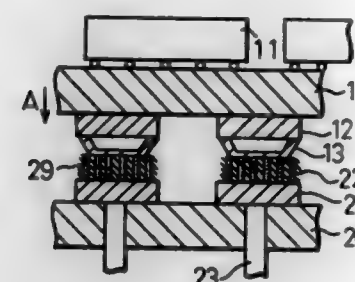
Filed Jul. 20, 1994, Ser. No. 277,992

Claims priority, application Japan, Oct. 14, 1993, 5-257004

Int. Cl.<sup>6</sup> H05K 1/02

U.S. Cl. 361-790

10 Claims



1. An electrical connecting device comprising:
  - a first circuit board providing thereon with input/output terminals, each of said terminals having a tip surface coated with a first metal layer;
  - a second circuit board providing thereon with contact terminals, each of said terminals having a tip surface coated with a second metal layer;
  - a low-melting point alloy layer being formed by a mutual action of metals in the respective first and second metal layers, when said input/output terminals of the first circuit board are in contact with the respective terminals of the second circuit board and electrically connected to each other through said low-melting point alloy; and
  - at least one of said first and second metal layers comprising a plurality of wire-like metal supports extending substantially perpendicular to said tip surface of the terminal and a low-melting point metal retained by said wire-like metal supports.

5,440,455

## DEVICE FOR FASTENING A HOUSING

Werner Rottmar, Steinen, Germany, assignor to Endress + Hauser GmbH + Co., Germany

PCT No. PCT/DE93/00904, § 371 Date Jun. 1, 1994, § 102(e)

Date Jun. 1, 1994, PCT Pub. No. WO94/08213, PCT Pub.

Date Apr. 14, 1994

PCT Filed Sep. 21, 1993, Ser. No. 244,596

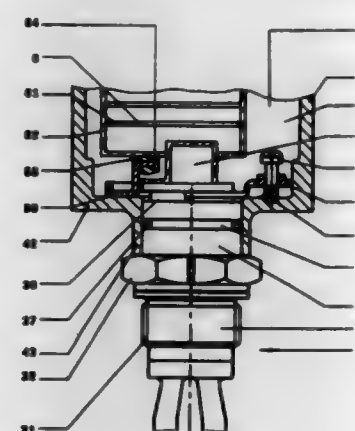
Claims priority, application Germany, Oct. 5, 1992, 42 33

315.6

Int. Cl.<sup>6</sup> H01H 9/20; H02B 7/04

U.S. Cl. 361-809

17 Claims



1. Device for fastening a housing, in particular the electron-

ics housing of a level measuring device, with a screw insert by means of which the level measuring device is fastened in the wall which encloses the medium to be measured, a sensor for detecting the measured value physically, and a separable connection by means of which the electronics housing is connected with the screw insert as well as fixed and retained axially in its position relative to the sensor, characterized by the fact that the separable connection between the electronics housing (4) and the screw insert (3) is formed by only one screw (46) which penetrates through a clamping disk (47), and by projections (53,54) of the clamping disk (47) which engage into a groove (36) of the screw insert (3).

5,440,456

## HEADLIGHT FOR VEHICLES

Johannes Bertling, Yaihingen; Heike Eichler, and Henning Hogrefe, both of Reutlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

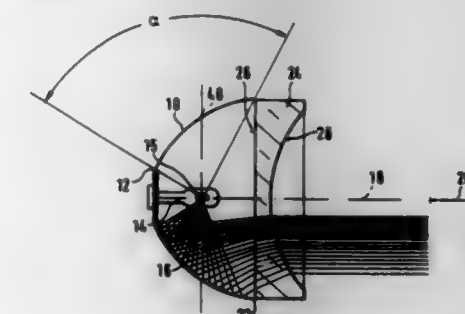
Filed Apr. 18, 1994, Ser. No. 229,473

Claims priority, application Germany, May 8, 1993, 43 15 393.3

Int. Cl.<sup>6</sup> F21M 3/12

U.S. Cl. 362-61

8 Claims



1. A headlight for a vehicle, comprising a light source; a reflector reflecting light emitted by said light source as a light bundle converging at least in horizontal longitudinal planes, said reflector having a front edge facing in a light outlet direction; and a dispersing lens arranged in the region of said front edge of said reflector so that the light bundle reflected by said reflector passes through said dispersing lens, said reflector and said dispersing lens having shapes which are such and so determined relative to one another that the light emitted by said light source after reflection on said reflector and passage through said dispersing lens forms a light intensity distribution required for the vehicle headlight, said dispersing lens being a cylindrical lens having a cylinder axis extending substantially vertical and perpendicular to an optical axis of said reflector, said light source and said reflector being formed so that the light emitted by said light source is reflected by said reflector as a light beam which converges in horizontal planes and is substantially parallel in vertical planes, and then during passage through said cylindrical lens deviates in the horizontal planes but remains unaffected in the vertical planes.

5,440,457

## VENTILATING MEANS FOR SPOTLIGHTS ON AUTOMOTIVE VEHICLES

Bruce A. Meyer, Richmond, Tex., assignor to Linear Solutions, Inc., Richmond, Tex.

Filed Sep. 30, 1994, Ser. No. 315,550

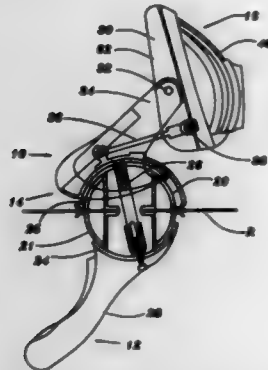
Int. Cl.<sup>6</sup> F21M 3/00; F21V 29/00

U.S. Cl. 362-66

12 Claims

1. A spotlight assembly adapted to fit on a roof of an automotive vehicle for directing a light beam in a desired direction; said lamp assembly comprising:
  - a base secured to said roof;
  - a lamp assembly mounted on said base for pivotal movement

between predetermined positions; said lamp assembly including a body having a transparent lens adjacent a front side and a reflector adjacent an opposed rear side thereof to define a generally air tight inner space therebetween; a bulb mounted within said body in said space between said transparent lens and said reflector; an inlet opening of a predetermined relatively small size in said body in fluid communication with said inner space to



permit the entry of air within said space particularly upon movement of said vehicle in a forward direction; an outlet opening of a predetermined relatively small size in said body in fluid communication with said inner space and with atmosphere; and means on said body for directing air flow past said outlet opening to provide a suction thereat for the discharge of air from said inner space particularly upon movement of said vehicle in a forward direction.

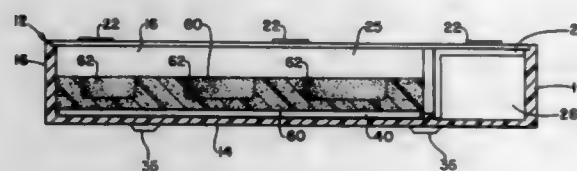
5,440,458

## ILLUMINATED LENS CASE

Donald A. Volk, 7893 Enterprise Dr., Mentor, Ohio 44060  
Filed Nov. 2, 1993, Ser. No. 146,743  
Int. Cl.<sup>6</sup> F21V 33/00; A45C 11/04

U.S. Cl. 362-84

17 Claims

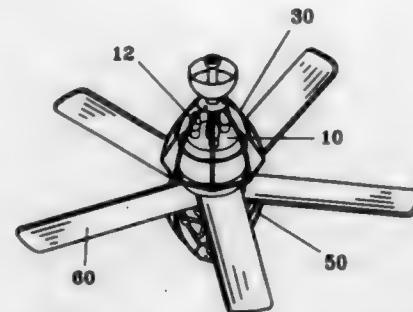


1. An illuminated lens case comprising:  
a container having a bottom wall, at least one side wall and a top wall which together enclose an interior space adapted to receive a plurality of individual and differing diagnostic or therapeutic optical lenses used for imaging or treatment of a patient's eye, each of said bottom wall, at least one side wall and top wall having an outside surface and an inside surface;  
at least one of said walls being hingedly mounted on said container and being adapted to swing between an open position and a closed position;  
a lens holder for said plurality of diagnostic or therapeutic optical lenses disposed in the interior space of said lens case and having a plurality of recesses for receipt of said optical lenses; and  
a source of light disposed in the interior space of said container for illuminating the area of said plurality of recesses for identification of said diagnostic or therapeutic optical lenses received therein.

5,440,459  
CEILING FAN HAVING A LIGHT ASSEMBLY  
Bobby Chan, No. 199 Sec. 2 Feng Shr Road, Feng Yuan City, Taichung, Taiwan  
Filed Dec. 6, 1994, Ser. No. 354,033  
Int. Cl.<sup>6</sup> F21V 33/00

U.S. Cl. 362-96

1 Claim



1. A light assembly for a ceiling fan, comprising:  
a housing including an upper portion and a lower portion, said lower portion enclosing a motor and a plurality of fan blades rotatably coupled to said motor;  
at least one first lamp socket disposed on said upper portion of said housing for engagement with a respective first lamp;  
a shaft extending upward from said upper portion of said housing;  
a first lamp shade secured to said shaft for covering said lamps, said first lamp shade having an open bottom portion for circulation of air therein;  
a control box secured to said lower portion of said housing; at least one second lamp socket secured to said control box for engagement with a respective second lamp;  
a pole extending downward from said control box; and  
a second lamp shade secured to said pole for covering said second lamp, said second lamp shade having an open upper portion for circulation of air therein.

5,440,460

## LIGHT LEDGE FOR A LEVEL GLASS

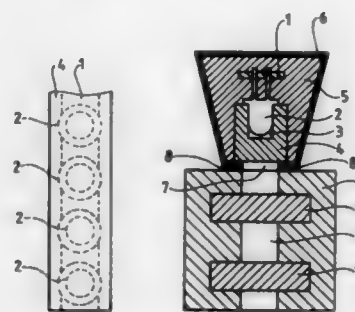
Tollak Melberg, Stavanger, Norway, assignor to Technor AS, Norway

Filed Oct. 15, 1993, Ser. No. 137,307

Claims priority, application Norway, Oct. 16, 1992, 924013  
Int. Cl.<sup>6</sup> F21V 33/00

U.S. Cl. 362-101

3 Claims



1. A light ledge for a level instrument, which ledge device comprises:  
at least one light emitting diode connected, mounted and wired to a circuit board;  
a translucent ledge having a cavity for receiving each said light emitting diode, each said cavity shaped so that each said diode tightly joins said ledge for a fluid tight seal around each said diode, wherein each said diode and each

said ledge are sealed and encapsulated within a tight casting mass;  
means to seal each said diode with said translucent ledge and with said circuit board; and  
a packing comprising a housing having separated glass walls for conducting liquid between said glass walls, wherein said packing rests tightly against said translucent ledge.

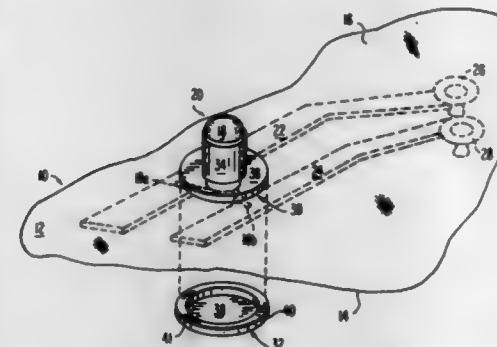
5,440,461

## LIGHT ILLUMINATING ASSEMBLIES FOR WEARING APPAREL WITH LIGHT ELEMENT SECUREMENT MEANS

Craig P. Nadel, 201 Wingate Rd., Parsippany, N.J. 07054, and  
Dietmar Nagel, 11 South Rd., Chester, N.J. 07930  
Filed May 2, 1994, Ser. No. 237,021  
Int. Cl.<sup>6</sup> F21L 15/08

U.S. Cl. 362-103

14 Claims



1. An assembly for affixing a light emitting element having a pair of outwardly projecting electrode prongs to an article of wearing apparel having at least one substantially flexible section and a conductive pattern carried on an interior surface of the flexible section, comprising:

a first member defining an axial bore dimensioned and arranged to receive said light emitting element and having a base flange portion for placement on an exterior surface portion of the flexible section; and  
a second member including a base and at least one sidewall portion dimensioned and arranged to receive said base flange in a captive snap-fitting manner with the second member and positioned on the interior surface of the flexible section, wherein the light emitting element is positionable within said axial bore such that the prongs thereof are inserted through the flexible section and wherein said second member is engageable with a portion of said interior surface aligned with said axial bore such that the element prongs are pressed into electrically-conductive contact with the conductive pattern.

5,440,462

## HEAD-MOUNTED LIGHTING ASSEMBLY

Richard Kim; Eric J. Slezka, both of Ann Arbor, Mich., and  
David Nowak, Dexter, Mich., assignors to General Scientific Corporation, Ann Arbor, Mich.

Filed Apr. 6, 1994, Ser. No. 223,540

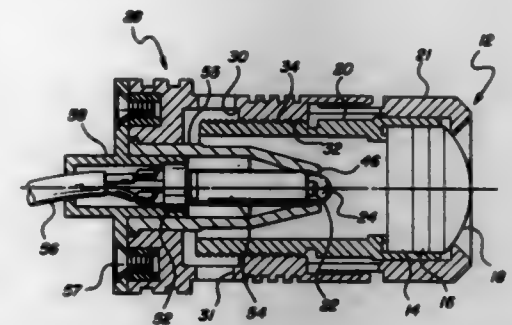
Int. Cl.<sup>6</sup> F21L 15/14

U.S. Cl. 362-105

10 Claims

1. An optical assembly for providing a lightweight source of localized, intense illumination from a filament lamp having a collection lens integral therewith, said assembly comprising:  
a lens subassembly disposed along an optical axis and including:  
a low scatter angle diffuser for diffusing light transmitted by a light source disposed along said optical axis;  
a projection/focussing lens for projecting and focussing

said diffused light into a uniform light beam of adjustable illumination areas; and



means for retaining said subassembly in aligned relationship along said optical axis.

5,440,463

## FLASHLIGHT LAMP CONFIGURATION TO PRODUCE EITHER A SPOT OR BROAD BEAM WITH ENHANCED BRIGHTNESS

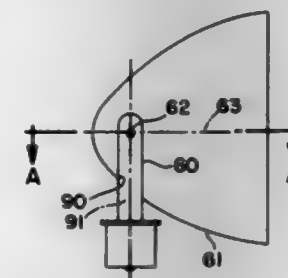
M. Edmund Ellison, 3660 Woodstock Rd., Santa Ynez, Calif. 93460

Filed Sep. 8, 1993, Ser. No. 118,472

Int. Cl.<sup>6</sup> F21L 3/00; F21M 3/18

U.S. Cl. 362-188

4 Claims



2. A flashlight comprising:  
a reflector having an internal reflecting surface in the shape of a single parabola, said reflector being a continuous surface of revolution about a central axis having an apex without an opening, and a focal point, and a side opening through said reflector forming a bearing passage, said bearing passage having a mounting axis normal to and intersecting said central axis;  
a bulb mounted in said bearing passage for rotation therein around said mounting axis, a linear elongated filament in said bulb having a dimension of length, said filament being disposed in said reflector so as to intersect said central axis, in one rotary position of the bulb, said filament being normal to said central axis, and in another rotary position being coincident with said central axis;  
conductive lead means to said bulb; and  
switch means connected to said conductive lead means adapted to connect said lead means to a source of electricity or to disconnect said lead means from said source.

5,440,464

## LIGHT SHROUD FOR HIGHWAY SIGNS

Richard R. Nowlin, 18381 Old Coast Hwy., Ft. Bragg, Calif. 95437, and Lewis O. Wing, Box 785, Salem, Ark. 72576

Filed Sep. 30, 1994, Ser. No. 316,631

Int. Cl.<sup>6</sup> F21V 7/00

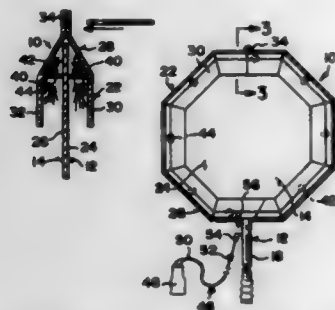
U.S. Cl. 362-190

3 Claims

1. A light shroud for a highway sign comprising:  
a) a hand held sign having a panel with an indicia display thereon and a handle extending downwardly from a bottom edge of said panel, so that a person can grip said



- handle and hold up said panel to display said indicia thereon, wherein said indicia can include the word 'STOP' printed on one surface of said panel and the word 'SLOW' printed on an opposite surface of said panel; and
- b) means attached about the perimeter of said panel for illuminating said indicia upon said panel, wherein said illumination means includes:
- a cover having generally a V-shaped configuration in cross section, with a pair of side walls, and divided into two halves;
  - a top hinge on said cover, so that said cover can fit over the perimeter of said panel with said side walls of said cover spaced away from said two surfaces of said panel;



- a bottom latch mechanism on said cover being a hook on one side and an engaging bail on an opposite side, so that said cover can be retained in place on said panel;
- pair of flanges, each extending from an inner surface of one said side wall of said cover about the perimeter of said panel;
- a first series of lamps mounted to an inner surfaces of said flanges;
- a second series of lamps mounted to an outer surfaces of said flanges; and
- means for supplying electricity to said lamps, so that said lamps will light up the two surfaces of said panel, and said V-shaped configuration of said cover.

5,440,465

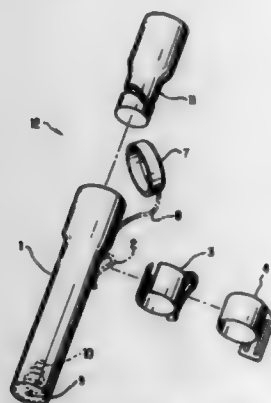
## COMBINATION FLASHLIGHT HOLSTER-LIGHTWAND DEVICE

Richard S. Hasnens, Langhorne, Pa., assignor to Walterscott International Corp., Bensalem, Pa.

Filed Feb. 14, 1994, Ser. No. 193,476

Int. Cl.<sup>6</sup> F21L 7/00

U.S. Cl. 362-191



1. An elongate container body of tubular cross-section, for accommodating therein a flashlight with the light projecting end of said flashlight directing out of said container, the container body comprising: a light-transmitting translucent body member substantially conforming in shape to said flashlight so as to accommodate the overall dimensions of said flashlight,

the container body having a first end that is open, a second end that is closed and a removable cover member conforming to the overall circumferential dimensions of said first open end, whereby said flashlight is removably insertable into said tubular body through said first open end with the light projecting end of said flashlight exposed from said first open end, such that said removable cover member may be accommodated over said first open end.

5,440,466

## FLOURESCENT LIGHTING FIXTURE RETROFIT UNIT AND METHOD FOR INSTALLING SAME

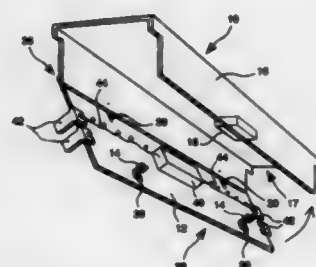
William W. Belisle, Newark; Robert A. Catone, Granville; John C. McCartney, and Robert D. Zeller, both of Newark, all of Ohio, assignors to Holophane Lighting, Inc., Newark, Ohio

Filed Feb. 7, 1994, Ser. No. 192,567

Int. Cl.<sup>6</sup> F21V 17/00

U.S. Cl. 362-222

18 Claims



1. A retrofit unit for a fluorescent lighting fixture having a housing with a length, a width, and an open face, the retrofit unit comprising:
  - a reflector plate for covering the open face of the housing, the reflector plate having a plurality of reflector plate slots formed therein; and
  - a plurality of brackets for attaching the reflector plate to the housing, each bracket cooperating with one of the plurality of reflector plate slots to selectively position the reflector plate across the width of the housing, at least one of the plurality of brackets acting as a hinge allowing the reflector plate to rotate away from the open face of the housing.

5,440,467

## TASK LIGHT

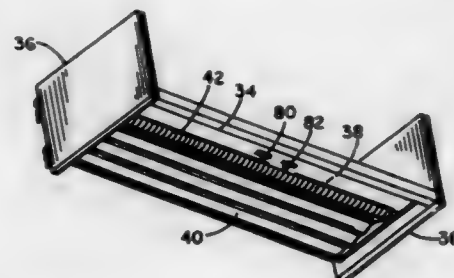
Terry L. Lautzenheiser, Grand Haven, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Apr. 22, 1994, Ser. No. 231,280

Int. Cl.<sup>6</sup> F21S 3/00

U.S. Cl. 362-222

33 Claims



1. A light assembly for illuminating a task supported on a horizontal surface below and in front of the light assembly, comprising:
  - an elongated housing configured for mounting over the horizontal surface, said elongated housing including a front portion;

- an elongated linear light source supported in said housing; controls for operating said light source located in said front portion;
- a reflector supported by said housing for reflecting light generated by said light source onto the task; and
- a tubular lens having prism-shaped rings located on an inside surface mounted on said light source for controlling the light from the light source.

5,440,468

## LENS CLIP AND CAP FOR LED AND GRIPPED PANEL ASSEMBLY

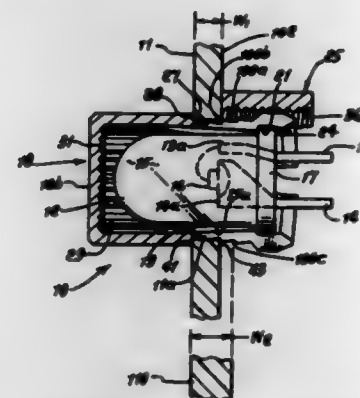
John M. Savage, Jr., 538-B Via De La Valle, Solana Beach, Calif. 92075

Filed May 16, 1994, Ser. No. 243,326

Int. Cl.<sup>6</sup> H01R 33/00

U.S. Cl. 362-226

14 Claims



1. In a light emitting diode assembly attachable to a display panel, said assembly comprising:
  - a light emitting diode having locking structure thereon, said structure defining a boss, the diode having a side,
  - a lens cap receiving the diode forwardly therein, clip means integral with the cap and projecting sidewardly proximate the diode locking structure,
  - said clip means defining spring fingers projecting rearwardly at the side of the diode, the fingers defining first grooves to receive the boss on the diode, and second grooves to receive portions of the display panel adjacent an opening formed in the panel,
  - and wherein the spring fingers define serrations presented outwardly at said second grooves for engagement with said portions of the display panel to position the clip means and lens cap relative to the panel.

5,440,469

## LOW VOLTAGE TRACK LIGHTING FIXTURE

Roy Gomes, 136 Waverley Pl., New York, N.Y. 10011

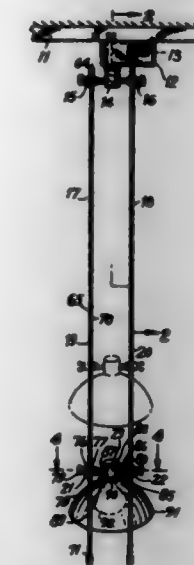
Filed Apr. 8, 1994, Ser. No. 224,790

Int. Cl.<sup>6</sup> H01R 33/00

U.S. Cl. 362-226

4 Claims

4. An improved track lighting fixture comprising: a track element, a housing element slidably mounted upon said track element, a cylindrical member depending from said housing element and arranged for relative movement about a vertical axis relative thereto; first and second rod elements supported at upper ends thereof from said cylindrical member; third and fourth rod elements coaxially arranged and threadedly engaged with said first and second rod elements, respectively;



lamp holder element having means for relative rotational movement about a horizontal axis.

5,440,470

## FLOATING REFLECTOR ASSEMBLY FOR A LIGHTING FIXTURE

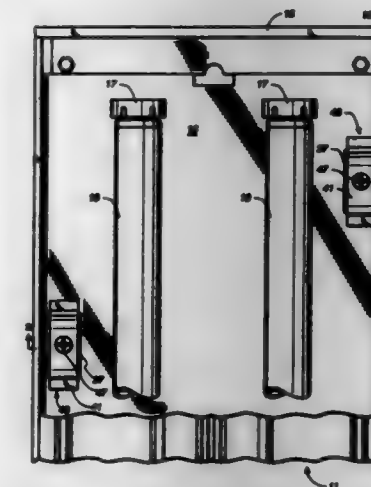
Hue Ly, Richmond, Calif., assignor to Peerless Lighting Corporation, Berkeley, Calif.

Filed Jun. 23, 1992, Ser. No. 904,441

Int. Cl.<sup>6</sup> F21S 3/00

U.S. Cl. 362-341

19 Claims



1. A floating reflector assembly for a luminaire housing, having reflector securement points comprising
  - a reflector element having tie down openings and top surface portions adjacent said tie down openings, said tie down openings being formed in said reflector element at locations where the tie down openings will overlay the reflector securement points in said luminaire housing, retaining clips for the tie down openings of said reflector element, each of said retaining clips having a center portion and extended end portions, said extended end portions being formed to overlap the retaining clip's corresponding tie down opening so as to contact the top surface portions of said reflector element, and
  - fastening means for each of said retaining clips for fastening

the center portion of said retaining clip to a reflector securement point of said luminaire housing through a corresponding reflector tie down opening and for drawing said center portion inwardly relative to the top surface portions of said reflector element so as to create a floating pressure contact between the extended ends of said retaining clip and the top surface portions of said reflector element.

5,440,471

**FLORESCENT LIGHT FIXTURE ASSEMBLY**

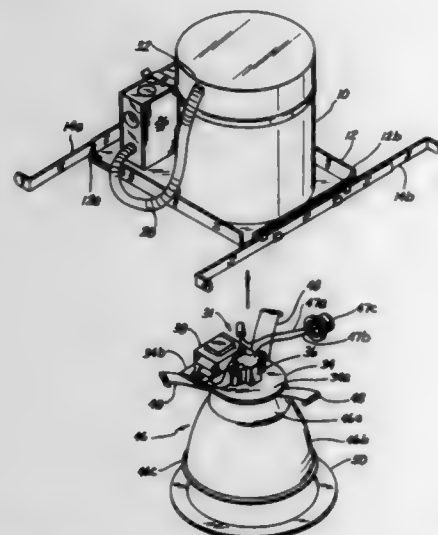
Rohollah E. Zadeh, Los Angeles, Calif., assignor to Amp Plus, Inc., Culver City, Calif.

Filed Jun. 6, 1994, Ser. No. 254,378

Int. Cl.<sup>6</sup> F21S 3/021

U.S. Cl. 362-365

2 Claims



1. For insertion into a cylindrical housing for a lamp, said housing being secured in a circular ceiling opening, said housing having a side wall defining a cylindrical space and having an open lower end disposed in a common transverse plane and an upper closed end, said housing further having a first inside diameter and said housing having an aperture near its upper closed end to permit insulated electrical power wiring to be passed through the side wall adjacent the closed upper end of the side wall and extended to electrical connector means;

a florescent lamp holding fixture, said fixture comprising an insulated plate disposed transversely within the cylindrical space intermediate the upper closed end and open lower end of the side wall, but more proximate to the said upper closed end, said plate having a maximum linear dimension less than the first inside diameter of the housing;

a plurality of spring clip means secured to and extending transversely outwardly from said plate to provide a combined overall dimension of said plate and each of said clip means at least slightly greater than said first inside diameter of the housing, whereby said plate, when inserted axially into said housing, may be suspendedly retained transversely within the housing by said clip means;

said plate having a first side facing the closed end of the side wall and a second side facing the open lower end of said side wall, said plate supporting on its first side a socket for a florescent lamp and a transformer and conductive means to form a circuit between the transformer and said socket and to connect said circuit through said power wiring to said electrical connector means, and said plate being orificed in alignment with said socket to enable a florescent lamp to be inserted into said socket from the second side of said plate, whereby, the florescent lamp will extend downwardly toward the open lower end of said side wall;

and a reflector housing having a lower open end of a diameter only slightly less than said first inside diameter of the housing, and said reflector housing having an upper open end with a second diameter substantially less than the first inside diameter and the upper open end of said reflector housing being disposed about the orifice in alignment with the lamp socket in the plate and secured to the plate, said reflector housing having an increasing diameter from its upper open end to its lower open end, and said reflector housing having an axial length with the lower open end which terminates with the common transverse plane of the open lower end of the wall.

ter only slightly less than said first inside diameter of the housing, and said reflector housing having an upper open end with a second diameter substantially less than the first inside diameter and the upper open end of said reflector housing being disposed about the orifice in alignment with the lamp socket in the plate and secured to the plate, said reflector housing having an increasing diameter from its upper open end to its lower open end, and said reflector housing having an axial length with the lower open end which terminates with the common transverse plane of the open lower end of the wall.

5,440,472

**INTEGRATED MAGNETIC POWER CONVERTER**

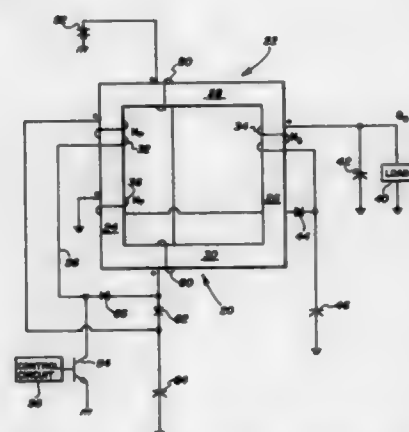
Clayton L. Sturgeon, Lowell, Mass., assignor to Powercube Corporation, Billerica, Mass.

Filed Feb. 14, 1994, Ser. No. 195,869

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363-20

2 Claims



1. An integrated magnetic power converter for supplying power to a load comprising:

a continuous magnetic structure having first and second oppositely disposed legs and third and fourth oppositely disposed legs and a magnetic path therebetween;

a first winding wound on said first leg;

a second winding wound on said second leg and connected to the load;

a third winding in series with said second winding and wound on said first leg;

a fourth winding wound on said third leg and being connected to an energy source for supplying power to the converter;

a fifth winding in series with said fourth winding and wound on said fourth leg;

first circuit means operable between an active and inactive state and being connected to said first winding for supplying energy to said first winding when said first circuit means is activated, such that when energy is supplied to said first winding, energy is transferred via said second and said third windings to the load;

second circuit means connected to said fifth winding for supplying energy to said first circuit means and for storing energy, such that when said first circuit means is inactive, energy is stored in said second circuit means and when said first circuit means is activated, said stored energy is transferred to said first winding from said second circuit means; and

third circuit means connected to said second winding for storing energy when said first circuit means is inactive and for transferring said stored energy to the load when said first circuit means is inactive or active.

5,440,473

**AC-DC CONVERTER**

Masanori Ishii, and Koji Arakawa, both of Kawagoe, Japan, assignors to Toko, Inc., Tokyo, Japan

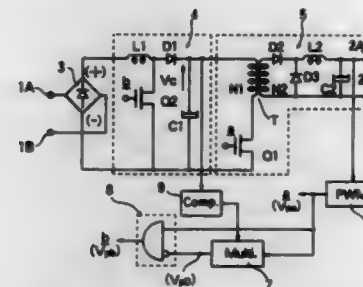
Filed Sep. 8, 1994, Ser. No. 302,527

Claims priority, application Japan, Sep. 17, 1993, 5-254758; Feb. 21, 1994, 6-045078

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363-21

6 Claims

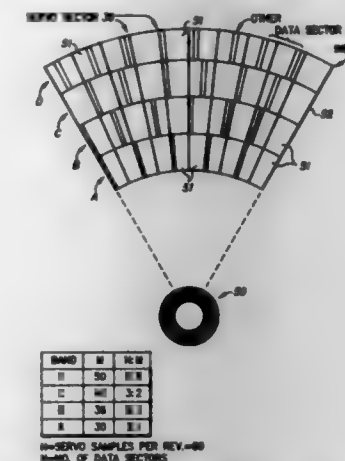


1. An AC-DC converter having a rectifier for rectifying an AC input voltage from an AC power supply, a boost chopper for boosting up a rectified output voltage of the rectifier and a DC-DC converter for receiving a high output voltage of said boost chopper to supply a stabilized DC voltage from output terminals to a load comprising:

a converter driving circuit for detecting an output voltage of the AC-DC converter to output a first pulse signal having a pulse width determined by said detected output voltage; a one-shot multivibrator for generating a delay pulse signal having a predetermined pulse width when said first pulse signal is received to generate an ON pulse of said first pulse signal; and

means for obtaining a second pulse signal by synthesizing said first pulse signal and said delay pulse signal, said DC-DC converter being driven by said first pulse signal and said booster chopper being driven by said second pulse signal.

sectors, each of the servo sectors extending generally radially across the bands with at least one of the servo sectors being



located within one of the data sectors of one of the bands and splitting that data sector into multiple portions.

5,440,475

**ELECTRONIC BALLAST WITH LOW HARMONIC DISTORTION**

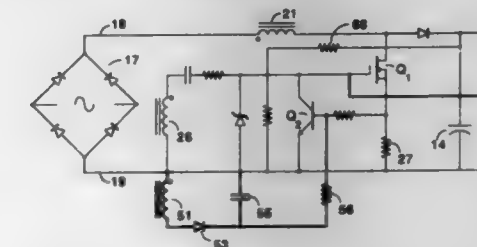
Randy G. Russell, Glen Ellyn, and Kent E. Crouse, Hanover Park, both of Ill., assignors to Energy Savings, Inc., Schaumburg, Ill.

Filed Nov. 8, 1993, Ser. No. 148,295

Int. Cl.<sup>6</sup> H02M 1/12; H05B 37/02

U.S. Cl. 363-45

10 Claims



1. An electronic ballast for powering a gas discharge lamp from an AC power line, said ballast having low harmonic distortion and comprising:

a rectifier for converting alternating current from said power line into direct current having a ripple; a boost circuit operating at a frequency at least one order of magnitude higher than the frequency of said AC power line, said boost circuit having an input connected to said rectifier and an output; a capacitor coupled to the output of said boost circuit; and means coupled to said boost circuit for varying the switching frequency of said boost circuit in phase with said ripple.

5,440,474

**MAGNETIC RECORDING DISK WITH EQUALLY-SPACED SERVO SECTORS EXTENDING ACROSS MULTIPLE DATA BANDS**

Steven R. Hetzler, Sunnyvale, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 58,348, May 5, 1993, Pat. No.

5,285,327, which is a continuation of Ser. No. 466,194, Jan. 17, 1990, Pat. No. 5,210,660. This application Nov. 10, 1993, Ser. No. 150,939

The portion of the term of this patent subsequent to May 11, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> G11B 5/09, 5/596

U.S. Cl. 360-135

6 Claims

3. A magnetic recording disk, the magnetic recording surface of the disk having (a) a plurality of radially-spaced bands, each band comprising a plurality of concentric data tracks; (b) a plurality of data sectors in each data track of each band, the number of data sectors per data track being the same for all data tracks in a band and different from the number of data sectors per data track in the other band or bands, but each data sector in each band containing the same number of data bits; and (c) a plurality of generally equally angularly-spaced servo



5,440,476

## SYSTEM FOR POSITIONING A WORK POINT IN THREE DIMENSIONAL SPACE

Sheldon Leftkowitz, Sewickley; Donald M. Youngwirth, Jefferson Boro, both of Pa.; Gerald E. Gore, North Branch, and Harry T. Roman, East Orange, both of N.J., assignors to Pentek, Inc., Coraopolis, Pa.

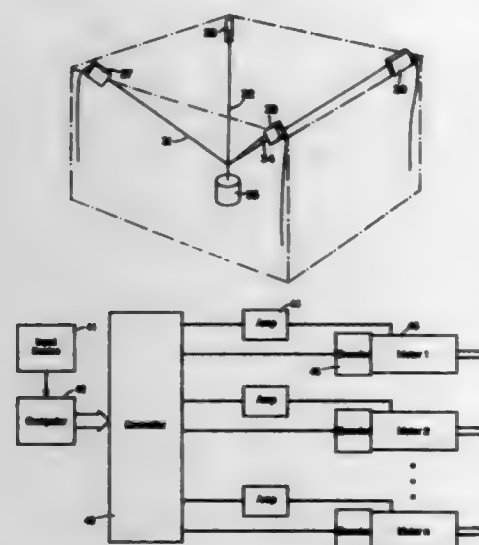
Filed Mar. 15, 1993, Ser. No. 31,417

The portion of the term of this patent subsequent to Apr. 18, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> G05B 19/18

U.S. Cl. 364-167.01

26 Claims



1. A system for moving a work point through three dimensional space, the system comprising:
  - at least three reeving systems spaced apart from one another;
  - an adjustable support element associated with each reeving system, each of said support elements connected to the work point and to a corresponding reeving system to support the work point, the length of each support element between the work point and the respective reeving system determining the location of the work point with respect to at least three different spatial coordinate axes;
  - a plurality of actuators, each of said actuators associated with a corresponding reeving system, for releasing and taking up the support element connected to the corresponding reeving system to move the work point with respect to the at least three different spatial coordinate axes; and
  - a programmable control system for controlling at least one motion parameter of the work point in a predetermined manner by controlling the release and take up of each of said support elements to move the work point with respect to each of the at least three different spatial coordinate axes.

5,440,477

## MODULAR BOTTLE-MOUNTED GAS MANAGEMENT SYSTEM

Roderick G. Rohrberg, Torrance; Russell D. Young, Redondo Beach, and Timothy K. Rohrberg, Torrance, all of Calif., assignors to Creative Pathways, Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 702,856, May 20, 1991, abandoned. This application Apr. 30, 1993, Ser. No. 56,216

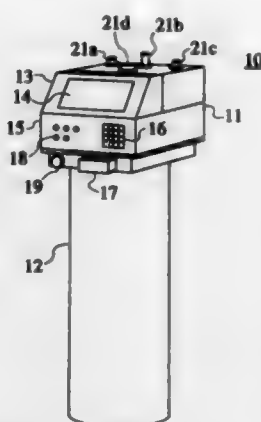
Int. Cl.<sup>6</sup> G05B 15/00

U.S. Cl. 364-188

9 Claims

1. An apparatus for use in combination with a gas bottle (12) comprising:
  - a housing (11); said housing being adapted to mount directly on the top of said gas bottle (12);

said housing (11) having a gasket (144) for forming a seal between said gas bottle (12) and said housing (11);  
 a gas outlet (21a); said gas outlet (21a) extending through said housing  
 a gas manifold (22); said gas manifold (22) being mounted within said housing (11);  
 said gas manifold (22) being capable of receiving gas directly from said gas bottle (12);



said gas manifold (22) being capable of controlling the flow of gas to said gas outlet (21a);  
 a purge gas inlet (21c) for receiving a purge gas to purge said housing (11) and said gas manifold (22); and  
 a vent (21b) for venting said housing (11) and said gas manifold (22).

5,440,478

## PROCESS CONTROL METHOD FOR IMPROVING MANUFACTURING OPERATIONS

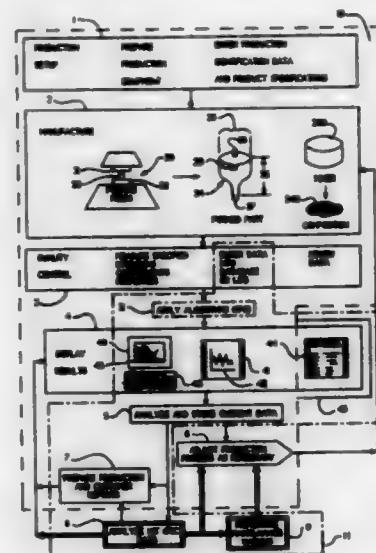
Gary Fisher, Mineral Ridge, Ohio, and Mark Clark, II, Hermitage, Pa., assignors to Mercer Forge Company, Mercer, Pa.

Filed Feb. 22, 1994, Ser. No. 199,056

Int. Cl.<sup>6</sup> G05B 15/00

U.S. Cl. 364-188

16 Claims



1. A method for controlling a manufacturing process which produces a product comprising the steps of
  - a. establishing at least one specification for the product which specification defines one of a specification nominal value with tolerances and a range, and has a corresponding specification plot line;

- b. taking samples of the product during...a plurality of time periods;
- c. measuring the samples relative to the specification to create at least one measurement for each sample;
- d. recording the measurements and corresponding time period for each sample in a database;
- e. applying for a plurality of time periods at least one statistical process control algorithm to at least one selected set of sample measurements from that time period to define for that set of sample measurements and time period at least one statistical value with an associated sample plot line reflecting a statistical representation of the set of sample measurements;
- f. graphically displaying in a bar type graph the specification plot line adjacent sample plot lines from the plurality of time periods for which the statistical process control algorithm has been applied; and
- g. adjusting the manufacturing process as necessary in response to the bar type graph, wherein steps b thru f are performed during at least one of a setup run and a manufacturing run.

5,440,479

## APPARATUS AND METHOD FOR PURCHASING FLORAL ARRANGEMENTS

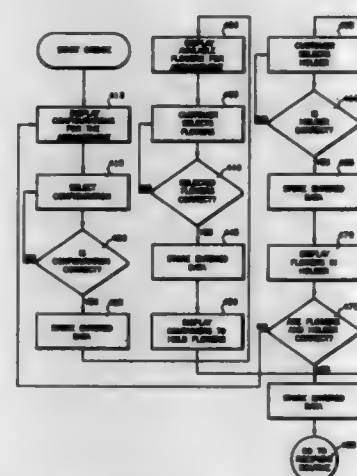
Glenn W. Hutton, 9725 Hammocks Blvd., No. 206, Miami, Fla. 33196

Filed Mar. 22, 1994, Ser. No. 216,170

Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 364-401

15 Claims



1. Apparatus for purchasing floral arrangements, which comprises:
  - a user station having user interface means for interfacing with a user, payment means for facilitating payment of the purchase and printing means for printing purchase data;
  - database means positioned within said user station and having stored data representing floral information; and
  - processing means associated within said user station and having stored programs and memory, said processing means being connected to:
    - a) said user interface means so as to permit a user to select the floral information and to configure the floral information to create a customized floral arrangement;
    - b) said payment means for receiving payment data therefrom;
    - c) said printing means for transmitting purchase data thereto; and
    - d) said database means for receiving the floral information therefrom.

5,440,480

## METHOD FOR DETERMINING FLEXIBLE DEMAND IN A MANUFACTURING PROCESS

John R. Costanza, Parker, Colo., assignor to JIT Institute of Technology, Inc., Englewood, Colo.

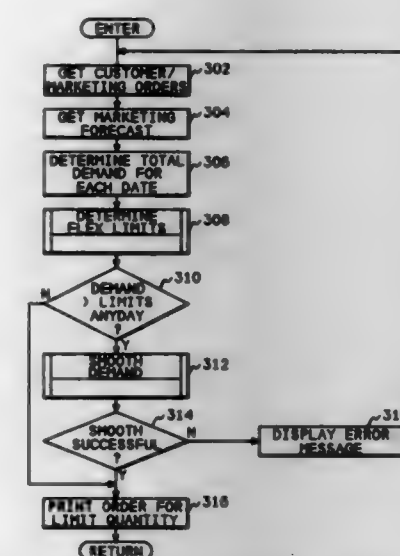
Continuation of Ser. No. 884,599, May 15, 1992, abandoned.

This application Jun. 16, 1994, Ser. No. 264,171

Int. Cl.<sup>6</sup> G06F 17/60; G06G 7/52

U.S. Cl. 364-401

3 Claims



1. In a computerized manufacturing system, a computer implemented method for determining a production quantity for a plurality of flex periods, and ordering material for said production quantity during said plurality of flex periods, said method comprising:

- (a) accepting a quantity of flex periods from a user of the system and assigning each flex period a sequential number, wherein said flex periods occur after a demand fence date;
- (b) accepting a daily rate total demand from the user of the system, wherein said daily rate total demand equals said production quantity at said demand fence date;
- (c) accepting a flex period percentage for each of said flex periods from the user;
- (d) accepting a flex period number of days, one said flex period number of days for each said flex period;
- (e) calculating a flex period total demand for each of said flex periods, comprising the steps of
  - (e1) calculating a first multiplier by dividing said flex period percentage for said flex period by one-hundred and adding one to a result of said dividing to produce said first multiplier;
  - (e2) calculating a second multiplier by raising said first multiplier to the power of said sequential number assigned to said flex period in step (a), and
  - (e3) calculating said flex period total demand for said flex period by multiplying said second multiplier by said daily rate total demand, and
  - (e4) assigning said flex period total demand to each day of said flex period;
- (f) accepting at least one customer order from a user of said system;
- (g) for each said customer order accepted, increasing said production quantity for all days in each of said flex periods prior to a day of said customer order and after said flex fence date, wherein said production quantity for each of said days does not exceed said flex period total demand set for said day; and
- (h) placing an order for material for said production quantity for each of said flex fence periods.

# 5,440,481 SYSTEM AND METHOD FOR DATABASE TOMOGRAPHY

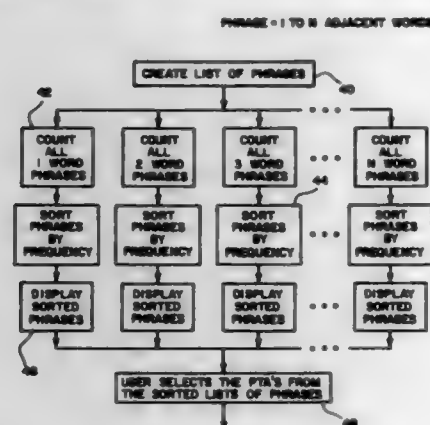
Ronald N. Kostoff, Falls Church, Va.; David L. Miles, and Henry J. Eberhart, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1992, Ser. No. 967,341

Int. Cl. G06F 17/20, 17/30

U.S. Cl. 364-419.08

14 Claims



1. A system for full-text database searching, for identification of often repeated phrases which by virtue of their repeated occurrence, frequency of occurrence above a user-set threshold, or user input constitute phrases having a high user-interest designated as pervasive theme areas (PTAs), said phrases consisting of one to n words (n\*words), where n is an integer, in one or more documents defined as the database, relationships defined as connectivity among said PTAs, and phrases in close physical proximity to and which are supportive of said PTAs, comprising:

means for introducing document information content into a full-text database in digital form;

means for digitally storing said database;

means for processing said digitally stored database;

means operatively associated with said processing means and said storing means for identifying pervasive theme areas (PTAs) defined as often-repeating word phrases consisting of one or more adjacent words such that said phrases are one word phrases, adjacent 2 word phrases, adjacent 3 word phrases ... and adjacent n\* word phrases, and for entering said phrases in said storing means;

means for identifying phrases in said database related to said PTAs, said phrases being defined as m words, where  $m=1,2,3,\dots,n$  and where each word phrase for  $m=2,3,\dots,n$  is composed of adjacent words, said word phrase for  $m=1$  being a single word phrase, for  $m=2$  a double word phrase, for  $m=3$  a triple word phrase ... and for  $n=m$  an nth word phrase, by applying a user specified range of interest R expressed as a number of single words appearing both before and after said PTAs, and for storing said identified phrases in said storing means;

means for counting for each PTA the extracted phrases within said range of said PTA stored in said storage means, sorting all phrases found for each PTA by frequency of occurrence, listing each PTA and its related sorted list of extracted phrases, and storing said counts and said lists of PTA's and their related sorted list of extracted phrases in said storing means;

means for quantifying the strength of relationship between extracted phrases and each pervasive theme area (PTA) applying user-predefined numerical indices and figures of merit, and providing the results of said quantifying means to said storing means;

means for obtaining the results of said quantification from said quantifying means and said storing means and presenting said results to said user for user-selection of phrases

having a relationship to each PTA predicated on the relationship strengths obtained by said quantifying means; means for identifying PTAs which are closely related, said means employing user-input figure of merit threshold values above a user-predetermined number for selecting phrases of high-user interest, said means storing identified closely related PTAs in said storing means; means for identifying phrases in common among PTA and storing those identified in said storing means; means for identifying and grouping related PTA based upon the number of phrases in common among the PTA, said number being above a user-input predetermined threshold, each group having at least one PTA having extracted phrases in common with one or more other PTA in said group, said groupings of PTA's stored in said storing means; and means for displaying relationships among related PTA and between PTA and related phrases said display means connected to said processing means.

# 5,440,482 FORWARD AND REVERSE BOYER-MOORE STRING SEARCHING OF MULTILINGUAL TEXT HAVING A DEFINED COLLATION ORDER

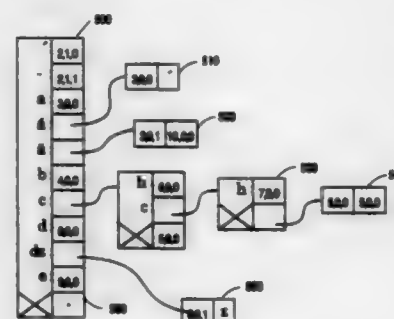
Mark E. Davis, Cupertino, Calif., assignor to Taligent, Inc., Cupertino, Calif.

Filed Mar. 25, 1993, Ser. No. 36,749

Int. Cl. G06F 17/30

U.S. Cl. 364-419.13

4 Claims



3. A method for searching first text string for an occurrence of a second text string, the first text string and the second text string consisting of characters belonging to a language which has a predefined character precedence, the method operating in a computer system having a processor, a memory connected to the processor and containing locations for storing information including the first text string and the second text string and a program stored in the memory and controlling the processor to retrieve information stored in the memory, to manipulate the retrieved information and to store the manipulated information in the memory and comprising the steps of:

(a) defining at least one ordering value for each character based on the predefined character precedence of the language;

(b) storing ordering values for all characters in the memory;

(c) preprocessing the first text string to generate a first index table comprising ordering values for each character in the first text string and a second index table comprising minimum shift values for shifting the second text string relative to the first text string in order to obtain a match;

(d) shifting the second text string relative to the first text string in either of a first direction or a second direction opposite to the first direction by an amount indicated by the second index table; and

(e) performing a comparison of the ordering values of the characters in the second string to the ordering values in the first index table to determine whether the second text string occurs in the first text string.

# 5,440,483 PROCESS AND DEVICE FOR EVALUATING THE PRECIPITATIONS OVER AN AREA OF TERRAIN

Guy Badoche-Jacquet, Vaucluse; Frédéric Blanchet, and Béatrice Blanchet, both of Chalon, all of France, assignors to Rheo, Nanterre, France

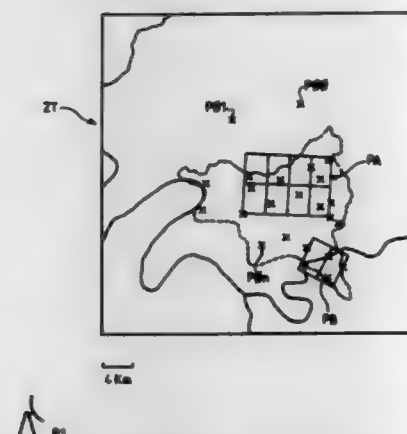
Filed Jul. 8, 1993, Ser. No. 87,331

Claims priority, application France, Jul. 9, 1992, 92 08545

Int. Cl. G01W 1/02

U.S. Cl. 364-420

10 Claims



1. A process for evaluating precipitation over an area of terrain, comprising the steps of:

deploying automatic rain gauges within the area of terrain;

synchronizing the rain gauges;

providing, via the rain gauges, dated local rainfall data accumulated over a first chosen time interval

sampling pixels of radar images over a plurality of reflectivity levels to obtain meteorological radar data with given radar periodicity, the radar images representing rain-bearing cells over a radar workspace which encompasses the area of terrain; analyzing a succession of radar images within the area of terrain to track main rain-bearing cells dynamically by their shape and motion;

compiling a radar rainfall measurement chart by accumulating, for each pixel of the area of terrain, precipitations during a second chosen time interval which are due to the main rain-bearing cells by interpolating the shapes and positions of the main rain-bearing cells during the second time interval,

selecting from the deployed automatic rain gauges at least one sub-array of at least four rain gauges which are separated from one another by about 2 to 4 kilometers and are affected by at least one main rain-bearing cell; and correcting a rainfall measurement chart as a function of a relationship between the rainfall data provided by the rain gauges of the selected at least one sub-array and rainfall data from the rainfall measurement chart taking into account a ratio between the first and second chosen time intervals.

# 5,440,484 CALIBRATION METHOD FOR A RELATIVE HEADING SENSOR

Wei-Wen Kao, Fremont, Calif., assignor to Zexel Corporation, Tokyo, Japan

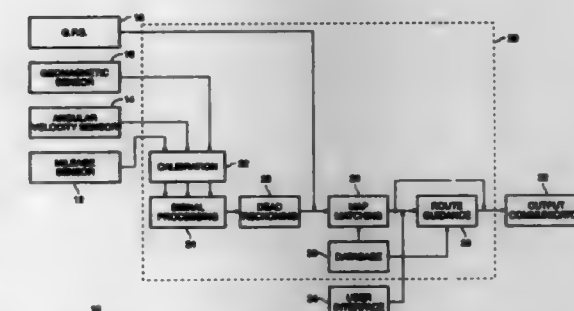
Continuation of Ser. No. 883,859, May 15, 1992, Pat. No.

5,345,382. This application Jun. 7, 1994, Ser. No. 255,212

Int. Cl. G06F 165/00; G12B 13/00

U.S. Cl. 364-424.01

8 Claims



1. A direction sensor for a vehicle navigation system, said direction sensor comprising:

a relative heading sensor for producing a relative heading signal;

an absolute heading sensor for producing a first absolute heading signal;

means for determining a first maximum and a first minimum in said first absolute heading signal in a first direction as said vehicle is rotated through an angle of at least 360°;

means for calculating a first difference between said relative heading signal at a first point corresponding to said first maximum and said relative heading signal at a second point corresponding to said first minimum;

means for dividing said first difference by 180° to obtain a first relative heading conversion constant; and

means for calibrating said relative heading sensor by generating a calibrated relative heading using said first relative heading conversion constant and said relative heading signal at a third point.

# 5,440,485 STARTING APPARATUS OF PASSENGER PROTECTING APPARATUS

Yukihiro Okimoto, Takashi Furui, and Katsuhiko Ohmoe, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Hyogo and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, both of Japan

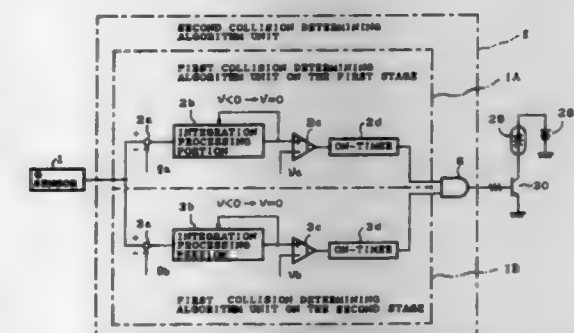
Filed May 28, 1993, Ser. No. 68,197

Claims priority, application Japan, May 29, 1992, 4-161643

Int. Cl. B60R 21/12, 21/32

U.S. Cl. 364-424.05

5 Claims



4. A starting apparatus of a passenger protecting apparatus comprising:



a first collision determining algorithm unit including an acceleration sensor converting an acceleration at a time of collision into an electrical acceleration signal to output said electrical acceleration signal,

first subtracting means for subtracting a first threshold value from said acceleration signal output from said acceleration sensor,

first integrating means for integrating an output from said first subtracting means, having a reset function for forcedly resetting an integrated value to zero when said integrated value is less than zero, and

first comparing means for comparing an output from said first integrating means with a second threshold value;

a fourth collision determining algorithm unit including positive acceleration signal passing means for extracting only an acceleration signal on a positive side in said acceleration signal output from said acceleration sensor,

second subtracting means for subtracting a third threshold value from an output from said positive acceleration signal passing means,

second integrating means for integrating an output from said second subtracting means, having a reset function for forcedly resetting an integrated value to zero when said integrated value is less than zero,

second comparing means for comparing an output from said second integrating means with a fourth threshold value,

negative acceleration signal inverting/passing means for extracting only an acceleration signal on a negative side in said acceleration signal output from said acceleration sensor,

third subtracting means for subtracting a fifth threshold value from an output from said negative acceleration signal inverting/passing means,

third integrating means for integrating an output from said third subtracting means, having a reset function for forcedly resetting an integrated value to zero when said integrated value is less than zero,

third comparing means for comparing an output from said third integrating means with a sixth threshold value, and

a first AND circuit prohibiting an output from said second comparing means by an output from said third comparing means;

a seventh collision determining algorithm unit including a second AND circuit obtaining the AND of outputs from said first and fourth collision determining algorithm units; and

starting means for outputting a starting signal depending upon an output from said seventh collision determining algorithm unit.

5,440,486

**PREDICTIVE ELECTRIC MOTOR POSITIONING DEVICE, NORMAL OPERATING SYSTEM THEREFOR**  
Robert G. Rudzewicz, Sterling Heights; Michael A. Dahl, Royal Oak; Thomas G. Dunn; Kenneth J. Wenzel, both of Farmington Hills, and Ronald A. Muckley, Milford, both of Mich., assigns to Chrysler Corporation, Highland Park, Mich.

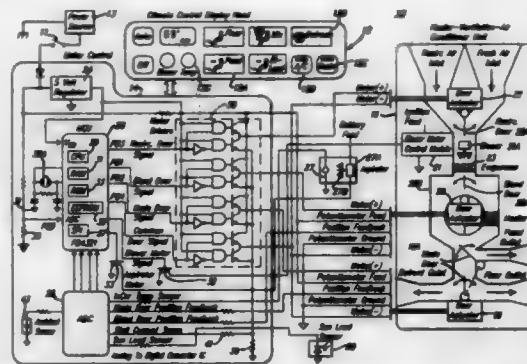
Filed Jun. 1, 1993, Ser. No. 71,148  
Int. Cl.<sup>6</sup> F24F 7/00; B60H 1/00

U.S. Cl. 364—424.05

16 Claims

1. A motor control system for maintaining a steady comfort level inside a vehicle during various weather conditions, the system including an automatic temperature control (ATC) unit formed in firmware that interacts with a climate control display panel containing an operator controlled temperature control knob for indicating desired temperature settings and a pushbutton for initiating automatic temperature control, the ATC unit also including an ambient air temperature, an in-car temperature and a sun sensor for providing sensed environmental data to the ATC unit, the system also including a heater-ventilation-air conditioning (HVAC) unit containing at least a pair of closed-loop motors with shaft position sensing poten-

tiometers, at least one open-loop motor having a shaft that does not have a position sensing potentiometer, the open-loop motor being used to control movement of a door used to regulate the flow at an outside air inlet and a recirculating air inlet of the vehicle, wherein the HVAC unit also includes an evaporator of an air-conditioning component located in a first chamber containing a blower motor for blowing air directed by the open-loop motor over the evaporator for cooling the air as needed to achieve the desired comfort levels of the vehicle, wherein a first motor of the pair of closed-loop motors being used to direct the air leaving the evaporator through a heater in a first leg of a two-legged, second chamber or through an open channel in a second leg of the second chamber, the first motor of the pair of closed-loop motors also being used to blend the air leaving the second chamber so as to contain a mixture of the air passing through the open channel and the air leaving the heater in the first leg of the second chamber, wherein a second motor of the pair of closed-loop motors being used to deflect the air from the second chamber to a panel outlet, a floor outlet or a defrost outlet in response to signals from the ATC unit, wherein the motor control system controlling direction and time of movement of shafts of the open loop and the pair of closed-loop motors in response to control signals from the ATC unit, the system being used to control normal and fault operation of the open-loop and the pair of closed-loop motors, the motor shafts in the open-loop and the pair of closed-loop motors being connected to linkage for moving the, doors in the HVAC unit, the system contain-



ing prestored software data providing time of travel to a normal stall condition and average system voltage relative to the open-loop motor and the first and the second motor of the pair of closed-loop motors being controlled, obtained during a pre-calibration process, the system comprising:

- (a) an input power device having terminals for receiving electric power from a designated source and generating therefrom regulated and raw powers used by components in the system, the input device including an ON and OFF switch for applying or removing the powers from the motor control system when desired;
- (b) motor drivers having a first set of input terminals for receiving the regulated and raw powers and a second set of input terminals for receiving logical control signals and providing therefrom at output terminals voltage control signals for bi-directional control of movement of the motor shafts in the open-loop and the pair of closed-loop motors in response to the logical control signals;
- (c) an external analog-to-digital converter (ADC) having input terminals coupled to the potentiometers of the pair of closed-loop motors which provide analog signal representations of changes in position of the motor shafts and producing therefrom at output terminals digital signal equivalents of the analog signal representations;
- (d) a microcontroller having:
  - (1) a timer system that provides a reference clock signal and operates in conjunction with random access memory (RAM) based counters to provide therefrom at a first output terminal a first clock signal proportioned to

the chosen frequency of the reference clock signal and at a second output terminal a second clock signal of another chosen frequency apportioned to the first clock signal;

- (2) door motor control firmware containing instructions used by a central processing unit (CPU) of the microcontroller for generating the digital signals used to form the logical control signals sent to the second set of terminals of the motor drivers, the CPU requesting instructions from the door motor control firmware at a rate dictated by the first clock signals;
- (3) programmable input/output circuits containing: (a) programmable output registers for receiving at input terminals the digital signals from the CPU and producing therefrom at output terminals the logical control signals sent to the second set of terminals of the motor drivers, (b) a serial peripheral interface that receives variable digital signals from the external ADC and producing therefrom digital data used by the CPU to establish locations of the structures attached to the motor shafts, (c) an internal ADC for receiving variations of the raw power from the input power device while the motor shaft of the open-loop motor and the first and the second motor of the pair of closed-loop motors rotates and then providing equivalent digital values used by the CPU to derive the average system voltage relative to the open-loop motor and the first and the second motor of the pair of closed-loop motors; and
- (4) door motor normal and fault operation firmware containing instructions used by the CPU for: (a) computing the time and direction required to move the motor doors connected to the open-loop motor and the pair of closed-loop motors to desired positions for regulating the temperature inside the vehicle in response to requested comfort level indications supplied by the ATC unit, (b) requesting the execution of instructions from the door motor control firmware for turning ON the open-loop motor or the first or second motor of the pair of closed-loop motors and driving its motor shaft with structures attached to desired positions in response to signals from the ATC unit, the CPU requesting instructions from the door motor normal and fault firmware at a rate dictated by the second clock signal.

5,440,487

**PROCESS AND DEVICE FOR DEALING WITH ERRORS IN ELECTRONIC CONTROL DEVICES**

Helmut-Jürgen Althoff, Stolzheim; Guenter Driedger, Oberriexingen; Klaus Meder, Ditzingen; Jürgen Schuk, Markgroeningen; Manfred Stahl, Stuttgart; Karl Viehmann, Murr; Eberhard Weis, Hemmingen; Jürgen Neumann, Laeneburg, and Bert Zorbach, Gerlingen, all of Germany, assigns to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE92/00909, § 371 Date Jul. 25, 1994, § 102(e) Date Jul. 25, 1994, PCT Pub. No. W093/09020, PCT Pub. Date May 13, 1993

PCT Filed Oct. 31, 1992, Ser. No. 240,687

Claims priority, application Germany, Nov. 5, 1991, 41 36

336.5

Int. Cl.<sup>6</sup> G06F 11/00; G05B 9/03; B62D 7/14

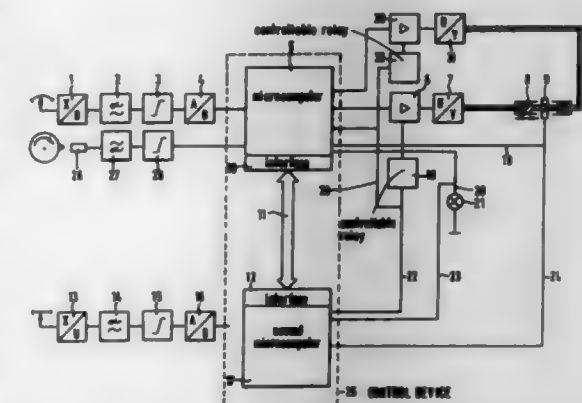
U.S. Cl. 364—424.05

22 Claims

1. Process for error recovery in electronic control devices for controlling parts of an apparatus, said electronic control devices including at least one microcomputer, transmitter means for generating transmitter signals containing information regarding said parts of said apparatus, said transmitter means comprising a plurality of transmitters including duplicate transmitters and said transmitter means being connected to said at least one microcomputer to transmit said transmitter signals to said at least one microcomputer, at least one actuating member, at least one actuator connected to said at least one actuating member and connected to said microcomputer so that said at least one actuating member is controllable by said at least one microcomputer via said at least one actuator, at

least one safety device connected to said at least one actuator and said at least one microcomputer, wherein said at least one microcomputer includes at least one main program means for controlling said at least one actuating member, at least two emergency program means for controlling said at least one actuating member and means for deciding which of said program means is to control said at least one actuating member, said process including the steps of:

- a) detecting said transmitter signals from said transmitters in said at least one main program means in said at least one microcomputer;
- b) calculating values from said transmitter signals detected in step a);
- c) checking at least one of said values calculated in step b) and said transmitter signals detected in step a) for consistency;
- d) adjusting said at least one actuating member by generating control signals for control of said at least one actuating member at least partly using said values calculated from said transmitter signals and feeding said control signals to said at least one actuator which controls said at least one actuating member at least partially using said control signals;
- e) deciding which of said program means is to be run based on said checking in step c);



- f) activating said at least one safety device with a first one of said at least two emergency program means to interrupt control of said at least one actuator by said main program means when said first emergency program means is selected in said deciding step e);
- g) continuing to detect said transmitter signals in a second one of said at least two emergency program means and calculating other values from said transmitter signals detected in said second emergency program means when activated;
- h) checking said other values calculated in step g) for consistency;
- i) multiplying said other values calculated in step g) by a factor which decreases as time proceeds during operation of said second emergency program means so as to achieve a gradual damping of said at least one actuating member; and
- j) generating other control signals for at least partially controlling said at least one actuating member from said other values multiplied by said factor in step i) and supplying said other control signals to said at least one actuator, so that said other values calculated in step g) at least in part act to adjust said at least one actuating member via said at least one actuator.



# **5,440,485** **SYSTEM FOR CONTROLLING DAMPING FORCE** **CHARACTERISTIC OF SHOCK ABSORBER OF** **VEHICLE**

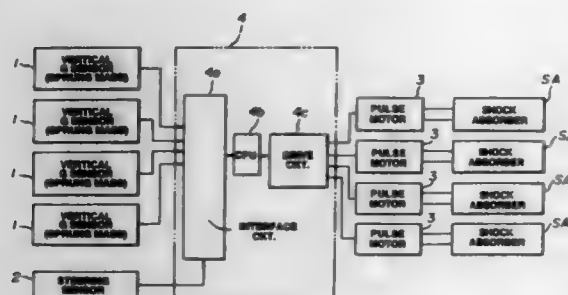
Fumiyuki Yamaoka, and Mitsuo Sasaki, both of Atsugi, Japan, assignors to Unisia Jecs Corporation, Japan

Filed Sep. 14, 1993, Ser. No. 120,404

Claims priority, application Japan, Sep. 16, 1992, 4-246109

Int. Cl.<sup>6</sup> B60G 17/015

U.S. Cl. 364-424.05



1. A system for controlling damping forces for respective shock absorbers of a vehicle, comprising:

- a plurality of shock absorbers, each shock absorber being interposed between a sprung mass and an unsprung mass of the vehicle;
- first means for varying a damping force characteristic of at least one side of a piston stroke of each shock absorber in response to a control signal;
- second means for detecting a behavior of the sprung mass of the vehicle;
- third means for detecting a steering angular displacement and a steering angular velocity of a vehicular steering system; and
- fourth means for receiving a first signal indicating the steering angular displacement and a second signal indicating the steering angular velocity from said third means and a third signal indicating the sprung mass behavior detected by said second means and producing the control signal derived using values of the first, second, and third signals, said control signal being transmitted to said first means so that the damping force characteristic of each shock absorber is controlled according to the control signal;

wherein each shock absorber has an extension stroke side and a compression stroke side with respect to the piston and each shock absorber is so constructed as to form three modes of control: a first control mode to provide an extension stroke side hard characteristic such that the damping force characteristic is variable at the extension stroke side and that at the compression stroke side is fixed to a predetermined low damping force characteristic; a second control mode to provide a compression stroke side hard characteristic such that the damping force characteristic at the compression stroke side is variable and that at the extension stroke side is fixed to the predetermined low damping force characteristic; and a third control mode to provide a soft characteristic such that the damping force characteristics at both extension and compression stroke sides are fixed to the predetermined low damping force characteristics; and

wherein, when a value of the control signal is a positive value and exceeds a predetermined threshold value ( $\delta$ ), said fourth means produces the control signal to the first means so that at least the corresponding shock absorber is controlled to provide the extension stroke side hard characteristic, when the value of the control signal is within a plus and minus threshold value ( $\pm\delta$ ), said fourth means produces the control signal to the first means so that the corresponding shock absorber is controlled to provide the soft characteristic, and when the value of the control

signal is lower than the minus predetermined threshold value ( $-\delta$ ), the fourth means produces the control signal to the first means so that the corresponding shock absorber is controlled to provide the compression stroke side hard characteristic.

# **5,440,489** **REGULATING A RAILWAY VEHICLE**

Gregory D. Newman, Chippenham, United Kingdom, assignor to Westinghouse Brake & Signal Holdings Ltd., United Kingdom

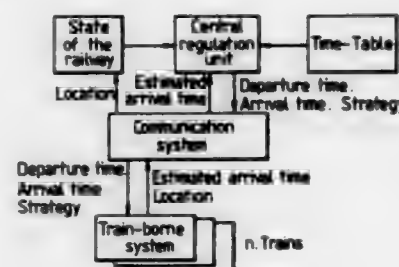
Filed Jan. 21, 1993, Ser. No. 6,456

Claims priority, application United Kingdom, Feb. 6, 1992, 9202520

Int. Cl.<sup>6</sup> G06F 165/00

U.S. Cl. 364-426.05

5 Claims



2. A railway vehicle regulation system including first and second railway vehicles, wherein each of said vehicles includes apparatus for regulating the respective railway vehicle, the apparatus including:

- calculating means for calculating running profiles of distance with respect to velocity among a plurality of fixed locations;
- first receiving means for receiving the time at which at least one of the fixed locations will become clear for use by the respective railway vehicle;
- second receiving means for receiving the time table arrival and departure times scheduled for the respective railway vehicle at any of said fixed locations;
- means for controlling the calculation by said calculating means of a calculated running profile on the basis of the information received by the first and second receiving means by selecting and optimizing one of journey time, power consumption and inter-vehicle headway;
- said calculating means further calculating an arrival time of one of said first and second railway vehicle;
- means for operating the traction and braking system of the respective railway vehicle for use in driving the respective vehicle to the calculated running profile; and
- means for reporting to the other of said first and second railway vehicles the calculated arrival time of the respective vehicle at any of said fixed locations.

# **5,440,490** **AIRCRAFT ENGINE EMERGENCY CONTROL SYSTEM**

Leslie R. Summerfield, Bristol, England, assignor to Rolls-Royce plc, London, England

Filed Nov. 18, 1993, Ser. No. 154,081

Claims priority, application United Kingdom, Nov. 20, 1992, 9224330

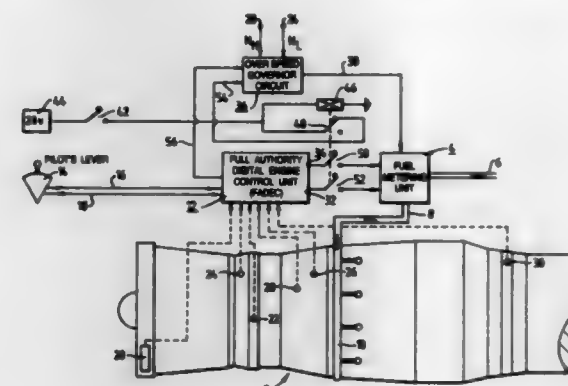
Int. Cl.<sup>6</sup> B64D 39/00, 37/00

U.S. Cl. 364-431.02

10 Claims

1. An aircraft engine control system comprising: engine speed or thrust demand signal generating means for generating an engine speed or thrust demand signal, a main engine control unit connected to receive said generated engine speed or thrust demand signal and to compute and output, in accordance with normal operating schedules, a fuel level signal at a level commensurate with said

generated engine speed or thrust demand signal and signals relating to current engine performance, a fuel metering unit connected between a source of fuel and the engine to deliver to the engine fuel at a flow rate determined by the fuel level signal, engine speed governor means operable in the event of a failure or a malfunction of the main engine control unit to



limit the fuel flow rate delivered by the fuel metering unit, and an emergency control system selectively operable to receive the generated engine speed or thrust demand signal and to vary the fuel flow rate set by the engine speed governor means to produce a fuel flow rate in accordance with a measured engine speed signal and the generated engine speed signal.

# **5,440,491** **PSEUDO GPS SIGNAL TRANSMITTING SYSTEM IN A BASE STATION**

Shuichi Kawano, and Masatoshi Harigae, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

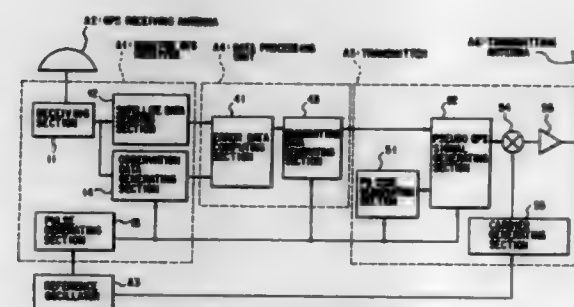
Filed Oct. 18, 1994, Ser. No. 324,503

Claims priority, application Japan, Oct. 19, 1993, 5-260679; Dec. 2, 1993, 5-303061

Int. Cl.<sup>6</sup> H04B 7/185; G01S 5/08

U.S. Cl. 364-443

3 Claims



1. A pseudo GPS signal transmitting system in a base station installed on the ground and transmitting a pseudo GPS signal for use as one of GPS satellites, comprising:

- a GPS receiving antenna for picking up radio waves from GPS satellites;
- a monitor GPS receiver containing a receiving section for receiving GPS signals from each GPS satellite via said GPS receiving antenna, a satellite data sensing section for sensing satellite data from the received GPS signals, a pulse generating section for generating user clock pulses synchronized with a reference clock, and an observation data calculating section for obtaining observation data

from the received GPS signals on the basis of the user clock pulses;

a data processing unit containing an error data computing section for determining a pseudo range error value for the theoretical distance between a transmitting GPS satellite and a known receiving point from the satellite data and the observation data obtained at said monitor GPS receiver, and a transmission data generating section for formatting these data items in a specified manner to generate transmission data;

a transmitter containing a PN code generating section for generating PN codes for spectrum diffusion in synchronization with said user clock pulses, a pseudo GPS signal generating section for generating pseudo GPS signals by combining PN codes generated at the PN code generating section with the transmission data from said data processing unit on the basis of said user clock pulses, a carrier generating section for generating a carrier signal synchronized with said reference clock, a modulator for modulating the carrier signal generated at said carrier generating section using said pseudo GPS signal, and a power amplifier for power-amplifying the output of said modulator; and

a transmitting antenna for transmitting the pseudo GPS signal from said transmitter in a given direction, wherein the pseudo GPS signal sent from said transmitting antenna is transmitted directly or via a specific stationary satellite to a user GPS receiver.

# **5,440,492** **KINEMATICALLY POSITIONED DATA ACQUISITION** **APPARATUS AND METHOD**

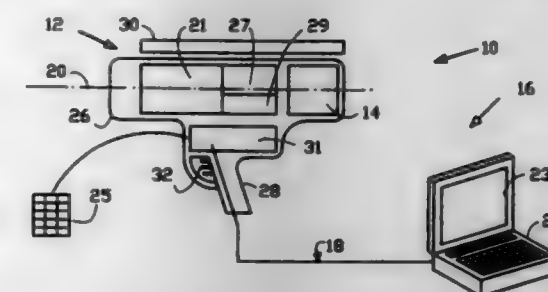
Ghassan F. Kozah, and Charles M. Donoghue, both of 3530 Bee Caves Rd., #210, Austin, Tex. 78746

Filed Dec. 23, 1992, Ser. No. 996,078

Int. Cl.<sup>6</sup> G01B 7/00

U.S. Cl. 364-454

9 Claims



1. A kinematically or semi-kinematically positioned data acquisition apparatus for measuring the physical location of a point on an object or space in a local reference frame, the apparatus comprising:

- a measuring means for determining the location of the point along a measuring axis;
- an inertial measurement means connected to the measuring means for continually providing data on the relative change in position and orientation of the measuring means;
- computing means for computing the location and orientation of the measuring means in a local reference frame in real-time based upon readings from the inertial measurement means and for calculating the coordinates of the measured point;
- gravity vector detection means for detecting the direction of the earth's gravitational field and providing the direction of the earth's gravitational field to the computing means;
- north direction detection means for detecting the direction of north and providing the direction of north to the computing means;
- error correcting means for correcting positional errors



caused by drift in the inertial measurement means by using the earth's gravitational field and the direction of north as reference directions; and

(g) data transfer means for transferring data between the measuring means, inertial measurement means, the computing means and a data port.

5,440,493

# **LOT TRANSPORTING SYSTEM BETWEEN STATIONS HAVING DIFFERENT MANUFACTURING EQUIPMENTS** Tetsuo Daida, Yamaguchi, Japan, assignor to NEC Corporation, Tokyo, Japan

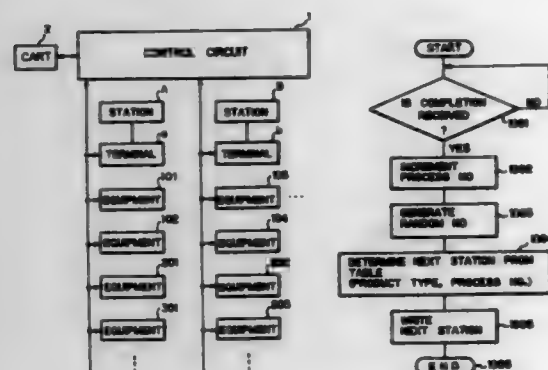
Filed Apr. 7, 1994, Ser. No. 224,741

Claims priority, application Japan, Apr. 15, 1993, 5-088256

Int. Cl. G06F 19/00; G05B 19/418

U.S. Cl. 364-468

3 Claims



3. A lot transporting system comprising: a plurality of stations at different sites, each station having a plurality of manufacturing equipments, each specific to one manufacturing process, at least one of said stations having different types of manufacturing equipments; means for determining a next manufacturing process to be performed upon a lot; means for selecting one of said stations having manufacturing equipments specific to the next manufacturing process in accordance with predetermined ratios of processing said lot allocated to said stations; and means for transporting the lot to a station selected by said selecting means; wherein a plurality of random numbers are allocated to each of said stations, said selecting means comprising: means for generating a random number; and means for selecting one of said stations to which the random number is allocated.

5,440,494

# **APPARATUS FOR AUTOMATIC REMODELLING OF ARTICLE PROCESSING SYSTEM**

Hidefumi Akamara, Ishikawa, Japan, assignor to Shibuya Kogyo Co., Ltd., Kanazawa, Japan

Continuation of Ser. No. 935,546, Aug. 26, 1992, abandoned.

This application Jan. 24, 1994, Ser. No. 266,091

Claims priority, application Japan, Sep. 3, 1991, 3-250439; Mar. 6, 1992, 4-084566

Int. Cl. G05B 19/18

U.S. Cl. 364-468

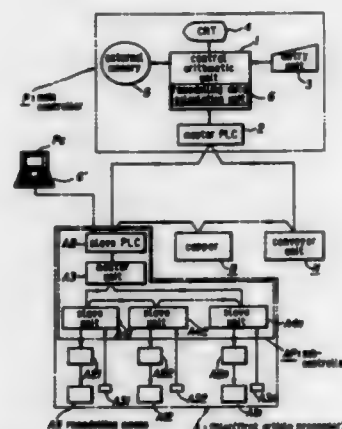
13 Claims

1. An apparatus for automatic remodelling of an automatic article processing system, the article processing system including a first article processing means for processing an article supplied thereto, a second article processing means disposed downstream of the first article processing means for sequentially processing an article supplied from the first article processing means, and a main controller for controlling the operation of the first and the second article processing means, the apparatus comprising:

first remodelling means for moving to a position which

corresponds to the size of an article, first drive means for moving the first remodelling means to a given position which corresponds to the size of an article, first detecting means for detecting the movement of the first remodelling means to the given position, and a first sub-controller for controlling the first drive means to move the first remodelling means and for feeding a remodelling complete signal to the main controller in response to a detection by the first detecting means of the movement of the first remodelling means to the given position, the first remodelling means, first drive means, first detecting means and first sub-controller all being associated with the first article processing means;

second remodelling means for moving to a position which corresponds to the size of an article, second drive means for moving the second remodelling means to a given position which corresponds to the variety of an article,



second detecting means for detecting the movement of the second remodelling means to the given position, and a second sub-controller for controlling the second drive means to move the second remodelling means and for feeding a remodelling complete signal to the main controller in response to a detection by the second detecting means of the movement of the second remodelling means to the given position, the second remodelling means, second drive means, second detecting means and second sub-controller all being associated with the second article processing means; and

the main controller including means for providing a signal which depends on the variety of an article to be processed to each of the first and second sub-controllers and means for enabling the operation of the article processing system only after receiving the remodelling complete signals from both of the first and second sub-controllers.

5,440,495

# **CONTROL DEVICE FOR WEFT INSERTING IN JET LOOM**

Tsutomu Sainen, and Shigeo Yamada, both of Ishikawa, Japan, assignors to Tsudakoma Kogyo Kabushiki Kaisha, Ishikawa, Japan

Filed Feb. 28, 1992, Ser. No. 843,546

Claims priority, application Japan, Mar. 8, 1991, 3-067684

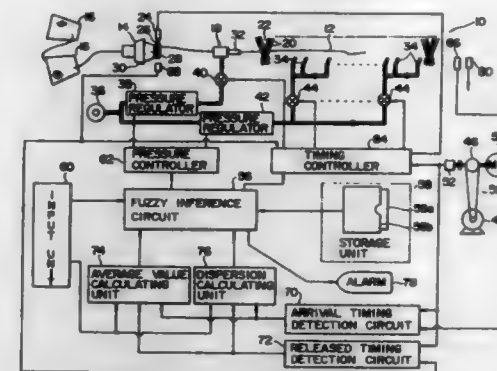
Int. Cl. G06F 15/46

U.S. Cl. 364-470

11 Claims

1. A control device for weft inserting in a jet loom, comprising: information generating means for detecting a last released timing and a last arrival timing of a weft to be inserted and generating the timing informations corresponding thereto; and control means for obtaining, on the basis of both said timing informations outputted from said information generating

means, at least two pieces of operating information selected from a group consisting of the average value of the last released timing, the dispersion of the last released timing, the average value of the last arrival timing and the dispersion of the last arrival timing, and inferring by fuzzy



inference a corrected value of either a main pressure or a subpressure for weft inserting so as to make the last arrival timing to be attained at an objective value on the basis of the obtained operating information, and then controlling said corresponding pressure on the basis of the inferred corrected value.

5,440,496

# **PROCEDURE AND APPARATUS FOR PRODUCING INDIVIDUALLY DESIGNED, THREE-DIMENSIONAL BODIES USABLE AS TOOTH REPLACEMENTS, PROSTHESES, ETC.**

Matts Andersson, Lerum; Lennart Carlsson, Mölndal, and Erik Isberg, Ellis, all of Sweden, assignors to Nobelpharma AB, Goteborg, Sweden

Continuation of Ser. No. 805,955, Dec. 12, 1991, abandoned.

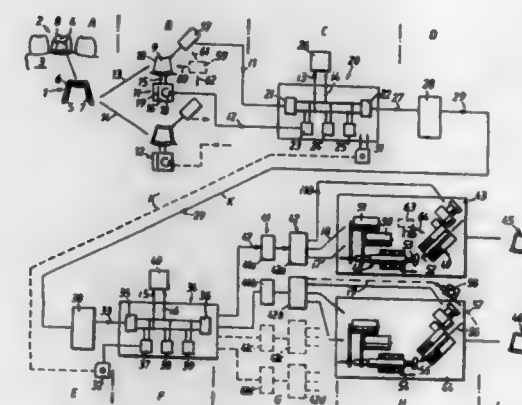
This application Mar. 25, 1994, Ser. No. 217,761

Claims priority, application Sweden, Dec. 12, 1990, 9003967

Int. Cl. G01B 11/00; G05B 19/00

U.S. Cl. 364-474.05

19 Claims



1. A method for producing at least one three-dimensional body, said method comprising the steps of:

- presetting conditions for sensing at least one model, said conditions including at least an angle of at least one sensor with respect to a longitudinal axis of said model and a relationship between a rotation speed of said model and a speed of movement of said sensor and said model relative to each other in a direction parallel to said longitudinal axis of said model;
- rotating said model while simultaneously moving at least one of said model and said sensor relative to each other in a direction parallel to said longitudinal axis of said model while simultaneously sensing a plurality of distances gen-

erated by interaction between said sensor and a surface of said model to obtain a first set of data;

- transmitting said preset conditions and said first set of data to at least one control means for controlling at least one working tool for producing said three-dimensional bodies;
- substantially duplicating said preset conditions of said at least one sensor and said at least one model for at least one working tool and at least one blank respectively; and
- producing said three-dimensional body by varying a position of said working tool relative to said blank corresponding to said sensed distance generated by interaction between said sensor and said model, such that said working tool selectively removes material from said blank to substantially reproduce said surface of said model on said blank.

5,440,497

# **METHOD OF AND SYSTEM FOR LAYING OUT BUS CELLS ON AN INTEGRATED CIRCUIT CHIP**

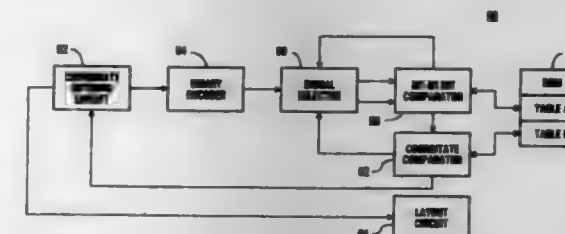
David A. Krause, Raleigh, N.C., assignor to Mitsubishi Semiconductor America, Inc., Durham, N.C.

Filed Jun. 29, 1993, Ser. No. 82,869

Int. Cl. G06F 17/50

U.S. Cl. 364-491

11 Claims



1. A method of laying out signal paths on an integrated circuit having first, second, third and fourth bus strips using an automatic layout system having a binary encoder, a bit-by-bit comparator and a coordinate comparator, said first bus strip being parallel to said third bus strip and perpendicular to said second and fourth bus strips, said method comprising the steps of:

- supplying the automatic layout system with coordinates of signal paths to be routed through said first, second, third and fourth bus strips;
- forming by the binary encoder a binary representation of each of the signal paths so as to define any of the first, second, third and fourth bits of the binary representation as a first logic level if the corresponding signal path passes through said first, second, third and fourth bus strips, respectively, and to define any of the first, second, third and fourth bits of the binary representation as a second logic level if the corresponding signal path does not pass through said first, second, third and fourth bus strips, respectively;
- comparing by the bit-by-bit comparator the binary representation of each of the signal paths to select the signal paths that share one of the bus strips;
- comparing by the coordinate comparator the coordinates of each of the selected signal paths to find the signal paths that do not overlap with one another; and
- laying out the signal paths that do not overlap with one another as a common signal path.

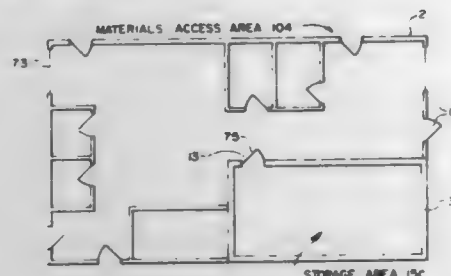
5,440,498

## METHOD FOR EVALUATING SECURITY OF PROTECTED FACILITIES

Ronald E. Timm, 57 Stone Creek Dr., Lemont, Ill. 60439  
Filed May 6, 1993, Ser. No. 58,491  
Int. Cl.<sup>6</sup> G06G 7/48

U.S. Cl. 364—516

15 Claims



1. A method for equipping a protected facility, such as a building, manufacturing site, or storage depot, with a security system comprising the steps of:

- creating physical zones within the protected facility;
- providing security elements to be located in the physical zones of the protected facility;
- associating a security rating with each of the security elements;
- providing means for tabulating identifiers for the security elements and values for the security ratings according to the physical zones;
- determining a value for the probability of security detection in each of the physical zones as a function of the security elements in each of the physical zones and the security ratings corresponding to the security elements in each of the physical zones;
- determining outcome probability values for the physical zones as a function of the probability values of detection and intrusion paths into the protected facility, and locating the outcome probability values on the tabulating means, the event tree having branches corresponding to the effectiveness of the security elements in the physical zones, this determining step including the substeps of:
  - (1) configuring an event tree within the tabulating means, the event tree having branches corresponding to the intrusion paths; and
  - (2) locating the probability values along the branches of the event tree; and
- installing the security elements associated with the outcome probability values of step f. to equip the protected facility with the security system that was produced by the outcome of step f.

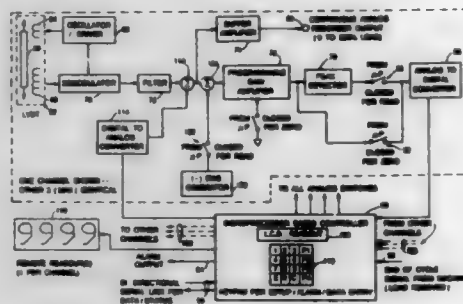
5,440,499

## CONTINUOUS DUTY PRESS MONITORING SYSTEM

Robert F. Rasmussen, 1094 Dorah Rd., South Euclid, Ohio 44121-3832  
Filed Feb. 18, 1993, Ser. No. 19,017  
Int. Cl.<sup>6</sup> G01B 7/16

U.S. Cl. 364—551.01

20 Claims



1. A press operation data acquisition apparatus comprising:
  - a linear variable displacement transducer including a coil portion movably disposed relative to a core portion such that magnetic flux generated by current impressed on the coil portion is influenced by a position of the core portion relative thereto;
  - securing means adapted for securing the core portion to a first portion of a housing of an associated press and the coil portion to spaced apart portions of the housing of the associated press such that compression and expansion of the housing will influence a relative position of the core portion to the coil portion;
  - means for providing an electric current to the coil portion;
  - means continuously sensing the magnetic flux induced by operation of the associated press by monitoring of current in the coil portion;
  - position signal generating means for periodically generating a position signal representative of a relative position of the coil portion to the core portion in accordance with sensed magnetic flux; and
  - calibrating means adapted for automatically calibrating the position signal to a base level prior to completing a press cycle of the associated press;
  - means for generating a press deflection signal in accordance with the position signal.

5,440,500

## SETTABLE PRINTING APPARATUS

Paul Mitchell, Herts, and Peter J. Treadwell, Essex, both of United Kingdom, assignors to Pitney Bowes plc., Harlow, England

Filed Nov. 12, 1993, Ser. No. 151,602  
Claims priority, application United Kingdom, Nov. 13, 1992, 9223893

Int. Cl.<sup>6</sup> G01D 5/34

U.S. Cl. 364—559

3 Claims



1. An improved settable printing apparatus for a postage meter, said postage meter having a postage meter housing, wherein the improved settable printing apparatus comprises:
  - a plurality of print wheels; support means fixably mounted within said postage meter for rotative supporting each of said print wheels within said postage meter such that said print wheels are aligned along a common axis;
  - a plurality of settable members rotatively mounted to said support means and operatively connected to a respective one of said print wheels for adjusting said respective one of said printwheels to one of a plurality of predetermined position;
  - a charge couple device fixably mounted to and within said postage meter having a plurality of detectors and an illumination means for providing an illumination by a light source;
  - each of said settable members having an optical detectable means, said optical detectable means having a plurality of sequentially aligned multi-digit bar code markings positionable to an index position such that one of said bar code markings is positioned to said index position in response to said respective settable member positioning said respective print wheel to a respective one of said predetermined positions such that said bar code marking is correlatable to a unique one said predetermined positions of said respective print wheel;

1. A power-conserving capacitance-type measuring device for absolute measurement of positions, comprising:
  - displacement sensing means having a fixed element and a movable element, said movable element being capacitance-coupled to said fixed element and relatively movable with respect to said fixed element, for outputting signals corresponding to relative positions of said movable element with respect to said fixed element;
  - signal processing means for processing the output signals of said displacement sensing means and outputting an absolute measurement value corresponding to displacement of said movable element with respect to said fixed element;
  - state detecting means for detecting whether said movable element of said displacement sensing means is in a moving or a stopped state and for outputting a state signal indicative of the detected state;
  - control means for controlling the operations of said displacement sensing means and said signal processing means and for periodically activating said signal processing means at a selected interval so as to perform a cyclic intermittent measurement operation regardless of the detected state of said movable element; and
  - power supply means for supplying electric power to said displacement sensing means, said signal processing means, said control means and said state detecting means; said control means selecting the interval of the intermittent measurement operation based on the output of said state detecting means so as to reduce power consumption by said signal processing means.

5,440,501

## ENERGY SAVING CAPACITANCE TYPE MEASURING DEVICE FOR ABSOLUTE MEASUREMENT OF POSITIONS

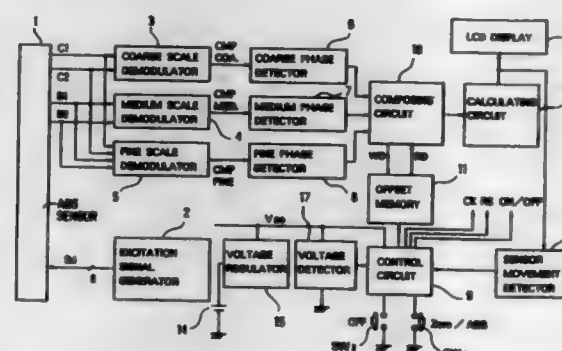
Toshitaka Shimomura, Satoshi Adachi, Toru Yaku, Tatsuhiko Matsura, and Osamu Kawatoko, all of Kawasaki, Japan, assignors to Mitutoyo Corporation, Tokyo, Japan  
Filed Jun. 10, 1993, Ser. No. 74,952

Claims priority, application Japan, Jun. 26, 1992, 4-193231; Jul. 10, 1992, 4-207321

Int. Cl.<sup>6</sup> G01B 3/20, 3/18

U.S. Cl. 364—560

23 Claims



1. A power-conserving capacitance-type measuring device for absolute measurement of positions, comprising:
  - displacement sensing means having a fixed element and a movable element, said movable element being capacitance-coupled to said fixed element and relatively movable with respect to said fixed element, for outputting signals corresponding to relative positions of said movable element with respect to said fixed element;
  - signal processing means for processing the output signals of said displacement sensing means and outputting an absolute measurement value corresponding to displacement of said movable element with respect to said fixed element;
  - state detecting means for detecting whether said movable element of said displacement sensing means is in a moving or a stopped state and for outputting a state signal indicative of the detected state;
  - control means for controlling the operations of said displacement sensing means and said signal processing means and for periodically activating said signal processing means at a selected interval so as to perform a cyclic intermittent measurement operation regardless of the detected state of said movable element; and
  - power supply means for supplying electric power to said displacement sensing means, said signal processing means, said control means and said state detecting means; said control means selecting the interval of the intermittent measurement operation based on the output of said state detecting means so as to reduce power consumption by said signal processing means.

5,440,502

## STYLUS OPERABLE COMPUTER WITH WIRELESS KEYBOARD IN STORAGE BAY

David S. Register, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Dec. 26, 1991, Ser. No. 814,733

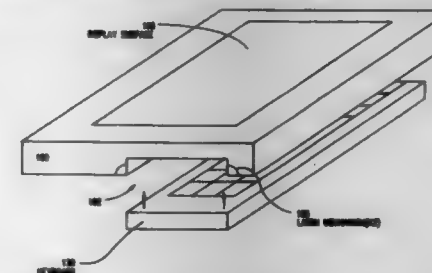
The portion of the term of this patent subsequent to Aug. 31, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> G12B 9/00; H05K 5/02; H04B 10/00

U.S. Cl. 364—708.1

13 Claims

1. A portable handheld computer selectively useable in either a keyboard or stylus input mode, comprising:
  - a hand holdable chassis structure having an elongated, generally rectangular configuration with opposite end portions, opposite front and rear sides extending between said opposite end portions, and an elongated recess formed in said rear side and longitudinally extending between said opposite end portions, said chassis structure further having disposed therein a CPU, a primary power supply, a program memory, and an infrared data receiver to receive signals from an infrared transmitter;
  - display means fixedly secured to said front side of said chassis structure and to provide a visible image corresponding to keyboard input signals transmitted to said CPU, said display means to sense the position of a user-operated stylus positioned against said display means and responsively transmit stylus position signals to said CPU; and
  - a wireless keyboard having keys dimensioned for touch-



typing, said keyboard having an elongated, generally rectangular configuration and being positionable in (1) a stylus use orientation in which said keyboard is removably and complementarily received in said recess in said rear side of said chassis structure to permit a user to hold the entire computer in one hand while using a stylus on said display means to input data to said CPU, and (2) in a keyboard use orientation in which said keyboard is removed from said recess and positioned in a spaced apart relationship with said chassis structure with no physical connection thereto, said wireless keyboard having disposed therein a power supply and an infrared transmitter to transmit keyboard input signals to said infrared receiver when said keyboard is in said keyboard use position.

5,440,503

## DIGITAL FILTERING CIRCUIT OPERABLE AS A THREE-STAGE MOVING AVERAGE FILTER

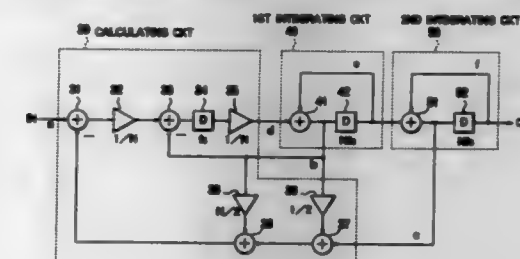
Yuichi Maruyama, Tokyo, Japan, assignor to NEC Corporation  
Filed Feb. 15, 1994, Ser. No. 196,532

Claims priority, application Japan, Feb. 15, 1993, 5-024619

Int. Cl.<sup>6</sup> G06F 15/31; H03H 3/00

U.S. Cl. 364—724.1

8 Claims







5,440,509

# **ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY WITH NAND CELL STRUCTURE AND INTERMEDIATE LEVEL VOLTAGES INITIALLY APPLIED TO BIT LINES**

Masaki Momodomi, Yokohama; Koichi Totta, Tokyo; Yasuo Itoh, Kawasaki; Yoshihisa Iwata; Fujio Masuoka, both of Yokohama; Masahiko Chiba, Aomori; Tetsuo Endo, Yokohama; Ritsiro Shirota, Kawasaki, and Ryouhei Kirisawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 722,220, Jun. 27, 1991, abandoned, which is a continuation of Ser. No. 272,404, Nov. 17, 1988, Pat. No. 5,050,125. This application Feb. 24, 1993, Ser. No. 22,392

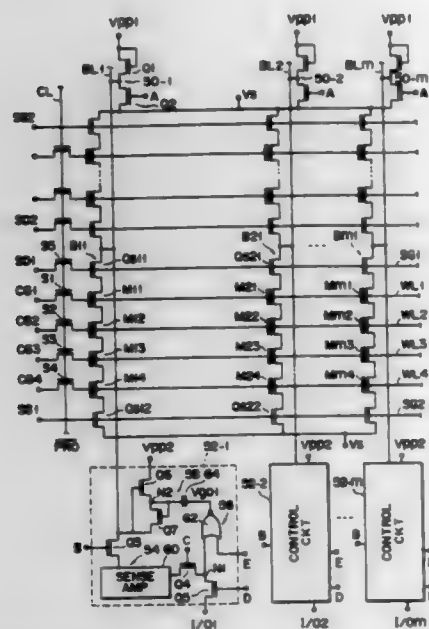
Claims priority, application Japan, Nov. 18, 1987, 62-290858; May 10, 1988, 63-111620; Aug. 19, 1988, 63-204670

The portion of the term of this patent subsequent to Sep. 17, 2006, has been disclaimed.

Int. Cl.<sup>6</sup> G11C 16/04

U.S. Cl. 365—185

17 Claims



1. A non-volatile semiconductor memory device comprising:

a semiconductor substrate;  
bit lines arranged on said substrate;  
memory cells connect to said bit lines, said memory cells being subdivided into a plurality of cell blocks each block including a series array of memory cell transistors, each of said memory cell transistors having a carrier storage layer and a control gate;

word lines insulatively crossing said bit lines above said substrate and being connected to control gates of said memory cell transistors; and

control circuit means for writing data into a selected memory cell transistor in a certain cell block, by applying a first level voltage to a certain word line connected to said selected memory cell transistor, applying a second level voltage to all word lines positioned between said selected word line and a contact node connecting said certain cell block and a specific bit line associated therewith, and applying to said specific bit line, which has been charged to a third level voltage having an intermediate potential between the first and second level voltages, a voltage corresponding to data to be written, while causing non-selected bit lines to be held at the third level voltage, whereby the data is selectively written into said selected memory cell transistor.

5,440,510

# **INTEGRATED CIRCUIT ENTIRELY PROTECTED AGAINST ULTRAVIOLET RAYS**

Paolo Caprara, Milan, and Emilio Camerlinghi, Bergamo, both of Italy, assignors to SGS-Thomson Microelectronics, S.R.L., Agrate Brianza, Italy

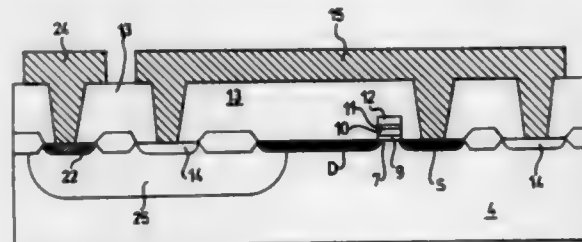
Filed Jun. 30, 1993, Ser. No. 86,342

Claims priority, application European Pat. Off., Jun. 30, 1992, 92830339

Int. Cl.<sup>6</sup> G11C 11/34

U.S. Cl. 365—185

30 Claims



1. An integrated circuit memory cell which is fully protected from UV radiation, being of a type implemented in MOS technology over a semiconductor substrate comprising:

at least one memory transistor having source and drain diffusions and a channel separating said source and drain, and having at least one gate overlying and insulated from and capacitively coupled to at least a portion of said channel;

a metallic shield embedded in the semiconductor substrate and covering said transistor,

a diffused region defining a closed loop path on the substrate surface all around said transistor, said shield being peripherally connected to said diffused region in an unbroken fashion, and

first and second wells extending in the substrate from the transistor to outside said diffused region, the first of said wells being connected directly to said gate of said transistor, and

a protection diode connected to said control gate and located inside the closed loop path defined by said diffused region.

5,440,511

# **SEMICONDUCTOR MEMORY DEVICE**

Hiroshi Yamamoto; Kiyonori Ogura, and Takashi Horii, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

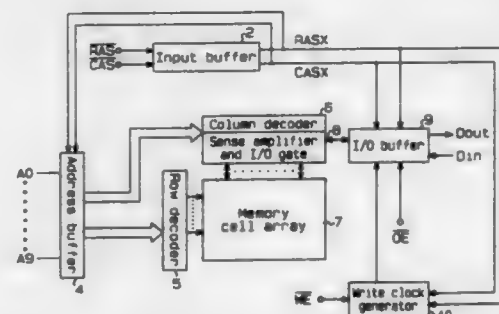
Filed Mar. 18, 1994, Ser. No. 210,385

Claims priority, application Japan, Jun. 15, 1993, 5-144001

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—189.05

6 Claims



1. A semiconductor memory device responsive to at least one input control signal and to a plurality of memory location address signals for outputting data when supplied with power

5,440,513

# **SRAM WITH PROGRAMMABLE PRESET DATA**

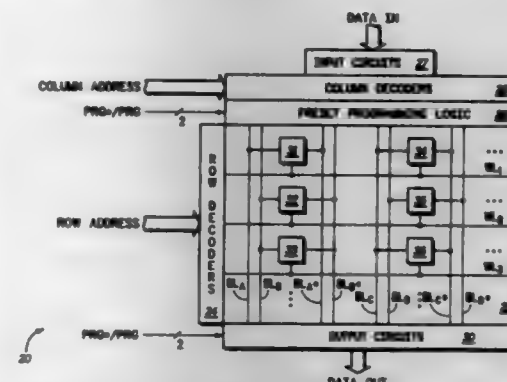
Bradley P. Smith, Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 3, 1993, Ser. No. 55,451

Int. Cl.<sup>6</sup> G11C 11/413

U.S. Cl. 365—190

19 Claims



1. An integrated circuit memory, comprising:  
a plurality of memory cells organized as rows and columns, each column of said plurality of memory cells comprising a first bit line pair and a second bit line pair;  
decoding means for selecting a memory cell in response to receiving an address signal; and  
programming means, coupled to said first bit line pair and to said second bit line pair, for charging said first bit line pair to a first predetermined logic state and charging said second bit line pair to a second predetermined logic state in response to receiving a first control signal;  
wherein the programming means comprises:  
driving means for coupling said first and second bit line pairs of a column to said decoding means in response to a second control signal; and  
charging means, coupled to said first and second bit line pairs of said column, for charging said first bit line pair to the first predetermined logic state and charging said second bit line pair to the second predetermined logic state in response to receiving said first control signal;  
wherein a memory cell of said column is selectively coupled to either of said first bit line pair or said second bit line pair, for storing either of said first or second predetermined logic states, respectively, in response to said first control signal.

5,440,512

# **SEMICONDUCTOR MEMORY DEVICE**

Takayuki Harima, Kawaguchi, and Makoto Segawa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

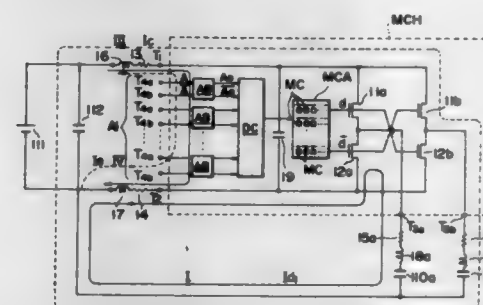
Continuation of Ser. No. 611,071, Nov. 9, 1990, abandoned. This application Apr. 8, 1993, Ser. No. 44,115

Claims priority, application Japan, Nov. 10, 1989, 1-292991

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—190

8 Claims



1. A semiconductor memory chip, comprising:  
address input means for receiving an address signal from outside of said semiconductor memory chip and outputting an internal address signal corresponding to said address signal;  
an address decoder for decoding said internal address signal and outputting a decoded signal;  
a memory cell array having a plurality of memory cells, each cell being capable of storing data and being selected by said decoded signal, said selected memory cell outputting memory cell data; and  
output means provided with first and second output terminals for simultaneously outputting complementary truth and false memory cell data outside of said semiconductor memory chip via said first and second terminals in accordance with data stored in said selected memory cell.

5,440,514

# **WRITE CONTROL FOR A MEMORY USING A DELAY LOCKED LOOP**

Stephen T. Flannagan; Ray Chang, and Lawrence F. Childs, all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 8, 1994, Ser. No. 207,510

Int. Cl.<sup>6</sup> G11C 7/10

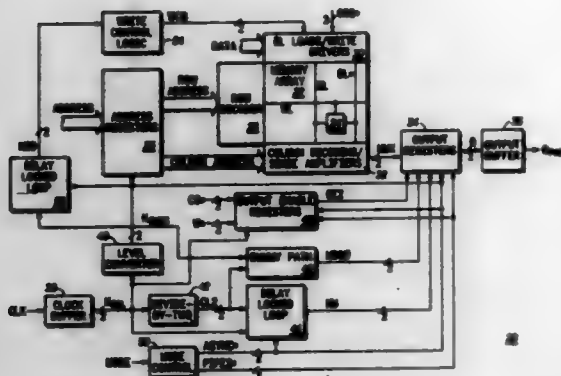
U.S. Cl. 365—194

21 Claims

1. An integrated circuit memory, comprising:  
a plurality of memory cells, each memory cell coupled to a bit line pair and to a word line;  
a write control logic circuit, coupled to the plurality of memory cells, the write control logic circuit receiving a delayed clock signal, and in response, providing a write control signal during a write cycle of the integrated circuit memory; and  
a delay locked loop circuit, coupled to the write control logic circuit, for receiving a clock signal, and in response,



providing the delayed clock signal a predetermined time after the clock signal, wherein a length of the predeter-



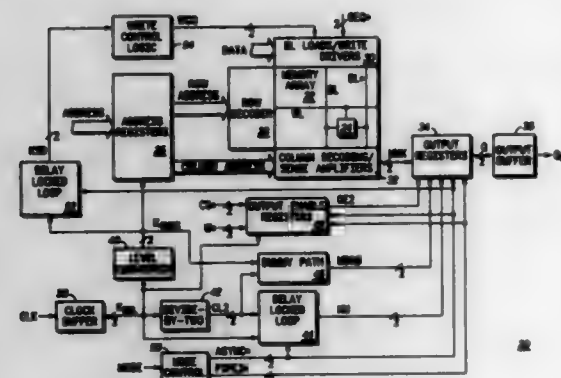
mined time changes proportional to a value of a control voltage.

#### 5,440,515 DELAY LOCKED LOOP FOR DETECTING THE PHASE DIFFERENCE OF TWO SIGNALS HAVING DIFFERENT FREQUENCIES

Ray Chang, Stephen T. Flanagan, and Kenneth W. Jones, all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.  
Filed Mar. 8, 1994, Ser. No. 207,517  
Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365-194

9 Claims



1. An integrated circuit memory, comprising: a plurality of memory cells, each memory cell coupled to a bit line and to a word line; an output data register, coupled to the plurality of memory cells, the output data register for receiving data signals corresponding to data stored in the plurality of memory cells, the output data register providing an output data signal in response to receiving a delay locked loop signal; and a delay locked loop circuit for receiving a clock signal, and in response, providing the delay locked loop signal, the delay locked loop signal for controlling the output data register.

#### 5,440,516 TESTING CIRCUITRY OF INTERNAL PERIPHERAL BLOCKS IN A SEMICONDUCTOR MEMORY DEVICE AND METHOD OF TESTING THE SAME

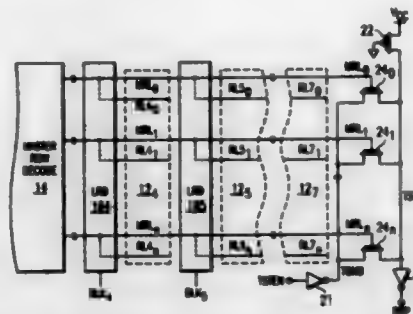
William C. Stemmer, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jan. 27, 1994, Ser. No. 188,158

Int. Cl.<sup>6</sup> G11C 11/40

U.S. Cl. 365-201

21 Claims



1. A circuit for testing the operation of a signal driver and a signal line in a semiconductor memory, comprising: means for communicating a test mode signal indicating selection of a special test mode; a test transistor, having a control electrode coupled to the signal line at a location distant from the signal driver, and having a conduction path with a first end coupled to said communicating means to receive the special test mode signal; and a bias transistor, having a conduction path coupled between a second end of the conduction path of said test transistor and a bias voltage; wherein said test transistor is conductive responsive to receiving said special test mode signal at the first end of its conduction path in combination with receiving an active signal from the signal driver at its control electrode.

#### 5,440,517 DRAMs HAVING ON-CHIP ROW COPY CIRCUITS FOR USE IN TESTING AND VIDEO IMAGING AND METHOD FOR OPERATING SAME

Donald M. Morgan, and Michael A. Shore, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

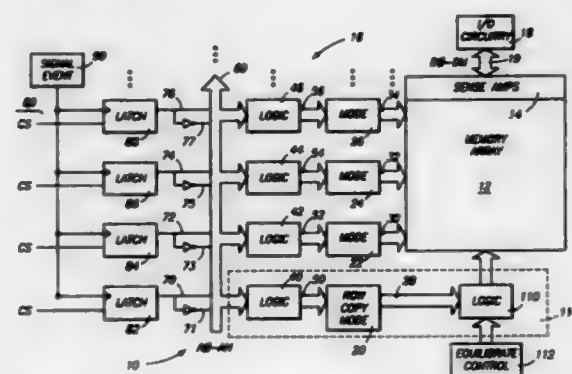
Filed Aug. 15, 1994, Ser. No. 290,388

The portion of the term of this patent subsequent to Jan. 10, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365-202

7 Claims



1. A DRAM integrated circuit device, comprising: a memory array having multiple row access lines, multiple paired digit lines that intersect the row access lines, and a plurality of memory cells coupled at intersections of indi-

vidual row access lines and paired digit lines to form rows of memory cells; the row access lines being used to access associated rows of memory cells and the paired digit lines being used to carry data to and from the accessed memory cells;

an equilibration circuit, electrically coupled to the paired digit lines of the memory array, to equalize potentials on the paired digit lines; and

an on-chip copy circuit, electrically coupled to the memory array and the equilibration circuit, to copy data carried by the paired digit lines and stored in a first row of memory cells to at least one other row of memory cells by suspending activation of the equilibration circuit to prevent equalization of potentials on the paired digit lines.

#### 5,440,518 NON-VOLATILE MEMORY CIRCUITS, ARCHITECTURE AND METHODS

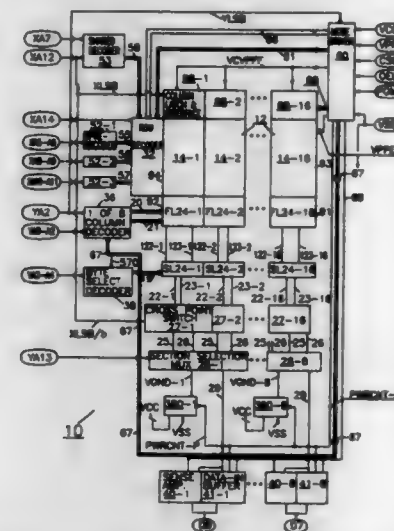
Emanuel Hazani, 1210 Sesame Dr., Sunnyvale, Calif. 94087  
Division of Ser. No. 713,995, Jun. 12, 1991, Pat. No. 5,278,995.

This application Jan. 10, 1994, Ser. No. 179,587

Int. Cl.<sup>6</sup> G11C 13/00

U.S. Cl. 365-218

13 Claims



1. A method of operating an electrically readable, electrically erasable and electrically programmable non-volatile memory system that includes a memory array of cells that are organized along rows and columns, whereby a given row is controllable by control inputs of said memory system and said row stores at least one page of data bytes that were supplied from one or more data inputs that is separate from said control inputs of said memory system, said method comprising: applying to said control inputs a first combination of voltage levels that are within a range of voltage levels applied to said control inputs during the read operation and representing a first combination of logical levels to cause erasure of only one page of data from said memory array; and applying to said control inputs a second combination of voltage levels that are within said range of voltage levels applied to said control inputs during the read operation and representing a second combination of logical levels to cause the simultaneous erasure of at least two pages of data from said memory array.

#### 5,440,519 SWITCHED MEMORY EXPANSION BUFFER

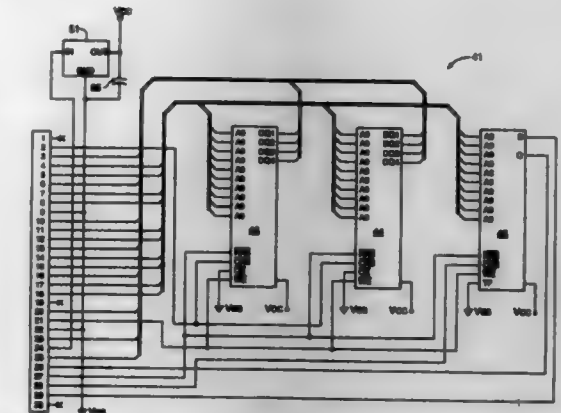
Chase S. Mart, Meridian, and Kenneth J. Kledzik, Boise, both of Id., assignors to Micron Semiconductor, Inc., Boise, Id.

Filed Feb. 1, 1994, Ser. No. 189,813

Int. Cl.<sup>6</sup> G11C 5/14

U.S. Cl. 365-226

22 Claims



1. Array module, for connection to external circuitry, in which a plurality of semiconductor integrated circuit devices are arranged in a manner such that information is obtained by addressing information from a selected number of the integrated circuit devices in the array in a format, characterized by:

- a) a plurality of connection terminals for connection of the module to the external circuitry, in which one of the plurality of connection terminals receives power supply current at an elevated potential, and some of the other connection terminals receive the power supply current at a preferred potential;
- b) a voltage regulator circuit connected to said one connection terminal at an elevated potential, the voltage regulator circuit providing the output to said plurality of integrated circuit devices at the preferred potential, the preferred potential being less than the elevated potential; and
- c) the plurality of connection terminals configured to isolate said one connection terminal, at the elevated potential, from external circuitry at the preferred potential.

#### 5,440,520 INTEGRATED CIRCUIT DEVICE THAT SELECTS ITS OWN SUPPLY VOLTAGE BY CONTROLLING A POWER SUPPLY

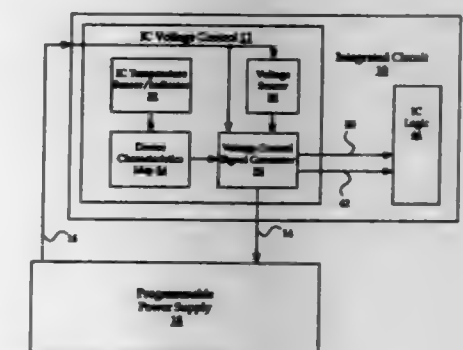
Joseph D. Schutz, Portland, Oreg., and Bill C. Rash, Saratoga, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 16, 1994, Ser. No. 307,190

Int. Cl.<sup>6</sup> G11C 7/04

U.S. Cl. 365-226

7 Claims



5. An apparatus comprising:

a programmable power supply providing a supply voltage according to a plurality of voltage control signals; an integrated circuit (IC) which includes internal logic powered by the supply voltage, the IC further including a sensor providing a temperature signal which corresponds to a current temperature of the IC; a memory storing a plurality of operational voltage values, the memory outputting an operational voltage value which corresponds to the current temperature in response to the temperature signal; and a control signal generator which generates the plurality of voltage control signals in response to the operational voltage value such that the supply voltage corresponds to the operational voltage value.

5,440,521

**SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE**  
Mamoru Tsunozaki, Kodaira; Kyoko Ishii, Hamura; Koichi Nomaki, Chitose; Hiroshi Yoshioka, Akishima; Yoshihisa Koyama, Akishima; Shinji Udo, Akishima; Hidetomo Aoyagi, Akishima; Shinichi Miyatake, Akishima; Makoto Morino, Akishima, and Akihiko Hoshida, Fussa, all of Japan, assignors to Hitachi, Ltd.; Hitachi VLSI Engineering Corp., both of Tokyo and Hitachi Hokkai Semiconductor, Ltd., Hokkaido, all of Japan

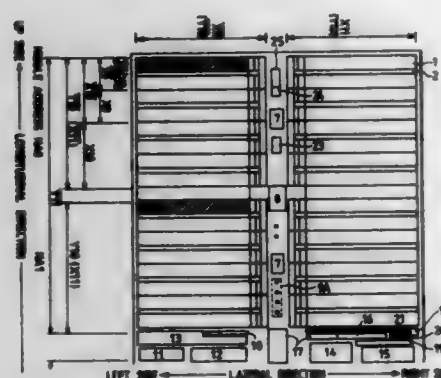
Filed Aug. 19, 1993, Ser. No. 109,071

Claims priority, application Japan, Aug. 19, 1992, 4-242751

Int. Cl. G11C 27/10

U.S. Cl. 365—230.03

13 Claims



1. A semiconductor integrated circuit device formed in a single chip, comprising:

first and second memory blocks each comprising a first selection line, a second selection line and a plurality of memory units, each of said plurality of memory units comprising:

- a first memory mat including:
  - a pair of first data lines,
  - a pair of second data lines, and
  - a plurality of first memory cells each of which is coupled to a corresponding one line of said first and second data lines;
- a second memory mat including:
  - a pair of third data lines,
  - a pair of fourth data lines, and
  - a plurality of second memory cells each of which is coupled to a corresponding one line of said third and fourth data lines;
- a pair of first lines coupled to said pair of first data lines and said pair of third data lines;
- a pair of second lines coupled to said pair of second data lines and said pair of fourth data lines;
- a pair of transmitting lines;
- first switch means for coupling said pair of first lines to said pair of transmitting lines in accordance with a first selection signal transmitted by said first selection line;
- second switch means for coupling said pair of second lines to said pair of transmitting lines in accordance with a

second selection signal transmitted by said second selection line;

(h) a first sense amplifier coupled to said pair of first lines; and

(i) a second sense amplifier coupled to said pair of second lines,

a selecting circuit, disposed in a first plan view area on a main surface of the chip substantially central to both of said first memory block and said second memory block, being coupled to said first selection lines of said first and second memory blocks and coupled to the second selection lines of said first and second memory blocks,

wherein said selecting circuit selects said first selection lines in said first and second memory blocks at the same time and selects said second selection lines of said first and second memory blocks at the same time,

wherein said pair of first lines, said pair of second lines, said pair of transmitting lines, said first switch means, said second switch means, said first sense amplifier and said second sense amplifier are formed in a second plan view area on the main surface of the chip corresponding to a spacing between said first memory mat and said second memory mat,

wherein each of said first selection lines of said first and second memory blocks are branched into two branch lines in at least one portion in said second plan view area, and wherein each of said second selection lines of said first and second memory blocks are branched into two branch lines in at least one portion in said second plan view area.

5,440,522

**CONNECTION/DISCONNECTION CONTROL CIRCUIT FOR DATA LINES BETWEEN MEMORY GROUPS**  
Shin-ichi Hirano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

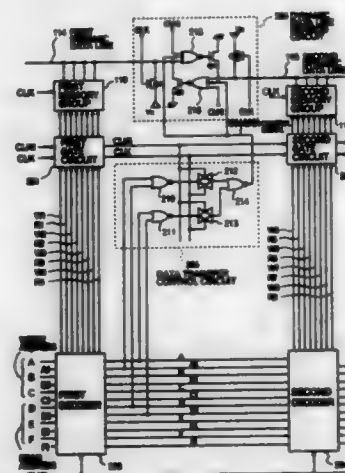
Filed Dec. 6, 1994, Ser. No. 354,136

Claims priority, application Japan, Dec. 6, 1993, 5-305197

Int. Cl. G11C 8/00

U.S. Cl. 365—230.03

15 Claims



1. A memory system comprising a plurality of memory groups each having a plurality of memory cells, a data line provided for each of the plurality of memory groups and commonly connected to the input/output terminals of the plurality of the memory cells of the memory group, and a memory controller for performing data input/output control on all of the memory cells individually, said memory system further comprising:

data line division means capable of performing connection and disconnection between the data lines of two arbitrary adjacent memory groups of the plurality of memory groups; and  
data transfer control means for causing the data line division

means to connect the adjacent data lines only when data transfer is performed between the two adjacent memory groups in accordance with the data input/output control of the memory controller.

5,440,523

**MULTIPLE-PORT SHARED MEMORY INTERFACE AND ASSOCIATED METHOD**

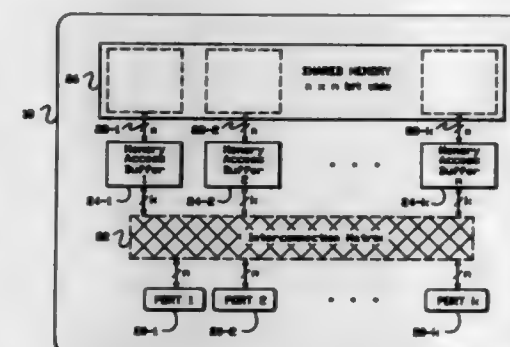
Alexander Joffe, Palo Alto, Calif., assignor to Multimedia Communications, Inc., Santa Clara, Calif.

Filed Aug. 19, 1993, Ser. No. 109,805

Int. Cl. G11C 11/401, 8/04

U.S. Cl. 365—230.05

30 Claims



1. For use in a multi-port memory system which includes random access memory (RAM) and multiple data ports, a memory interface comprising:

multiple buffers, each including multiple storage elements for simultaneous storage of multiple respective data burst subsets transmitted between different respective data ports and said RAM, and further including parallel data path circuitry connectable between individual storage elements and said RAM; and

an interconnect circuit which includes a multiplicity of data lines which interconnect each respective data port with multiple respective buffers such that different respective subsets of any given data burst transmitted between a respective data port and said RAM are conducted to or from different respective buffers via different respective data lines.

5,440,524

**METHOD AND APPARATUS FOR SIMULTANEOUS LONG WRITES OF MULTIPLE CELLS OF A ROW IN A STATIC RAM**

William L. Devanney, Pacific Grove, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Feb. 1, 1994, Ser. No. 190,806

Int. Cl. G11C 8/00

U.S. Cl. 365—230.06

1 Claim

1. An integrated circuit, comprising:

a plurality of static random access memory cells organized in a matrix having a plurality of rows and a plurality of columns;

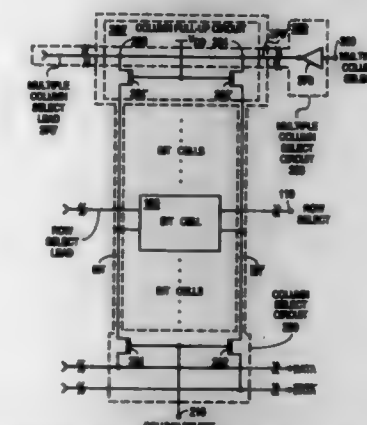
a row addressing circuit having a plurality of row select leads, each of said row select leads being coupled to a corresponding one of said rows of memory cells;

a column addressing circuit having a plurality of column select output terminals;

a plurality of column select circuits, each of said column select circuits having a column select input terminal, each of said column select circuits further comprising a bit line coupled to a corresponding column of said memory cells; and

a multiple column select circuit coupled to said plurality of said column select circuits, wherein said multiple column select circuit comprises a multiple column select lead, said multiple column select lead being coupled to each of said

plurality of column select circuits wherein said multiple column select circuit further comprises a digital logic element having an output terminal, said output terminal of said digital logic element being coupled to said multiple column select lead, said digital logic element being selected from the group consisting of: an inverter, a buffer, a NAND gate, an AND gate, a NOR gate, an OR gate, an exclusive OR gate, an exclusive NOR gate, a latch, and a flip-flop, wherein each of said column select circuits comprises a column pull-up circuit being coupled to said multiple column select lead, said second terminal of each of said column pull-up circuits being coupled to a corresponding one of said bit lines, wherein each of said column



select circuits comprises two bit lines, and wherein each column pull-up circuit comprises a first field effect transistor and a second field effect transistor, a gate of said first field effect transistor being coupled to a gate of said second field effect transistor, a first terminal of said first field effect transistor being coupled to said multiple column select lead, a first terminal of said second field effect transistor being coupled to said multiple column select lead, a second terminal of said first field effect transistor being coupled to one of two bit lines of a column select circuit, a second terminal of said second field effect transistor being coupled to another of said two bit lines of said column select circuit.

5,440,525

**SEISMIC DATA HYDROCARBON INDICATOR**

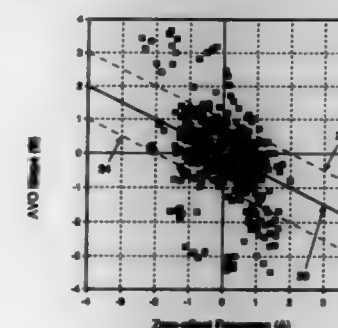
Samir K. Dey-Sarkar; Douglas J. Foster, both of Plano; Steven W. Smith, Houston, and Herbert W. Swan, Richardson, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 25, 1993, Ser. No. 140,913

Int. Cl. G01V 1/36, 1/34

U.S. Cl. 367—52

7 Claims



1. A method for displaying a seismic trace to indicate the presence of hydrocarbons comprising:



selecting from common midpoint seismic data a gather of traces having a common midpoint;  
performing a normal move out correction of the gather of traces;  
calculating a zero offset reflectivity, or A, trace and an amplitude versus offset slope, or B, trace from the corrected gather;  
cross plotting each time sample value of the A trace against the corresponding time sample value of the B trace;  
determining the regression line of the cross plotted A and B samples;  
assigning a value to each time sample proportional to the deviation of said sample from said regression line;  
plotting said assigned values in their sequential time sample positions, whereby said plot provides an indication of hydrocarbons.

5,440,526

## LOW ENERGY ANIMATED TIME PIECE

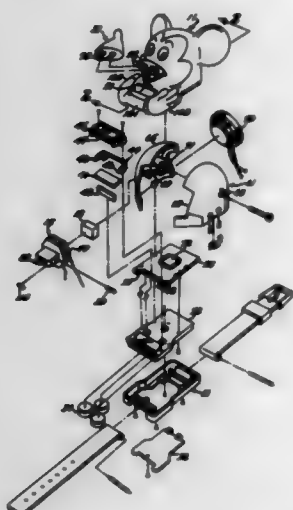
Harold D. Pierce, Westlake Village, Calif.; Stephen C. Jacobsen, and William B. Lee, both of Salt Lake City, Utah, assignors to Sounds Fun, Inc., Northridge, Calif.

Continuation of Ser. No. 775,308, Oct. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 625,485, Dec. 11, 1990, Pat. No. 5,197,044. This application Aug. 15, 1994, Ser. No. 291,341

Int. Cl. G04B 21/08

U.S. Cl. 368-63

10 Claims



1. A low energy consumption animated miniature timepiece comprising:  
a three dimensional figure of an animated character, including at least one movable feature of said character;  
time display means;  
a magnet mounted on said housing;  
balanced animation means operative to move said moveable feature in response to an animation signal, said animation means including an electromagnet, said electromagnet and said moveable feature being balanced in combination as an assembly with said magnet mounted on said housing;  
voice synthesizer means operative to generate an electronic speech synthesizer signal representing a predetermined voice characteristic in response to a voice actuation signal;  
clock means operative to control said time display means and provide a time standard in response to clock control signals;  
means for selecting a first announcement phrase;  
means for inputting a time to be integrated into said first announcement phrase;  
means for selecting a second announcement phrase;  
means for creating a composite announcement incorporation

said first announcement phrase and said second announcement phrase;  
means for synchronously generating an animation signal and said synthesizer signal;  
means for generating clock control signals in response to an external input; and  
sound reproduction means for announcing said composite announcement responsive to said speech synthesizer signal.

5,440,527

## ELECTRONIC TIMEPIECES

Tetsushi Okamoto, Iruma, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

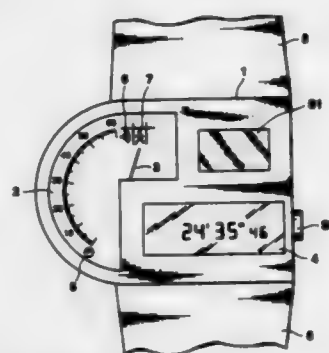
Filed Nov. 16, 1994, Ser. No. 340,548

Claims priority, application Japan, Nov. 22, 1993, 5-313995

Int. Cl. G04B 19/04, 25/00

U.S. Cl. 368-80

19 Claims



1. An electronic timepiece comprising:  
current time display function means for displaying the current time;  
a plurality of other function means different from said current time display function means for providing a plurality of different data;  
pointer means;  
pointer display control means for turning said pointer means within a predetermined range of angles to display data provided by a first at least one of said plurality of other function means;  
electro-optical display means for displaying data provided by a second at least one of said plurality of other function means different from said first at least one of said plurality of other function means; and  
function specifying control means for, when said electro-optical display means displays data provided by said second at least one of said plurality of other function means, moving said pointer means to a predetermined position outside the predetermined range of angles to specify the function of said second at least one of said plurality of other function means.

5,440,528

## DUAL TIME BASE ZERO DEAD ZONE TIME DOMAIN REFLECTOMETER

Joseph F. Walsh, Lynnwood, Wash., assignor to Fluke Corporation, Everett, Wash.

Division of Ser. No. 43,512, Apr. 6, 1993, Pat. No. 5,382,910.

This application Sep. 22, 1994, Ser. No. 311,616

Int. Cl. G04F 8/00, 10/00

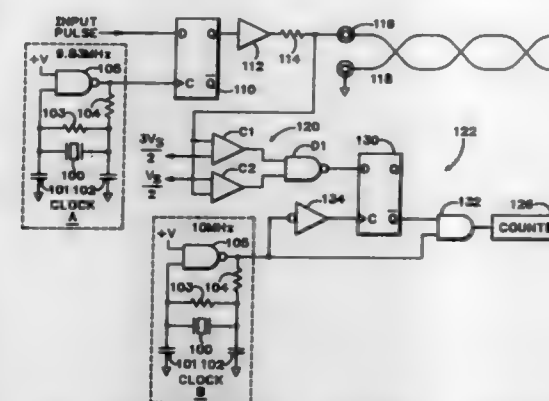
U.S. Cl. 368-113

3 Claims

1. A time interval detector for measuring the time interval between a pulse having a magnitude  $V_s$  and its reflection, comprising:

a first comparator for producing a first output in response to receipt of said pulse and a second output in response to a reflection if the reflection is negative;

a second comparator for producing an output in response to a reflection if the reflection is positive; and



a logic circuit responsive to the outputs of said first and second comparators for producing a logic signal whose duration is proportional to said time interval.

5,440,529

## AUDIO AND GENERAL DIGITAL DATA RECORDING AND/OR REPRODUCING APPARATUS HAVING TWO INTERFACE CIRCUITS

Masayuki Takekawa, Tokyo, and Yasuaki Maeda, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

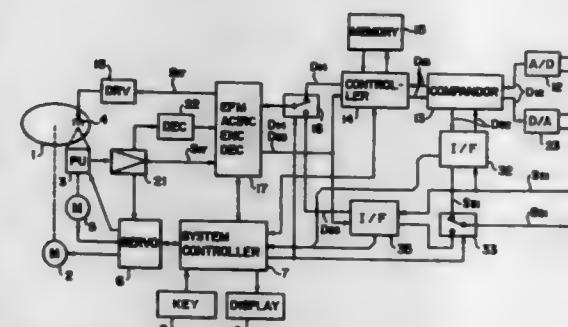
Filed Feb. 10, 1994, Ser. No. 194,402

Claims priority, application Japan, Feb. 24, 1993, 5-059599

Int. Cl. G11B 13/04, 7/00

U.S. Cl. 369-13

10 Claims



1. A digital recording and/or reproducing apparatus using a recording medium, comprising:

a first interface circuit for inputting and outputting digital audio data;  
a second interface circuit for inputting and outputting general digital data excluding said digital audio data;  
an input connector for inputting said digital audio data and said general digital data;  
an output connector for outputting said digital audio data and said general digital data; and  
recording and/or reproducing means for recording and/or reproducing said digital audio data and said general digital data;

wherein in recording said digital audio data, said digital audio data input from said input connector is supplied to said first interface circuit, and said digital audio data output from said first interface circuit is supplied to said recording and/or reproducing means and recorded onto said recording medium by said recording and/or reproducing means;

in reproducing said digital audio data, said digital audio data is reproduced from said recording medium by said recording and/or reproducing means, and said digital audio data

reproduced is supplied to said first interface circuit and output from said output connector;  
in recording said general digital data, said general digital data input from said input connector is supplied to said second interface circuit, and said general digital data output from said second interface circuit is supplied to said recording and/or reproducing means and recorded onto said recording medium by said recording and/or reproducing means; and  
in reproducing said general digital data, said general digital data is reproduced from said recording medium by said recording and/or reproducing means, and said general digital data reproduced is supplied to said second interface circuit and output from said output connector.

5,440,530

## INTEGRATED MAGNETO-OPTICAL HAVING A MAGNETIC HEAD SET BACK FROM AN OPTICAL HEAD

Jean-Marc Fedeli, Besenroissat; Hubert Jouve, Biviers; Stéphane Renard, Champ-Sur-Drac, and Serge Valette, Grenoble, all of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Division of Ser. No. 879,840, May 6, 1992, Pat. No. 5,317,800.

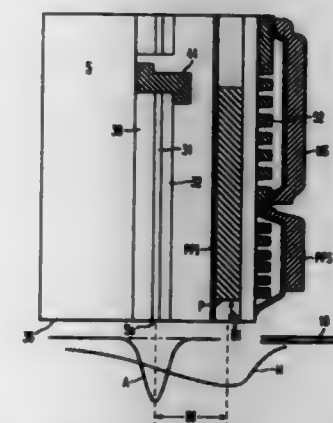
This application Mar. 8, 1994, Ser. No. 207,207

Claims priority, application France, May 7, 1991, 91 05622

Int. Cl. G11B 11/00

U.S. Cl. 369-13

4 Claims



1. Integrated magneto-optical read and write head on a magnetic recording medium (10), said head comprising two subassemblies integrated on a substrate (S), namely:

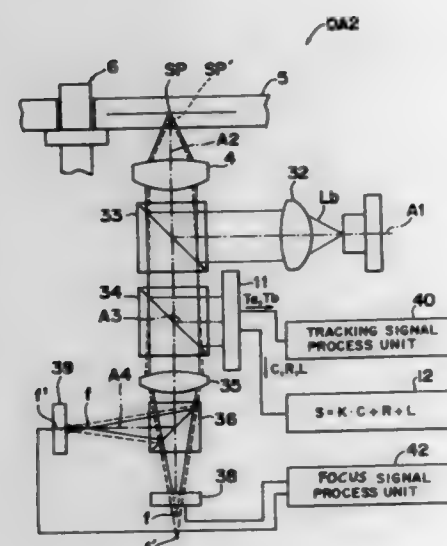
A) a first subassembly (SE1), comprising an optical input (EO) able to receive an optical radiation, an optical output (SO) placed in an output plane (36), first optical guide means (30, 31, 32, MP1, MP2) between said input (EO) and said output (SO), a photodetector (D), second optical guide means between said output (SO);

B) a second subassembly (SE2) being fixed to one side of the first subassembly (SE1) and non-movable with respect to said first subassembly (SE1), comprising a magnetic circuit with at least one polar part (PPI) placed in a plane perpendicular to the output plane, said polar part (PPI) exhibiting a magnetic pole (P) turned toward said recording medium (10), an electrically conductive coil (52) formed about an axis substantially perpendicular to the magnetic pole surrounding said magnetic circuit, said head being characterized by the fact that said magnetic pole (P) is set back relative to said optical output plane (36), said optical output (SO) of said first subassembly (SE1) and said magnetic pole (P) of said second subassembly (SE2) thus exhibiting a crosswise offset (Dt); and said crosswise offset (Dt) being a difference between a distance (Dp), defined by a length between the first sub-





- a second converging means having a focal point located in said second path for converging said first guided laser beam on said focal point;
- a second beam guide means located in said second path between said first guide means and said second converging means for guiding a portion of said first guided laser beams in a third direction to produce a second guided laser beam having a third path;
- a first photodetection means located in said third path for receiving said second guided laser beam to produce tracking signals and information signals based on said second guided laser beam received thereon, said first photodetection means formed by dividing a photoelectric element into four portions vertically and into two portions horizontally such that eight segments of said divided photoelectric element are arranged in a matrix, said matrix formed in a rectangular shape, each of said eight segments producing an electric signal based on said second guided laser beam received thereon;
- a second photodetection means located in said second path between said second converging means and said focal point, said second photodetection means receiving said first guide laser beam to produce a first focus signal;



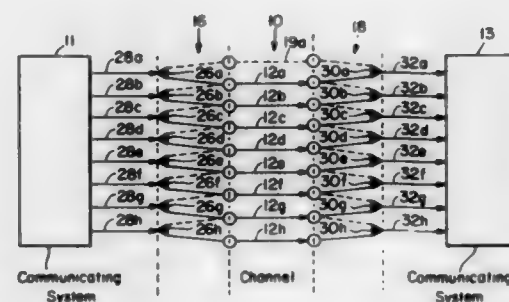
- a beam dividing means located in said second path between said second converging means and said second photodetection means for guiding a portion of said first guided laser beam in a fourth direction to produce a third guided laser beam having a fourth path;
- a third photodetection means located in said fourth path far away from said focal point, said third photodetection means receiving said third guided laser beam to produce a second focus signal; and
- a signal reproduction means connected with said first photodetection means for reproducing said record signal, said signal reproduction means comprising:
- (a) a first addition means for adding signals produced by four of said eight segments arranged in opposite vertical side end portions of said matrix to produce a first added signal;
- (b) a second addition means for adding signals produced by four of said eight segments arranged in center portions of said matrix to produce a second added signal;

- (c) a multiplier means for multiplying said second added signal by a predetermined value to produce a first multiplied signal; and
- (d) a third addition means for adding said first added signal and said first multiplied signal to produce said record signal.

5,440,537

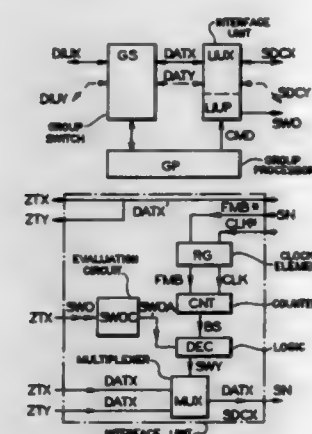
Patent Not Issued For This Number

**5,440,538**  
**COMMUNICATION SYSTEM WITH REDUNDANT LINKS AND DATA BIT TIME MULTIPLEXING**  
 James J. Olsen, Concord, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.  
 Filed Sep. 23, 1993, Ser. No. 126,302  
 Int. Cl.<sup>6</sup> H04L 1/00, 1/22  
 U.S. Cl. 370-13 25 Claims



1. A method of continuing use of a multiple link communication channel as links of the channel become inoperative comprising:
- reconfiguring the communication channel to use less than all communication links of the channel; and
- transmitting the data over operating links by storing bits of a data word being transmitted while directly transmitting remaining bits of the data word such that data words are transmitted across the channel over the operating links in time multiplexed fashion.

**5,440,539**  
**METHOD OF CONTROLLING AN ELECTRICAL SWITCHING DEVICE IN RESPONSE TO A SIGNAL CONFIGURATION OF A SWITCHING SIGNAL**  
 Werner Nagler, Schäftlarn, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany  
 PCT No. PCT/EP92/00030, § 371 Date Jul. 20, 1993, § 102(e) Date Jul. 20, 1993, PCT Pub. No. WO92/13429, PCT Pub. Date Aug. 6, 1992  
 PCT Filed Jan. 9, 1992, Ser. No. 94,087  
 Claims priority, application European Pat. Off., Jan. 23, 1991, 91100852  
 Int. Cl.<sup>6</sup> H04J 3/14; H04Q 1/20  
 U.S. Cl. 370-16 6 Claims

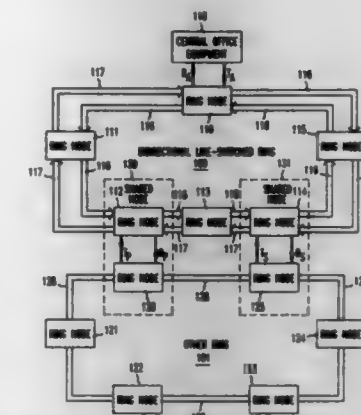


1. A method of controlling an electrical switching device for switching between at least two switching states, the two switching states being a normal switching state and a protection-switching state, by a switching signal, comprising the steps of:
- controlling the switching device such that the switching device is placed into a switching state of the two switching states in response to the switching signal, said switching signal having at least a static signal configuration and a pulse-shaped signal configuration;
- controlling the signal configuration of the switching signal by an exciter device as a function of switching conditions monitored by the exciter device;
- controlling the switching device such that the switching device is placed into the protection-switching state when the switching signal has a static signal configuration;
- controlling the switching device such that the switching device is placed into the normal switching state when the switching signal has a pulse-shaped signal configuration.

**5,440,540**  
**RING INTERWORKING BETWEEN A BIDIRECTIONAL LINE-SWITCHED RING TRANSMISSION SYSTEM AND ANOTHER RING TRANSMISSION SYSTEM**  
 Wilhelm Kremer, 59 Colonial Dr., Dracut, Mass. 01826  
 Filed Mar. 26, 1992, Ser. No. 855,795  
 Int. Cl.<sup>6</sup> H04J 1/16 36 Claims

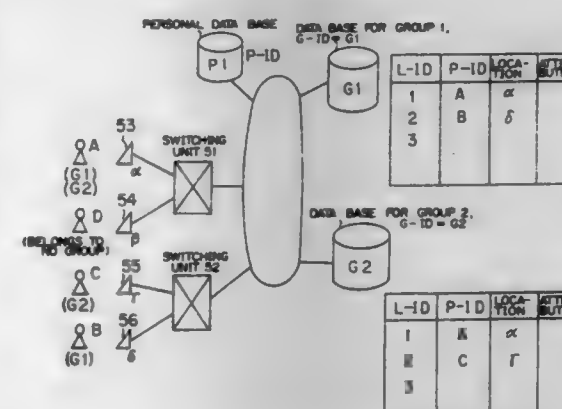
- U.S. Cl. 370-16.1
1. A first ring node for use in a first ring transmission system, comprising:
- a means for monitoring signals into the first ring node to determine whether a second ring node in the first ring transmission system has failed, wherein the second ring

- node connects the first ring transmission system to a second ring transmission system;
- a means responsive to a determination that the second ring node has failed for detecting an active communications circuit passing through the first ring node and terminated in the second ring transmission system; and



- a means for redirecting the active communications circuit to a third ring node in the first ring transmission system, wherein said redirecting means is responsive to the detecting means and the third ring node connects the first transmission system to the second ring transmission system.

**5,440,541**  
**SYSTEM AND METHOD FOR ESTABLISHING COMMUNICATIONS BETWEEN SUBSCRIBERS BASED ON PERSONAL NUMBER ASSIGNED TO EACH SUBSCRIBER**  
 Ichiro Iida, and Toshihiko Kurita, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan  
 Filed Jul. 29, 1993, Ser. No. 99,163  
 Claims priority, application Japan, Dec. 16, 1992, 4-336026  
 Int. Cl.<sup>6</sup> H04J 3/24 21 Claims  
 U.S. Cl. 370-60.1



1. A personal communications method for establishing communications based on a personal identifier indicating a personal ID assigned to each subscriber, the method comprising the steps of:
- assigning to each subscriber said personal identifier and an additional identifier which is a sum of a group identifier indicating a group to which a subscriber belongs and a local identifier indicating a local ID of said subscriber within said group;
- storing, in a personal data base, a location information of the subscriber associated with said personal identifier including an area identifier;

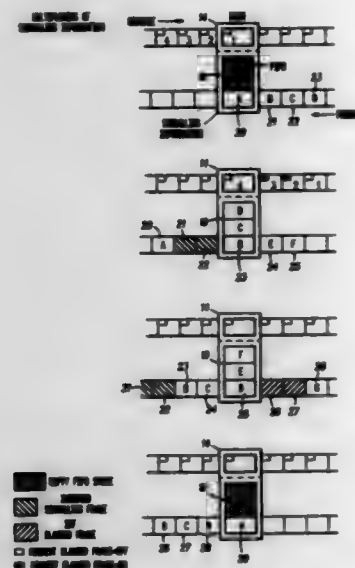
storing, in a group data base, a location information of the subscriber associated with the group identifier and the local identifier;  
inputting into a group data base one of the personal identifier and the additional identifier which is a sum of the group identifier and the local identifier, of a destination subscriber;  
retrieving location information of the destination subscriber using one of the personal identifier from the personal data base and the additional identifier which is a sum of the group identifier and the local identifier, from the group data base; and  
establishing communications between a source subscriber and the destination subscriber based on the location information of the destination subscriber.

5,440,542

# METHOD AND APPARATUS FOR MULTIPLEXING CONTROL INFORMATION INTO A USER SIGNAL STREAM OF A CDMA CELLULAR SYSTEM

Lee M. Procter, Elgin, and Jay P. Jayapalan, Buffalo Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.  
Filed Oct. 14, 1993, Ser. No. 114,943  
Int. Cl.<sup>6</sup> H04J 13/00, 3/12; H04Q 7/22  
U.S. Cl. 370—18

5 Claims

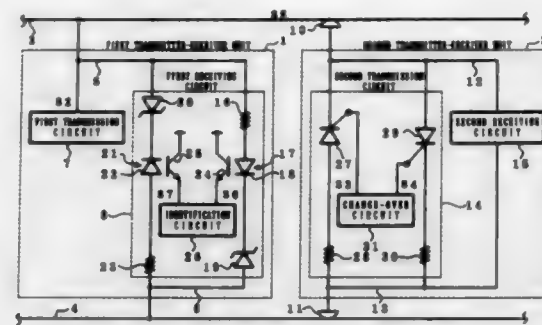


1. In a base station controller of a cellular communication system using code division multiple access encoding, a method of multiplexing control information for a communication unit into a user signal stream, the method comprising the steps of: receiving at a transcoder of the base station from an interworking function of the cellular system, user information to be encoded and communicated to the communication unit in the user signal stream; receiving at the transcoder control information to be inserted in the user signal stream; determining a temporal measure of the received control information; inserting the control information into the user signal stream while buffering a corresponding temporal measure of user information; communicating the temporal measure to the interworking function by marking a corresponding temporal measure of information communicated from the transcoder to the interworking function on a reverse channel; generating, within the interworking function, a set of null characters temporally equal to the temporal measure; and substituting the buffered user information for the null characters.

## 5,440,543 DUPLEX SYSTEM USING A SINGLE TRANSMISSION LINE

Takao Wakabayashi, Osaka, Japan, assignor to Nakanishi Metal Works Co., Ltd., Osaka, Japan  
Filed Jun. 5, 1992, Ser. No. 146,741  
Claims priority, application Japan, Jun. 7, 1991, 3-136841  
Int. Cl.<sup>6</sup> H04L 5/14, 27/00; H03D 3/02  
U.S. Cl. 370—24

6 Claims



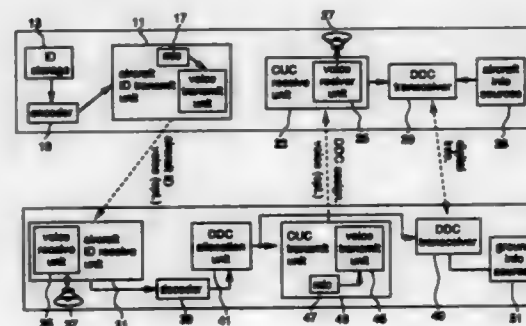
1. A signal transmitter-receiver system comprising first and second transmitter-receiver units interconnected by a signal transmission line, the first transmitter-receiver unit including first transmission means for delivering an a.c. signal, selected among a plurality of a.c. signals each having a distinct phase difference with respect to a reference a.c. signal to the signal transmission line at each of predetermined communication time intervals, the second transmitter-receiver unit including second receiving means for identifying the phase difference of the a.c. signal or the signal transmission line with respect to the reference a.c. signal at each communication time interval, the second transmitter-receiver unit including second transmission means for changing the combination of positive and negative amplitudes of the a.c. signal on the signal transmission line to one of a plurality of states at each communication time interval, the first transmitter-receiver unit including first receiving means for identifying the state of the combination of positive and negative amplitudes of the a.c. signal on the signal transmission line at each communication time interval.

5,440,544

# INTEGRATED DATA LINK CONCEPT FOR AIR TRAFFIC CONTROL APPLICATIONS

Richard L. Zinser, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
Filed Dec. 27, 1993, Ser. No. 173,226  
Int. Cl.<sup>6</sup> H04J 4/00; H04M 11/00  
U.S. Cl. 370—50

10 Claims



1. A system for communicating information between an aircraft unit and a ground unit comprising:  
a) an aircraft ID transmission means in the aircraft unit, capable of transmitting an aircraft identification on an existing radio voice channel;

- b) an aircraft ID receive means in the ground unit, capable of receiving the transmitted aircraft identification from the aircraft ID transmission means;
- c) a dedicated digital channel (DDC) allocation unit in the ground unit, coupled to the aircraft ID receive means for determining if there is a channel currently allocated to this aircraft ID and corresponding aircraft, and if not, for allocating a frequency for digital communications with this aircraft which is between existing aircraft voice channels;
- d) a control uplink channel (CUC) transmitter in the ground unit, coupled to the DDC allocation unit, for transmitting the DDC frequency information on a control uplink channel (CUC) frequency which has been predetermined for this ground unit;
- e) a CUC receiver in the aircraft unit capable of receiving the DDC frequency allocated for the aircraft;
- f) a DDC transceiver in the aircraft unit, responsive to the CUC receiver, for communicating digital information with the ground unit on the allocated DDC frequency with minimal interference; and
- g) a DDC transceiver in the ground unit, responsive to the CUC receiver, for communicating digital information with the aircraft unit on the allocated DDC, frequency with minimal interference.

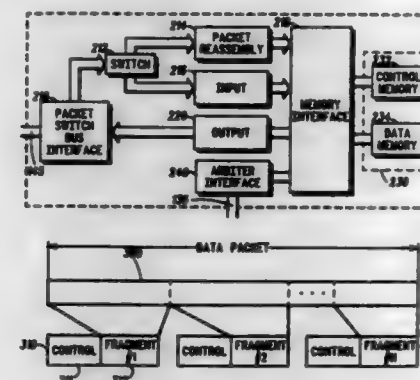
5,440,545

# PACKET DELIVERY SYSTEM

Dale R. Buchholz, Palatine; William K. Does, Lake In The Hills; R. Lee Hamilton, Jr., Palatine; Richard E. White, Cary, and Karen Robbins, Lake Zurich, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.  
Filed Aug. 2, 1993, Ser. No. 100,403  
Int. Cl.<sup>6</sup> H04L 12/56

U.S. Cl. 370—60

5 Claims



1. In a packet switching system, a packet switch for acknowledging receipt of a plurality of packet fragments associated with a fragmented data packet, said packet switch comprising:

- a transceiver for transmitting acknowledgment signals and receiving said plurality of packet fragments, each packet fragment comprising address, control and data information associated with the fragmented data packet;
- said packet switch, coupled to the transceiver and comprising memory logic, for acknowledging, via acknowledgment signal, reception of said packet fragments and determining whether all packet fragments comprising the fragmented data packet have been received;
- means, coupled to the memory logic, for enabling a system processor interrupt signal when all packet fragments comprising the fragmented data packet have not been received;
- means, coupled to the enabling means, for interrupting a system processing resource via said interrupt signal upon receipt of a retransmitted packet fragment; and
- means, coupled to the system processing resource, for sched-

uling transmission of an acknowledgment signal of the retransmitted packet fragment.

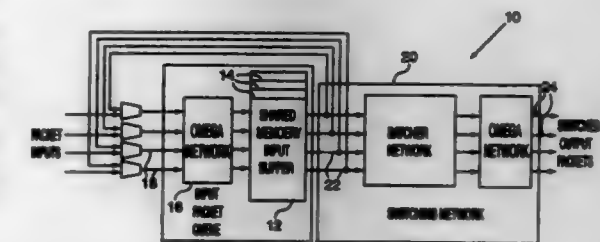
5,440,546

# PACKET SWITCH

Ronald P. Bianchini, Jr., and Hyong S. Kim, both of Pittsburgh, Pa., assignors to Carnegie Mellon University, Pittsburgh, Pa.  
Continuation of Ser. No. 777,737, Oct. 16, 1991, Pat. No. 5,287,346. This application Oct. 22, 1993, Ser. No. 141,919  
The portion of the term of this patent subsequent to Feb. 15, 2011, has been disclaimed.  
Int. Cl.<sup>6</sup> H04Q 11/04

U.S. Cl. 370—60

15 Claims



1. A packet switch comprising:  
a shared memory queue having M interleaved storage banks having addresses at which respective packets are stored, where M is an integer > 3;  
a presentation network having N input ports for receiving packets and providing the respective packets to desired addresses in the shared memory queue, where N is an integer, the shared memory queue in communication with the presentation network for receiving the packets;  
a distribution network having J output ports, for receiving packets from the shared memory queue and providing them to the desired output ports, the distribution network in communication with the shared memory queue;  
means for simultaneously generating addresses for packets received by the presentation network such that packets received on ordered input ports by the presentation network are caused to be provided by the presentation network to consecutively ordered addresses in the shared memory queue; and  
feedback means having F ≥ 0 feedback channels in communication with the shared memory and the presentation network for restoring packets blocked from the distribution network.

5,440,547

# DATA-TRANSFER ROUTING MANAGEMENT FOR PACKET-ORIENTED DIGITAL COMMUNICATION SYSTEM INCLUDING ATM NETWORKS

Hiroshi Easaki; Shigeyasu Natsubori, both of Yokohama; Takeshi Saito, Tokyo; Yoshiyuki Tsuda, Kawasaki, and Shigeo Matsuzawa, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Filed Jan. 5, 1994, Ser. No. 177,547  
Claims priority, application Japan, Jan. 7, 1993, 5-001267; Mar. 12, 1993, 5-079112; Sep. 14, 1993, 5-229241  
Int. Cl.<sup>6</sup> H04L 12/56

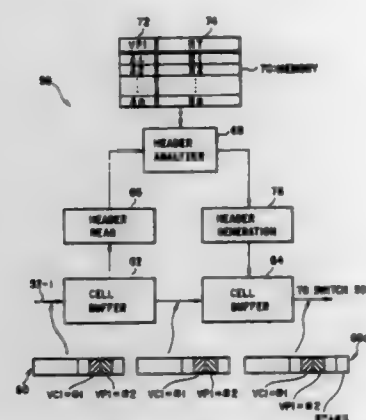
U.S. Cl. 370—60

19 Claims

1. An asynchronous transfer mode network adapted to be associated with a plurality of data terminals, said network comprising:  
a plurality of data exchange nodes;  
a plurality of data transfer links interconnecting said data exchange nodes so that said terminals are connected by corresponding data links associated therewith to said data exchange nodes in said network;  
means for selectively establishing in said network a virtual circuit over which a series of data packets including one



or a plurality of coded cells are routed from at least one source terminal toward at least one destination terminal, each of said cells having an information field and a header section; and  
said means (i) writing, when a cell is transferred from said source terminal to said destination terminal along a presently determined route including selected links associated

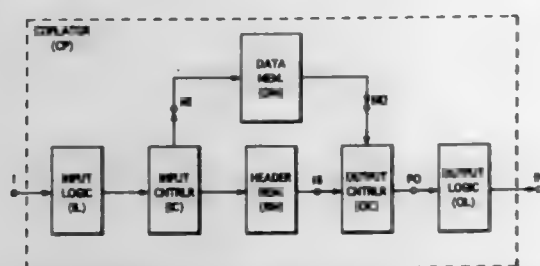


**5,440,548**  
**MULTICAST PACKET GENERATION DEVICE FOR A PACKET SWITCHING TELECOMMUNICATION SYSTEM**  
Frank L. Denissen, Van Lieruslaan, Belgium, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 24, 1993, Ser. No. 36,477  
Claims priority, application European Pat. Off., Mar. 27, 1992, 92200870

Int. Cl.<sup>6</sup> H04L 12/56  
U.S. Cl. 370-60

11 Claims

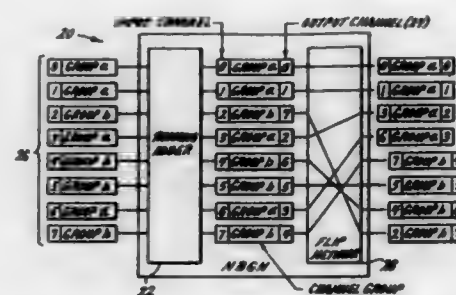


1. A telecommunication system having at least one system input (I; I1/m) and a plurality of system outputs (O1/n) and including a plurality of multicast packet generation devices (CP1/m) and a packet switching network (SN), said packet switching network having a plurality of network inlets (IN1/m) and a plurality of network outlets (O1/n), each of said network outlets (O1/n) respectively corresponding to one of said system outputs (O1/n), each of said multicast packet generation devices having a single inlet corresponding to one of said system inputs and a single outlet connected to one of said network inlets, each of said multicast packet generation device being adapted to derive a plurality of distinct multicast packets from an original packet applied to said single inlet and to transmit said multicast packets in series to said single outlet, and said switching network being adapted to control the trans-

fer of each of said multicast packets from any one of said network inlets to any one of said network outlets.

**5,440,549**  
**BROADBAND MULTI-CHANNEL SWITCH WITH MULTICASTING CAPABILITY**  
Paul S. Min, and Hossein Saidi, both of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.  
Filed Apr. 22, 1993, Ser. No. 52,635  
Int. Cl.<sup>6</sup> H04L 12/56  
U.S. Cl. 370-60

35 Claims

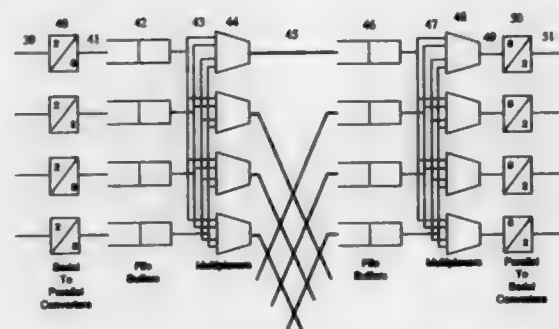


1. A non-blocking switch for an ATM network having: a plurality of inputs for connection to a plurality of input channels over which a plurality of data cells arrive in a sequence; a plurality of outputs over which said data cells are routed to a plurality of output channels; said plurality of output channels being grouped into a plurality of channel groups; and means for processing said data cells from said inputs to at least one of said channel groups, said processing means including means for maintaining the sequence of said data cells as they are processed to thereby ensure their sequence is the same as they leave said switch through said outputs.

**5,440,550**  
**HIGH SPEED SWITCHING ARCHITECTURE**  
Douglas Follett, Carlingford, Australia, assignor to Telstra Corporation Limited, Sydney, Australia  
PCT No. PCT/AU92/00322, § 371 Date Nov. 18, 1993, § 102(e) Date Nov. 18, 1993, PCT Pub. No. WO93/01669, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 1, 1992, Ser. No. 180,076  
Claims priority, application Australia, Jul. 1, 1991, PK6968  
Int. Cl.<sup>6</sup> H04L 12/56  
U.S. Cl. 370-60

6 Claims



1. A multistage space division packet switch, comprising a switching fabric unit SFU having a plurality of inputs and a plurality of outputs, each input having an input port controller means and each output having an output port controller means, wherein said input port controller means are adapted to convert each input serial packet into a plurality of parallel sub-packets, said SFU including internal parallel switching planes,

each of said parallel switching planes comprising a first stage including a first buffer means, a parallel interconnect network, and a second stage comprising at least one buffer means associated with each of a plurality of addressable outputs, and said output port controller means including means for converting said parallel subpackets into a serial packet form for output.

**5,440,551**  
**MULTIMEDIA PACKET COMMUNICATION SYSTEM**  
Hiroshi Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
Filed Jan. 4, 1994, Ser. No. 177,755  
Claims priority, application Japan, Jan. 5, 1993, 5-000141  
Int. Cl.<sup>6</sup> H04Q 11/04  
U.S. Cl. 370-60

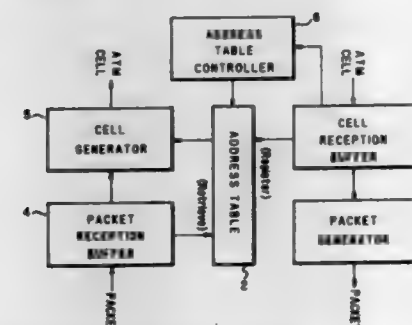
3 Claims

300	UDP	TCP Short burst	TCP Long burst (FTP)	Stream type Realtime
301	No set up delay	Short setup delay	Low loss High-throughput Long setup delay	Low loss & delay High-throughput Long setup delay
302	CONNECTIONLESS MODE	CONNECTION MODE		
303	FIXED/DEFAULT RATE BAND ALLLOCATION	DYNAMIC/ADAPTIVE RATE BAND ALLLOCATION		
304	DATA TYPE AAL		STREAM TYPE AAL	

1. A multimedia packet communication system, comprising: a network layer; and an application layer of a higher order than said network layer; said application layer delivering a plurality of different quality parameters including an identifier between a stream type and a burst type, a degree of a delay of packet transfer and a degree of a throughput together with an address of the other party to said network layer; said network layer including mapping means for mapping, for each packet, setting of a mode to a connectionless mode or a connection mode and setting of whether or not reservation of a band should be performed in accordance with the quality parameters delivered thereto from said application layer, and an ATM driver for establishing a connection to the address of the other party in accordance with a result of the mapping and executing band control to effect a transfer of packets in an asynchronous transfer mode.

**5,440,552**  
**ATM CELL ASSEMBLING/DISASSEMBLING SYSTEM**  
Masahiro Sugita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
Filed Jan. 19, 1994, Ser. No. 182,987  
Claims priority, application Japan, Jan. 21, 1993, 5-027297  
Int. Cl.<sup>6</sup> H04L 12/56, 12/66  
U.S. Cl. 370-60

5 Claims

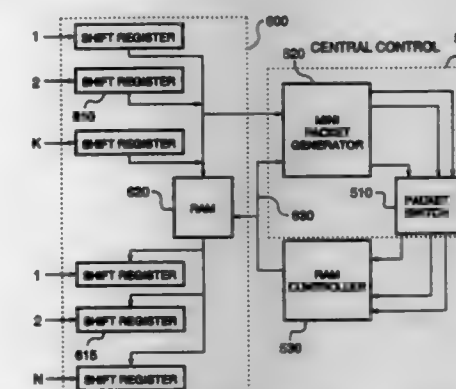


1. An asynchronous transfer mode (ATM) cell assembling/disassembling system comprising:

a cell reception buffer connected to a system bus for storing successive received ATM data cells, packet generation means connected to a local area network (LAN) for assembling packet data from the ATM data cells stored in said cell reception buffer, an address table for registering address information included in said received ATM data cells, a packet reception buffer for storing successive received packet data from the LAN, cell generation means connected to the system bus for disassembling the packet data stored in said packet reception buffer into ATM cell data on the basis of address information retrieved from said address table, and control means for controlling registration and retrieval of address information in said address table, said control means being operative to register all address information of said received ATM data cells in said address table at the time of receiving the ATM data cells and update address information which is the same in said address table only when there is idle time for a process of assembling packet data from said ATM data cells by said packet generation means or when there is no empty area in said address table.

**5,440,553**  
**OUTPUT BUFFERED PACKET SWITCH WITH A FLEXIBLE BUFFER MANAGEMENT SCHEME**  
Indra Widjaja, 30 St. Charles Street West, Apt. 1522, Toronto, Ontario, Canada M4Y 1R5, and Alberto Leon-Garcia, 8 Longspur Road, Toronto, Ontario, Canada M4B 2Z2  
Continuation of Ser. No. 140,599, Oct. 21, 1993, abandoned, which is a continuation of Ser. No. 894,116, Jun. 5, 1992, Pat. No. 5,274,642. This application Dec. 19, 1994, Ser. No. 359,350  
Int. Cl.<sup>6</sup> H04L 12/56  
U.S. Cl. 370-60

23 Claims



1. A central control switch for switching an input column of data packets having predetermined destination addresses and predetermined priority values, comprising:

- a memory means for receiving and storing said input column of data packets at memory locations defined by predetermined memory addresses, and in response outputting said memory addresses;
- a central control connected to said memory means, said central control for receiving said memory addresses and header data corresponding to said memory addresses, respectively, and in response generating a column of output minipackets for specifying the locations of said data packets to be output at a predetermined time;
- a memory controller connected to said memory means and said central control for reading out said data packets from said memory means in accordance with data contained in said output minipackets, wherein said central control further comprises:
- a minipacket generator connected to said memory means for receiving said header data from said input data packets

and said memory addresses of said data packets and in response generating a column of minipackets; and  
e) a packet switch connected to said minipacket generator for receiving and switching said column of minipackets according to said header data and in response transmitting said output minipackets to said memory controller.

5,440,554

## BROADBAND PRIVATE AUTOMATIC BRANCH EXCHANGE

Richard Stannard, Stuttgart; Hartmut Dugger, Hemmingen, and Volker Werbus, Stuttgart, all of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

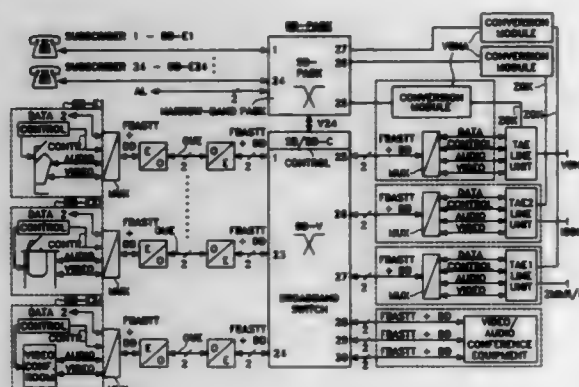
Filed Jan. 31, 1991, Ser. No. 648,487

Claims priority, application Germany, Feb. 1, 1990, 40 02 162.3

Int. Cl. H04L 12/64

U.S. Cl. 370-60.1

7 Claims



1. Broadband private automatic branch exchange comprising:
  - a broadband switching array for switching video, audio, and data messages;
  - a plurality of broadband terminals each connected to a respective one of a plurality of input/output terminals of the broadband switching array;
  - a subscriber line unit for a public switched broadband network, said line unit being connected to an additional input/output terminal of the broadband switching array;
  - a telephone private automatic branch exchange having said plurality of broadband terminals each also connected to a corresponding input/output terminal of the telephone private automatic branch exchange like a conventional narrow band telephone user station;
  - a narrow band/broadband signaling conversion module connected to the subscriber line unit and, like a conventional narrow band telephone user station, to an additional input/output terminal of the telephone private automatic branch exchange; and
  - a narrow band/broadband connection computer connected to the broadband switching array and the telephone private automatic branch exchange for setting up and releasing broadband connections.

5,440,555

## ACCESS SYSTEM

Morihisa Momona, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 25, 1993, Ser. No. 111,552

Claims priority, application Japan, Aug. 27, 1992, 4-228117

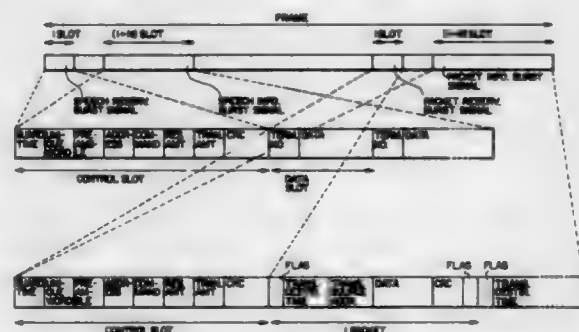
Int. Cl. H04J 3/16

U.S. Cl. 370-79

8 Claims

1. An access system, comprising:
  - a master station and a plurality of slave stations;
  - a channel of the broadcasting type for allowing communica-

tion from said master station to all of said slave stations; and  
a multiple access channel for allowing communication from all of said slave stations to said master station, wherein each of said slave stations transmits, in accordance with control information from said master station, reservation information for acquirement of a transmission right or both the reservation information and data to said master station by way of said multiple access channel, and said master station, based on the reservation information received from said slave stations, transmits to each of said slave stations that do not request the transmission right, control information of an instruction of transmission of the reservation information, and transmits to each of said slave stations which request the transmission right, control information of an instruction of transmission of the reservation information and data, by way of said channel of the broadcasting type, said access system characterized in that



- each of said slave stations requests from said master station, the transmission right for constant bit rate data and variable bit rate data, and
- for each request for the transmission right for constant bit rate data from each of said slave stations, said master station allocates the transmission right for constant bit rate data to all of the slave stations for each transmission period for constant bit rate data which depends upon the transmission bit rate of the constant bit rate data, and
- for a request for the transmission right for variable bit rate data from each of said slave stations, after the allocation of the transmission right for constant bit rate data, said master station successively allocates the transmission right for variable bit rate data to a non-used region within the transmission period for the constant bit rate data in the order in which the requests for the transmission right for variable bit rate data were accepted, thereby accommodating the constant bit rate data and the variable bit rate data in the transmission period.

5,440,556

## LOW POWER ISOCHRONOUS NETWORKING MODE

Brian C. Edem, San Jose; Debra J. Worsley, Vista, and Michael S. Evans, San Jose, all of Calif., assignors to National Semiconductor Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 970,313, Nov. 2, 1992. This application Nov. 1, 1993, Ser. No. 146,723

Int. Cl. H04B 1/38; H04J 3/06; H04L 7/00

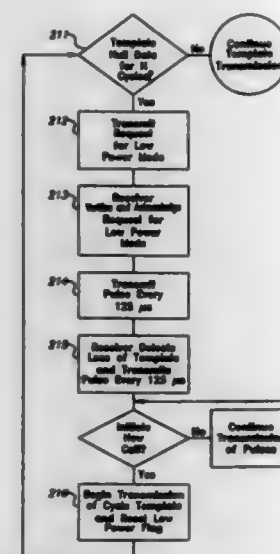
U.S. Cl. 370-79

23 Claims

1. A method for conserving power consumption in an isochronous data network having first and second transceivers which communicate over a network medium comprising the steps of:

- repetitively transmitting cycle frame templates from said first transceiver to said second transceiver over said network medium;
- repetitively transmitting cycle frame templates from said second transceiver to said first transceiver over said network medium;

detecting, by said first transceiver, a repeated transmission of null data in a plurality of cycle frame templates received from said second transceiver over said network medium; transmitting from said first transceiver to said second transceiver over said network medium a request to enter a low power operating mode;



- transmitting from said second transceiver to said first transceiver over said network medium an acknowledgement of said request; and
- repetitively transmitting from said first transceiver to said second transceiver over said network medium a first transceiver pulse of a given duration in lieu of transmitting said cycle frame templates for conserving power in said first transceiver.

5,440,557

## APPARATUS AND METHODS FOR PROVIDING AN INTERFACE BETWEEN FDDI-II RINGS

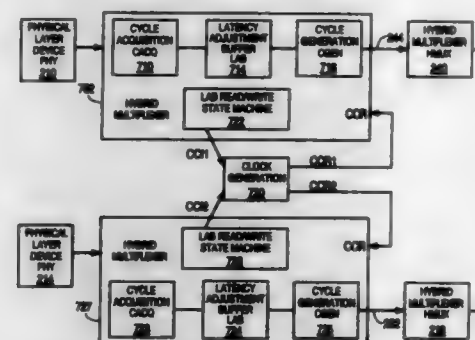
David C. Brief, Palo Alto, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 21, 1993, Ser. No. 176,372

Int. Cl. H04L 7/08, 12/66; H04J 14/02

U.S. Cl. 370-85.14

27 Claims



12. A method for frequency aligning signals provided by an FDDI-II hybrid multiplexer HMUX1 having a latency adjustment buffer LAB1 with signals provided by another FDDI-II hybrid multiplexer HMUX2 having a latency adjustment buffer LAB2, said method comprising the steps of:
  - controlling the frequency of writing data into said buffer LAB1 by a cycle reference signal CLK1;
  - controlling the frequency of writing data into said buffer LAB2 by a cycle reference signal CLK2; and

selecting one of said signals CLK1, CLK2 to control the frequency of reading data from said buffers LAB1, LAB2.

5,440,558

## DATA LINK SETUP IN CONNECTION-ORIENTED LOCAL AREA NETWORK WITH FLOATING ADMINISTRATION OF DATA LINK ADDRESSES

Takayuki Ban, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 673,306, Mar. 22, 1991, abandoned.

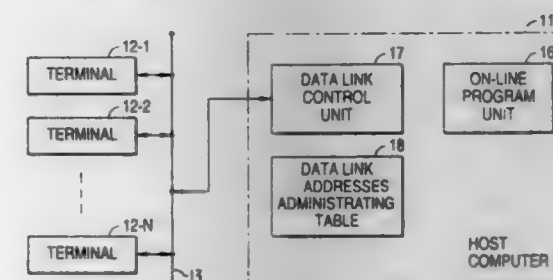
This application Mar. 14, 1994, Ser. No. 212,690

Claims priority, application Japan, Mar. 22, 1990, 2-72842

Int. Cl. H04L 12/28

U.S. Cl. 370-85.1

7 Claims



1. An on-line information processing system comprising:
  - a host computer;
  - a plurality of terminals; and
  - a connection-oriented local area network for connecting said terminals to said host computer, said terminals delivering local connection requests to said connection-oriented local area network;
- said host computer including:
  - an on-line program unit for carrying out on-line information processing and for producing host connection requests for said terminals;
  - a data link control unit connected to said connection-oriented local area network and to said on-line program unit for establishing a plurality of data links between said host computer and said terminals in said connection-oriented local area network in compliance with said host connection requests and said local connection requests; and
  - a data link address administrating table connected to said data link control unit and having a number of communication control information areas equal to or less than the number of terminals, said data link address administrating table storing predetermined information related to establishment of data links, each of said areas including a frame retransmission number field, a response monitoring time interval field, a data link address field and a data link state field;
- wherein, data link addresses are stored in said data link address field and are preassigned for each of said terminals.

5,440,559

## PORTABLE WIRELESS COMMUNICATION DEVICE

Garold B. Gaskill, Tualatin, Oreg., assignor to Seiko Communications Holding N.V., Netherlands Antilles

Filed Nov. 10, 1993, Ser. No. 149,993

Int. Cl. H04B 10/22; H04J 3/00; H04Q 7/20

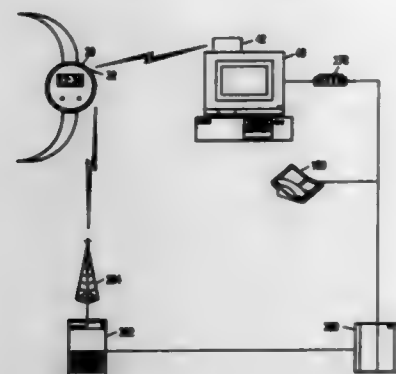
U.S. Cl. 370-95.1

4 Claims

1. A method for a personal communication device and a second device to communicate, where the personal communication device includes a receiver and the second device includes a short-range transmitter, the method comprising:
  - the second device transmitting a hailing message using the short-range transmitter of the second device; and
  - the personal communication device periodically attempting



to receive a hailing message using the receiver of the personal communication device wherein the personal communication device includes a group list containing a group name, further comprising



the step of hashing the group name, resulting in a number representing a time slot, and wherein the step of periodically attempting to receive a hailing message is characterized by attempting to receive during the time slot.

5,440,560

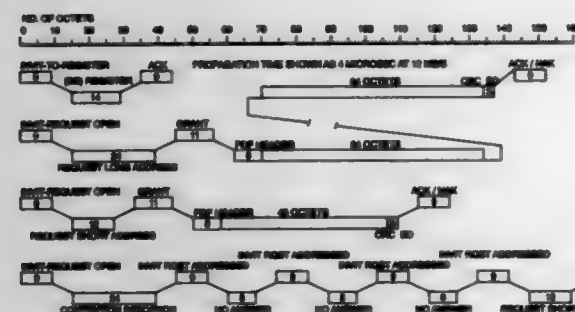
# SLEEP MODE AND CONTENTION RESOLUTION WITHIN A COMMON CHANNEL MEDIUM ACCESS METHOD

Chandos A. Rypinski, 130 Stewart Dr., Tiburon, Calif. 94920  
Continuation-in-part of Ser. No. 813,956, Dec. 24, 1991. This application Mar. 20, 1992, Ser. No. 854,493

Int. Cl.<sup>6</sup> H04J 3/16

U.S. Cl. 370-95.2

10 Claims



1. A method for sleep mode control for a wireless data communication network that serves battery-powered portable stations having an active mode with full functional capability and a quiescent mode where function is minimized for the purpose of reducing quiescent power drain, and where said stations automatically switch between these modes in response to user needs, and where said data communication network uses a system with a plurality of wireless access-points controlled from a common processor, and having an access method based upon exchange of data messages to manage channel access, said messages including registration, polling and invitation-to-request-service messages, said method for sleep mode control comprising the steps of:

polling each station with periodic asynchronously-timed addressed messages to assign either an active state to be maintained until after the next periodic message is received, thereby enabling an addressed station to receive data transfer messages transmitted from the system, or to assign permission to be inactive for a period of time specified in that message and after which a further periodic message will be received to renew the instruction, thereby reducing power supply to the circuit functions in said addressed station until the indicated inactive time has expired;

transmitting a poll acknowledgement message from said

addressed station to the system to confirm the active or inactive status to the system of that addressed station until the next poll; and  
transmitting a poll acknowledgement message from said addressed station to the system to advise the system whenever that addressed station will become active for the purpose of initiating data transfer messages to the system.

5,440,561

# METHOD FOR ESTABLISHING FRAME SYNCHRONIZATION WITHIN A TDMA COMMUNICATION SYSTEM

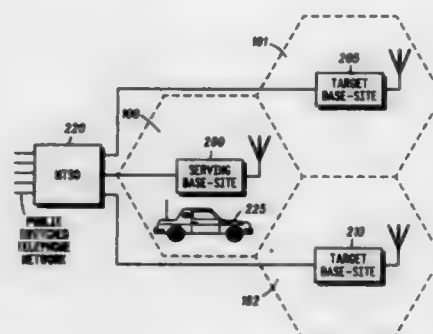
Alton P. Werronen, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1991, Ser. No. 767,726

Int. Cl.<sup>6</sup> H04J 3/06

U.S. Cl. 370-105.1

13 Claims



1. A method for establishing frame synchronization between a serving base-site and an adjacent base-site within a TDMA communication system comprising the steps of:  
said adjacent base-site determining serving base-site timing relative to adjacent base-site timing by:  
identifying at least one mobile unit serviced by the serving base-site, said mobile unit engaged in an active call;  
receiving at least some of the mobile unit's transmission signals; and  
processing the received signals to determine the serving base-site timing;  
calculating a timing difference between the serving base-site timing and the adjacent base-site timing; and  
said adjacent base-site identifying frame boundaries within a serving base-site TDMA traffic channel utilizing the timing difference.

5,440,562

# COMMUNICATION THROUGH A CHANNEL HAVING A VARIABLE PROPAGATION DELAY

Victor H. Cutler, Jr, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1993, Ser. No. 172,989

Int. Cl.<sup>6</sup> H04J 3/06

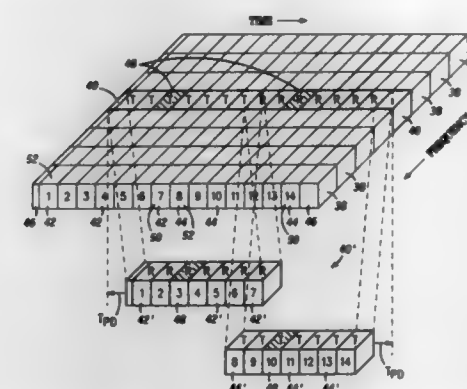
U.S. Cl. 307-108

27 Claims

1. A method for communicating through a channel that delays communications conveyed therethrough by a variable duration, said method comprising the steps of:

receiving timing data which define a propagation time through said channel, said timing data being updated as said propagation time of said channel changes;  
delaying a signal by a delay-duration that is a function of said propagation time;

changing said delay-duration in response to changes in said propagation time;



sending said signal through said channel after said delay-duration.

5,440,563

# SERVICE CIRCUIT ALLOCATION IN LARGE NETWORKS

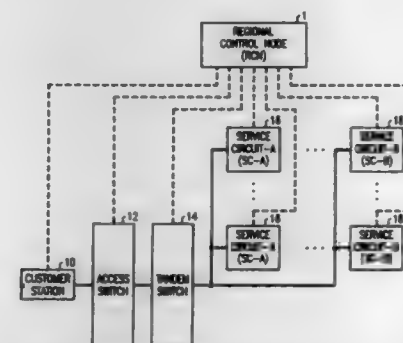
Alessandro L. Isidoro, Howell, N.J., and Vikram Punj, Naperville, Ill., assignors to AT&T Corp., Murray Hill, N.J.

Filed Oct. 12, 1993, Ser. No. 135,106

Int. Cl.<sup>6</sup> H04J 3/12

U.S. Cl. 370-110.1

6 Claims



1. In a regional telecommunications network, apparatus for associating members of a common pool of service circuits to a call served by any of a plurality of switching systems of said regional network, comprising:

plurality of service circuits, in said common pool, each connectable to at least two of said plurality of switching systems; and  
a regional control node for selecting any of said plurality of service circuits and for controlling a connection of a selected service circuit to a call on any of said switching systems of said regional telecommunications network;  
wherein said regional control node selects said any service circuit using a topology manager to minimize resource use for connecting the selected service circuit to said call.

5,440,564

# DATA MULTIPLEXER WITH SIMULTANEOUS MULTIPLE CHANNEL CAPABILITY

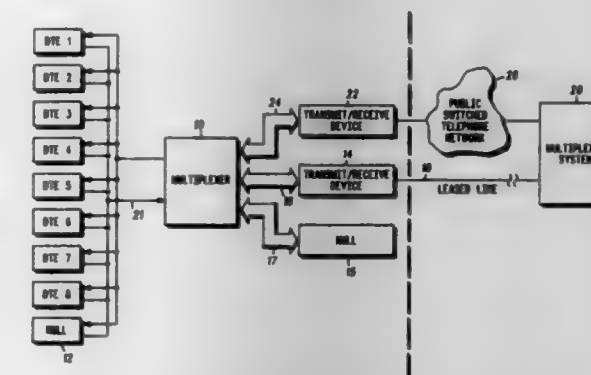
Esther Ovada, Barrington, R.I.; Arthur J. Barabell, Natick, and Manickam R. Sridhar, Norton, both of Mass., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 531,829, Jun. 1, 1990, abandoned. This application Feb. 9, 1993, Ser. No. 15,324

Int. Cl.<sup>6</sup> H04J 1/16

U.S. Cl. 370-112

22 Claims



1. A baud clock driven data multiplexer comprising:  
means for receiving data from at least a first data terminal equipment (DTE) port;  
means for data multiplexing said received data to form a first data stream wherein said first data stream is a sum of data streams of at least the first DTE port and is carried by a first communication channel to a data demultiplexer that demultiplexes said first data stream back to its original constituent data;  
quality-responsive diverting means, responsive to a signal that indicates that a quality of the first communication channel that carries the sum of the data streams of at least the first DTE port has become reduced such that said channel carries less data than said sum of data streams, for automatically diverting part, but not all, of the received data to a second data stream carried by a second channel so that said first and second data streams together support transmission of said received data over said first and second communication channels,  
where said diverting means establishes communications over said second communication channel only upon said quality of the first communication channel becoming reduced such that said first communication channel is unable to carry all of said first data stream.

5,440,565

# TEST METHOD AND APPARATUS CAPABLE OF TESTING RECEPTION OF A DESIRED CELL THROUGH A VIRTUAL PATH

Akihiro Miyamoto; Ryuichi Ikematsu, both of Tokyo; Haruhiko Matsunaga, and Hiromi Ueda, both of Kanagawa, all of Japan, assignors to NEC Corporation, Japan

Continuation of Ser. No. 965,886, Oct. 23, 1992, abandoned.

This application Jun. 13, 1994, Ser. No. 259,120

Claims priority, application Japan, Oct. 24, 1991, 3-277964

Int. Cl.<sup>6</sup> G06F 11/30; H04B 3/46

U.S. Cl. 371-20.4

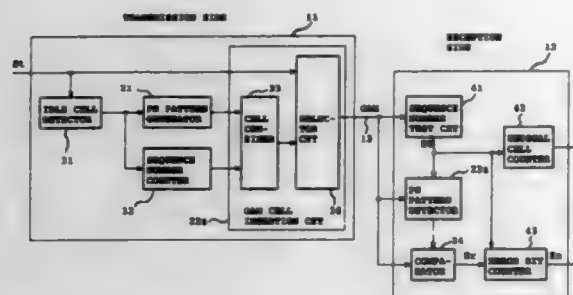
5 Claims

1. A test method of testing a virtual path between a transmission side and a reception side in an asynchronous transfer mode system which carries out transmission in an asynchronous transfer mode, said test method comprising the steps of:  
producing, in said transmission side, a predetermined pseudo noise pattern and an assigned sequence number both of which are assigned to a test operation administration monitoring cell;

forming, in said transmission side, said test operation administration monitoring (OAM) cell which includes said predetermined pseudo noise pattern and said assigned sequence number;

receiving, in said reception side, a reception operation administration monitoring cell which corresponds to said test operation administration monitoring cell and which includes a reception pseudo noise pattern and a reception sequence number corresponding to said predetermined pseudo noise pattern and said assigned sequence number, respectively;

detecting in said reception side, said reception pseudo noise pattern from the reception operation administration monitoring cell to judge whether or not the reception pseudo



noise pattern is coincident with the predetermined pseudo noise pattern and to produce an error which results from incoincidence between the reception and the predetermined pseudo noise patterns;

detecting, in said reception side, said reception sequence number from said reception operation administration monitoring cell to judge whether or not the reception sequence number is coincident with the assigned sequence number and to produce an incoincidence signal on incoincidence between said reception sequence number and said assigned sequence number; and

interrupting, in said reception side, the reception pseudo noise pattern when said incoincidence signal is produced in the reception sequence number detecting step.

5,440,566

#### FAULT DETECTION AND DIAGNOSIS FOR PRINTED CIRCUIT BOARDS

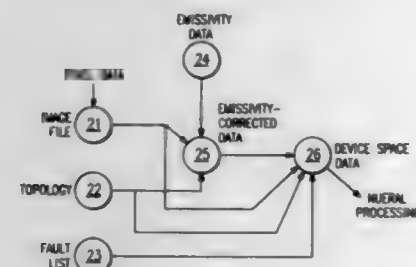
Hugh F. Spence; Daniel P. Burris, both of San Antonio, and Robert A. Houston, Somerset, all of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Continuation of Ser. No. 763,954, Sep. 23, 1991, abandoned. This application Apr. 6, 1994, Ser. No. 224,658

Int. Cl.<sup>6</sup> G01R 31/00; G01N 21/84

U.S. Cl. 374-41

13 Claims



1. A method for detecting and diagnosing faults of an object, comprising the steps of:

obtaining an emissivity map of said object, while said object is substantially in thermal equilibrium with its ambient environment, by capturing a basis thermal image, illuminating said object, capturing an illumination image while said object is illuminated, calculating a difference image between said basis thermal image and said illumination

image, and using said difference image to determine an emissivity map at various points on said object;

heating said object;

obtaining a thermal image of said object during said heating step;

correcting said thermal image, using said emissivity map to compensate for varying emissivities on said object, such that an emissivity-corrected thermal image is obtained;

inputting data representing said emissivity-corrected thermal image to an artificial neural network, wherein said neural network has been previously trained to provide a certain output when said data is associated with a known fault; and

using said neural network to indicate whether a fault exists on said object.

5,440,567

#### COMPLEMENTARY BOUNDARY-SCAN CELL

Koichi Tsukamoto, Sagami, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

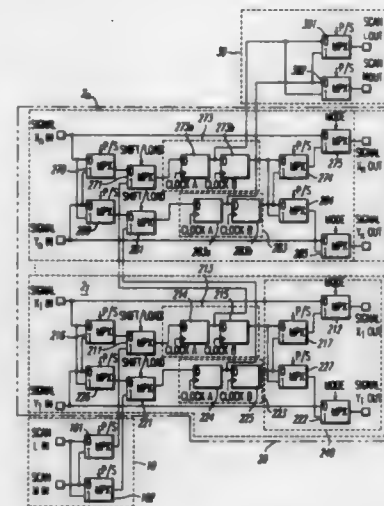
Filed Mar. 11, 1994, Ser. No. 208,833

Claims priority, application Japan, Mar. 11, 1993, 5-051053

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 371-22.3

5 Claims



1. A complementary boundary-scan cell comprising:

m (m is an integer equal to 2 or more) number of system input terminals adapted so that signals are inputted from the system side thereto;

m number of scan input terminals adapted so that signals are inputted thereto for scan;

m number of registers supplied with the signals inputted to said system input terminals or said scan input terminals and adapted for holding the signals;

m number of system output terminals supplied with the signals held by said registers and adapted for outputting the signals to the system side;

m number of scan output terminals supplied with the signals held by said registers and adapted for outputting the signals for scan;

m number of first multiplexers having m number of input terminals and an output terminal, and capable of switching the connection relationship between the input terminals of said first multiplexers and said system input terminals;

m number of second multiplexers having m number of input terminals and an output terminal, and capable of switching the connection relationship between the input terminals of said second multiplexers and said system input terminals;

m number of third multiplexers having two input terminals and an output terminal, the output terminal of said third multiplexers is connected to an input terminal of a corresponding register of said registers, and capable of switch-

ing the connection relationship between the output terminal of said first multiplexers, the output terminal of said second multiplexers and the output terminal of said third multiplexers;

m number of fourth multiplexers provided between said registers and said system output terminals, and capable of switching the connection relationship between said registers, said system input terminal, and said system output terminal; and

m number of fifth multiplexers provided between said registers and said scan output terminals, and capable of switching the connection relationship between said registers and said scan output terminal;

m number of paths connecting said system input terminals, said first multiplexers, said third multiplexers, said registers, said fifth multiplexers, and said scan output terminals being permitted to be arbitrarily switched, m number of paths connecting said scan input terminals, said second multiplexers, said third multiplexers, said registers, said fourth multiplexers, and said system output terminals being permitted to be arbitrarily switched.

5,440,568

#### SYSTEM FOR DETERMINING THE OPERATIONS OF AN INTEGRATED CIRCUIT AND PROCESSOR FOR USE THEREIN

Paul C. Foster, Hampshire, United Kingdom, assignor to GenRad Inc., Concord, Mass.

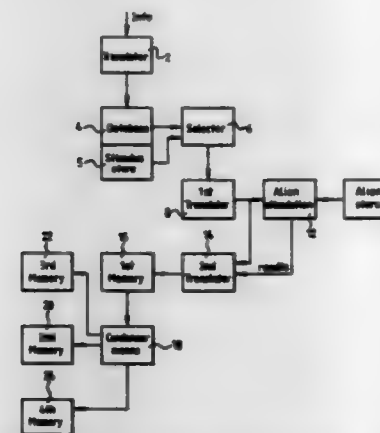
Filed Mar. 27, 1992, Ser. No. 859,578

Claims priority, application United Kingdom, Mar. 28, 1991, 9106758

Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 395-500

10 Claims



1. A system for determining the operation of an integrated circuit IC, comprising:

receiving means for receiving and storing information about said integrated circuit and for pre-storing a range of stimuli defined by a reference IC circuit simulator language to be applied to a model of said integrated circuit;

selecting means for selecting at least one stimulus from said range;

a first translator for translating said selected stimulus defined by the reference IC circuit simulator language into a translated stimulus defined by an alien IC circuit simulator language;

an alien simulator for applying said translated stimulus to an alien model of said integrated circuit and obtaining a response to said translated stimulus;

a second translator for translating said response defined by said alien IC circuit simulator language into a translated response defined by said reference IC circuit simulator language; and

store means for storing said translated response, said stimu-

lus and said response portraying operation of the integrated circuit.

5,440,569

#### FLIP-FLOP CIRCUITS FOR TESTING LSI GATE ARRAYS

Mitsugu Naito, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

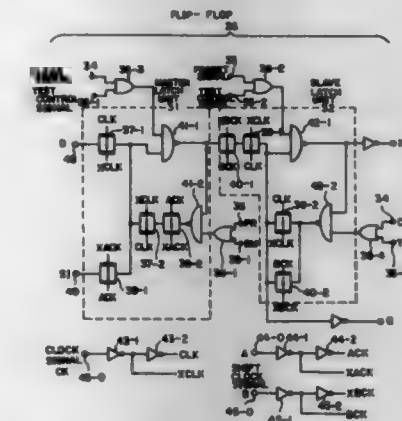
Continuation of Ser. No. 710,829, Jun. 5, 1991, abandoned. This application Feb. 14, 1994, Ser. No. 195,606

Claims priority, application Japan, Jun. 6, 1990, 2-147751

Int. Cl.<sup>6</sup> H04B 17/00

U.S. Cl. 371-22.3

10 Claims



1. A flip-flop circuit comprising:

a serially connected flip-flop circuit including a flip-flop having synchronous and asynchronous flip-flop terminals associated with a combination circuit and configuring a scanning circuit for testing said combination circuit;

gate means provided between said serially connected flip-flop circuit and an asynchronous system input circuit that is connected to an asynchronous terminal of said flip-flop for controlling a signal from said asynchronous system input circuit which determines an output of said serially connected flip-flop circuit; and

means for detecting failures of said asynchronous system input circuit using said gate means during a scanning test through said scanning circuit;

said flip-flop circuit having a master latch flip-flop unit and a slave latch flip-flop unit respectively equipped with at least either a clear terminal or a preset terminal as said asynchronous terminal.

5,440,570

#### REAL-TIME BINARY BCH DECODER

Shyue-Win Wei, Chang Hua Hsien, and Che-Ho Wei, Hsin Chu, all of Taiwan, assignors to National Science Council, Taiwan

Continuation-in-part of Ser. No. 499,664, Mar. 27, 1990, abandoned. This application Jan. 22, 1992, Ser. No. 823,981

Int. Cl.<sup>6</sup> G06F 11/10; H03M 13/00

U.S. Cl. 371-37.1

9 Claims

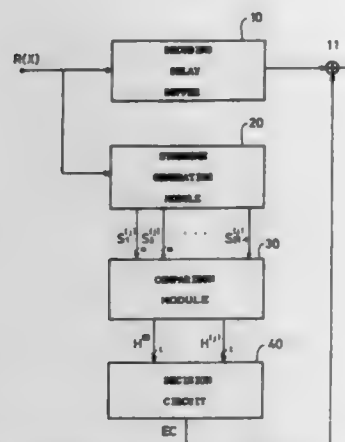
1. A Bose-Chaudhuri-Hocquenghem (BCH) decoder for correcting bit errors which occur during transmission of digital information that has been encoded into BCH binary code-words, wherein each binary codeword comprising binary bits and is represented by the polynomial  $R(x)$  and has an error pattern  $E(x)$ , the BCH decoder comprising:

a decoding delay buffer shifting the bits of the word  $R(x)$  to form a group of shifted words  $R^{(j)}(x)$ ,  $j=1, 2, \dots, n-1$ , and complementing a predetermined bit in each of the shifted words  $R^{(j)}(x)$ ,  $j=1, 2, \dots, n-1$  to form a group of error-trial words  $R^{(j)}(x)$ ,  $j=1, 2, \dots, n-1$ ;

a syndrome generating module receiving the word  $R(x)$  and generating syndrome values  $S_i^{(0)}$ ,  $i=1, 3, \dots, 2t-1$  of the received word  $R(x)$  which form syndrome matrices  $L_p^{(0)}$ ,  $p=1, 2, \dots, t$ , and generating syndrome values  $S_i^{(j)}$ ,  $i=1, 3,$



...  $2t-1$  of the error-trial words  $R^{(j)}(x)$ ,  $j=1,2,\dots,n-1$  which form syndrome matrices  $L_p^{(j)}$ ,  $p=1,2,\dots,t$ ; a comparison module coupled to the syndrome generating module for determining determinants of the syndrome matrices  $L_p^{(j)}$ ,  $p=1,2,\dots,t$ , and for determining determinants of the syndrome matrices  $L_p^{(j)}$ ,  $p=1,2,\dots,t$ ,  $j=1,2,\dots,n-1$  and for determining the zeroness of the determinants  $\det(L_p^{(j)})$  for  $p=1,2,\dots,t$  and  $\det(L_p^{(j)})$  for  $p=1,2,\dots,t$  and  $j=1,2,\dots,n-1$ , and for determining a weight of the error pattern of the received word  $R(x)$  in accordance with the zeroness of the determinants  $\det(L_p^{(j)})$ ,  $p=1,2,\dots$



...  $t$  and weights of the error patterns of the error-trial words  $R^{(j)}(x)$ ,  $j=1,2,\dots,n-1$  in accordance with the zeroness of the  $\det(L_p^{(j)})$ ,  $p=1,2,\dots,t$  and  $j=1,2,\dots,n-1$ ; a decision circuit receiving and comparing the weight of the error pattern of the received word  $R(x)$  with the weights of the error patterns of the error-trial words  $R^{(j)}(x)$ ,  $j=1,2,\dots,n-1$  from the comparison module and for outputting a correcting bit; and a logic circuit responsive to said correcting bit from the decision circuit for correcting the bit errors of the received word  $R(x)$ .

5,440,571

# CIRCUIT OF ADDRESSING A MEMORY BUFFER FOR ERROR CORRECTION IN A DIGITAL AUDIO TAPE RECORDER

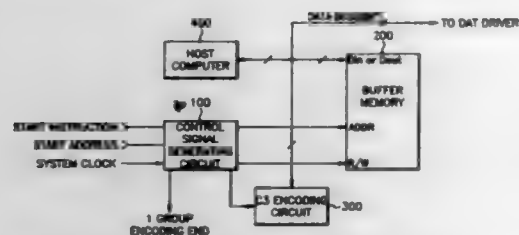
Cheol-Woong Mok, Incheon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea  
Filed Nov. 17, 1992, Ser. No. 977,830

Claims priority, application Rep. of Korea, Nov. 22, 1991, 20935/1991

Int. Cl.<sup>6</sup> H03M 13/00

U.S. Cl. 371-40.1

10 Claims



1. An address signal generating circuit comprising: a buffer memory connected to receive digital data transmitted from a host computer, for storing and accessing the digital data supplied by a given control signal; a control signal generating circuit connected to receive a start instruction and a start address from the exterior, for generating a control signal applied to said buffer memory; and a C3 encoding circuit connected to receive the control signal

of said control signal generating circuit, for generating a parity of two symbols with respect to 44 data symbols on the basis of a digital data storage (DDS) format.

5,440,572

# DIGITAL SIGNAL DECODING APPARATUS AND A METHOD THEREOF HAVING A FUNCTION OF INITIALIZING A PASS METRIC FOR AT LEAST ONE COMPRESSION BLOCK

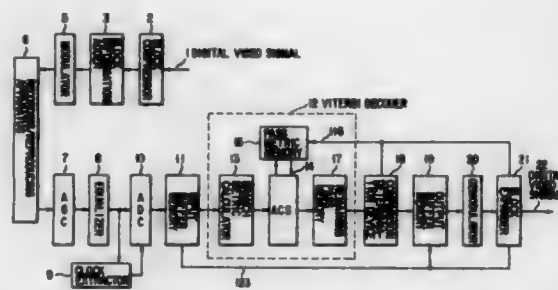
Shoji Kitaori, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 20, 1994, Ser. No. 309,900

Claims priority, application Japan, Sep. 20, 1993, 5-232867  
Int. Cl.<sup>6</sup> H01J 13/12

U.S. Cl. 371-43

14 Claims



1. A digital signal decoding apparatus comprising: maximum-likelihood decoding means for maximum-likelihood decoding a digital signal consisting of compression block data obtained by compressing digital data for every plurality of digital data units, and for outputting a maximum-likelihood decoded digital signal; detection means for receiving the maximum-likelihood decoded digital signal from the maximum-likelihood decoding means, for detecting at least one compression block data unit, and for outputting a predetermined control signal; and initialization means for initializing maximum-likelihood information used for the maximum-likelihood decoding by the maximum-likelihood decoding means, to a predetermined value on the basis of the control signal outputted from the detection means.

5,440,573

# METHOD AND APPARATUS FOR CONTROLLING LASER EMISSION WAVELENGTH USING NON-LINEAR EFFECTS

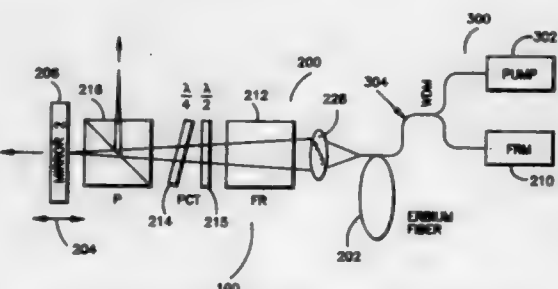
Martin E. Fermann, Ann Arbor, Mich., assignor to IMRA America, Inc., Ann Arbor, Mich.

Filed Mar. 22, 1994, Ser. No. 215,579

Int. Cl.<sup>6</sup> H01S 3/098

U.S. Cl. 372-18

24 Claims



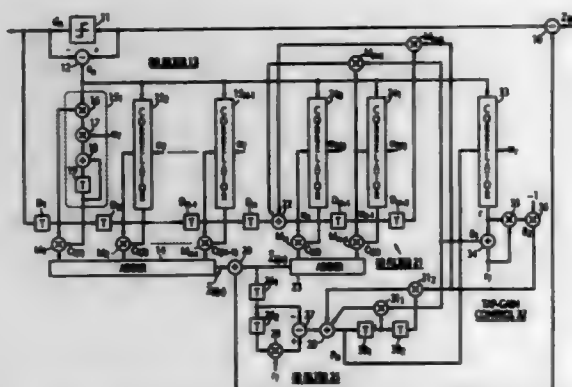




tap-gain multipliers for operating on said nonrecursive tap signals respectively, means for summing the outputs of said tap-gain multipliers and producing an output signal of the nonrecursive filter, and correlator means for detecting correlations between said nonrecursive tap signals and said decision error for controlling the tap gains of said tap-gain multipliers;

a first recursive filter including a series of first and second delay-line taps, first and second tap-gain multipliers for respectively operating on signals at the first and second delay-line taps of the first recursive filter, means for summing the outputs of the first and second tap-gain multipliers and producing an output signal of the first recursive filter, third and fourth tap-gain multipliers for respectively operating on the outputs of the first and second delay-line taps of the first recursive filter, means for providing a sum of the outputs of the third and fourth tap-gain multipliers and the output of the tapped delay line of said nonrecursive filter and applying said sum to the first delay-line tap of the first recursive filter, and correlator means for detecting correlations between the inputs of said first and second delay-line taps of the first recursive filter and the decision error of said error detector for controlling the tap gains of said first and second tap-gain multipliers of the first recursive filter;

a second recursive filter including a series of first and second delay-line taps for receiving said output signal of said first recursive filter, weighing means for weighing the output



of the second delay-line tap of the second recursive filter with an attenuation coefficient of constant value, and means for detecting a difference between the output of the weighing means and the output of the first delay-line tap of the second recursive filter to produce a difference signal, a series of third and fourth delay-line taps, third and fourth tap-gain multipliers for respectively operating on the outputs of said third and fourth delay-line taps of the second recursive filter, summing means for supplying a sum of the outputs of the third and fourth tap-gain multipliers of the second recursive filter and said difference signal to an input of the third delay-line tap of the second recursive filter to produce an output signal of the second recursive filter;

tap-gain control means for summing said attenuation coefficient of constant value with an attenuation coefficient of variable quantity to produce a positive feedback coefficient and multiplying said attenuation coefficient of constant value with said attenuation coefficient of variable quantity to produce a negative feedback coefficient, updating said attenuation coefficient of variable quantity with a correlation between said decision error and said output signal of said second recursive filter, and controlling the tap gains of said third tap-gain multipliers of said first and second recursive filters with said positive feedback coefficient and controlling the tap gains of said fourth tap-gain multipliers of said first and second recursive filters with said negative feedback coefficient; and an adder for supplying a sum of the output signals of said

nonrecursive filter and the first recursive filter to the second input of said subtractor as said cancelling signal.

5,440,584

# PROCESS FOR TRANSMITTING OR STORING OVER DISTURBED CHANNELS A DIGITALIZED, ENCODED AUDIO SIGNAL COMPOSED OF A SERIES OF INFORMATION BLOCKS

Detlef Wiese, Goldach, Germany, assignor to Institut fuer Rundfunktechnik GmbH, Munich, Germany

PCT No. PCT/EP92/02401, § 371 Date Apr. 20, 1994, § 102(e) Date Apr. 20, 1994, PCT Pub. No. WO93/08656, PCT Pub. Date Apr. 29, 1993

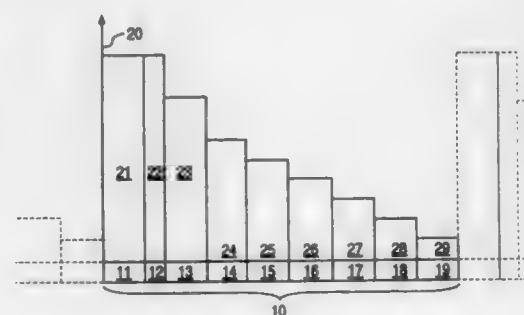
PCT Filed Oct. 20, 1992, Ser. No. 211,825

Claims priority, application Germany, Oct. 24, 1991, 41 35 070.7

Int. Cl.<sup>6</sup> H04B 14/04

U.S. Cl. 375—242

3 Claims



1. A method of transmitting or storing a digitized encoded audio signal composed of a sequence of information blocks over interference affected channels, wherein the individual information blocks are composed of information units containing different informations, with the information units being associated with respect to encoded sampled values with a certain spectral structure and wherein the encoded audio signal is subjected to channel coding that is dimensioned according to a predetermined error protection, the method comprising the steps of:

effecting an error correction when an error is detected and, if the error is not correctable, concealing the error; providing a variable bit error protection for the channel coding of the information units with respect to the encoded sampled values, the variable bit error protection being a function of the different association of the individual information units with a predetermined spectral structure so that information units for the encoded sampled values of lower frequency audio signal components have a higher bit error protection than information units for the encoded sampled values of higher frequency audio signal components; determining a selected variable error protection for the individual information units according to subjective criteria as a function of a permissible duration and frequency of error concealment measures employed; and containing informations regarding additional error protection with respect to expanded error detection in at least one unit for the succession of information units regarding the encoded sampled values.

5,440,585

# APPLICATIONS OF SIMULTANEOUS ANALOG AND DIGITAL COMMUNICATION

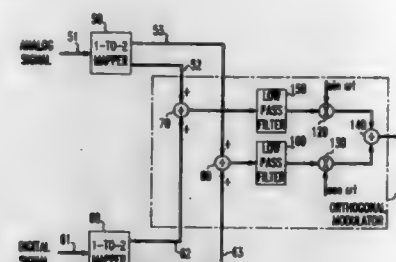
B. Waring Partridge, III, Mendham, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Jun. 14, 1993, Ser. No. 76,518

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 375—261

8 Claims



1. A modem comprising:

a signal mapper having digital signals applied to the mapper at a digital port and analog signals applied to the mapper at an analog port, said mapper developing a plurality of mapped output signals related to said digital signals and to said analog signals,

a modulator, responsive to the output signals of the signal mapper, for developing a modulated output signal at an output port of the modulator, said modulated output signal occupying an N-dimensional signal space that is composed of a plurality of N-dimensional mutually exclusive spaces, N being greater than 1, with a predetermined point in the each of the plurality of spaces associated with a digital symbol applied to said mapper via the applied digital signal, where a digital symbol is defined by a collection of bits contained in the applied digital signal, and other points in each of the plurality of spaces associated with the analog signals applied to said signal mapper simultaneously with the applied digital signal, and

switch means interposed between an output port of the modem and the modulator output port, and responsive to an operational state of the modem, for connecting the modem output port to the modulator output port when the operational state of the modem indicates the presence of a predetermined condition and for connecting the modem output port to the analog port when the operational state of the modem indicates the absence of said predetermined condition, where the operational state of the modem is the collection of signal conditions in electronic circuits making up the modem.

5,440,586

# RECEIVER HAVING REDUCED INFLUENCE OF OSCILLATOR RADIATION AND PARASITIC CROSSTALK EFFECTS ON GAIN CONTROL

Gerard P. Den Braber, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 909,239, Jul. 6, 1992, abandoned. This application Mar. 31, 1994, Ser. No. 221,557

Claims priority, application European Pat. Off., Jul. 15, 1991, 91201848

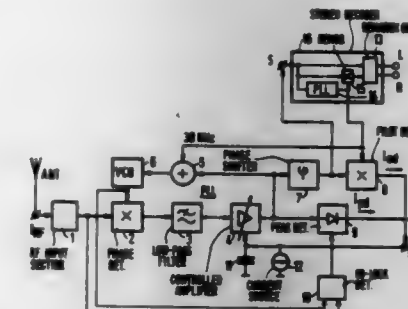
Int. Cl.<sup>6</sup> H03D 3/18, 3/24

U.S. Cl. 375—327

15 Claims

1. A receiver having a radio frequency (RF) input section for receiving an RF input signal; a phase-locked loop coupled to an output of said RF input section, said phase-locked loop having a signal path incorporating a phase detector, a loop filter, a controlled amplifier and a controlled oscillator, said phase detector having a first input coupled to the output of said RF input section, and an output coupled to an input of said loop filter, an output of said loop filter being coupled to an input of said controlled amplifier, an output of said controlled amplifier being coupled to a control input of said controlled oscillator, and an output of said controlled oscillator being

coupled to a second input of said phase detector; a signal generator for generating a local auxiliary pilot; and a pilot detector for detecting the local auxiliary pilot, a first input of said pilot detector being coupled to the signal path of the phase-locked loop between an output of the controlled amplifier and the control input of the controlled oscillator, a second input of said pilot detector being coupled to an output of the signal generator, and an output of said pilot detector being



coupled to a control input of the controlled amplifier via a selection device, said selection device converting the output from said pilot detector to a gain control voltage for said controlled amplifier, wherein the output of the signal generator is also coupled to the signal path between the output of the controlled amplifier and the control input of the controlled oscillator which causes an output signal of the controlled oscillator to be angle modulated with the local auxiliary pilot.

5,440,587

# DEMODULATOR FOR DIGITALLY MODULATED WAVE

Tatsuya Ishikawa, and Noboru Taka, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

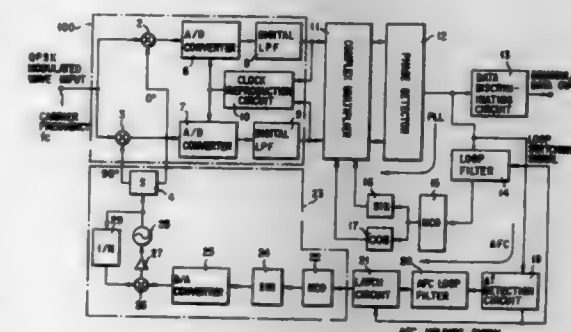
Continuation of Ser. No. 921,018, Jul. 28, 1992, abandoned. This application Jul. 8, 1994, Ser. No. 272,862

Claims priority, application Japan, Aug. 7, 1991, 3-197789; Aug. 7, 1991, 3-197790

Int. Cl.<sup>6</sup> H03D 3/22; H04L 27/14

U.S. Cl. 375—332

5 Claims



1. A demodulator for demodulating a digitally modulated wave, comprising:

a local oscillation unit for modulating a first frequency converting carrier and a second frequency converting carrier, wherein said first frequency converting carrier and said second frequency converting carrier have carrier phase axes which are different, and wherein said local oscillation unit comprises an oscillation frequency control terminal; a frequency converting unit for converting components of a first phase axis and a second phase axis of a digital modulated wave to a frequency band in accordance with said first frequency converting carrier and said second frequency converting carrier, respectively, thereby obtaining a first digital signal and a second digital signal,



wherein said frequency band is substantially a base band, and wherein said first digital signal and said second digital signal are produced by digitally converting said components of said first phase axis and said components of said second phase axis and by spectrum-shaping each said digitally converted component;

complex multiplier means for multiplying said first digital signal and said second digital signal by a first reproducing carrier and a second reproducing carrier and for obtaining a first calculation output and a second calculation output, wherein said first calculation output and said second calculation output each having an expression which comprises a complex number;

means for obtaining phase difference data and quadrant data corresponding to a phase expressed by said first calculation output and second calculation output, and for obtaining a demodulation output having a multi-phase from said phase difference data and said quadrant data;

phase lock loop means, for producing said first reproducing carrier and said second reproducing carrier, wherein said phase lock loop comprises:

a first loop filter for filtering said phase difference data, thereby producing filtered phase difference data;

a first numerical value control oscillator for receiving said filtered phase difference data, and for generating oscillated phase difference data in accordance with said filtered phase difference;

data conversion means for converting said oscillated phase difference data, thereby producing said first reproducing carrier and said second reproducing carrier; and

automatic frequency control means for controlling an oscillation frequency of said local oscillation unit, wherein said automatic frequency control means comprises:

a second loop filter for filtering a frequency error data, thereby outputting filtered frequency error data;

latch means for latching said filtered frequency error data, thereby outputting latched frequency error data and for supply said latched frequency error data to said oscillation frequency control terminal; and

frequency error detection means for outputting said frequency error data, wherein said frequency error data is based upon said phase difference data, and wherein said frequency error detection means comprises:

means for continuing an operation state of said automatic frequency control means by setting said output of said latch means to be in a through state and said output of said phase lock loop means to be in a fixing state when a value of said frequency error data is larger than a first predetermined value, and for controlling said phase lock loop means to be in an operating state by maintaining said output of said latch means when said value of said frequency error data is smaller than said first predetermined value.

5,440,588

# METHOD AND APPARATUS FOR ESTIMATING MAXIMUM LIKELIHOOD SEQUENCE IN DIGITAL COMMUNICATION RECEIVER WITH REDUCED REAL TIME CALCULATIONS

Junzo Murakami, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1993, Ser. No. 36,687

Claims priority, application Japan, Mar. 25, 1992, 4-067191 Int. Cl.<sup>6</sup> H03D 1/06

U.S. Cl. 375-341

20 Claims

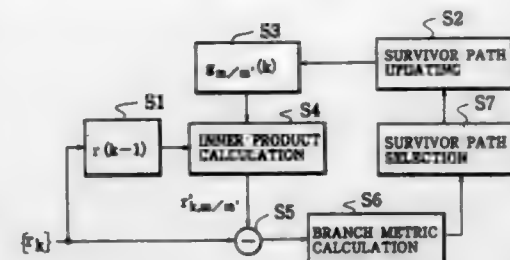
1. A method for estimating a maximum likelihood sequence in a digital communication receiver, comprising the steps of: sampling received signals at a predetermined sampling frequency;

sequentially storing at least N of the received signals sampled for at least N previous sampling times by the sampling step, where N is an integer, for forming an N-dimensional received signal vector for a present sampling time,

in a first memory means;

storing N-dimensional vectors corresponding to all possible transmission sequence candidates of a prescribed length L, which are pre-calculated according to a prescribed definition for defining the N-dimensional vectors, in a second memory means;

calculating an inner product of one of the N-dimensional vectors stored in the second memory means corresponding to each transmission sequence candidate resulting from each one of branches reaching to each state at the present sampling time with the N-dimensional received



signal vector for the present sampling time stored in the first memory means to obtain an estimated received signal for said each one of the branches at the present sampling time; and

estimating the maximum likelihood sequence as a survivor path for said each state at the present sampling time by selecting one of the branches reaching to said each state which minimizes a path metric defined as a cumulative value of a square of an absolute value of a difference between the estimated received signal for each sampling time up to the present sampling time calculated by the calculating step and an actual received signal for said each sampling time up to the present sampling time.

5,440,589

# FREQUENCY OFFSET DEALING MODULATOR AND DEMODULATOR APPARATUS

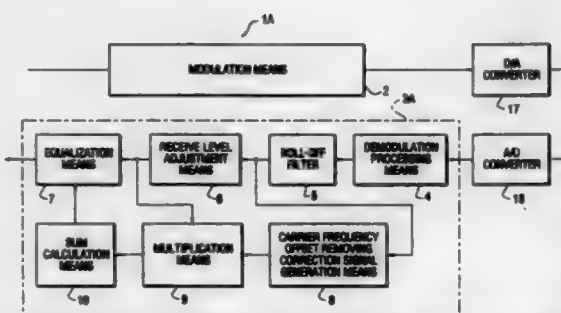
Takashi Kaku, Hiroyasu Murata, and Kyoko Hirao, all of Kawasaki, Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Aug. 13, 1993, Ser. No. 105,628

Claims priority, application Japan, Feb. 18, 1993, 5-029366 Int. Cl.<sup>6</sup> H04L 27/06

U.S. Cl. 375-344

24 Claims



1. A frequency offset dealing modulator and demodulator apparatus, comprising:

modulation means for modulating and transmitting data; and

demodulation means for demodulating a receive signal to reproduce such data;

said demodulation means including demodulation processing means for digitally demodulating a receive signal, digital roll-off filter means for processing the digital demodulation signal from said demodulation processing means by band separation processing, receive level adjust-

ment means for adjusting the level of the output of said roll-off filter means, equalization means for equalizing the level-adjusted signal from said receive level adjustment means, carrier frequency offset removing correction signal generation means for generating, from the output of said roll-off filter means, a correction signal for removing a carrier frequency offset, multiplication means for multiplying the output of said receive level adjustment means by the correction signal from said carrier frequency offset removing correction signal generation means, and sum calculation means for processing the output of said multiplication means by sum calculation processing to reproduce an impulse signal output to the equalization means;

said carrier frequency offset removing correction signal generation means including phase difference information calculation means for calculating phase difference vector information for a one symbol period from the output of said roll-off filter means, and normalization means for processing the phase difference vector information calculated by said phase difference information calculation means by normalization processing.

5,440,590

# METHOD AND APPARATUS FOR PRODUCING A USABLE SIGNAL FROM RECEIVED DIVERSE MODULATED SIGNALS

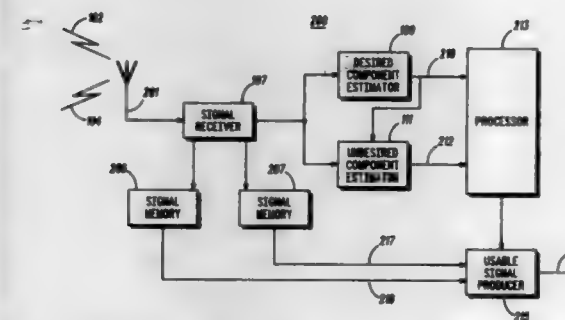
Mark A. Birchler, Roselle; Steven C. Jasper, Hoffman Estates; Karen A. Braillean, Chicago, and Timothy J. Wilson, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1993, Ser. No. 143,589

Int. Cl.<sup>6</sup> H04B 7/10; H04L 1/02

U.S. Cl. 375-347

7 Claims



3. A diversity receiver that receives time diverse modulated signals, the diversity receiver comprising:

receiving means for alternately receiving a first modulated signal and a second modulated signal, wherein a first received modulated signal includes a first information portion, a first fading portion, and a first undesired component and wherein a second received modulated signal includes a information portion, a second fading portion, and a second undesired component;

signal memory means for storing at least the first received modulated signal;

a desired component estimator, operably coupled to the receiving means, wherein the desired component estimator alternately calculates an estimate of the first information portion and the first fading portion, and an estimate of the second information portion and the second fading portion to produce an estimated first desired component and an estimated second desired component;

an undesired component estimator, operably coupled to the receiving means, wherein the undesired component estimator alternately estimates the first undesired component and the second undesired component to produce an estimated first undesired component and an estimated second undesired component;

a processor, operably coupled to the desired component estimator and the undesired component estimator, wherein the processor calculates a first ratio based on the

estimated first desired component and the estimated first undesired component, calculates a second ratio based on the estimated second desired component and the estimated second undesired component, and weights the first modulated signal and the second modulated signal based on the first ratio and the second ratio to produce a weighted first modulated signal and a weighted second modulated signal; and

a usable signal producer, operably coupled to the processor and the signal memory means, wherein the usable signal producer produces a usable signal based on the weighted first modulated signal and the weighted second modulated signal.

5,440,591

# SWITCHING APPARATUS FOR DIGITAL SIGNALS

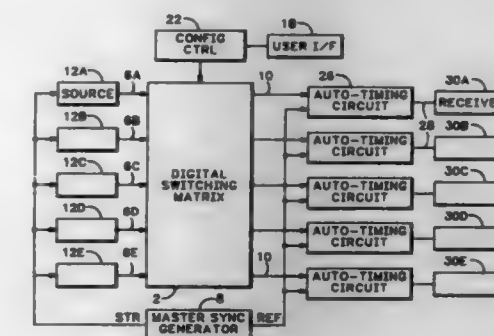
John E. Liron, Grass Valley, Calif., and Leon J. Stanger, Farmington, Utah, assignors to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Apr. 10, 1992, Ser. No. 866,703

Int. Cl.<sup>6</sup> H04L 4/00

U.S. Cl. 375-354

12 Claims



1. Switching apparatus for coupling a source to a receiver comprising:

a switch having at least first and second input terminals for receiving respective data signals from the source, each data signal composed of successive frames of nominally uniform duration, at least one output terminal, and means for selectively connecting either the first input terminal or the second input terminal to the output terminal, and

a timing circuit having an input terminal connected to said output terminal and also having an output terminal coupled to the receiver, the timing circuit being operative to propagate a data signal received at its input terminal to its output terminal and being responsive to an external reference signal to impose a delay on propagation of the data signal to its output terminal such that the signal at the output terminal of the timing circuit is timed with respect to the external reference signal.

5,440,592

# METHOD AND APPARATUS FOR MEASURING FREQUENCY AND HIGH/LOW TIME OF A DIGITAL SIGNAL

David Ellis, Hillsboro, and Gary Brady, Aloha, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 31, 1993, Ser. No. 40,623

Int. Cl.<sup>6</sup> H04L 7/00

U.S. Cl. 375-354

12 Claims

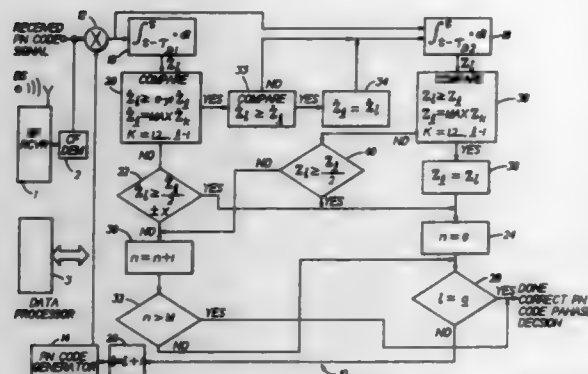
1. In a digital system comprising a periodic digital signal, an apparatus for determining the periodic digital signal's frequency and the period's high and low time of the periodic digital signal low time, said apparatus comprising:

a) delay means comprising a plurality of delay elements for receiving said periodic digital signal applying a plurality of delays to the received periodic digital signal, and gener-





(e) comparing the second result to a second threshold having a value that is a function of a previous second result; if the second result is determined to be less than the second threshold, changing the local PN code, and repeating



steps (a) through (c); else if the second result is determined to be equal to or greater than the second threshold, setting the second threshold equal to the second result; and (f) if the end of the PN code space has not been reached, repeating steps (a) through (c).

5,440,598

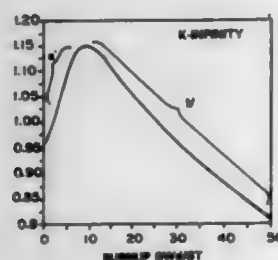
### FUEL BUNDLE DESIGN FOR ENHANCED USAGE OF PLUTONIUM FUEL

Anthony P. Reese, San Jose, and Russell E. Stachowski, Fremont, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jan. 21, 1994, Ser. No. 184,168  
Int. Cl. G21C 3/32

U.S. Cl. 376-435

21 Claims



1. A nuclear fuel bundle comprising:
  - a plurality of fuel rods arranged in a generally square array, each of said rods having a predetermined concentration of fissile material with at least a majority of said rods including plutonium;
  - a predetermined number of said rods having a concentration of a material for absorbing neutrons, said predetermined number of rods constituting an interior array thereof, all of which predetermined number of rods be within a surrounding exterior array of fuel rods of said plurality thereof;
  - said predetermined number of rods in said interior array thereof having said concentration of material for absorbing neutrons being in excess of 20% of the total number of said plurality of rods in said fuel bundle.

### 5,440,599 SPACER GRID WITH INTEGRAL "SIDE SUPPORTED" FLOW DIRECTING VANES

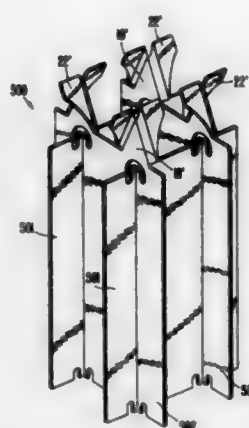
Thomas Rodack, Granby; Zeses E. Karoutas, Simsbury, and Richard P. Broders, Grandy, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 3, 1994, Ser. No. 191,122

Int. Cl. G21C 3/34

U.S. Cl. 376-439

6 Claims



1. A nuclear fuel rod spacer grid comprising:
  - a first set of strips which is slottedly interlocked with a second set of strips;
  - a plurality of integral tabs formed on each of said first strips and which are coplanar with said first strips; and
  - side-supported vanes comprising a portion of each said tab which is bent along a predetermined bend line which extends outwardly along each said tab and which is coplanar with the strip on which each said tab is formed.

5,440,600

### LAMINATED ELECTROMAGNETIC PUMP STATOR CORE

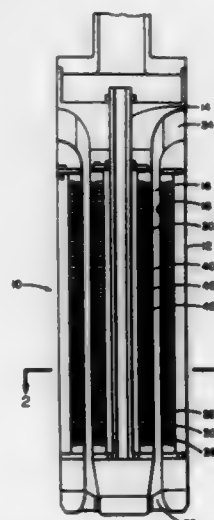
Alan W. Fanning, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Continuation-in-part of Ser. No. 818,944, Jan. 10, 1992, and a continuation-in-part of Ser. No. 836,475, Dec. 18, 1992, Pat. No. 5,195,231. This application Jan. 15, 1993, Ser. No. 6,276

Int. Cl. G21C 1/01

U.S. Cl. 376-463

15 Claims



1. A stator core comprising a plurality of elements laminated together in a circumferential array, each of said elements being

arranged between a pair of adjacent elements and having first and second planar radial surfaces which lie in respective radial planes intersecting a centerline axis of said stator core, said first planar radial surface of each one of said elements being in contact and opposing said first planar radial surface of an adjacent one of said elements, and said second planar radial surface of each one of said elements being in contact and opposing said second planar radial surface of an adjacent one of said elements, said first and second planar radial surfaces being disposed at an acute angle relative to each other, each of said elements having a key-shaped profile with a generally square back and an elongated shank, said square back being radially inward of said elongated shank, each of said elements further comprising:

- a coplanar perimeter extending around said element along first and second sides from an inner edge to an outer edge along the tops and bottoms of said shank and said back, said first side of said perimeter forming said first planar radial surface;
- a tapered central recess in said first side extending in increasing depth from said back along said shank and within said perimeter; and
- a tapered central elevation on said second side being complementary to said recess on said first side and extending in increasing height from said back along said shank and within said perimeter, said elevation forming said second planar radial surface.

5,440,601

### COUNTING STATION FOR COUNTING THE NOTES OF VALUE, IN PARTICULAR BANKNOTES, OF A BANDEROLED PACK OF NOTES

Runwalt Kuehfuess, Lausanne, Switzerland, assignor to De La Rue Giori S.A., Lausanne, Switzerland

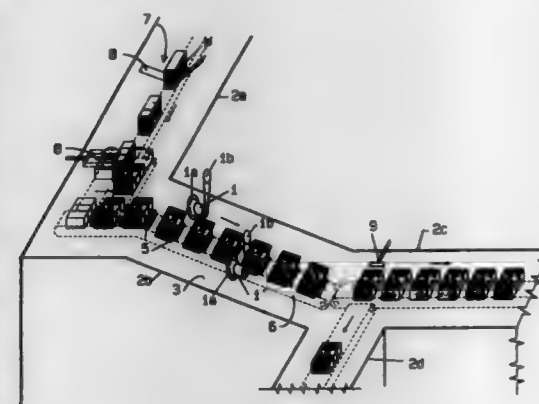
Filed Mar. 3, 1994, Ser. No. 205,571

Claims priority, application Switzerland, Mar. 11, 1993, 734/93

Int. Cl. G06M 7/06

U.S. Cl. 377-8

11 Claims



1. A counting station for counting the notes of value, in particular banknotes, of banded packs of notes P in a processing apparatus for freshly printed notes of value, having at least one automatically operating counting device (1, 1') with rotating counting disk (1a, 1a') and with a transporting section for the packs of notes, wherein the counting device (1, 1') with its counting disk (1a, 1a') is arranged stationarily on the transporting section (2b, 12) and this transporting section is equipped with a feed system (4, 5, 6, 16, 18) moving the packs of notes at certain intervals from one another uniformly past the counting disk (1a, 1a') whereby the banknotes of each pack are counted by the counting device as the packs move on the feed system past the counting disc.

5,440,602

### METHOD AND DEVICE FOR COUNTING CLOCK PULSES FOR MEASURING PERIOD LENGTH

Helmut Gimmier, Walblingen; Ulrich Nester, Neuhausen, and Dinh D. Tu, Plattenhardt, all of Germany, assignors to Daimler-Benz AG, Stuttgart, Germany

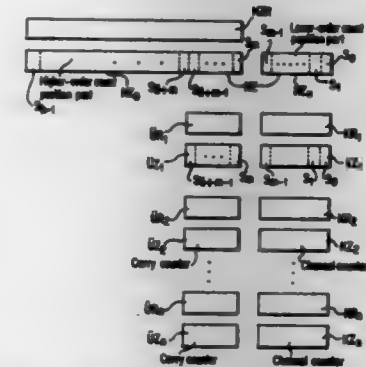
Filed Apr. 28, 1994, Ser. No. 234,155

Claims priority, application Germany, Apr. 27, 1993, 43 13 780.6

Int. Cl. G01F 15/00

U.S. Cl. 377-20

9 Claims



1. Method for counting clock pulses for measuring period lengths in a number n of measuring period lengths in a number n of measuring channels with n greater than or equal to one, during a prescribed measurement period, comprising the steps:
  - a) simultaneously starting, at a start of measurement ( $E_{0,1}$ ),  $n$  of  $m_i$ -digit channel counters ( $KZ_i$ ) separately provided for each measuring channel, and an  $h$ -digit main counter ( $HZ$ ),  $h$  being greater than all the  $m_i$ ;
  - b) upon occurrence of a period end ( $E_{jk}$ ;  $k=1, 2, \dots$ ) in one (j) of the measuring channels, stopping the channel counter ( $KZ_j$ ) of that measuring channel and reading out  $m_j$  count positions from that channel counter, reading out  $h-m_j$  higher-order count positions of the main counter ( $HZ$ ) and forming an  $h$ -digit total count value, which combines the two read-out count positions and represents a temporal spacing of said period end from the start ( $E_0$ ) of measurement;
  - c) after readout of the channel counter ( $KZ_j$ ), starting this channel counter again and synchronized with the  $m_j$  lower-value count positions of the main counter ( $HZ$ ), which have continued to run;
  - d) repeating steps b) and c) up to a specifiable measurement period end; and
  - e) respectively determining the number of counting pulses which has occurred between the start ( $E_{jk-1}$ ) and the end ( $E_{jk}$ ) of each period ( $k=1, 2, \dots$ ) of each measuring channel ( $i=1, \dots, n$ ) and is representative of the respective period length, by subtracting the count value belonging to the period start ( $E_{jk-1}$ ) from the count value belonging to the period end ( $E_{jk}$ ) for each period.

5,440,603

### WATCH-DOG TIMER CIRCUIT AND A MICROCOMPUTER EQUIPPED THEREWITH

Kazuya Sugita, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1994, Ser. No. 230,457

Claims priority, application Japan, May 19, 1993, 5-116837  
Int. Cl. H01J 37/305

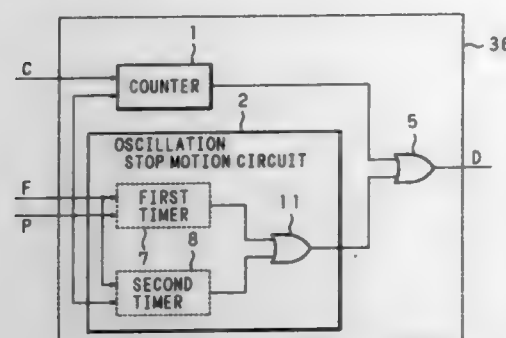
U.S. Cl. 377-20

12 Claims

1. A watch-dog timer circuit, comprising:
  - a counter for counting clock pulses of a central processing unit, a count of said counter being initialized every time the count reaches a specified value, and when said counter is not initialized, said counter outputting a reset request



signal for generating a reset signal of the central processing unit;  
 a first timer circuit which is refreshed every time after a rear edge of said clock pulse till a next front edge passes, and when said first timer circuit is not refreshed, said first timer circuit outputting the reset request signal for generating said reset signal; and



a second timer circuit which is refreshed every time after a front edge of said clock pulse till a next rear edge passes, and when said second timer circuit is not refreshed, said second timer circuit outputting the reset request signal for generating said reset signal.

5,440,604

# COUNTER MALFUNCTION DETECTION USING PRIOR, CURRENT AND PREDICTED PARITY

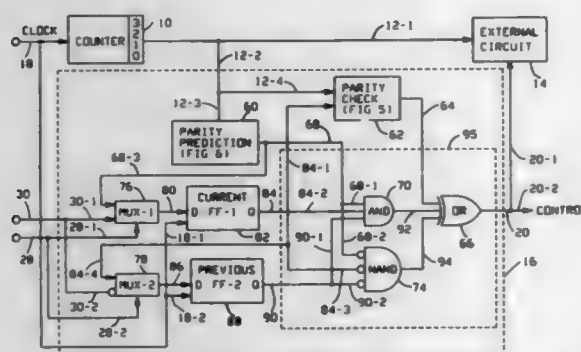
Joseba M. De Subijana, Minneapolis, and Wayne A. Michaelson, Circle Pines, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 26, 1994, Ser. No. 233,842

Int. Cl.<sup>6</sup> G06F 11/00; H03K 21/40

U.S. Cl. 377-28

11 Claims



1. For use with a binary counter operating in response to count advance signals to provide binary count signals with a predetermined parity system for use in detecting errors and a source of initializing signals, a counter error detection system comprising;

- input terminals arranged to receive the binary count signals from the binary counter;
- a parity checking circuit coupled to said input terminals and arranged to provide a first parity error signal when the binary count signals do not satisfy the predetermined parity system;
- a parity prediction circuit coupled to said input terminals and arranged to provide a predicted parity signal indicative of the parity for the next sequential count of the binary counter;
- a first bistable device coupled to said parity prediction circuit for temporarily storing said predicted parity signal as the current parity signal during the occurrence of a first next applicable count advance signal;
- a second bistable device coupled to said first bistable device

for temporarily storing said current parity signal as the previous parity signal during the occurrence of a second next applicable count advance signal;

a comparator circuit coupled to said parity checking circuit, to said parity prediction circuit, to said first bistable device and to said second bistable device said comparator circuit operable during the occurrence of each of the count advance signals, and arranged to provide a second parity error signal when said predicted parity signal, said current parity signal, and said previous parity signal fail to have a predetermined relationship; whereby it can be determined that the binary counter has failed to properly advance during count advance cycle - during which the malfunction occurs.

5,440,605

# MULTIPLICATION CIRCUIT

Guoliang Shou; Weikang Yang; Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc., Tokyo, Japan

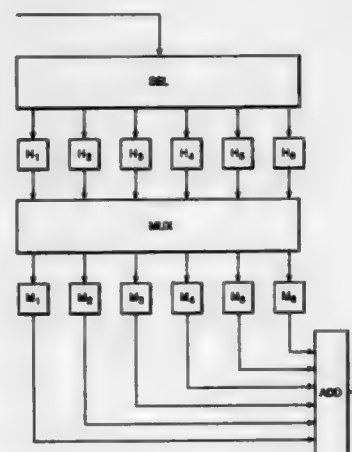
Filed May 16, 1994, Ser. No. 242,837

Claims priority, application Japan, May 17, 1993, 5-139136

Int. Cl.<sup>6</sup> G11C 27/02; G06F 7/44

U.S. Cl. 377-47

3 Claims



1. A multiplication circuit comprising:

- a selector having one input and a plurality of outputs;
- a plurality of sample hold circuits corresponding to said outputs of said selector, each having one input and one output, said input of each said sample hold circuit being connected to one of said outputs of said selector;
- a multiplexer having a plurality of inputs and outputs corresponding to said outputs of said selector, each said input being connected with one output of said sample hold circuit;
- a plurality of multiplication circuits corresponding to said outputs of said selector, each said multiplication circuit having one input and output, each said input being connected to one of said output of said multiplexer, each said multiplication circuit comprising a plurality of capacitances having opposite terminals, a first terminal of each capacitance being connected commonly with said outputs of said multiplexer and a second terminal of each capacitance being connected with said output of said multiplication circuit, said capacitances having capacitance values corresponding to digits of a binary number.

5,440,606

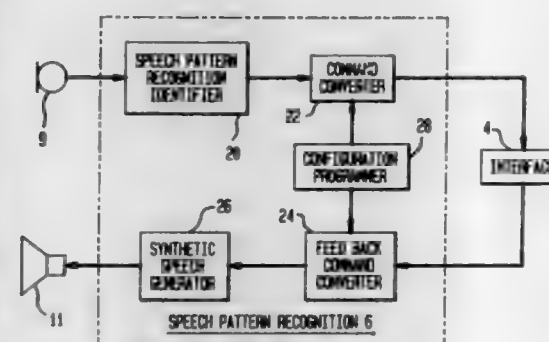
# X-RAY SYSTEM CONTROL

David D. Faul, Erlangen; Hans-Joachim Greiner, Buckenhof, and Gerd Wessels, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany  
 Continuation of Ser. No. 130,164, Sep. 30, 1993, which is a continuation of Ser. No. 875,562, Apr. 27, 1992, abandoned, which is a continuation of Ser. No. 577,973, Sep. 4, 1990, abandoned, which is a continuation of Ser. No. 218,378, Jul. 13, 1988, abandoned. This application Apr. 21, 1994, Ser. No. 231,348

Int. Cl.<sup>6</sup> H05G 1/64

U.S. Cl. 378-98

17 Claims



1. An X-ray system comprising:

- a plurality of system components connected in series from a first to a last in a transmission path, whereby each of said system components can directly communicate with the other said system components in said transmission path, said system components including at least a speech recognition system for creating an adjustment signal in said transmission path corresponding to a spoken statement identifying a desired adjustment in said X-ray system, an X-ray generator component for selectively generating an X-ray beam, and an X-ray positioning component for controlling the spatial relationship between said X-ray beam and an object to be X-rayed, wherein said X-ray generator component and said X-ray positioning component directly communication with each other via said transmission path and operate in response to digitally-coded signals representative of the desired adjustment to provide said desired adjustment in response to said adjustment signal; and
- a microprocessor control device included in each of said system components, the microprocessor control devices being coupled in series to each other via said transmission path, each said microprocessor control device being capable of generating a digitally-coded signal which is transmitted via said transmission path and/or responding to a digitally-coded signal in said transmission path which is communicated to said microprocessor control device via said transmission path;

wherein when a first system component addressed by said digitally-coded signal requires a response from at least one other system component to provide said desired adjustment, said microprocessor control device of said first system component generates a digitally-coded sub-message signal directed via said transmission path to communicate to said at least one other system component, for control of said at least one other system component by said digitally-coded sub-message signal.

5,440,607

# IMAGE RECORDING/REPRODUCING APPARATUS

Junko Nakaya, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

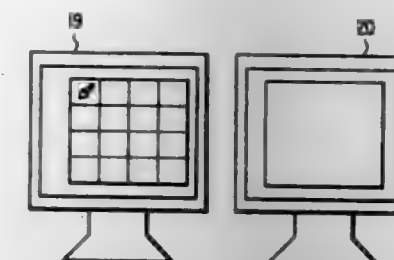
Filed Oct. 29, 1993, Ser. No. 143,056

Claims priority, application Japan, Oct. 30, 1992, 4-293253

Int. Cl.<sup>6</sup> G06F 15/64

U.S. Cl. 378-98.2

10 Claims



1. An image recording/reproducing apparatus comprising: storing means for storing a plurality of X-ray images which are repeatedly picked-up along a time base, such that frame numbers are serially given to the X-ray images in the order of the X-ray images being picked-up; first displaying means, connected to said storing means, for extracting an m-number of X-ray images, whose frame numbers are discrete, from the X-ray images, and visually displaying the extracted X-ray images as images for use in retrieval; designating means for designation by the operator of specific X-ray image designated by a frame number n from among the displayed X-ray images; and second displaying means, connected to said storing means, for dynamically visually displaying a series of X-ray images following the X-ray image having frame number n+1.

5,440,608

# METHOD AND SYSTEM FOR EXTENDING THE SERVICE LIFE OF AN X-RAY TUBE

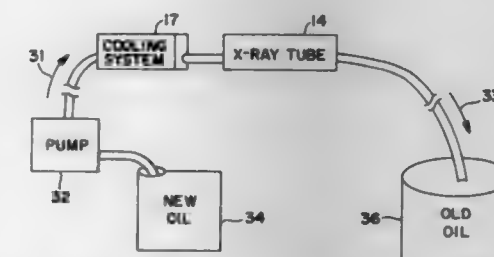
Eduardo Peralta, Freeport, N.Y., and David V. Habib, Jr., 24 Grandview Ter., Tenafly, N.J. 07670, assignors to David V. Habib, Jr., Tenafly, N.J.

Filed Jul. 13, 1993, Ser. No. 90,703

Int. Cl.<sup>6</sup> H01J 35/10

U.S. Cl. 378-199

14 Claims



1. In a radiographic apparatus having an x-ray tube coupled to a cooling system and the cooling system circulates an existing fluid through a closed circulation system which includes the x-ray tube to remove heat and provide electrical insulation, a method for extending the service life of the x-ray tube in the radiographic apparatus comprising the steps of:
  - a) determining, based on predetermined criteria, that the existing fluid be replaced;
  - b) opening the closed circulation system, without removing the x-ray tube, to gain access to the existing fluid;
  - c) replacing substantially all of the existing fluid with new fluid by way of the opening in step b);
  - d) closing the circulation system; and

e) protecting the x-ray tube from damage during or after replacement of the existing fluid but prior to operating the x-ray tube again, thereby replacing the existing fluid in the closed circulation system without damaging or removing the x-ray tube.

5,440,609

## TELEPHONE TESTER JUNCTION BOX

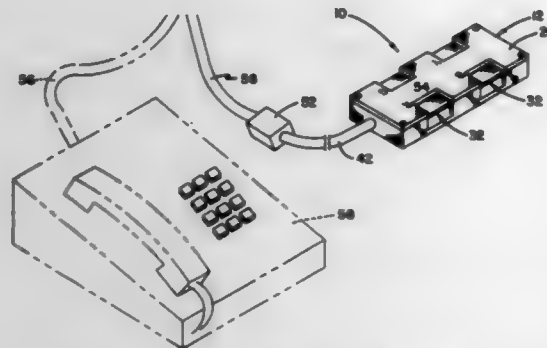
Tony G. Curtis, 2931 S. Clearfork Rd., Sevierville, Tenn. 37862

Filed May 5, 1994, Ser. No. 238,626

Int. Cl.<sup>6</sup> H04M 3/08, 3/22

U.S. Cl. 379-21

1 Claim



1. A telephone tester junction box comprising: a rectangular housing having a front wall spaced from a rear wall with a pair of spaced side walls extending parallel between said front and rear walls, the housing further including a base integrally formed with said walls and a cover plate removably coupled to said walls at a location above the base, with each of the side walls being provided with two rectangularly shaped, spaced side wall apertures which extend from said upper surface of said side walls to said base, said cover plate having four cover plate apertures orthogonally aligned with respective side wall apertures to thereby create a general quadrature type arrangement; four contacts secured to said base for engaging alligator clips of a telephone testing apparatus, each of said contacts being aligned with an individual one of said cover plate apertures, each of said contacts comprising a contact base plate secured to said base, a contact vertical plate extending orthogonally from said contact base plate, with an orthogonally projecting contact horizontal plate extending from said contact vertical plate and positioned slightly below said respective cover plate apertures; an extension line disposed within and projected from the housing and having four contrasting colored leads, each of said leads being electrically coupled to an individual one of said contacts, said extension line further having a modular female jack electrically coupled thereto, said modular female jack being operable to engage a modular telephone male connector; and indicating indicia positioned upon said cover plate for labeling each contact relative to said contrastingly colored leads.

5,440,610

## MECHANISM FOR CONTROLLING OPERATION OF TELEPHONE METALLIC LOOP MEASUREMENT DEVICE IN DEPENDENCE UPON RATE OF SETTling OF TELEPHONE LINE VOLTAGE

Onofrio Schillaci, Camarillo; Ben Pierce, Oja; Steve R. Coffelt, and Edward K. W. Sin, both of Simi Valley, all of Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 14, 1993, Ser. No. 48,348

Int. Cl.<sup>6</sup> H04M 1/24, 3/08, 3/22

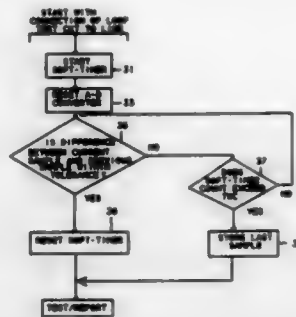
U.S. Cl. 379-24

16 Claims

1. For use with a communication link testing device which is controllably operative to conduct one or more tests of said

communication link, a method of controllably enabling said communication link testing device to proceed with testing of said communication link, comprising the steps of:

(a) monitoring a prescribed characteristic of an electrical parameter of said communication link; and



(b) in response to the prescribed characteristic of the electrical parameter of said communication link in step (a) being representative that said electrical parameter of said communication link has settled to within acceptable limits, enabling said communication link testing device to proceed with testing of said communication link.

5,440,611

## METHOD OF DETERMINING THE PHYSICAL LENGTH OF A TELEPHONE LINE

Anders O. Lindstrom, Vallinby, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

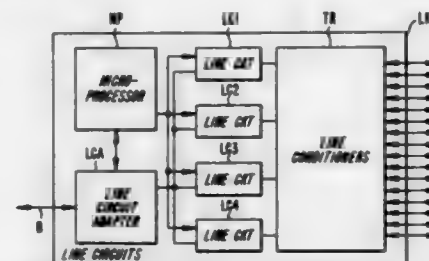
Filed Jul. 30, 1993, Ser. No. 99,665

Claims priority, application Sweden, Aug. 7, 1992, 9202311

Int. Cl.<sup>6</sup> H04M 1/24

U.S. Cl. 379-24

8 Claims



1. A method for determining a physical length L of a line between a first node and a second node in a telephone system, the second node including a subscriber line circuit for communicating line signals between the first node and the second node, comprising the steps of:

retrieving from a memory an attenuation D db per unit length of the line;

retrieving from a memory the subscriber line circuit's amplification factor G dB for the line signals communicated on the line; and

determining the physical length L based on the attenuation D and the amplification factor G and predetermined circuit properties of the second node.

5,440,612

## METHOD AND DEVICE FOR MEASURING OPERATION PARAMETERS OF TELEPHONE SUBSCRIBER LINES AND ASSOCIATED INTERFACE CIRCUITS

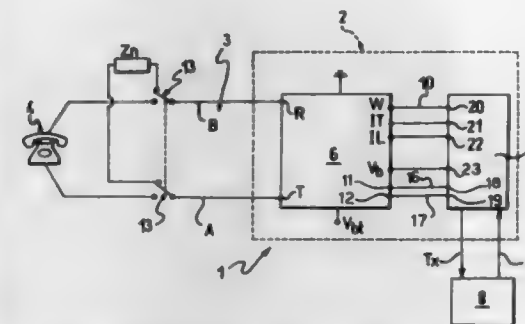
Marco Siligoni, deceased, late of Milan, Italy by Maria I. Marconi, legal representative, and Ferdinando Lari, Vimercate, Italy, assignors to SGS-Thomson Microelectronics s.r.l., Milan, Italy

Filed Oct. 22, 1992, Ser. No. 964,612

Int. Cl.<sup>6</sup> H04M 1/24

U.S. Cl. 379-27

16 Claims



1. A method of measuring, under running conditions operation parameters of an interface circuit and of a telephone subscriber line connected to it, with said interface circuit comprising a first integrated circuit operating on a high voltage with first outputs connected to said line and second outputs on which transverse and longitudinal electric current values of the line appear respectively during normal operation, and a second integrated circuit operating on a low voltage between said first integrated circuit and a telephone exchange, comprising the steps of:

switching said first outputs to the opposed ends of an impedance having a predetermined value; measuring, by means of said first circuit, the values of the currents present on said second outputs; again switching said first outputs from the opposed ends of said impedance to leads in said line; measuring, by means of said first circuit, the values of transverse and longitudinal currents of said line; for each measurement, encoding the measured values in digital form, using said second circuit, and transmitting the values thus encoded to the telephone exchange.

5,440,613

## ARCHITECTURE FOR A CELLULAR WIRELESS TELECOMMUNICATION SYSTEM

James J. Fuentes, South Barrington, Ill., assignor to AT&amp;T Corp., Murray Hill, N.J.

Continuation of Ser. No. 998,310, Dec. 30, 1992, abandoned.

This application Jul. 27, 1994, Ser. No. 281,249

Int. Cl.<sup>6</sup> H04Q 7/24

U.S. Cl. 379-60

10 Claims

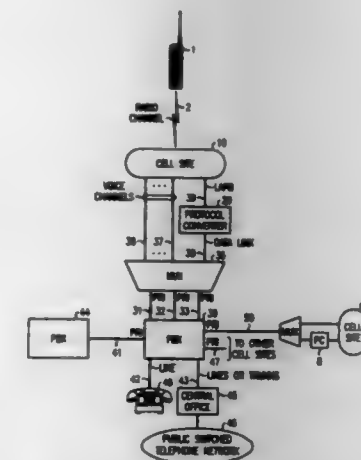
1. A wireless telecommunications system for handing off calls from one to another of a plurality of cell sites, comprising: a telecommunications switching system conventionally adapted to communicate only with land based stations and land based switching systems;

a plurality of wireless cell sites arranged for communicating with a mobile switching center;

protocol conversion means for converting between a cell site control protocol, said cell site control protocol for signaling to and receiving signals from a wireless cell site, and an out of band telephone station control (OTSC) protocol for communicating between a telecommunications switching system and a land based telephone station; wherein said telecommunications switching system is connected to each of said plurality of wireless cell sites by a plurality of communication links, and said telecommunications switching system is connected to each of said

plurality of wireless cell sites by data link means via said protocol conversion means;

wherein said telecommunications switching system sends OTSC protocol signaling messages of a type used for controlling land-based telephone stations to said protocol conversion means as if it were communicating directly with a land based telephone station, and said protocol conversion means converts said OTSC protocol signaling messages to equivalent cell site control protocol messages for transmission to a cell site, for controlling said cell site; wherein said cell site sends cell site control protocol signaling messages of a type used for communicating with a mobile switching center to said protocol conversion



means as if it were communicating directly with a mobile switching center for communicating with cell sites, and said protocol conversion means converts said cell site control protocol signaling messages to equivalent OTSC protocol signaling messages for transmission to said telecommunications switching system; wherein one of said wireless cell sites sends locate request messages to a plurality of said plurality of wireless cell sites via said protocol conversion means and wherein said protocol conversion means receives locate response messages from said plurality of said plurality of wireless cell sites for selection of a handoff cell site by either of said protocol conversion means or the cell site which transmitted the locate request.

5,440,614

## SYSTEM AND METHOD FOR DYNAMICALLY SPECIFYING THE MANNER IN WHICH CALLS TO A ROAMING CELLULAR TELEPHONE SUBSCRIBER ARE TO BE HANDLED

Kenneth W. Sonberg, Medford, and Timothy A. Bein, Millbury, both of Mass., assignors to Electronic Data Systems Corporation, Plano, Tex.

Continuation of Ser. No. 935,054, Aug. 24, 1992, abandoned, which is a division of Ser. No. 565,016, Aug. 9, 1990, Pat. No. 5,142,654. This application Aug. 25, 1994, Ser. No. 295,971

Int. Cl.<sup>6</sup> H04Q 7/38

U.S. Cl. 379-60

34 Claims

1. The method for enabling a cellular telephone subscribed to dynamically specify the manner in which calls to the subscriber are to be handled when the subscriber is located in a foreign service area, the method comprising:

detecting the presence of a subscriber in a foreign service area before subscriber makes a call by detecting a change in a MTSO system identification code; sending a registration message to at roam site MTSO; receiving at the roam site MTSO, information indicating









memory means for storing received personal information; and  
 means, responsive to personal information stored in said memory means, for controlling said multi-purpose keyboard and said indication means;  
 wherein said main device has means, responsive to personal identification information received from a communication terminal device, for transferring personal information corresponding to said received personal identification information from said memory to the communication terminal device from which said personal identification information was received, whereby said communication terminal device is personally controlled.

5,440,626

# ARRANGEMENT FOR SHARING A TELEPHONE OFFICE CODE

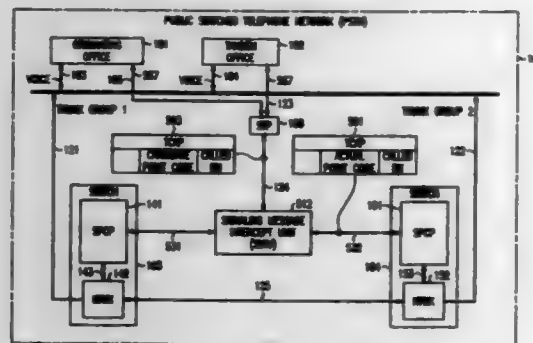
Valerie Y. Boyle, Wheaton; Ronald B. Martin, Carol Stream, and Robert A. Swanson, Naperville, all of Ill., assignors to AT&T Corp., Murray Hill, N.J.

Continuation-in-part of Ser. No. 156,546, Nov. 23, 1993. This application Jul. 28, 1994, Ser. No. 281,961

Int. Cl.<sup>6</sup> H04M 7/00, 3/00

U.S. Cl. 379-219

11 Claims



1. An office code sharing end office communication switching system for use in the Public Switched Telephone Network (PSTN), wherein the PSTN comprises a communication switching network comprising: a plurality of member communication switching systems and a plurality of interconnecting communication channels; and a Common Channel Signaling (CCS) network comprising: a plurality of Signal Transfer Points (STP), a plurality of nodes each having individually assigned discrete point codes, and interconnecting signaling channels;

said office code sharing end office communication switching system comprising:

a first switch serving at least one office code in a national numbering plan and comprising:

a first network comprising: a plurality of subscriber line ports assigned individual directory numbers (DN), and a first plurality of trunk ports for connection to a first plurality of trunk channels of said plurality of interconnecting communication channels;

a first signaling port identified by a first one of said discrete point codes of said CCS network; and

a first control processor coupled to said signaling port for controlling establishment and release of connections through said first network;

## CHARACTERIZED IN THAT

said office code sharing end office communication switching system further comprises:

a second switch, serving, on a shared basis, at least one of said office codes served by said first switch, and comprising:

a second network comprising a plurality of subscriber line ports assigned individual directory numbers, and a second plurality of trunk ports for connection to a

second plurality of trunk channels of said plurality of interconnecting communication channels;

a second signaling port identified by a second one of said discrete point codes of said CCS network; and

a second control processor for controlling establishment and release of connections through said second network;

and signaling message intercept means for receiving signaling messages for incoming calls from a STP, for determining whether a signaling message having a candidate point code of said first switch is destined for said first switch or said second switch, for converting said candidate point code to a converted code, wherein said converted code is selected from one of the two discrete point codes based on a directory number of a message, and for transmitting messages to a signaling port over an interoffice signaling link identified by said converted code.

5,440,627

# COMPUTER PHONE DIALING SYSTEM

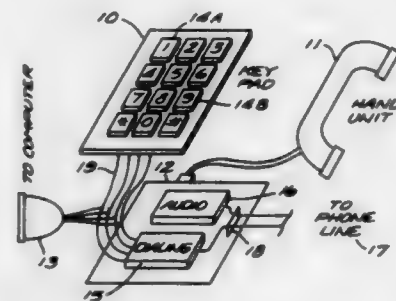
Rajendra P. Puri, 2133 W. Tanglewood Dr., Tucson, Ariz. 85745

Filed Apr. 21, 1994, Ser. No. 231,228

Int. Cl.<sup>6</sup> H04M 1/27

U.S. Cl. 379-355

22 Claims



1. A telephone dialing system comprising:

a) a telephone having,

1) a number keypad means for operator entry of values,

2) a dialing circuit means for communicating said values to a telephone line,

3) linkage means for communicating said values from said keypad means to said dialing circuit means, and,

4) a handset for vocal communication via said telephone line;

b) a computer having a memory means for storing at least two series of values; and,

c) a communication channel for communicating a selected one of said at least one series of values from said memory means to said linkage means.

5,440,628

# OFF-HOOK TELEPHONE WITH TEMPORARY PARK FEATURE

Thomas A. Mile, Carran, Canada, assignor to Mitel Corporation, Kanata, Canada

PCT No. PCT/CA92/00357, § 371 Date Feb. 17, 1994, § 102(e) Date Feb. 17, 1994, PCT Pub. No. WO93/04548, PCT Pub. Date Mar. 4, 1993

PCT Filed Aug. 21, 1992, Ser. No. 196,238

Claims priority, application Canada, Aug. 21, 1991, 2049583

Int. Cl.<sup>6</sup> H04M 1/00

U.S. Cl. 379-422

4 Claims

1. A telephone apparatus comprising:

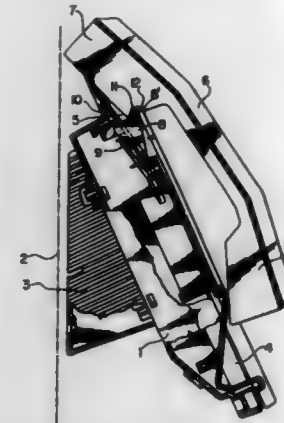
(a) a base and a handset;

(b) a stationary cradle lying in an inclined plane and provided on said base for receiving the handset and being shaped such that a handset placed thereon normally falls naturally into a fully seated position therein;

(c) a separate switch member in said cradle displaceable out

of said inclined plane between a retracted position and a protruding position in response to the presence or absence of the handset in said fully seated position to place the apparatus in an "on-hook" or "off-hook" condition respectively; and

(d) said switch member and said handset comprising co-operating and mutually engageable means to permit said handset to be hooked onto said switch member such that



the tendency of said handset to fall naturally down said inclined plane into said fully seated position urges said switch member outwardly of said inclined plane into said protruding position to permit said handset to be temporarily retained in a partially seated position on said cradle wherein said handset is parked temporarily on said cradle with the telephone apparatus remaining in the "off-hook" condition.

5,440,629

# CHANGEABLE CONTOUR CONSTRUCTION OF WIRELESS TELEPHONE

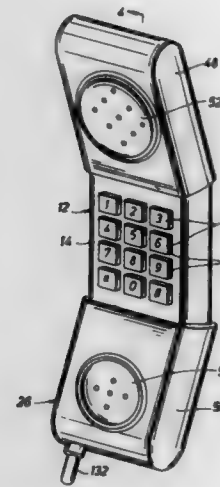
Robert R. Gray, 5225 Memorial Dr., Houston, Tex. 77007

Filed Jul. 2, 1993, Ser. No. 87,165

Int. Cl.<sup>6</sup> H04M 1/00

U.S. Cl. 379-433

15 Claims



1. A portable telephone handset comprising:

(a) an elongate substantially straight telephone handset chassis having an end section;

(b) a pair of guide and positioning arms each having pivots connected in pivotal relation with said telephone chassis, each of said guide and positioning arms being flexible and having an elongate arm section and a locking projection thereon;

(c) at least one end closure defining internal guide slots of

elongate configuration and having spaced locking recesses defined in part by a cam surface and being disposed for receiving a respective one of said locking projections, said end closure being in linear sliding and articulatable assembly with said telephone handset chassis and being movable easily from a collapsed position where said at least one end closure encloses said end section of said telephone handset chassis and being linearly movable to an extended position exposing said end section of said telephone handset chassis;

(d) said elongate arm section of each of said guide and positioning arms being received in guiding relation within a respective one of said internal guide slots; and

(e) said at least one end closure being linearly movable in guided relation with said telephone chassis and said guide and positioning arms from collapsed positions enclosing said end section of said telephone handset chassis and extended positions exposing said end section of said telephone handset chassis, said at least one end closure further being pivotally movable about said pivots at the substantially fully extended positions to thus provide for articulation of said at least one end closure to inclined relation with said telephone chassis.

5,440,630

# TELEPHONE RECEIVER WITH ELECTROSTATIC DISCHARGE PREVENTION

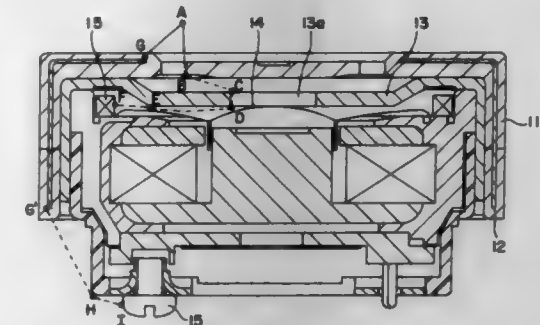
Takuro Yamaguchi, Tokyo; Yoshimori Wada, Akishima, both of Japan, and Mark A. Armstrong, Stittsville, Canada, assignors to Foster Electric Co., Ltd. and Mitel Corporation, Canada

Continuation of Ser. No. 999,801, Dec. 28, 1992, abandoned, which is a continuation of Ser. No. 650,044, Feb. 4, 1991, abandoned. This application Feb. 18, 1994, Ser. No. 198,537

Int. Cl.<sup>6</sup> H04M 1/00

U.S. Cl. 379-437

4 Claims



1. A receiver, comprising:

(a) an electroacoustic transducer comprising a voice coil and a vibrating element coupled to the voice coil and being coaxially disposed in front of the voice coil, an electrically conductive magnetic circuit surrounding the voice coil comprised of an annular magnet and an annular plate in contact with the magnet, the magnet extending coaxially to the voice coil a distance in a direction opposite to the vibrating element,

(b) an electrically insulating generally cup shaped housing through which conductive contacts pass, an extending portion of the magnet being contained in said cup shaped housing, conductors of the voice coil being connected to corresponding ones of said contacts,

(c) an electrically insulating generally cup shaped electrostatic discharge prevention plate containing said transducer, the inside bottom of said plate being spaced from the vibrating element and the sides overlapping sides of said housing, said bottom containing a single small central hole sufficiently large to allow acoustic energy to pass therethrough,

- (d) an electrically insulating generally cup shaped cover containing and disposed over said discharge prevention plate, having sides surrounding the sides and length of said discharge prevention plate, an end of the cover containing plural holes which are offset radially from said small central hole,
- (e) said discharge prevention plate being centrally depressed relative to said end of the cover to form an air gap therebetween, and
- (f) a hearing aid coil wound coaxially with the voice coil and having a diameter significantly larger than the diameter of the voice coil, the hearing aid coil being contained within said cup shaped electrostatic discharge prevention plate outside the depressed region thereof and adjacent the inside bottom thereof,
- whereby electrostatic discharges from a user must progress along a generally U-shaped path passing through a hole in said cover, at an angle through the air gap, through the central hole and radially outwardly to the hearing aid coil.

5,440,631

# INFORMATION DISTRIBUTION SYSTEM WHEREIN STORAGE MEDIUM STORING CIPHERED INFORMATION IS DISTRIBUTED

Ryota Akiyama, Takayuki Hasebe, and Makoto Yoshioka, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

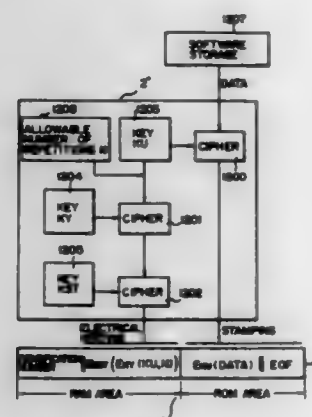
Filed Apr. 26, 1993, Ser. No. 51,749

Claims priority, application Japan, Apr. 24, 1992, 4-105033; Apr. 24, 1992, 4-105034

Int. Cl.<sup>6</sup> H04L 9/00

U.S. Cl. 380-4

41 Claims



8. A piece of storage medium containing first and second areas for storing first and second ciphered information, respectively, and said second ciphered information indicates a limit for an operation of reading the first ciphered information.

5,440,632

# REPROGRAMMABLE SUBSCRIBER TERMINAL

Kinney C. Bacon, Lawrenceville; R. Thomas Haman; David B. Lett, both of Duluth; Robert O. Banker, Cumming, and Michael P. Harney, Atlanta, all of Ga., assignors to Scientific Atlanta, Inc., Norcross, Ga.

Continuation of Ser. No. 983,909, Dec. 2, 1992, abandoned. This application Mar. 28, 1994, Ser. No. 220,626

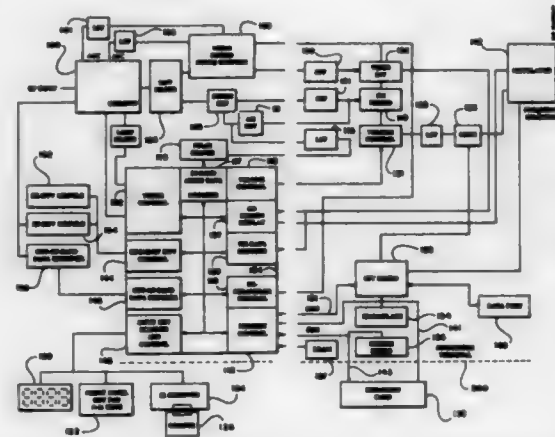
Int. Cl.<sup>6</sup> H04N 7/167, 7/00

U.S. Cl. 380-20

62 Claims

1. A method of downloading program code to modify the control program of a subscriber terminal of a subscription television system, said method comprising the steps of: providing a memory in the subscriber terminal; storing in said memory a boot code program operative for downloading new program code for the control program of the subscriber terminal into said memory from a remote

location, said control program operative for controlling predetermined features of the subscriber terminal; providing over one of a plurality of channels of said subscription television system a download program code parameters transaction to the subscriber terminal, said download program code parameters transaction including information identifying a selected one of said plurality of



channels on which said new program code will be transmitted; activating said boot code program in response to a predetermined condition; said boot code program operative for tuning the subscriber terminal to said selected one of said plurality of channels; and storing said new program code in said memory.

5,440,633

# COMMUNICATION NETWORK ACCESS METHOD AND SYSTEM

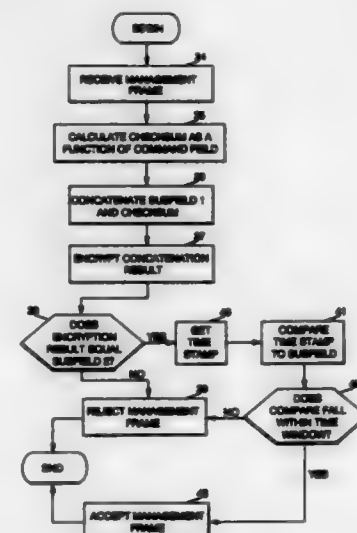
Kurt E. Augustine, Rochester, Minn.; James Edward Neeley, Sr., Chapel Hill, and Norman Clark Strole, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 25, 1993, Ser. No. 112,007

Int. Cl.<sup>6</sup> H04K 1/00

U.S. Cl. 380-23

22 Claims



1. In a communication network, a method for managing the network comprising the steps of: A—issuing a management frame to said network, said management frame containing a network management com-

mand and a security field, said security field comprising two sub fields, one of which is a time stamp of recent origin, and the other of which is an encryption of a function that is based upon said time stamp and said management command, said function being encrypted using a cryptographic key,

- B—receiving said management frame from said network,
- C—reading said management command and said time stamp as contained in said received management frame,
- D—encrypting said function that is based upon said time stamp and said management command as contained in said received management frame using said cryptographic key, and
- E—determining if the result of encrypting step D corresponds to said second sub field in said received management frame.

5,440,634

# VALUE TRANSFER SYSTEM

Timothy L. Jones, Hove, and Graham R. Higgins, Bath, both of England, assignors to Jonhig Limited, London, United Kingdom

PCT No. PCT/GB92/01901, § 371 Date Aug. 16, 1993, § 102(e) Date Aug. 16, 1993, PCT Pub. No. WO93/08545, PCT Pub. Date Apr. 29, 1993

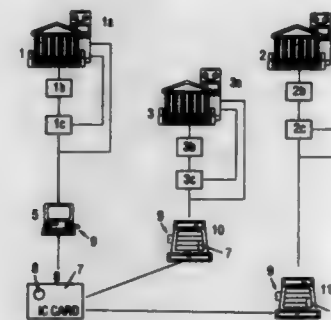
PCT Filed Oct. 16, 1992, Ser. No. 75,567

Claims priority, application United Kingdom, Oct. 16, 1991, 9121995

Int. Cl.<sup>6</sup> H04L 9/00

U.S. Cl. 380-24

26 Claims



1. A value transfer system comprising: a computer; a plurality of electronic purses; exchange devices associated with the electronic purses through which the purses communicate with each other to transfer value in transactions which are off-line from the computer; and, microprocessors respectively contained in the electronic purses or associated exchange devices, said microprocessors being programmed to effect transactions between a pair of purses including a sending purse which sends value and a receiving purse which receives value, wherein each transaction includes at least the microprocessor implemented processes of (a) the receiving purse or an exchange device associated with the receiving purse sending a requested value message denoting a request to receive value, (b) the sending purse or the exchange device associated with the sending purse creating a value message responsive to the requested value message sent by the receiving purse or the exchange device associated with the receiving purse, (c) the sending purse or the exchange device associated with the sending purse creating and storing a commitment message which signifies commitment of the value requested by the request value message sent by the receiving purse or the exchange device associated with the receiving purse, (d) the sending purse or the exchange device associated with the sending purse sending the commitment message to the receiving purse or the exchange device associated with the receiving purse, (e)

the sending purse or the exchange device associated with the sending purse sending the value message to the receiving purse or the exchange device associated with the receiving purse, and (f) the receiving purse or the exchange device associated with the receiving purse receiving and processing the value message.

5,440,635

# CRYPTOGRAPHIC PROTOCOL FOR REMOTE AUTHENTICATION

Steven M. Bellovin, Westfield, and Michael J. Merritt, Berkeley Heights, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Aug. 23, 1993, Ser. No. 110,595

Int. Cl.<sup>6</sup> H04K 1/00

U.S. Cl. 380-25

16 Claims



1. A method for generating a first cryptographic key to a first symmetric key cryptosystem, said method comprising: generating an authentication signal,  $D_A$ , that is not revealed to a remote party; generating a first one-way function of said authentication signal,  $E_A$ ; transmitting said first function of said authentication signal,  $E_A$ , to said remote party; forming an excitation signal based on a first signal,  $R_A$ ; forming an outgoing signal by encrypting at least a portion of said excitation signal with a second symmetric key cryptosystem and a second key that is based on said first function of said authentication signal; transmitting said outgoing signal to said remote party; receiving a response signal,  $Q$ , in response to said outgoing signal; generating said first cryptographic key based on said first signal and on said response signal; generating a validation signal based on a second function of said first cryptographic key and said authentication signal; and transmitting said validation signal to said remote party.



5,440,636

# APPARATUS AND METHOD FOR PROCESSING OF FREQUENCY HOPPING COMMUNICATIONS

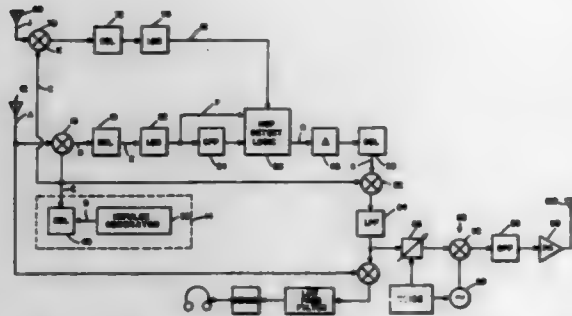
David L. Herrick, Hudson, N.H., assignor to Lockheed Sanders, Inc., Nashua, N.H.

Filed Feb. 27, 1987, Ser. No. 19,452

Int. Cl.<sup>6</sup> H04K 1/10; H04L 27/10

U.S. Cl. 380-34

9 Claims



1. Apparatus for detecting a frequency hopping signal, comprising:

- an antenna;
- first means, operatively connected to said antenna, for transforming a signal from said antenna;
- second means, operatively connected to said first means, for detecting any frequency hopping in the transformed antenna signal; and
- third means, operatively connected to and responsive to said second means, for converting the any detected frequency hopping in the transformed antenna signal to a non-hopping signal having a predetermined center frequency.

5,440,637

# LISTENING AND DISPLAY UNIT

Earl E. VanFleet, P.O. Box 915, Camden, Me. 04843

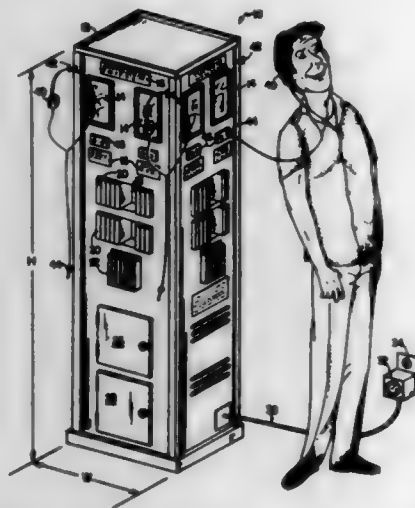
Continuation-in-part of Ser. No. 618,705, Nov. 27, 1990,

abandoned. This application Jan. 15, 1993, Ser. No. 5,225

Int. Cl.<sup>6</sup> H04R 5/00

U.S. Cl. 381-1

20 Claims



1. A listening and display unit for playing and promoting audio recordings, said unit comprising:

- a display surface adapted for display thereon of a plurality of promotional and instructional messages;
- playing devices, each device playing a preselected audio recording;
- a player support unit disposed within the listening display unit to support said playing devices, said player support

unit having a plurality of connectors, each connector corresponding to one of said playing devices;

a plurality of audio jacks mounted on said display surface, each of said audio jacks associated with one of said connectors and playing devices;

audio cables for connecting each of said audio jacks to an associated one of said playing devices;

an AC/DC power unit adapted to power said plurality of playing devices, wherein said playing devices are configured to play the preselected audio recordings when said power unit is turned on; and

wherein each of said playing devices is supported within an enclosure, said enclosure having a connector for coupling to an associated one of said plurality of connectors of said player support unit to provide power and audio signals to said playing devices.

5,440,638

# STEREO ENHANCEMENT SYSTEM

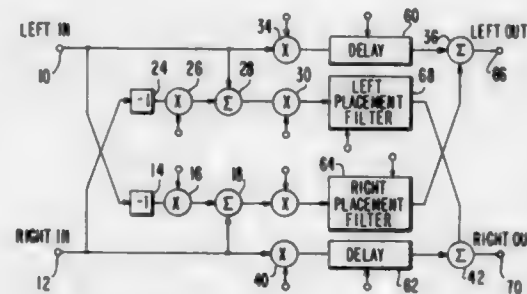
Danny D. Lowe; Scott Willing; William Gonnason, and Mark Williams, all of Calgary, Canada, assignors to Q Sound Ltd., Calgary, Canada

Filed Sep. 3, 1993, Ser. No. 115,577

Int. Cl.<sup>6</sup> H04S 5/00

U.S. Cl. 381-17

14 Claims



1. Stereo sound field enhancement apparatus for use in reproducing left and right stereophonic audio signals in a system employing left and right placement filters that alter the phase and amplitude of the signals on a predetermined frequency dependent basis, the apparatus comprising:

- first means receiving the left and right stereophonic audio signals for producing a left output signal from which substantially all audio information common to the right stereophonic audio signal is removed, said left output signal being fed to the right placement filter, and for producing a right output signal from which substantially all audio information common to the left stereophonic audio signal is removed, said right output signal being fed to the left placement filter;
- combining means for combining an output of the left placement filter and the right stereophonic audio signal to form an enhanced right-channel stereo signal and for combining an output of the right placement filter and the left audio signal to form an enhanced left-channel stereo signal; and
- a left-channel delay unit for delaying the left stereophonic audio signal fed to said combining means for combining with an output of said right placement filter, and a right-channel delay unit for delaying the right stereophonic audio signal fed to said combining means for combining with an output of said left placement filter.

5,440,639

# SOUND LOCALIZATION CONTROL APPARATUS

Yasutake Suzuki, and Junichi Fujimori, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

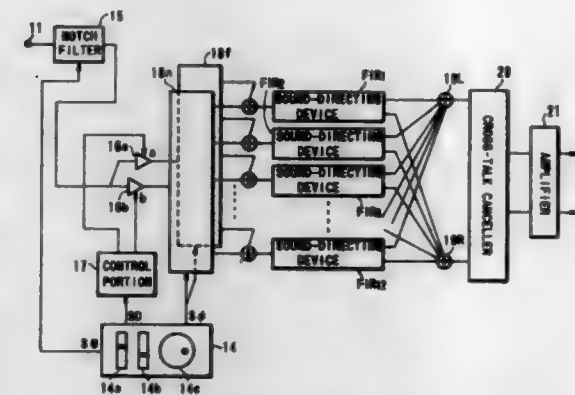
Filed Oct. 13, 1993, Ser. No. 135,900

Claims priority, application Japan, Oct. 14, 1992, 4-276375; Nov. 26, 1992, 4-317524

Int. Cl.<sup>6</sup> H04S 5/00

U.S. Cl. 381-17

22 Claims



1. A sound localization control apparatus comprising:
  - a plurality of sound directing means, each for localizing a sound corresponding to acoustic data applied thereto in each of predetermined sounding directions;
  - a designating means for producing a direction parameter and a distance parameter in connection with a target sound-image location at which the sounds are localized, said direction parameter designating a direction from a listener who listens to the sounds to said target sound-image location, while said distance parameter designates a distance between the listener and said target sound-image location; and
  - an allocating means for selecting at least one of said plurality of sound-directing means in response to the direction designated by said designating means, so that said allocating means allocates said acoustic data to said at least one sound-directing means selected, while said allocating means also allocates said acoustic data to one or some of said plurality of sound-directing means, other than said at least one sound-directing means selected, in response to the distance designated by said designating means, wherein outputs of said plurality of sound-directing means are mixed together to reproduce the sounds corresponding to said acoustic data which are localized in accordance with said target sound-image location.

5,440,640

# MULTISTREAM ENCRYPTION SYSTEM FOR SECURE COMMUNICATION

Michael M. Anshel; Izidor C. Gertner, both of New York, N.Y.; Dorian Goldfeld, Tenafly, and Boris A. Klebanov, Demarest, both of N.J., assignors to Arithmetica, Inc., Wilmington, Del.

Filed Oct. 5, 1993, Ser. No. 131,542

Int. Cl.<sup>6</sup> H04L 9/22

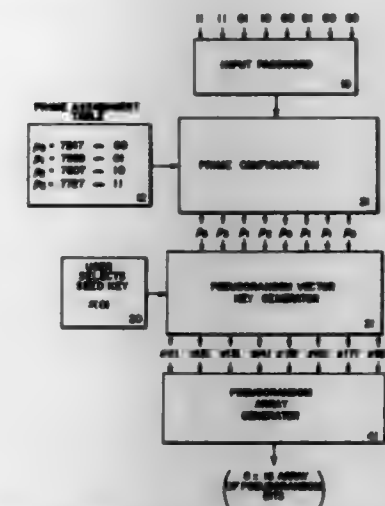
U.S. Cl. 380-46

13 Claims

5. An apparatus for encrypting blocks of data comprising:
  - a key vector generator having a seed key input and at least one next-state output and generating a time varying key;
  - a pseudorandom ring based array generator connected to said key vector generator;

an encryption array buffer connected to said pseudorandom array generator;

a data buffer;



means for combining information contained in said encryption array buffer with information contained in said data buffer.

5,440,641

# ACTIVE NOISE CANCELLATION SYSTEM

Juha Kuusama, Tampere, Finland, assignor to Nokia Technology GmbH, Pforzheim, Germany

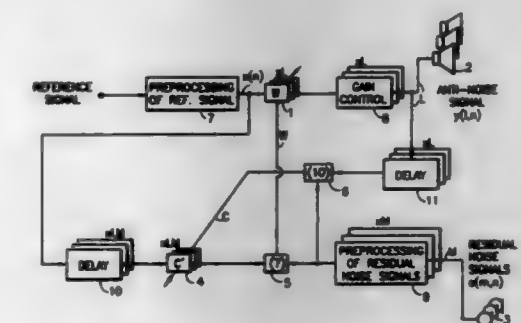
Filed Feb. 8, 1993, Ser. No. 14,785

Claims priority, application Finland, Feb. 14, 1992, 920642

Int. Cl.<sup>6</sup> A61F 11/06; H03B 29/00

U.S. Cl. 381-71

1 Claim



1. An active noise cancellation system, comprising:
  - means for generating one or more reference signals  $x(n)$  proportional to noise in a target area;
  - electronic means (1) having adjustable transfer functions  $(W)$ , including adaptive filters, to receive the one or more reference signals  $x(n)$  and to generate noise cancellation signals  $y(l,n)$ ;
  - a plurality of sound sources (2) to receive the noise cancellation signals  $y(l,n)$  and to generate cancellation noise in the target area for at least partial cancellation of the noise present therein;
  - a plurality of sensors (3) for detecting residual noise in the target area and converting it to electrical residual noise signals  $e(m,n)$ ;
  - transmission path means having an estimated transfer function  $(c')$  of the transmission path between each of the plurality of sound sources (2) and each of the plurality of sensors (3), to receive the one or more reference signals  $x(n)$  and to provide output signals;
  - tuning means (5) to receive the electrical residual noise

signals  $(e(m,n))$  and the output signals from the transmission path means (4) and to generate tuning signals  $(w)$  and transmit them to the electronic means (1) for tuning the adjustable transfer function  $(W)$  thereof; and second tuning means (6) to receive both the cancellation noise signals  $(y(l,n))$  and the residual noise signals  $(e(m,n))$  and to generate second tuning signals  $(c)$  and feed them back to the transmission path means (4) for tuning the estimated transfer functions  $(C')$  thereof, where  $l$  is a coefficient for  $L$  sound sources (2),  $m$  is a coefficient for  $M$  sensors (3), and  $n$  is a coefficient for time in the transfer functions, the second tuning means (6) generating the second tuning signals  $(c)$  in response to new values  $(c'(l,m,j,n+1))$ , which are determined by an algorithm, where  $c'(l,m,j,n+1) = c'(l,m,j,n) +$

$$\beta \left[ e(m,n) - \sum_{h=1}^L \sum_{k=1}^{J-1} c'(h,m,k,n) y(h,n-k) \right] y(l,n-j),$$

wherein  $\beta$  is an adaptation coefficient, where  $j$  is the coefficient of the transfer function  $i$  modeled with an FIR filter at time  $n$ ,  $J$  is the length of the FIR filter used to model the transfer function,  $h$  is a coefficient of the transfer function at time  $n$ .

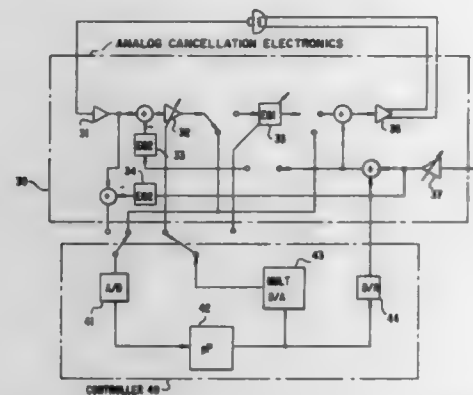
5,440,642

**ANALOG NOISE CANCELLATION SYSTEM USING DIGITAL OPTIMIZING OF VARIABLE PARAMETERS**  
Jeffrey N. Denenberg, 345 Putting Green Rd., Trumbull, Conn. 06611, and Randy V. Sabett, 8908 Liberty Rd., Randallstown, Md. 21133

Filed Sep. 20, 1993, Ser. No. 123,928  
Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381-71

9 Claims



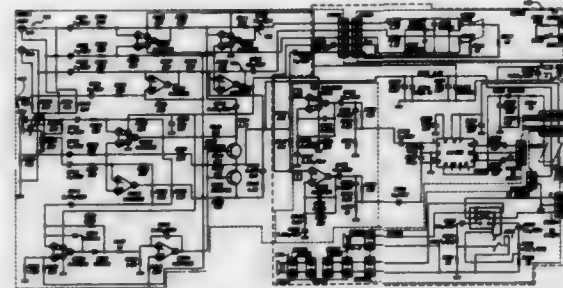
1. A hybrid noise cancellation system for canceling unwanted noise, said system comprising
  - a first noise canceling electronic means for canceling low frequency noise, and
  - a second noise canceling electronic means for canceling periodic noise,
 said first and second noise canceling means being connected and implemented in such a way that the second noise canceling means optimizes variable parameters employed in the first noise canceling means.

5,440,643  
**AUDIO PERIPHERAL MIXER CIRCUIT AND METHOD FOR NOISE REDUCTION**

David F. Wilson, Los Altos, and Lawrence F. Heyl, Mtn. View, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 13, 1993, Ser. No. 62,422  
Int. Cl.<sup>6</sup> H04B 1/00, 15/00; H03G 7/00  
U.S. Cl. 381-119

8 Claims



1. A circuit for mixing a first audio signal with a second audio signal, comprising:
  - a control signal generator coupled to receive the first audio signal and having an output, the control signal generator generating at its output a control signal having a first state corresponding to the first audio signal not lower than a threshold value and a second state corresponding to the first audio signal lower than the threshold value;
  - a selective attenuator coupled to receive the first audio signal and the control signal, the selective attenuator producing at its output an attenuated first audio signal to reduce noise in response to the control signal in the first state and a substantially unattenuated first audio signal in response to the control signal in the second state; and
  - a mixing circuit coupled to receive the output signal from the selective attenuator and the second audio signal, the mixing circuit combining the selective attenuator output with the second audio signal, wherein the second audio signal is substantially unattenuated.

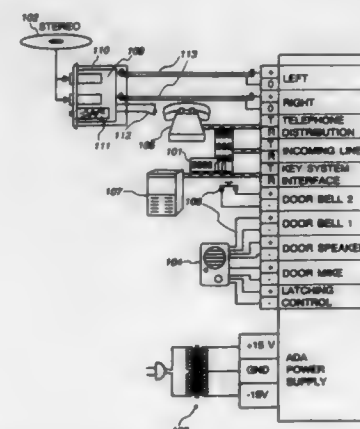
5,440,644

**AUDIO DISTRIBUTION SYSTEM HAVING PROGRAMMABLE ZONING FEATURES**

Robert Farinelli, and Thomas P. Carrin, both of Lexington, Ky., assignors to Square D Company, Palatine, Ill.  
Continuation-in-part of Ser. No. 956,901, Oct. 2, 1992, which is a continuation-in-part of Ser. No. 818,664, Jan. 9, 1992, which is a continuation-in-part of Ser. No. 639,507, Jan. 9, 1991, Pat. No. 5,131,048. This application Apr. 15, 1993, Ser. No. 48,203  
Int. Cl.<sup>6</sup> H04B 3/00

U.S. Cl. 381-81

5 Claims



1. An electronically controlled signal routing network hav-

ing designated signal zones, each zone representing a facility area in which audio signals are broadcasted, the network comprising:

- a plurality of signal generating devices, each said signal generating device generating a signal for broadcast independently of the other signal generating devices;
- a receiving circuit, arranged to operate independently with respect to the plurality of signal generating devices, receiving user input information to designate selected zones in which to route at least one of said respectively generated signals for broadcast; and
- an electronic control circuit including
  - a routing circuit for routing the signals respectively generated by said signal generating devices between a plurality of the signal zones, and
  - a programmable controller, responsive to the user input information received by the receiving circuit, for establishing and storing a routing path through the routing circuit;
 said electronic control circuit routing at least one of the plurality of signals to the selected zones for broadcast therein according to the established and stored routing path, wherein in response to repeated generation of said at least one of the respectively generated signals, the electronic control circuit repeatedly uses the stored routing path to route each said at least one of the respectively generated signals.

5,440,645

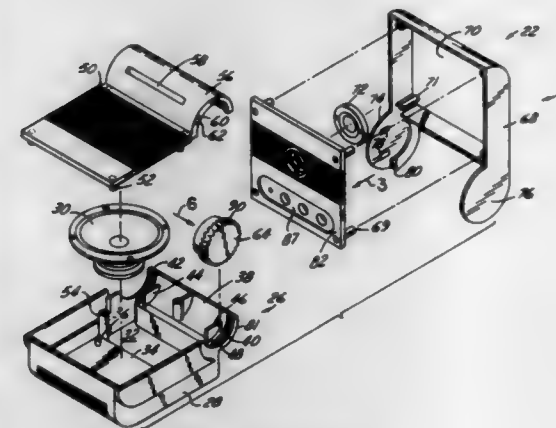
**COMPUTER SPEAKER**

Tommyca Freadman, Goshen, N.Y., assignor to Sparkomatic Corporation, Milford, Pa.  
Continuation of Ser. No. 781,433, Oct. 23, 1991, Pat. No. 5,291,559. This application Nov. 4, 1993, Ser. No. 148,107  
The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381-188

8 Claims



1. A speaker assembly comprising:
  - a mid-range woofer speaker;
  - a first speaker housing adapted to receive said mid-range woofer speaker;
  - a tweeter speaker;
  - a second speaker housing adapted to receive said tweeter speaker; and
 hinge means disposed between said first speaker housing and said second speaker housing for pivotally connecting and selectively positioning said second speaker housing relative to said first speaker housing between and including a closed position wherein said speakers are opposed and completely concealed from view and an open position wherein said second speaker housing is pivoted approximately 180° from the closed position and said mid-range woofer speaker and said tweeter speaker are oriented in an approximately common direction, said hinge means com-

municating at least one electric wire between said mid-range woofer speaker and said tweeter speaker.

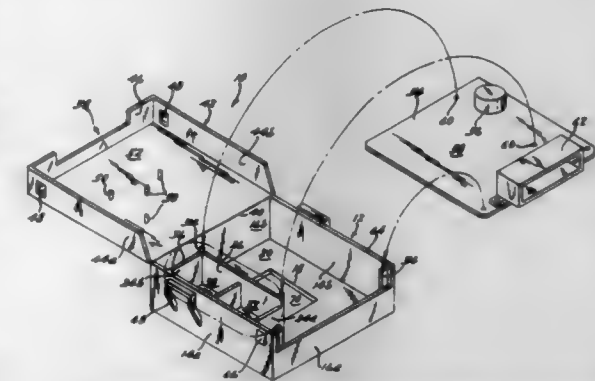
5,440,646

**MOLDED HOUSING WITH INTEGRAL ACOUSTIC CHAMBER AND ANTI-RATTLE PRINTED CIRCUIT BOARD SUPPORTS**

Steven R. Settles, Sterling Heights; Eric J. Krupp, Canton, and Frank Buccinna, Dearborn, all of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.  
Filed Feb. 18, 1994, Ser. No. 198,493  
Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381-188

11 Claims



1. A housing for producing enhanced audible sound waves, comprising:
  - a base portion including a bottom having an opening and transversely disposed walls extending from said bottom to define a cavity, said cavity including an acoustic chamber having distinct sections defined by a first wall and a second spaced apart wall which is shorter than said first wall, a third wall extending between said first and second walls and a partition wall disposed parallel to said first and second walls, wherein said partition wall is shorter than said first wall;
  - means for generating sound waves, said means including a circuit board disposed over said base portion and a sound generator integrally attached to said circuit board, said sound generator extending into a first section of said acoustic chamber; and
  - a cover attachable over said base portion and said circuit board;
 wherein upon activating the sound generator sound waves are directed over a specific path of travel to enhance the audible level of sound waves allowed to escape from the housing.

5,440,647

**X-RAY PROCEDURE FOR REMOVING SCATTERED RADIATION AND ENHANCING SIGNAL-TO-NOISE RATIO (SNR)**

Carey E. Floyd, Jr., Chapel Hill, and Alan H. Baydush, Durham, both of N.C., assignors to Duke University, Durham, N.C.  
Filed Apr. 22, 1993, Ser. No. 52,185  
Int. Cl.<sup>6</sup> G06K 9/00

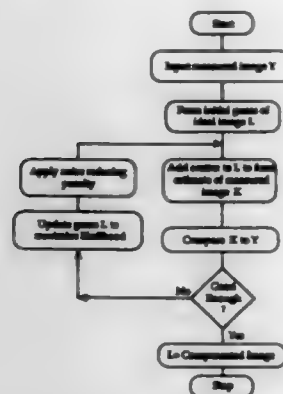
U.S. Cl. 382-132

11 Claims

1. A method for increasing the signal-to noise ratio (SNR) in projection radiography imaging comprising:
  - (a) subjecting an object under examination to projection radiography to measure the transmission of photons through the object so as to obtain measured digital imaging data;
  - (b) altering said measured digital imaging data to compensate for blurring degradation from said projection radiography;



- (c) altering said measured digital imaging data to compensate for noise therein from said projection radiography;



- (d) forming an enhanced image of the object under examination from said measured digital imaging data to have an increased signal-to-noise ratio (SNR); and  
(e) analyzing the enhanced image for interpretation thereof.

5,440,648

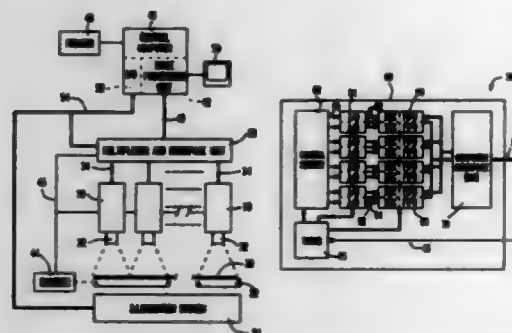
# HIGH SPEED DEFECT DETECTION APPARATUS HAVING DEFECT DETECTION CIRCUITS MOUNTED IN THE CAMERA HOUSING

James W. Roberts, Guelph, Canada; John G. Elias, Wilmington, Del., and Graham A. Jullien, Tecumseh, Canada, assignors to Dalsa, Inc., Waterloo, Canada and E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 19, 1991, Ser. No. 794,861  
Int. Cl.<sup>6</sup> H04N 7/18; G01N 21/89

U.S. Cl. 382-8

25 Claims



1. A defect detection system comprising a camera housing; an array sensor having a plurality of outputs mounted in the camera housing;  
a lens mounted on the camera housing for projecting an image of an object under test onto the array sensor;  
means for operating the array sensor to generate video signals from the respective outputs representing respective sections of the image of the object;  
a coordinate counter for generating a coordinate for pixels in the video signals from the outputs;  
means mounted in the camera housing for detecting pixels in the video signal of a defect in the object from each of the outputs;  
a section counter for generating a plurality of bits identifying the image section containing each of the detected defect pixels; and  
camera output means mounted in the camera housing for transmitting out of the camera housing to a remote image processing unit:  
the detected defect pixels apart from normal pixels in the video signal from each of the outputs whereby the quantity of pixel values transmitted by the camera out-

put means is less than the quantity of pixel values in the video signal,  
the coordinate for each of the detected defect pixels, and  
the plurality of bits identifying the image section containing each of the detected defect pixels.

5,440,649

# METHOD OF AND APPARATUS FOR INSPECTION OF EXTERNAL APPEARANCE OF A CIRCUIT SUBSTRATE, AND FOR DISPLAYING ABNORMALITY INFORMATION THEREOF

Senya Kiyasu, Yokohama, and Takanori Ninomiya, Hiratsuka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Division of Ser. No. 668,022, Mar. 12, 1991. This application  
Aug. 17, 1992, Ser. No. 930,346

Claims priority, application Japan, Mar. 14, 1990, 2-060961;  
Apr. 25, 1990, 2-107564; Aug. 1, 1990, 2-202441  
Int. Cl.<sup>6</sup> G06K 9/62

U.S. Cl. 382-147

11 Claims



1. A computer-aided inspection system for inspecting the external appearance of circuit substrates during a manufacturing process, and for displaying an abnormality grade and a presumed cause of an abnormality occurring during the manufacturing process, comprising:

defect detection means for producing two-dimensional image signals, each representing the external appearance of one of said circuit substrates, and for detecting characteristics, including coordinates of defect candidates for each of said circuit substrates by comparing each of said two-dimensional image signals with a reference signal;

first storage means for storing said detected characteristics and coordinates of defect candidates over said plurality of circuit substrates manufactured by said manufacturing process;

actual defect extraction means for extracting actual defects from said defect candidates by grouping defect candidates having coordinates within a predetermined distance range from coordinates of candidates of defects stored in said first storage means for each of said plurality of circuit substrates manufactured by said manufacturing process, and for calculating locations for each of said extracted actual defects;

an actual defect presumption knowledge base for storing a presumption rule of kind of actual defect, the presumption rule being based on a plurality of correspondencies between a combination of said characteristics and actual kinds of factors of said actual defects;

presumption means for presuming a kind of factor for generating an actual defect from a combination of said stored characteristics of defect candidates stored in said first storage means, in accordance with said presumption rule; second storage means for storing said calculated locations for each extracted actual defect extracted by said actual

defect extraction means and for storing said presumed kind of factor for each actual defect presumed by said presumption means;

feature parameter calculation means for calculating a two-dimensional distribution of actual defects for said each kind of factor in at least one of said circuit substrates from said locations for actual defects stored in said second storage means, and for calculating a variation of the number of said actual defects for each kind of factor stored in said second storage means over said plurality of circuit substrates manufactured by said manufacturing process;

an abnormality judgment knowledge base for storing an abnormality judgment rule, the abnormality judgment rule being based on a two-dimensional distribution reference and a reference number variation for each kind of factor;

abnormality judgment means for determining an abnormality grade according to a partiality of a two-dimensional distribution obtained by comparing said calculated two-dimensional distribution for said each kind of factor with said two-dimensional distribution reference for each kind of factor, and according to an increase rate of number variation of actual defects obtained by comparing said calculated number variation of said actual defects for each kind of factor with said reference number variation for each kind of factor in accordance with said abnormality judgment rule stored in said abnormality judgment knowledge base;

a cause-of-abnormality presumption knowledge base for storing a presumption rule of cause of abnormality based on (1) a plurality of correspondencies between a combination of the two-dimensional distribution of said actual defects and the number variation of said actual defects for said each kind of factor, and (2) causes of abnormalities; cause-of-abnormality presumption means for presuming a cause of the abnormality of said manufacturing process from a combination of said calculated two-dimensional distribution of actual defects and said calculated number variation of said actual defects for said each kind of factor stored in said second storage means, in accordance with said presumption rule of cause of abnormality; and

display means for displaying said abnormality grade determined by said abnormality judgment means and said cause of abnormality of said manufacturing process presumed by said presumption means.

5,440,650

# IMAGE PROCESSING SYSTEM FOR INSPECTION OF OVERPRINTED MATTER

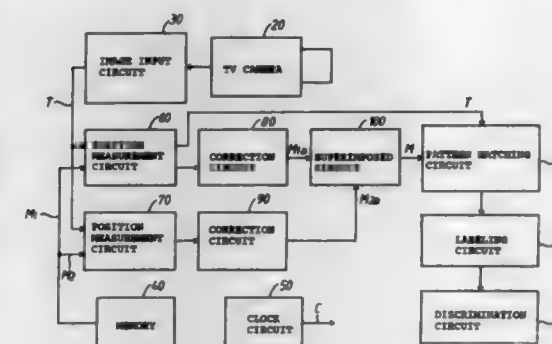
Takashi Hieda, Nagoya, and Yoshio Yokoyama, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan  
Continuation of Ser. No. 817,812, Jan. 8, 1992, abandoned. This  
application Mar. 22, 1994, Ser. No. 215,668

Claims priority, application Japan, Jan. 8, 1991, 3-012870

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382-112

5 Claims



1. An image processing system for inspection of an over-

printed matter having at least first and second layers different in lightness under appropriate illumination, comprising:

image forming means for forming a digital image of a surface of the overprinted matter, said image forming means including a camera which converts an image of the surface of said overprinted matter into electrical signals;

memory means for memorizing a first reference image representing a normal image of the first layer of said overprinted matter and memorizing a second reference image representing a normal image of the second layer of said overprinted matter;

first measurement means for measuring a first deviation between a first boundary of the first reference image and a portion of the digital image produced by said image forming means, corresponding with the first boundary, and for determining the measured first deviation as a first deviation amount;

second measurement means for measuring a second deviation between a second boundary of the second reference image and a portion of the digital image corresponding with the second boundary and represented by said image forming means, and for determining the measured second deviation as a second deviation amount;

first correction means for correcting the first reference image to produce a first corrected reference image in such a manner as to eliminate the first deviation amount;

second correction means for correcting the second reference image to produce a second corrected reference image in such a manner as to eliminate the second deviation amount;

superimposing means for superimposing the first and second corrected reference images to produce a finally corrected reference image;

matching circuit means for matching the finally corrected reference image and the digital image; and

discrimination means for discriminating the quality of the surface of said overprinted matter based on a result of the matching operation of said matching circuit means and producing an output signal indicative of the discrimination result.

5,440,651

# PATTERN RECOGNITION NEURAL NETWORK

Gale L. Martin, Austin, Tex., assignor to Microelectronics and Computer Technology Corp., Austin, Tex.

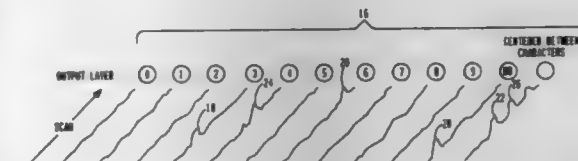
Continuation of Ser. No. 714,200, Jun. 12, 1991, abandoned.

This application Apr. 20, 1993, Ser. No. 49,967

Int. Cl.<sup>6</sup> G06K 9/62

U.S. Cl. 382-156

21 Claims



1. A multi-layered neural network for pattern recognition, comprising:

an input layer for mapping into a two-dimensional scan window, said scan window defining an input space that can be scanned over objects and which said scan window is sized to encompass more than one object;

an output layer comprised of at least one output node to represent the presence of a desired object substantially centered in said scan window; and

a hidden layer having local receptor fields and interconnected with said input layer and said output layer for mapping said input layer to said output layer, said hidden layer providing a stored representation of the position of said desired object in said scan window relative to the position when said desired object is substantially centered

within said scan window such that a determination of the position of said desired object relative to the substantial center of said scan window can be made, wherein said stored representation is trained on said desired object at multiple positions in said scan window at different activation levels for select ones of said positions;

said at least one output node operable to be activated at a predetermined level when an object is disposed at a given position within said scan window, which given position in said scan window and object corresponds to said stored representations, said predetermined level being a function of the relative position of said desired object in said scan window to the substantial center of said scan window.

5,440,652

# METHOD AND APPARATUS FOR PREPARING COLOR SEPARATIONS BASED ON N-WAY COLOR RELATIONSHIPS

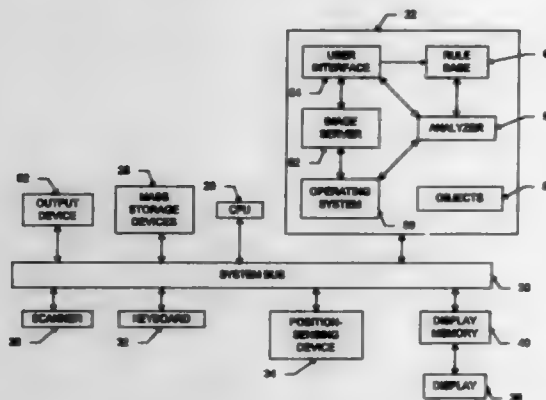
David M. T. Ting, Sudbury, Mass., assignor to Athens Design Systems, Inc., Cambridge, Mass.

Filed Sep. 10, 1993, Ser. No. 119,981

Int. Cl.<sup>6</sup> H04N 1/58; G06K 9/48

U.S. Cl. 382-165

16 Claims



1. A method of creating, from a pixelmap image datafile comprising a plurality of pixel locations, vectorized chromatic separations in accordance with a selected color model comprising a plurality of colors, the method comprising the steps of:

- defining pairwise color-relationship rules between the colors of the color model, each rule specifying an expansion or contraction distance for a color, the distance depending on the identity of an adjacent color;
- selecting a color of the color model;
- identifying, within the pixelmap, an initiating edge pixel lying at a transition between a selected color and pixels of at least one other color;
- for each edge pixel so identified,
  - defining, on a pixel-by-pixel basis, a primary edge by identifying a plurality of adjacent pixels that collectively define a contiguous edge, each pixel lying at a transition between a region of the selected color and pixels of at least one other color;
  - defining, on a pixel-by-pixel basis, a secondary edge by identifying, for each pixel of the primary edge, a corresponding secondary-edge pixel whose absolute distance from the primary-edge pixel is determined by the pairwise color relationship between the primary-edge pixel and the nearest pixel of a different color;
- storing the secondary edge as an ordered list of pixels;
- repeating steps (c) and (d) until the pixelmap contains no unidentified edge pixels; and
- repeating steps (b) through (f) for each remaining color of the color model.

5,440,653

# IMAGE MIRRORING AND IMAGE EXTENSION FOR DIGITAL FILTERING

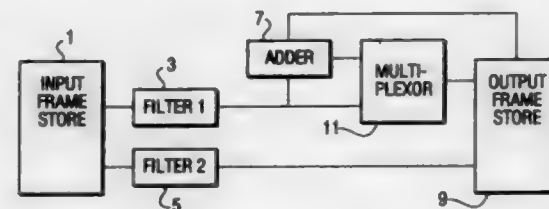
Lance Greggain, Woodbridge, and Peter Mandl, Aurora, both of Canada, assignors to Genesis Microchip Inc., Ontario, Canada

Filed Sep. 24, 1993, Ser. No. 126,388

Int. Cl.<sup>6</sup> G06K 9/36

U.S. Cl. 382-298

5 Claims



1. In a multi-rate digital signal processing system for re-sizing an image in at least two segments using at least one symmetric T-tap digital filter having T kernel-function weighting coefficients, where T is an odd plural integer, such that  $(T-1)/2$  kernel function weighting coefficients are provided on either side of a centre-tap kernel-function weighting coefficient of said symmetric T-tap digital filter, a first one of said segments being characterized by a first plurality of unfiltered pixels and second adjacent one of said segments being characterized by a second plurality of unfiltered pixels, a predetermined one of said unfiltered pixels being common to both said first and said second plurality at the image boundary of said two segments, the improvement comprising a method of seamlessly extending said image across said image boundary, comprising the steps of:

- multiplying the  $(T-1)/2$  of said first plurality and said second plurality of said unfiltered pixels adjacent said predetermined one of said unfiltered pixels by two times respective ones of said  $(T-1)/2$  kernel-function weighting coefficients for generating the first and second mirrored half kernel intermediate multiplication products;
- multiplying said predetermined one of said unfiltered pixels by said centre-tap kernel function weighting coefficient of said digital filter to generate an additional intermediate multiplication product;
- adding said first mirrored half-kernel intermediate multiplication products and said additional intermediate multiplication product to generate a first segment estimated boundary filtered output pixel;
- adding said second mirrored half-kernel intermediate multiplication products and said additional intermediate multiplication product to generate a second segment estimated boundary filtered output pixel;
- averaging said first segment estimated boundary filtered output pixel and said segment estimated boundary filtered output pixel to generate an average; and
- generating a further filtered output pixel at said boundary using said average to resize the image.

5,440,654

# FIBER OPTIC SWITCHING SYSTEM

L. Q. Lambert, Jr., Newton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 30, 1993, Ser. No. 175,994

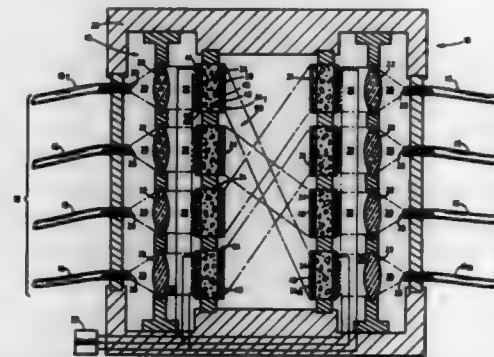
Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385-17

12 Claims

1. A fiber optic switching system, comprising:  
a plurality of fiber optic cables;  
a support structure for securing light emitting/light receiving ends of the plurality of fiber optic cables in predetermined positions; and  
means for re-directing light emitted from the light emitting/light receiving end of one of the fiber optic cables to the

light emitting/light receiving end of another one of the plurality of fiber optic cables; said redirecting means comprising:  
means for collimating the light emitted from one of the light emitting/light receiving ends for providing a collimated beam having a path with a direction;  
first means for intercepting and changing the direction of the path of the collimated beam;



second means, disposed in the path of the collimated beam from the first intercepting and changing means, for intercepting and changing the direction of the path of the collimated beam; and  
means, disposed in the path of the collimated beam from the second intercepting and changing means, for focusing the collimated beam to the light emitting/light receiving end of another one of the plurality of fiber optic cables.

5,440,655

# OPTICAL FIBER CONNECTOR BYPASS DEVICE AND METHOD USING SAME

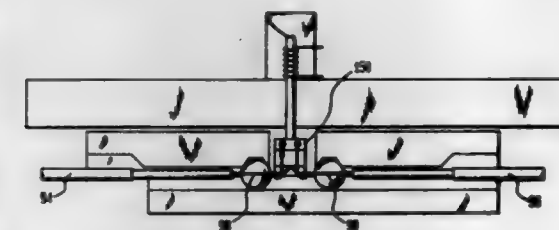
Wesley K. Kaplow, Troy, N.Y., and Richard J. Pimpinella, Hampton, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 29, 1993, Ser. No. 174,993

Int. Cl.<sup>6</sup> G02B 6/34, 6/36

U.S. Cl. 385-25

60 Claims



1. A retracting optical fiber connector comprising:  
first and second connector members, each comprising a first and second waveguide, each waveguide defining an optical path, where the connector members are configured so that the first and second waveguide of the first connector member align and optically engage the first and second waveguide of the second connector member, and where at least the first connector member further comprises a retractable housing having a first and second position, where in the first position when the connector members are not engaged, the retractable housing prevents access to the waveguides of that connector member, and in a second position the retractable housing, actuated by surface features of the other connector member, is positioned to allow mating engagement of the connector members; and  
a bypass device comprising an optical waveguiding region, where the waveguiding region is configured to direct an optical communication signal from the first waveguide of

the first connector member to the second waveguide of the first connector member;  
where the bypass device is connected to the retractable housing and oriented so that where the retractable housing is in the first position, the bypass device is positioned to engage the optical paths defined by the waveguides of the connector member, and where the retractable housing is in the second position, the bypass device does not engage the optical path defined by any of the waveguides.

48. A method for providing loopback of an optical signal propagating along a first optical path defined by optically communicating waveguides of a first and second connector member, mated to form an optical connector, where each connector member has at least a first and a second waveguide, comprising:

- providing an arrangement for waveguiding, which arrangement is configured to be received by at least one of the first and second connector members;
- placing the arrangement in the first optical path; and
- utilizing the arrangement for waveguiding to divert the optical signal from the first optical path to a second optical path defined by the first and second waveguide of the first or second connector member.

5,440,656

# WAVEGUIDE TYPE OPTICAL COMPONENT HAVING OPTICAL COUPLING SECTIONS WITH DIFFERENT COUPLING EFFICIENCIES

Ken Ueki, Takeo Shimizu, and Hisaharu Yanagawa, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00314, § 371 Date Nov. 16, 1993, § 102(e)

Date Nov. 16, 1993, PCT Pub. No. WO93/19389, PCT Pub.

Date Sep. 30, 1993

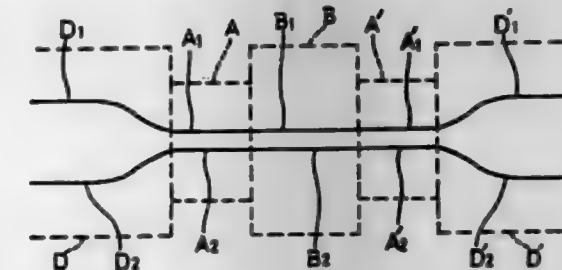
PCT Filed Mar. 17, 1993, Ser. No. 142,309

Claims priority, application Japan, Mar. 18, 1992, 4-062032

Int. Cl.<sup>6</sup> G02B 6/00

U.S. Cl. 385-30

9 Claims



1. In a waveguide type optical component having optical coupling sections, said optical coupling sections comprising only first and second coupling sections, the improvement wherein:

- said first optical coupling section includes two optical waveguides having a same propagation constant; and
- said second optical coupling section includes two optical waveguides having respective different propagation constants, each of the optical waveguides of said first optical coupling section and a corresponding one of the two optical waveguides of said second optical coupling section being connected in series with each other, and the two optical waveguides of each of said first and second optical coupling sections being linearly configured and disposed so as to achieve an evanescent-field coupling therebetween.



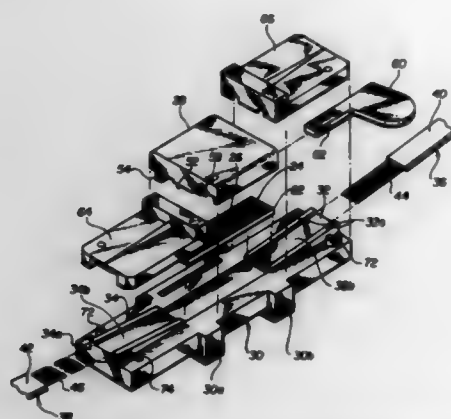
5,440,657

**RE-ENTERABLE SPLICER FOR RIBBON FIBER**  
Robert Essert, Wheaton, Ill., assignor to The Whitaker Corporation, Wilmington, Del.

Filed May 26, 1994, Ser. No. 249,536  
Int. Cl.<sup>6</sup> G02B 6/38

U.S. Cl. 385—71

13 Claims



1. A re-enterable splicer apparatus for splicing a plurality of optical fibers comprising:  
an elongate base having spaced apart ends defining an axis of elongation;  
first splicing means defining a splicing surface having a plurality of elongate parallel channels for receiving and aligning respective optical fibers, said first splicing means being positioned on said elongate base generally intermediate said spaced apart ends;  
second splicing means configured for overlying said first splicing means and maintaining said respective optical fibers in said channels;  
means for retaining said second splicing means on said base;  
guide means for guiding optical fibers of a ribbonized fiber optic cable from opposite ends of said base member into alignment with said channels of said first splicing means for retention between said first and second splicing means;  
an elongate passage longitudinally extending through said second splicing means generally parallel to said axis and spaced apart from said first splicing means; and  
splice opening means insertable into either end of said elongate passage for partially displacing said second splicing means relative to said base by an amount sufficient to facilitate manipulation of optical fibers positioned on a corresponding guide means relative to said channels.

5,440,658

**MODULAR FIBER OPTIC CABLE ASSEMBLY**  
John M. Savage, Jr., 538-B Via de la Valle, Solana Beach, Calif. 92075

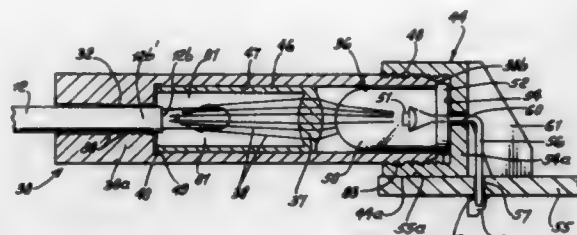
Continuation-in-part of Ser. No. 142,938, Oct. 29, 1993, which is a continuation-in-part of Ser. No. 82,963, Jun. 29, 1993, Pat. No. 5,368,503. This application Jul. 21, 1994, Ser. No. 278,246  
Int. Cl.<sup>6</sup> G02B 6/42

U.S. Cl. 385—79

30 Claims

16. In combination,  
a) a hollow connector having a first portion to receive a fiber optic cable and to position end extent of said cable relative to the connector interior,  
b) the connector having means thereon to grip the cable and to resist endwise withdrawal of the cable relative to the connector,  
c) and a lens unit mountable to a panel and having a lens and a depending skirt attachable to the connector, whereby the light-emitting end of the cable is maintained in selected open spaced relation to the lens,  
d) the cable having another end, there being another hollow connector having a primary portion coupled to said other

end of the cable, a light source also coupled to said other hollow connector, and an auxiliary lens positioned in said other hollow connector to receive light from said source and to direct light at said other end of the cable,



- e) said light source comprising an LED, and an LED socket, and wherein said other connector has additional means thereon to grip said socket to resist endwise separation thereof from said other connector.

5,440,659

**METHOD FOR FABRICATING A FIBER OPTIC CABLE HAVING IMPROVED POLARIZATION MODE DISPERSION (PMD) PERFORMANCE**

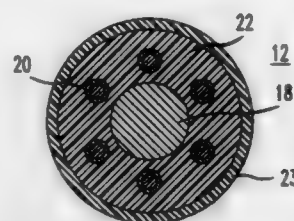
Neal S. Bergano, Lincroft, and Kwang S. Kim, Red Bank, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Sep. 30, 1993, Ser. No. 130,037

Int. Cl.<sup>6</sup> G02B 6/44

U.S. Cl. 385—100

12 Claims



1. A method for fabricating an optical fiber cable, comprising the steps of:  
providing a plurality of fiber optic supply bobbins;  
paying out a plurality of optical fibers from said plurality of supply bobbins;  
imparting a controlled amount of twist to each of said optical fibers so that each fiber retains said controlled amount of twist in said optical fiber cable; and  
subjecting said optical fibers to a cabling process;  
wherein said step of imparting includes twisting each of said plurality of optical fibers uniformly along its entire length and said twisting occurs at a rate between two and four twists per meter of optical fiber.

5,440,660

**FIBER OPTIC MICROCABLE PRODUCED WITH FIBER REINFORCED ULTRAVIOLET LIGHT CURED RESIN AND METHOD FOR MANUFACTURING SAME**

James H. Dombrowski, Carlsbad; Steven J. Cowen, and William A. Kerr, III, both of San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of Navy, Washington, D.C.

Continuation of Ser. No. 60,618, May 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 197,491, May 23, 1988, Pat. No. 5,259,055. This application Jun. 7, 1994, Ser. No. 255,129

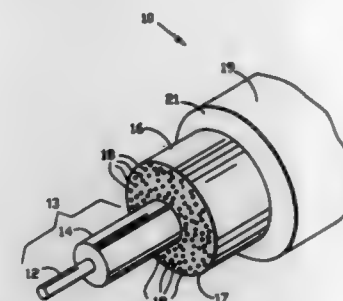
Int. Cl.<sup>6</sup> G02B 6/00, 6/44

U.S. Cl. 385—102

10 Claims

1. A fiber optic microcable, comprising:  
an optical fiber core;

a buffer surrounding said core;  
a protective sheath adhering to and surrounding said buffer, said protective sheath including:  
an ultraviolet light cured first resin having a post-cure Young's modulus ranging from approximately 700,000 to 2,500,000 kPa, a post-cure tensile strength of approximately 28,000 to 56,000 kPa, a post-cure moisture ab-



sorption of less than one per cent after 24 hours of water immersion, an uncured viscosity of less than 250 centipoise within the range of 27° C. to 60° C., and a glass transition temperature ranging from 60° C. to 105° C.; and  
a plurality of fibers embedded in said resin; and  
an unfilled overcoat sheath formed of an ultraviolet light cured second resin.

5,440,661

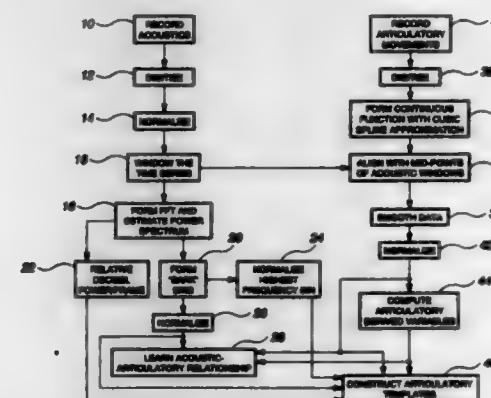
**TIME SERIES ASSOCIATION LEARNING**  
George J. Papcun, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 31, 1990, Ser. No. 473,090

Int. Cl.<sup>6</sup> G10L 9/00

U.S. Cl. 395—241

1 Claim



1. A method for recognizing human speech, comprising the steps of:

forming a series of acoustic waveforms functionally related to a concomitant set of uttered token human speech sounds;  
forming a series of digital articulation representations functionally related to selected articulatory movement sets of a speaker uttering said token human speech sounds;  
windowing each of said acoustic waveforms to form a time framed first digital speech signal series;  
temporally aligning said digital articulation representations with said time framed first digital signal series;  
inputting said speech signal series and said digital articulation representation to a neural network to form a learned relationship between said speech signal series as an input

to said neural network and said digital articulation representation as an output from said neural network;  
deriving selected acoustic features from each said time framed first digital speech signal;  
associating said selected acoustic features with said selected articulatory movement sets to form a template parameter set that uniquely associates each one of said series of acoustic waveforms with each one of said selected articulatory movement sets;  
forming from said human speech a second digital speech signal series;  
inputting said second digital speech signal series to said neural network having said learned relationship for outputting a learned articulatory parameter set; and  
comparing each said learned articulatory parameter set with each one of said template parameter sets to select one template parameter set having the best match with said learned articulatory parameter set.

5,440,662

**KEYWORD/NON-KEYWORD CLASSIFICATION IN ISOLATED WORD SPEECH RECOGNITION**

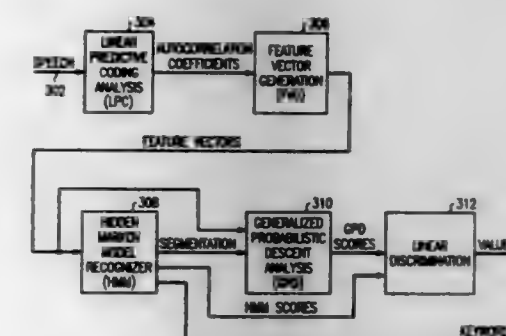
Rafid A. Sukkar, Aurora, Ill., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 11, 1992, Ser. No. 989,299

Int. Cl.<sup>6</sup> G10L 9/18

U.S. Cl. 395—245

7 Claims



1. A method to establish whether a speech signal comprising digitized speech represents a keyword, said method comprising the steps of:

transforming said digitized speech signal into feature vectors;  
processing said feature vectors in a Hidden Markov Model (HMM) keyword detector, said (HMM) keyword detector having output signals representing speech segmentation information and signals representing scores of a set of keywords compared to said digitized speech signal;  
forming a discriminating vector by deriving mean vectors from said feature vectors and concatenating said mean vectors with said segmentation information;  
non-linearly processing said discriminating vector to derive a first set of weighting factors, and linearly combining said feature vectors and said discriminating vector using said first set of weighting factors to develop a first set of confidence scores;  
processing said first set of confidence scores and said signals representing keyword scores from said HMM keyword detector with a second weighting factor to develop a second confidence score; and  
comparing said second confidence score to a threshold to determine whether a keyword has been detected.

5,440,663

**COMPUTER SYSTEM FOR SPEECH RECOGNITION**  
Gerald Moese, Alsfeld-Eifa; Karlheinz Mohr, Sinsheim, and  
Upali Bandara, Leimen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

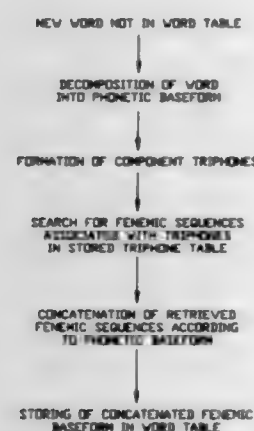
Filed Jun. 4, 1993, Ser. No. 72,624

Claims priority, application European Pat. Off., Sep. 28, 1992, 92116527

Int. Cl.<sup>6</sup> G01L 7/00

U.S. Cl. 395—264

14 Claims



1. A computer system for speech recognition, comprising:  
means for producing phonetic baseforms of words;  
means for deriving triphones from the phonetic baseforms of the words;  
means for producing all possible triphones of a language;  
means for producing associated fenemic sequences from said all possible triphones;  
a triphone table containing said all possible triphones and their associated fenemic sequences;  
means for producing fenemic baseforms from the associated fenemic sequences;  
a word table containing the words and the fenemic baseforms.

5,440,664

**COHERENT, FLEXIBLE, COATED-BORE  
HOLLOW-FIBER WAVEGUIDE**

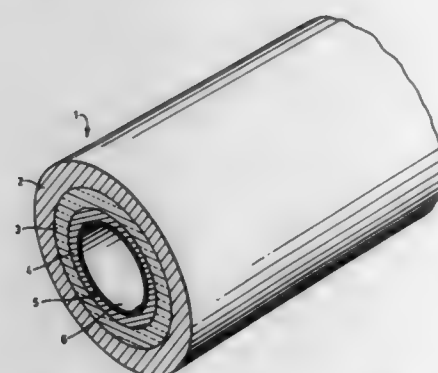
James A. Harrington, Martinsville; Todd C. Abel, Lakewood, and Jeffrey Hirsch, Princeton, all of N.J., assignors to Rutgers, The State University of New Jersey, Piscataway, N.J.

Filed Jan. 13, 1994, Ser. No. 181,852

Int. Cl.<sup>6</sup> G02B 6/20

U.S. Cl. 385—125

8 Claims



1. A waveguide for transmitting mid-infrared electromagnetic radiation, comprising:  
(a) a hollow flexible tube having a bore less than approximately 1.0 mm in diameter and having a smooth bore surface;  
(b) a reflective layer disposed upon the surface of the bore

- by placing a solution in contact with the bore surface, the exposed surface of which is approximately as smooth as the surface of the bore; and  
(c) a dielectric film formed upon the exposed smooth surface of the reflective layer, the thickness of which is selected for a particular wavelength of mid-infrared radiation, and having an exposed surface approximately as smooth as the surface of the reflective layer.

5,440,665

**FIBER OPTIC CABLE SYSTEM INCLUDING MAIN AND  
DROP CABLES AND ASSOCIATED FABRICATION  
METHOD**

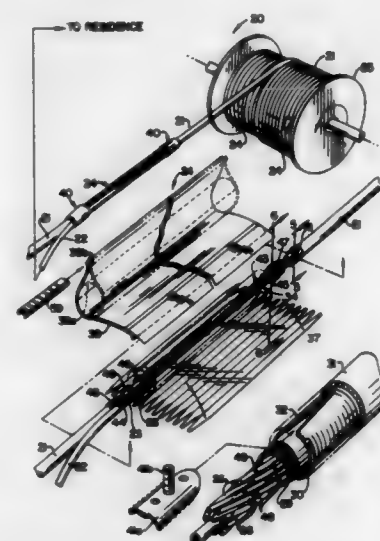
Craig D. Ray; Carney P. Claunch, II, both of Cary; Terrance D. Hunsinger; Julian S. Mullaney, both of Raleigh; Michael L. Randolph, Fuquay-Varina; Robert G. Sember, Raleigh; James R. Shaw, Garner; Amanda C. Smith, and Stephen E. Wald, both of Raleigh, all of N.C., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 16, 1993, Ser. No. 48,610

Int. Cl.<sup>6</sup> G02B 6/16

U.S. Cl. 385—135

53 Claims



1. A fiber optic cable system comprising:  
a fiber optic main cable comprising a buffer tube having opening at a first location, and at least one optical fiber having an end portion mending through the opening at the first location;  
a fiber optic drop cable having an end secured to said main cable at a second location downstream from the first location, said fiber optic drop cable comprising at least one optical fiber having an end portion extending outwardly from the end of said drop cable, the end portion of the at least one optical fiber of said drop cable being spliced together with an end portion of the at least one optical fiber of said main cable thereby defining at least one spliced together fiber portion;  
a splice closure extending between the first and second locations and surrounding the at least one spliced together fiber portion and said main cable, said splice closure comprising fiber guide means extending adjacent said main cable between the first and second locations for guiding the at least one spliced together fiber portion adjacent said main cable in a generally longitudinal direction such that said spliced together fiber portion must be devoid of a slack con of optical fiber, and said splice closure having dimensions smaller than sufficient to accommodate the minimum bend radius of a slack coil of optical fiber.

5,440,666

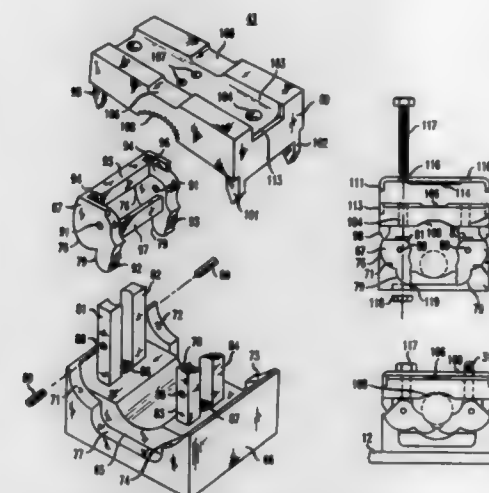
**SPLICE CLOSURE AND GRIP BLOCK**  
Denis E. Burek, Cumming; Marc D. Jones, Lithonia; Wesley W. Jones, Lawrenceville, and Phillip M. Thomas, Suwanee, all of Ga., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jun. 22, 1994, Ser. No. 263,645

Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385—135

12 Claims



1. An optical fiber cable splice closure comprising:  
a housing having a base portion and a cover portion defining an enclosure having a longitudinal axis and having first and second open ends for cable ingress and egress;  
gripping means mounted at at least said first end for gripping a cable passing through said first open end, said gripping means including pivoting means for automatically adjusting the gripping action of said gripping means to accommodate cables of different sizes;  
support means mounted on said base portion within said enclosure;  
at least one splice tray mounted on said support means and having a longitudinal axis parallel to the longitudinal axis of said enclosure for holding optically spliced portions of optical fibers contained within the cables;  
at least one splice holding member adapted to be mounted to said tray and having a plurality of parallel, spaced splice holding channels, each of said channels extending parallel to the longitudinal axis of said tray; and  
means for organizing, separating, and directing individual fibers from said cable to said splice tray.

5,440,667

**OHMIC HEATER INCLUDING ELECTRODES  
ARRANGED ALONG A FLOW AXIS TO REDUCE  
LEAKAGE CURRENT**

David P. Simpson, Chester, and Robert Stirling, Wirral, both of United Kingdom, assignors to Electricity Association Technology Limited, United Kingdom

Continuation-in-part of Ser. No. 645,492, Jan. 24, 1991, abandoned. This application Dec. 8, 1992, Ser. No. 986,742  
Claims priority, application United Kingdom, Apr. 10, 1990, 90 08 095.3

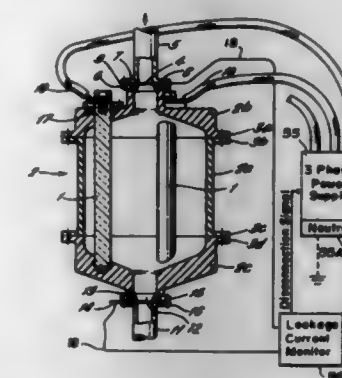
Int. Cl.<sup>6</sup> H05B 3/03, 1/02

U.S. Cl. 392—314

20 Claims

1. An ohmic heater for heating a fluid comprising  
a vessel having inlet and outlet ports at opposite ends thereof, on a common axis and between which said fluid flows when in use, along an axis;  
at least two electrodes arranged to be equally spaced about said axis of flow and contained within said vessel, such that the separation of said electrodes is substantially greater than the diameter of said inlet and outlet ports;  
means to supply a single phase of an electric power supply to

each said electrode such that the electric potential at any time along said axis and at said inlet and outlet ports is substantially at a neutral potential of the electric power supply;  
an electrically conductive guard ring exposed to the flow of



fluid positioned around the inner periphery of each said port;  
means to electrically connect said guard rings to a neutral point of the electric power supply; and  
means to monitor the leakage current between said guard rings and said neutral point.

5,440,668

**ELECTRODE BOILER WITH AUTOMATIC DRAIN  
CONTROL RESPONSIVE TO MEASURED ELECTRODE  
CURRENT**

Howard C. Jones, Haywards Heath, England, assignor to Eaton-Williams Group Limited, Edenbridge, England

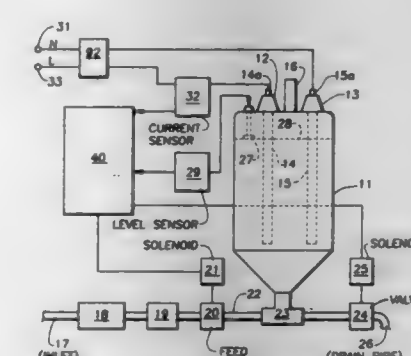
Filed Feb. 18, 1994, Ser. No. 198,260

Claims priority, application United Kingdom, Feb. 23, 1993, 9303562

Int. Cl.<sup>6</sup> F22B 1/30; F22D 5/26

U.S. Cl. 392—327

23 Claims



1. An electrode boiler comprising a container for containing water, electrodes within the container which serve to pass electrical current through such water and which extend in a generally vertical direction when the boiler is in use, feed and drain means connected to the container to enable water to be fed to and drained from the container, outlet means of the container through which steam generated inside the container can pass when the boiler is in use, an electrode current indicator arranged to provide an indication of the value of the electrical current passing through the electrodes, and control means connected to the feed and drain means and the electrode current indicator, in which the control means are such as to cause the feed means to open when a predetermined drop in the electrode current has occurred owing to boiling away of water from the boiler, and then to cause the feed means to close when a predetermined increase in the electrode current has occurred









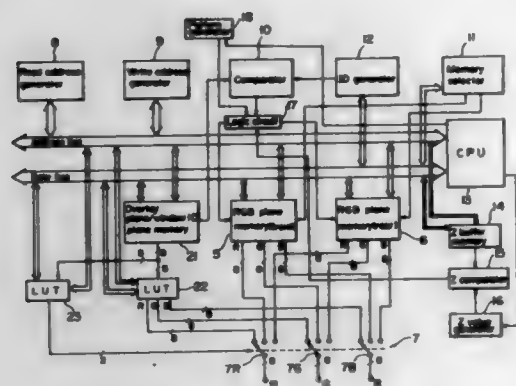
5,440,680

**IMAGE DISPLAY CONTROLLER HAVING A COMMON MEMORY FOR STORAGE OF IMAGE OVERLAY DATA AND WINDOW IDENTIFICATION DATA**

Northito Ichikawa; Masatoshi Imai, both of Tokyo; Hidehiro Hirase, Kanagawa, and Shinji Takashima, Tokyo, all of Japan, assignors to Sony Corporation, Japan  
Continuation of Ser. No. 778,013, Oct. 17, 1991, abandoned.  
This application Sep. 19, 1994, Ser. No. 308,634  
Claims priority, application Japan, Oct. 23, 1990, 2-283405  
Int. Cl.<sup>6</sup> G06F 3/14

U.S. Cl. 395—158

2 Claims



1. An image display controller for controlling a display device, comprising:

- a first memory for storing image data of at least a first image to be displayed in a first window on the display device;
- a second memory for storing image data of at least a second image to be displayed in a second window on the display device;
- a third memory for storing data which includes basic data of an overlay image, said overlay image to be displayed with said first and second images superimposed thereupon, said data stored in said third memory further including window identification data to set the range of the windows;
- first detecting means for obtaining data from said third memory, for detecting said basic data of an overlay image within said data obtained from said third memory, and for generating therefrom image data for display of the overlay image on the display device; and
- second detecting means for detecting, from the same data obtained from said third memory by the first detecting means, window identification data, and for generating therefrom switching data which indicates from which one of the first memory, the second memory and the first means for detecting image data is to be selected for display.

5,440,681

**METHOD AND APPARATUS FOR DISPLAY AND INTERACTIVE MODIFICATION OF THE TASKS IN A PRODUCTION PLAN**

Michiharu Kudo, Tokyo, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 733,045, Jul. 19, 1991, abandoned. This application Jan. 24, 1994, Ser. No. 185,721  
Int. Cl.<sup>6</sup> G06F 3/00

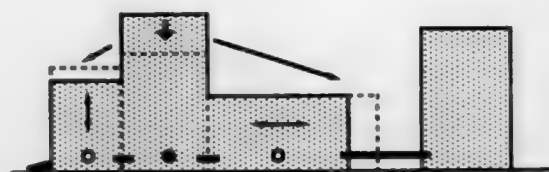
U.S. Cl. 395—161

15 Claims

1. A method for an interactive modification of a production plan for use with a computer system, the production plan comprised of a plurality of product tasks, each product task having two or more associated primitive tasks, with each primitive task having an associated primitive task information, comprising the steps of:

specifying primitive task information for each primitive task,

said primitive task information comprised of a time interval and a production quantity;  
storing said primitive task information for each of said plurality of product tasks on a storage device;  
displaying the production plan on a display device using a graphical representation for each primitive task, wherein the graphical representation for each primitive task is determined using the respective primitive task information and primitive task information of other primitive tasks that have overlapping time intervals, wherein each primitive task is graphically represented by at least one geometric object, and the primitive tasks of each product task are displayed having a common visual characteristic;  
establishing a plurality of modification rules for each product task, said rules defining how a change in the primitive task information of each primitive task associated with the product task, changes the primitive task information of other primitive tasks associated with the product task and



said modification rules require that a total production quantity obtained by summing the production quantities for all primitive tasks associated with the first product task remain unchanged as a result of applying the modification rules;  
storing said plurality of modification rules on a storage device;  
modifying said production quantity of said primitive task information associated with a first primitive task where said modification is performed by manipulating the graphical representation of the first primitive task;  
modifying said production plan by changing the primitive task information of other primitive tasks based on the modification of the production quantity of said first primitive task and the modification rules of the product task with which the first primitive task is associated; and  
updating the display device to reflect modifications of the production plan.

5,440,682

**DRAW PROCESSOR FOR A HIGH PERFORMANCE THREE DIMENSIONAL GRAPHIC ACCELERATOR**

Michael F. Deering, Los Altos, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.  
Continuation-in-part of Ser. No. 71,699, Jun. 4, 1993. This application Jan. 23, 1993, Ser. No. 82,065  
Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 395—162

17 Claims

7. A graphics accelerator, comprising a frame buffer having N horizontal interleaves and further comprising a set of N draw processors each coupled to receive a draw packet over a draw bus from a floating-point processor in the graphics accelerator wherein the draw packet contains a set of geometry parameters that define a geometry object including high level screen space descriptions of two dimensional and three dimensional point line and area graphics primitives, each draw processor having a unique assigned interleave value in a range 0 through N-1, each draw processor having circuitry that generates a set of adjusted geometry parameters by biasing an x coordinate of each geometry parameter according to the unique assigned interleave value, each draw processor having circuitry that renders a set of pixels corresponding to the geometry object by performing edgeworking and scan interpo-

5,440,684

**PARALLEL TO SERIAL CONVERSION OF INFORMATION DATA**

Henri M. Tack, Edegem, and René R. Govaert, Kapellen, both of Belgium, assignors to AGFA-Gevaert N. V., Mortsel, Belgium

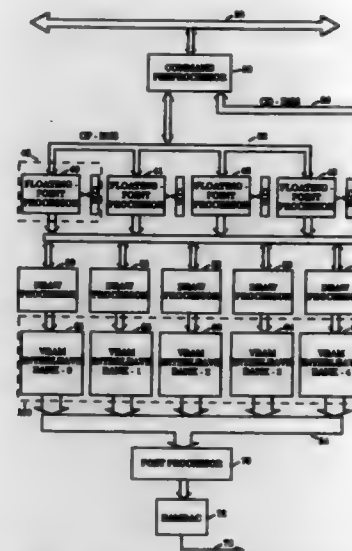
Filed Jun. 9, 1992, Ser. No. 895,837

Claims priority, application European Pat. Off., Jun. 24, 1991, 91201608

Int. Cl.<sup>6</sup> G06F 15/62

U.S. Cl. 395—164

7 Claims



a set of scan lines of a rasterized image corresponding to the geometry object.

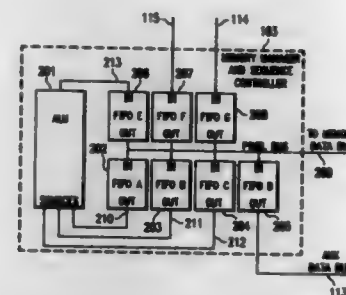
5,440,683

**VIDEO PROCESSOR MULTIPLE STREAMS OF VIDEO DATA IN REAL-TIME**

Robert M. Nally, Plano, and John C. Schafer, Wylie, both of Tex., assignors to Cirrus Logic, Inc., Fremont, Calif.  
Continuation of Ser. No. 842,216, Feb. 26, 1992, abandoned.  
This application Oct. 20, 1994, Ser. No. 328,382  
Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 395—162

20 Claims



1. A video processing unit, comprising:  
at least one input first-in-first-out register for receiving and storing portions of a digital video signal;  
a plurality of second first-in-first-out registers for receiving and storing ones of said portions received from said at least one input first-in-first-out register;  
means for selectively coupling in response to instructions said ones of said portions from said at least one input first-in-first-out register to ones of said second first-in-first-out registers; and  
an arithmetic and logic unit for processing instructions which operate on selected ones of said portions received from said second plurality of first-in-first-out registers, said arithmetic and logic unit including means for delaying execution of a particular instruction and executing another instruction if a poll of said at least one first-in-first-out register determines that a particular required one of said portions of said digital video signal has not been received and stored by said at least one input first-in-first-out register.

1. A method of effecting an electronic conversion of a train of parallel configured data signals corresponding to pixels making up at least one line of an original image to be reproduced and varying in value over a range of levels, each differing from an adjacent level by one unit, from zero to a maximum and corresponding to density gradation variations in said pixels of said original image, into a serial configuration of signals having a single level above zero for controlling the reproduction of the original image, comprising, under controlled synchronization, the steps of:

- a. Delivering said train of parallel configured data signals into a line memory having a capacity equal to said pixels of said at least one line;
- b. Transferring said parallel configured data signals of said train from said line memory one by one to a non-zero detector and downcounter for discrimination between a zero and a non-zero level and a reduction of all non-zero levels thus discriminated by a level of one unit while the zero level signals remain at zero;
- c. Outputting from said detector and downcounter to a control memory a train of control signals of zero value for all data signals discriminated as zero and unity value for all data signals discriminated as non-zero while feeding back to the line memory the train of data signals with all non-zero level signals at the reduced level, and
- d. Repeating step c. until all non-zero level signals have been reduced to zero.

5,440,685

**APPARATUS AND METHOD FOR CONTROLLING MANIPULATION AND STORAGE OF IMAGE DATA**

Shuichi Takiyama; Hitoshi Matsumoto, and Yuzuru Koga, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 10, 1993, Ser. No. 103,751

Claims priority, application Japan, Nov. 2, 1992, 4-294656

Int. Cl.<sup>6</sup> G06F 12/00

U.S. Cl. 395—164

20 Claims

1. An apparatus for controlling manipulation and storage of image data comprising:







said serial input request signal; a parallel register connected to said shift register; a shift counter coupled to said shift register for counting said input serial data in response to said shift allow signal and producing a count end signal when a counting value reaches a predetermined transfer bit length; means coupled to said shift counter for causing said parallel register to store said shifted signal data as parallel data; transfer means connected to said data bus and said parallel register, for transferring said parallel data from said parallel register to said data bus when one of said parallel data is a fresh datum that has never been transferred to said data bus; a parallel register empty flag, means coupled to said parallel register, for producing a parallel register empty signal when said parallel register is in an empty state; a serial input suspension request flag means for producing a serial input suspension request signal in compliance with a program for dealing with transfer of said fresh datum to said data bus; a suspension carry out flag means, connected to said parallel register empty flag means and said serial input suspension request flag means, for producing a serial input suspension carry out signal when said serial input suspension request signal is produced under a condition that said parallel register empty signal is not produced; a serial input request signal producing circuit connected to said shift counter, said parallel register empty flag means and said serial input suspension carry out flag means are being operative for suspending generation of said serial input response signal in response to said serial input request signal when said serial input request signal producing circuit receives both of said parallel register empty signal and said serial input suspension carry out signal.

5,440,695

# INPUT/OUTPUT MODULE HAVING A COMBINATION INPUT/OUTPUT POINT

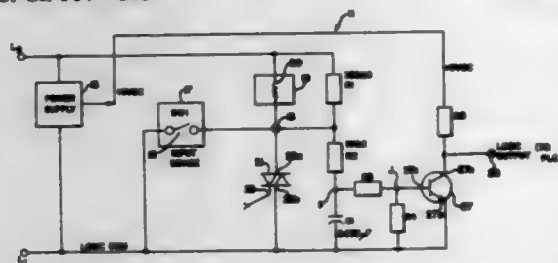
Donald R. Janke, Milwaukee, and Richard R. Sahroff, Lake Mills, both of Wis., assignors to AEG Schneider Automation, Inc., North Andover, Mass.

Continuation of Ser. No. 931,669, Aug. 19, 1992, abandoned, which is a continuation of Ser. No. 769,513, Oct. 1, 1991, abandoned, which is a continuation of Ser. No. 409,926, Sep. 20, 1989, abandoned. This application Mar. 16, 1994, Ser. No. 214,040

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 364-141

11 Claims



1. An input/output (I/O) module having a combination I/O point for use with a microprocessor based industrial programmable controller, the I/O module circuitry comprising:

- a first and second power lines;
- means for providing AC power across said first and second lines;
- a terminal means electrically connected between said first and second lines for serving as the combination I/O point, said terminal means providing an electrical common point for connection to both an input device and an output device connected in series across said first and second lines, respectively, at the same time, and said terminal means selectively operable either as an input point or an output point, or both, said predetermined operable status of said terminal means being operatively independent from said microprocessor of the industrial programmable controller;
- first circuit means for coupling the input device between said terminal means and said first line, said input device operable between a non-conductive state as an open switch and a conductive state as a closed switch;

- logic output means, responsive to the non-conductive and conductive states of said input device, for generating a logic output signal representative of the non-conductive and conductive states of the input device, said logic output means having said output signal coupled to said microprocessor of the industrial programmable controller;
- second circuit means for coupling the output device between said terminal means and said second line;
- third circuit means for selectively controlling said AC power applied to said output device, through either the input device or through a control signal from said microprocessor of the industrial programmable controller in which said control signal is fed back to said logic output means;
- said logic output means further including means for sensing the simultaneously coupling in series of both said input and output devices between said first and second lines, respectively, with said terminal means, connected as the common point between said I/O devices, said further sensing means for allowing operation of said input device in said conductive state as a momentary switch closure and said output device controlled by said microprocessor of the industrial programmable controller from said terminal means in response to said momentary switch closure after said input device returns to said non-conductive state; and
- wherein said input device and said output device are both operative and sensed when connected to said terminal means at the same time whether or not the microprocessor of the industrial programmable controller is sensing the logic output signal or providing the control signal to switch on the output device.

5,440,696

# DATA PROCESSING DEVICE FOR REDUCING THE NUMBER OF INTERNAL BUS LINES

Kenji Ijitsu, Yokohama; Masanobu Yuhara, and Hidenobu Ohta, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

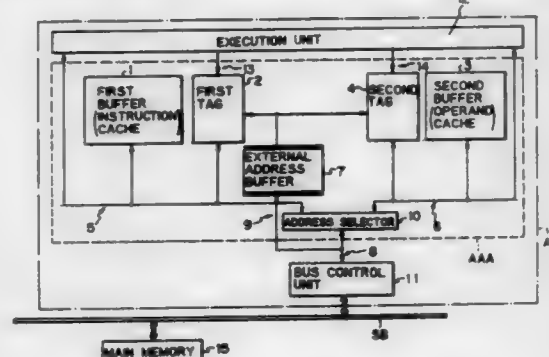
Continuation of Ser. No. 548,535, Jul. 5, 1990, abandoned. This application Jul. 1, 1993, Ser. No. 84,451

Claims priority, application Japan, Jul. 7, 1989, 1-174253

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395-308

21 Claims



1. A data processing device comprising:

- a bus control unit;
- a memory control unit connected to said bus control unit;
- an execution unit connected to said memory control unit; and
- internal data processing device buses connecting said bus control unit, said memory control unit, and said execution unit, said internal data processing device buses including a plurality of buses including 1) an internal address bus connected between said bus control unit and said memory control unit, and 2) an external address transferring bus connected to a bidirectional bus, said internal address bus being formed by said bidirectional bus, and said internal address bus transferring a write address input to said bus

control unit from outside of said data processing device to said memory control unit, wherein said memory control unit includes

an address selector, connected to said bus control unit through said bidirectional bus, said address selector for selecting an instruction address and an operand address from said execution unit and said address selector for transferring said selected instruction address and said selected operand address to said bidirectional bus, and an external address buffer, connected to said bus control unit through said bidirectional bus and said external address transferring bus, said external address buffer for holding an address transferred from a system bus through said bus control unit, said bidirectional bus and said external address transferring bus to said external address buffer, said system bus connected to said bus control unit.

5,440,697

# METHOD AND APPARATUS FOR SIMULATING I/O DEVICES

Mark A. Boegel; Douglas O. Bolstad; Stephen A. Knight; Harvey G. Kiel, all of Rochester; Robert R. Nelson, Oronoco, and Pamela A. Wright, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

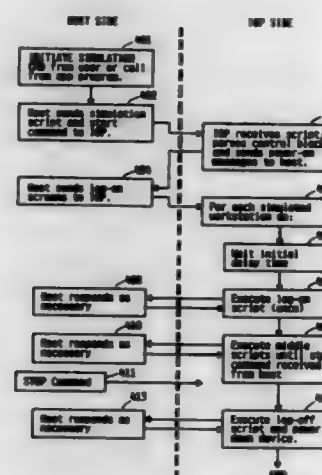
Continuation of Ser. No. 781,460, Oct. 23, 1991, abandoned.

This application Oct. 18, 1993, Ser. No. 138,602

Int. Cl.<sup>6</sup> G06F 13/10

U.S. Cl. 395-500

22 Claims



1. A computer system comprising:

- a central processing unit;
- a system I/O bus coupled to said central processing unit; and
- an I/O processor assembly coupled to said system I/O bus for communicating with one or more I/O devices attached to said I/O processor assembly via a communications path independent of said system I/O bus, said I/O processor assembly comprising a programmable processor for controlling the operation of said I/O processor assembly and a local memory for storing instructions which execute on said programmable processor; wherein said I/O processor assembly has means for simulating an I/O device to said system I/O bus, said means comprising said programmable processor and said local memory, and further comprising:
  - means for receiving a simulation script from said system I/O bus, and
  - means for executing said simulation script to simulate an I/O device.

5,440,698

# ARBITRATION OF PACKET SWITCHED BUSES, INCLUDING BUSES FOR SHARED MEMORY MULTIPROCESSORS

Pradeep S. Sindhu, Mountain View; Jean-Marc Frailong, Palo Alto, and Jean A. Gastinel, Mountain View, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

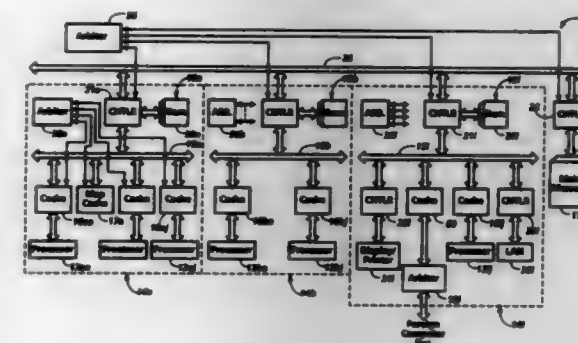
Continuation of Ser. No. 621,123, Nov. 30, 1990, abandoned.

This application Apr. 29, 1994, Ser. No. 236,883

Int. Cl.<sup>6</sup> G06F 13/14, 13/36, 13/42, 13/16

U.S. Cl. 395-200.08

6 Claims



1. An arbiter for resolving bus contention in a system having a synchronous packet switched bus, and a plurality of client devices that are interfaced with said bus; said client devices being synchronously clocked at a predetermined frequency for synchronously exchanging packets of information via said bus on a contention basis; each of said packets having a duration spanning a plurality of consecutive clock cycles on said bus, such that each packet has an initial cycle and a final cycle; said arbiter comprising:

a plurality of ports, each of said client devices being coupled to a respective one of said ports for registering arbitration requests with said arbiter and for receiving corresponding bus grants from said arbiter; said arbitration requests having a plurality of permissible encodings that said arbiter recognizes as representing requests for bus grants of differing durations, with at least some of said client devices having provision for registering arbitration requests with said arbiter for grants of different predetermined lengths to acquire control of said bus for packets spanning different numbers of clock cycles on said bus; and logic coupled to said ports for arbitrating said arbitration requests, in advance of each of said bus grants, in accordance with predetermined arbitration rules to provide bus grants spanning an appropriate number of clock cycles on said bus in response to one after another of said arbitration requests; each of said bus grants being time limited to give the client device to which a particular grant is communicated exclusive control of said bus for the duration of a single packet, with said control commencing and terminating concurrently with the initial cycle and the final cycle, respectively, of said packet; said arbitration requests being arbitrated sufficiently in advance of each of said bus grants based on control information provided by said logic that enables the client devices to anticipate and discriminate between bus grants for said different request types to enable said client devices to pack packets into consecutive clock cycles on said bus.



5,440,699

# SYSTEM BY WHICH A REMOTE COMPUTER RECEIVES SCREEN IMAGES FROM AND TRANSMITS COMMANDS TO A HOST COMPUTER

Scott C. Farrand, Tomball; Patrick E. Dobyns, Garland; Thomas J. Hernandez, Houston; Ronald A. Neyland, Spring; Richard A. Stupek, Houston; Said S. Saadeh; Paul R. Fulton, both of Plano; Richard P. Mangold, Tomball, and Andrew J. Miller, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

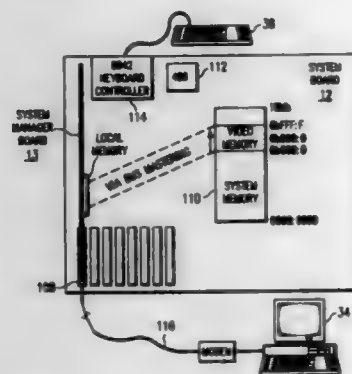
Continuation of Ser. No. 719,243, Jun. 24, 1991, abandoned.

This application Jul. 29, 1994, Ser. No. 282,824

Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 395—155

15 Claims



1. In a computer network having at least one computer system operable therein, said computer system having a plurality of components interconnected by a system bus for transferring information between said components, said computer system further having a local console, a remote console, and a system by which said remote console emulates said local console, said system comprising:

- a system memory having a video memory portion in which screen images of said local console are stored, said system memory disposed within said local console;
- means for transferring screen images from said system memory in said local console to said remote console thereby emulating the local console screen images at said remote console simultaneously with said local console;
- a keyboard controller connected to said local console so as to receive keyboard signals therefrom, said keyboard controller allowing a local keyboard and a remote keyboard to be operated simultaneously; and
- means for inserting keystrokes from said remote console into said keyboard controller, thereby emulating the local console keyboard, said local console being emulated at said remote console without the use of additional software in said local console.

5,440,700

# MICROPROCESSOR INCLUDING DEVICE FOR DETECTING PREDETERMINED INSTRUCTION AND GENERATING BUS CYCLE

Hiroaki Kaneko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 29, 1992, Ser. No. 891,556

Claims priority, application Japan, May 29, 1991, 3-124242

Int. Cl.<sup>6</sup> G06F 11/30

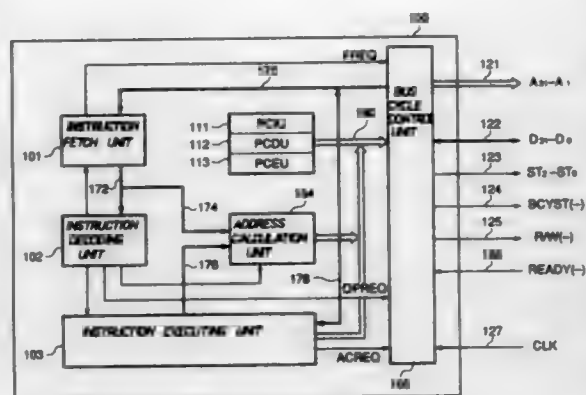
U.S. Cl. 395—375

5 Claims

1. A microprocessor which includes a particular instruction for executing a freezing or a temporary halt of an instruction execution, said microprocessor comprising:

- means for detecting said particular instruction and generating a bus cycle,
- first output means for outputting an encoded particular status signal of a plurality of bits in synchronism with said generated bus cycle, and
- second output means for outputting the content of a pro-

gram counter to one of either an address bus or a data bus, so that the content of the program counter which holds a location address of said particular instruction, becomes known by an external unit by the execution of said particular instructions,



wherein, after said bus cycle has been generated by said bus cycle generating means, a bus cycle start is requested only after said freezing or temporary halt is released, thereby maintaining a value of said content of said program counter during said bus cycle.

5,440,701

# FOR SHORTENING AN INSTRUCTION CODE LENGTH

Toshimichi Matsuzaki, Mino, and Masashi Deguchi, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

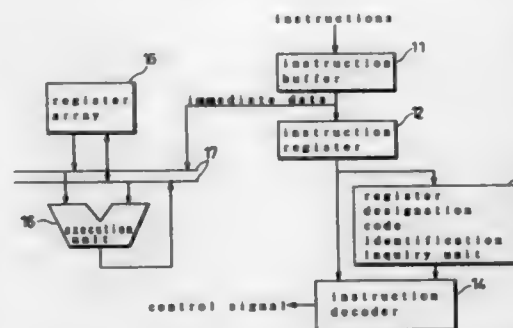
Filed Aug. 20, 1992, Ser. No. 932,652

Claims priority, application Japan, Aug. 21, 1991, 3-209112

Int. Cl.<sup>6</sup> G06F 9/30

U.S. Cl. 395—375

8 Claims



1. A data processing unit for compressing an instruction code size comprising:

- m data registers for holding data;
- n address registers for holding addresses;
- means for decoding an instruction, said decoding means decoding an 8-bit instruction comprising a code that designates at least one operation, a log<sub>2</sub>m-bit register-addressing code used to address at least one of said m data registers, and a log<sub>2</sub>n-bit register-addressing code used to address at least one of said n address registers;
- means for executing an instruction by computing and transferring data in accordance with a signal decoded by said decoding means, said executing means being connected to said one data register and said one address register, and said executing means transferring data between a memory addressed by said one address register and said one data register; and
- means for detecting whether the two register addressing codes contained in an 8-bit instruction match or not, said detecting means being connected to said decoding means to output a detection result,

wherein said executing means carries out a first process when said detecting means detects a match between said two register-addressing codes, and carries out a second process when said detecting means does not detect a match between said two register-addressing codes.

5,440,702

# DATA PROCESSING SYSTEM WITH CONDITION CODE ARCHITECTURE FOR EXECUTING SINGLE INSTRUCTION RANGE CHECKING AND LIMITING OPERATIONS

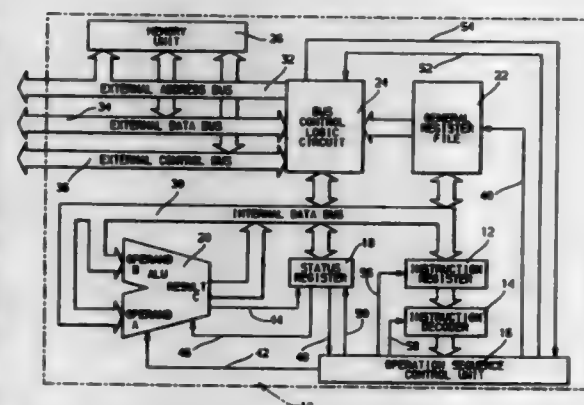
Kevin J. Brewer, Kokomo, and Scott L. Linke, Flora, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Oct. 16, 1992, Ser. No. 964,138

Int. Cl.<sup>6</sup> G06F 7/48

U.S. Cl. 395—375

14 Claims



14. A data processing system for operating on a numeric value of a software variable used by the data processing system to ensure that the numeric value is within a predetermined range of acceptable values established by an upper bound and a lower bound, the data processing system comprising:

- an arithmetic logic unit for performing an arithmetic operation to generate the numeric value of the software variable in response to execution of an arithmetic instruction selected from a set of arithmetic instructions defined for the data processing system;
- a register containing condition code flags;
- first means for setting the condition code flags to indicate a status of the arithmetic operation performed in the arithmetic logic unit to generate the numeric value of the software variable; and
- second means for executing a range checking and limiting instruction to (A) determine whether the numeric value of the software variable is outside the acceptable range of values based at least upon the indicated status of the arithmetic operation performed in the arithmetic logic unit, and (B) set the numeric value of the software variable to one of the upper and lower bounds based at least upon the indicated status of the arithmetic operation performed in the arithmetic logic unit, when the numeric value of the software variable is outside the acceptable range of values.

5,440,703

# SYSTEM AND METHOD FOR SAVING STATE INFORMATION IN A MULTI-EXECUTION UNIT PROCESSOR WHEN INTERRUPTABLE INSTRUCTIONS ARE IDENTIFIED

David S. Ray, Georgetown, and Alexander K. Spencer, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1993, Ser. No. 123,816

Int. Cl.<sup>6</sup> G06F 9/30, 9/38

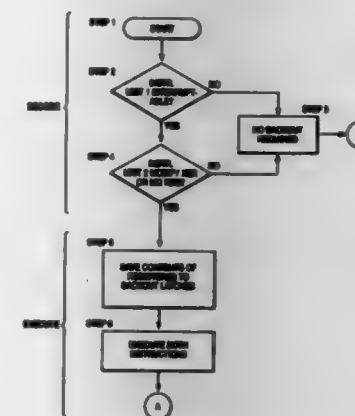
U.S. Cl. 395—375

23 Claims

1. A method for selectively saving a state of a multi-execu-

tion unit processing system based on a specific type of instruction to be executed, comprising the steps of:

- determining, prior to execution, if a first instruction is interruptable;
- determining if a second instruction to be executed concurrently with said first instruction modifies a register which is updated during the execution cycle;







5,440,709

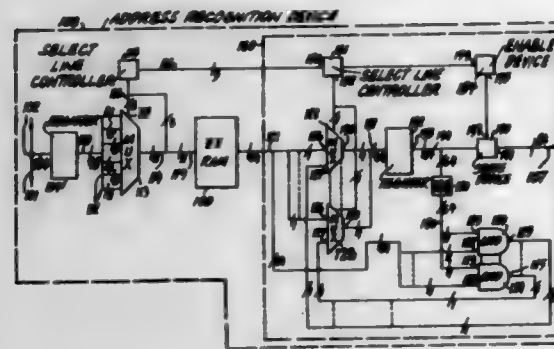
# APPARATUS AND METHOD FOR AN IMPROVED CONTENT ADDRESSABLE MEMORY USING A RANDOM ACCESS MEMORY TO GENERATE MATCH INFORMATION

Ron Edgar, Raymond, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 546,414, Jun. 29, 1990, Pat. No. 5,317,708. This application Feb. 28, 1994, Ser. No. 203,177  
Int. Cl.<sup>6</sup> G06F 12/06; G11C 15/00

U.S. Cl. 395—401

37 Claims



1. A computer system comprising

- a bus;
- at least one node coupled to the bus;
- an address recognition unit coupled to each node; each address recognition unit coupled to a corresponding controller;
- at least one component coupled to each address recognition unit via the corresponding controller, each of said at least one component being uniquely identified by a respective one of a plurality of data entities;
- said bus transmitting a first one of the plurality of data entities to each of said address recognition units;
- each address recognition unit comprising
  - a content addressable memory input coupled to the bus for inputting one of the plurality of data entities received from the bus, each of the plurality of data entities being divided into  $n$  slices;
  - an content addressable memory output;
  - a RAM coupled to said content addressable memory input, said RAM including a plurality of data storage locations, each of said data storage locations having a unique address and containing one of a plurality of data entities;
  - each of the data entities being associated with a certain one of the  $n$  slices of one of the plurality of data entities and including predetermined match information for said certain one of the  $n$  slices;
  - each certain one of the  $n$  slices forming at least a portion of the unique address which contains the one of the plurality of data entities associated with said certain one of the  $n$  slices;
  - said content addressable memory input including a multiplexer, said multiplexer operating to accept as input a first of the plurality of data entities and to serially output each of the  $n$  slices of said first of the plurality of data entities;
  - said content addressable memory input operating to serially provide  $n$  determined addresses to said RAM, wherein each of the  $n$  determined addresses corresponds to one of the  $n$  slices, and each of the  $n$  slices forms at least a portion of the corresponding one of the  $n$  determined addresses;
  - said RAM having an address port for serially inputting each of the  $n$  determined addresses, one determined address per preselected time cycle, as an address and said RAM operating to fetch the one of the plurality of data entities stored at each said address;
  - said RAM having an output port, said RAM further

operating to output each fetched one of the plurality of data entities, each fetched one of the plurality of data entities including predetermined match information for each of the corresponding  $n$  slices of said first of the plurality of data entities; and

- said content addressable memory output coupled to said output port, said content addressable memory output operating to output, to the corresponding controller, unique match information for the at least one component corresponding to said first of the plurality of data entities, said unique match information including said each fetched one of the plurality of data entities; and
- said corresponding controller being responsive to the unique match information to couple the first of the plurality of data entities to the at least one component if the identification information indicates that the first of the plurality of data entities is equal to the respective one of the plurality of data entities which uniquely identifies the at least one component.

5,440,710

# EMULATION OF SEGMENT BOUNDS CHECKING USING PAGING WITH SUB-PAGE VALIDITY

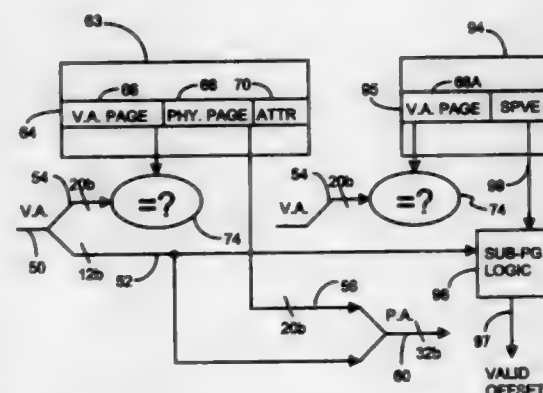
David E. Richter, San Jose; Earl T. Cohen, Fremont, and James S. Blomgren, San Jose, all of Calif., assignors to Exponential Technology, Inc., San Jose, Calif.

Filed Mar. 8, 1994, Ser. No. 207,857

Int. Cl.<sup>6</sup> G06F 12/10

U.S. Cl. 395—417

25 Claims



1. A paging system adapted for emulating segment bounds checking wherein pages completely contained within segment boundaries are not checked for segment bounds violations, whereas pages containing segment boundaries are tested for segment bounds violations by a sub-page validity buffer for checking validity of a virtual address, said virtual address comprising a virtual page number and a page offset, said sub-page validity buffer comprising:

- a plurality of buffer entries, each of said plurality of buffer entries comprising:
  - a virtual page number field; and
  - a sub-page validity field for indicating a valid subset of page offsets within a page;
- first compare means for receiving said virtual page number and comparing said virtual page number field with said virtual page number, said first compare means indicating a selected buffer entry of said plurality of buffer entries if said virtual page number field matches said virtual page number, said selected buffer entry including a selected sub-page validity field; and
- second compare means for receiving said selected sub-page validity field and comparing said page offset to said valid subset of page offsets, said second compare means indicating that said page offset is invalid if said page offset is not within said valid subset of page offsets, said second compare means signaling that said page offset is valid if no

buffer entry in said plurality of buffer entries is a matching buffer entry, said matching buffer entry containing said virtual page number field matching said virtual page number,

wherein the absence of said matching buffer entry in said sub-page validity buffer indicates that segment bound do not need to be checked for said virtual address, wherein pages completely contained within segment boundaries are not checked for segment bounds violations, whereby validity of said page offset is checked for pages having only a subset of page offsets valid.

5,440,711

# METHOD FOR CONTROLLING DRAM MEMORY IN A MICROCOMPUTER

Masaki Sugimoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

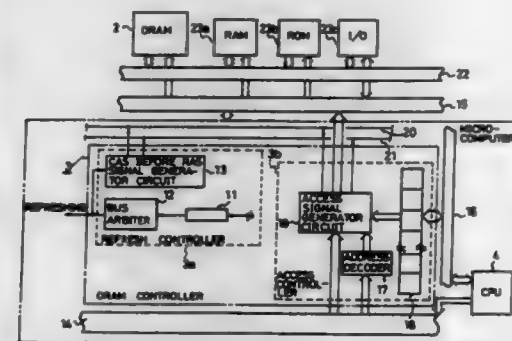
Continuation of Ser. No. 664,185, Mar. 1, 1991, Pat. No. 5,317,709. This application Dec. 13, 1993, Ser. No. 167,604

Claims priority, application Japan, Mar. 5, 1990, 2-054006

Int. Cl.<sup>6</sup> G06F 12/08, 13/18

U.S. Cl. 395—433

3 Claims



1. A method for operating a computer having a memory, the method comprising the steps of:

- defining a portion of said memory as an active memory space by asserting a plurality of area selection bits whereby the remainder of said memory is an inactive memory space;
- asserting a memory access effective bit, said bit for permitting access to said memory space and for controlling generation of row address strobe (RAS) and column address strobe (CAS) signals;
- asserting a refresh request to refresh said active memory space;
- asserting a CPU memory access request to said active memory space;
- arbitrating between said refresh request and said CPU memory access request;
- delaying, at least until refresh of said active memory space is complete, the CPU memory access request when said CPU memory access request requests data in said active memory space; and
- refreshing said memory, including said active and said inactive memory space, by asserting said CAS signal before asserting said RAS signal.

5,440,712

# DATABASE INPUT/OUTPUT CONTROL SYSTEM HAVING NONVOLATILE STORING UNIT FOR MAINTAINING THE DATABASE

Kuninaga Takeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 2, 1992, Ser. No. 862,072

Claims priority, application Japan, Apr. 2, 1991, 3-096346

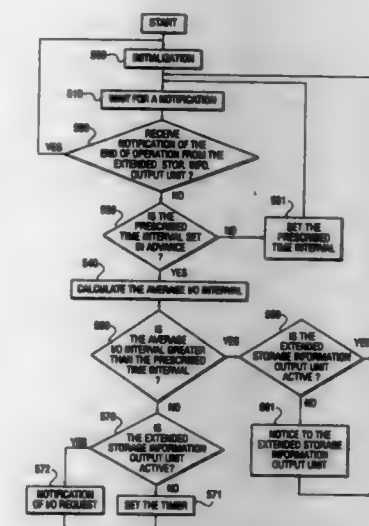
Int. Cl.<sup>6</sup> G06F 12/12

U.S. Cl. 395—444

6 Claims

1. A process for efficiently managing data in a system includ-

ing a main storage unit, an external storage unit, and an extended storage unit, said process comprising the steps of: exchanging data between said external storage unit and said main storage unit; exchanging data between said main storage unit and said extended storage unit; and



writing data in said extended storage unit into said external storage unit at predetermined time intervals and when a quantity of physical input/output (I/O) transactions, between said main storage unit and said external storage unit, drops below a set value.

5,440,713

# M-WAY N-PORT PAGED-INTERLEAVED MEMORY SYSTEM

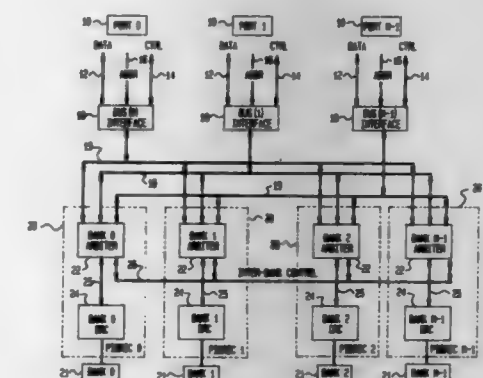
Chin-Lung Lin; Ming-Shia Yeh, both of Yunlin; Chin-Sheng Tsao, Taipei, and Pey-Horng Shue, Changhua City, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed May 29, 1992, Ser. No. 891,839

Int. Cl.<sup>6</sup> G06F 12/02

U.S. Cl. 395—485

10 Claims



1. A memory access system wherein  $N$  masters can access  $M$  memory banks comprising:

- a plurality of controllers, including one controller corresponding to each of said  $M$  memory banks, each of said controllers comprising a bank controller and a bank arbiter, each of said bank arbiters comprising:
  - means for receiving a plurality of current memory access requests from said  $N$  masters, each of said current memory access requests specifying a row address

- in one of said memory banks which said one memory bank corresponds to said controller of said bank arbiter,
- (2) means for asserting a first signal for each one of said current memory access requests if one of said N masters issued said current memory access request, unless a previous memory access request issued by said one master was ignored by another one of said bank arbiters,
  - (3) means for asserting a second signal for each one of said current memory access requests if said row address of said current memory access request issued from said one master equals a row address of the memory access request most recently granted by said bank arbiter,
  - (4) means for asserting a third signal for each one of said current memory access requests for which either of said first and second signals is asserted, and
  - (5) means for prioritizing among said current memory access requests issued by said one master for which said third signal is asserted, said prioritizing means also for generating a fourth signal for one of said current memory access requests indicating acceptance of said one current memory access request.

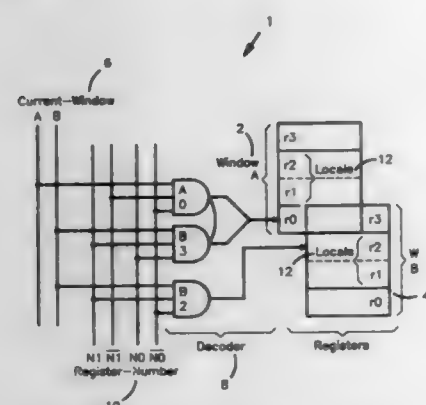
5,440,714

# METHOD AND SYSTEM CONFIGURATION FOR SIMPLIFYING THE DECODING SYSTEM FOR ACCESS TO AN REGISTER FILE WITH OVERLAPPING WINDOWS

Song-Tine Wang, Hsin Chu, Taiwan, assignor to Industrial Technology Research Institute, Hsin Chu, Taiwan  
Filed Dec. 14, 1992, Ser. No. 990,641  
Int. Cl.<sup>6</sup> G06F 9/34

U.S. Cl. 395-492

3 Claims



1. A decoding system for decoding a register access instruction including a window code of N bits for defining a current window and a register code of M bits for defining a current register, for accessing an access register among a plurality of registers wherein said registers including a global type, an input type an output type, and a local type, said registers being cataloged into a plurality of overlapping windows arranged in a predefined window sequence wherein each window including a plurality of registers of each of said types arranged in a predefined register sequence wherein said input registers of one of said windows sharing a common memory location according to an input-output correlation with said output registers of an adjacent window which being one less in sequence of said window sequence, comprising:

an overlapping and global decoding means for decoding first m bits of said register code, where  $m < M$ , for determining a register type for identifying if said current register being a global register, a local register, an output, register or an input register;

a window decoding means for decoding said window code of N bits to identify said current window, said window decoding means further employing said register type from

said overlapping and global decoding means for identifying an effective access window wherein:

- (i) if said register type being a global register, a local register, or an output register, said effective access window being identified the same as said current window; otherwise,
- (ii) said effective access window being identified as said adjacent window with one less in said window sequence; and

a register decoding means for determining an access register in said effective access window for accessing data stored therein wherein said register decoding means decoding the remaining (M-m) bits of said register code to identify said current register, and wherein:

- (i) if said register type being a global register, a local register or an output register, said register decoding means identifying said access register the same as said current register; otherwise,
- (ii) if said current register is an input register, said register decoding means employing said input-output correlation to identify said access register in said effective access window, which being an adjacent window with one less in said window sequence,

whereby duplicate reference to said common memory locations between said overlapping registers in said adjacent windows may be avoided.

5,440,715

# METHOD AND APPARATUS FOR EXPANDING THE WIDTH OF A CONTENT ADDRESSABLE MEMORY USING A CONTINUATION BIT

David C. Wyland, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

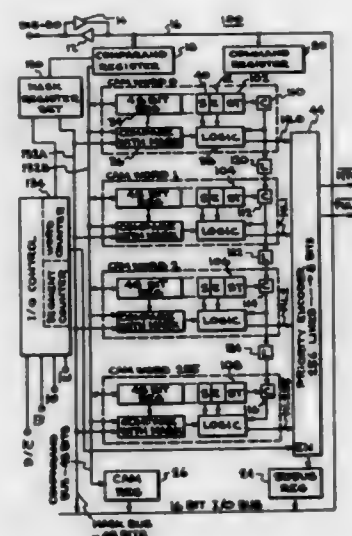
Continuation of Ser. No. 543,330, Jun. 27, 1990, abandoned.

This application Apr. 6, 1993, Ser. No. 44,543

Int. Cl.<sup>6</sup> G06F 12/00

U.S. Cl. 395-435

4 Claims



1. A content addressable memory system having a capability of matching a data line formed from a sequence of two or more data words, each of said data words having a predetermined width, comprising:

means for storing a comparand having said predetermined width;

a plurality of comparison blocks;

each of said comparison blocks including:

a register, each register storing a data word having said predetermined width, each register including means for storing a start bit, which indicates if a data word is the first data word of a particular data line, and each register including means for storing a chain bit, which indicates

that a match has occurred between the comparand and the data word stored in said register;

each comparison block including comparator means for comparing said data word stored in the register of said comparison block with said comparand and for providing a positive match output signal from said comparator means;

each of said comparison blocks including means for loading the start bit of said one of said registers into the means for storing the chain bit of a register;

each comparison block including latch means for storing the value of the chain bit from one of said registers and for inputting the stored value of the chain bit to another register means;

priority encoder means for receiving the match output signals from each of said comparator means for said comparison blocks, said priority encoder means including means for providing an output code word identifying the highest-priority comparison block which provides a positive match output signal to said priority encoder means; and wherein said comparator means includes means for masking predetermined bits of said data word and wherein said means for masking includes a mask register set for containing masking words corresponding to various words of said data line.

5,440,716

# METHOD FOR DEVELOPING PHYSICAL DISK DRIVE SPECIFIC COMMANDS FROM LOGICAL DISK ACCESS COMMANDS FOR USE IN A DISK ARRAY

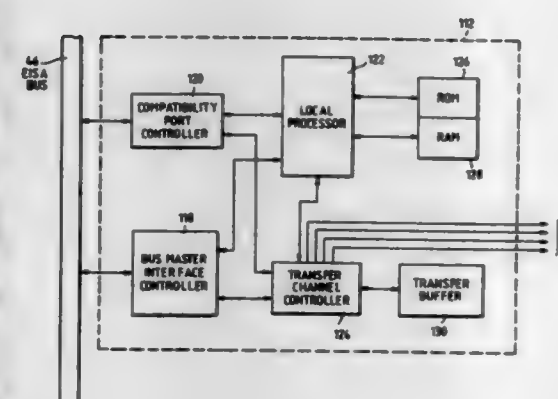
Stephen M. Schultz, Houston; David S. Schmenk, The Woodlands; E. David Neufeld, Tomball; David L. Grant, Houston, and David L. Flower, Tomball, all of Tex., assignors to Compaq Computer Corp., Houston, Tex.

Continuation of Ser. No. 431,748, Nov. 3, 1989, abandoned. This application Oct. 28, 1993, Ser. No. 145,029

Int. Cl.<sup>6</sup> G06F 7/22

U.S. Cl. 395-441

4 Claims



1. For use with a computer system having a disk array subsystem, the disk array subsystem having a plurality of disk drives forming a disk array and a microprocessor based disk array controller, a method for configuring the disk array subsystem comprising:

upon initialization of the computer system the disk array controller reading existing disk array information and individual disk drive configuration information from reserved sectors on each of the disk drives within the disk array;

the disk array controller comparing said disk array configu-

ration information to said individual disk drive configuration information read from each of the disk drives within the disk array to determine if said disk array information and said individual disk drive information read from each disk drive is consistent;

the disk array controller creating a new disk array configuration based on the results of said comparison of said disk array information and said individual disk drive information read from each of the disk drives; and the disk array controller writing said new disk array configuration to the reserved sectors on all disk drives within the disk array.

5,440,717

# COMPUTER PIPELINE INCLUDING DUAL-PORTED, CONTENT-ADDRESSABLE WRITEBUFFER

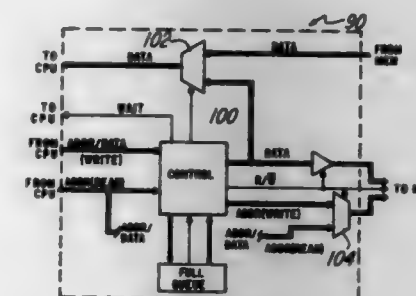
Patrick W. Bonhart, 12537 Montego Plaza, Dallas, Tex. 75230

Continuation of Ser. No. 841,896, Feb. 25, 1992, abandoned, which is a continuation of Ser. No. 456,187, Dec. 15, 1989, abandoned, which is a continuation of Ser. No. 761,221, Jul. 31, 1985, abandoned. This application Feb. 9, 1994, Ser. No. 194,136

Int. Cl.<sup>6</sup> G06F 12/00, 12/16, 9/30, 13/00

U.S. Cl. 395-486

9 Claims



1. A pipeline computer architecture, comprising: a central processor having an instruction set which includes instructions which perform read and write operations in a single instruction;

a memory coupled to said central processor, said memory containing data items to be read by said central processor, wherein said central processor is operable to write data to be placed in said memory;

buffer means having dual ports wherein one of said ports is coupled to said processor for receiving data and the other of said ports is coupled to said central processor and to said memory for writing data from said buffer means, wherein said buffer means holds a plurality of associatively accessible data items to be written to said memory until said memory is free to accept such data items, wherein said central processor is operable to read data items directly from said buffer means when a data item is to be read from said memory at a location which has a data item in said buffer means waiting to be written to such location; and

control circuitry operative to detect that an address to which a write is directed already exists in the buffer means, thereby not inserting additional data items into the buffer means when the data item for said address to which said write is directed already exists in the buffer means.



5,440,718

# SINGLE SEMICONDUCTOR SUBSTRATE RAM DEVICE UTILIZING DATA COMPRESSING/EXPANDING MECHANISM IN A MULTI-MICROPROCESSOR ENVIRONMENT

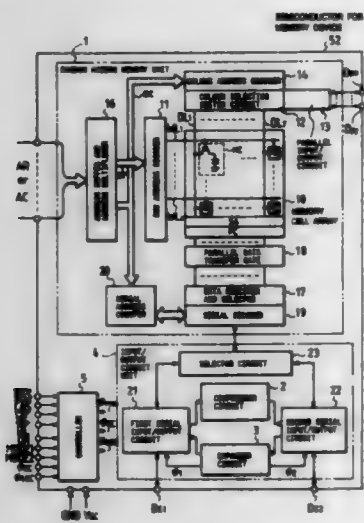
Takehiko Kumagai, Tokyo; Takashi Kikuchi; Takao Okubo, both of Akishima, and Yasuyuki Fuse, Koganei, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., Tokyo, Japan

Continuation of Ser. No. 129,016, Sep. 28, 1992, abandoned, which is a continuation of Ser. No. 585,864, Sep. 20, 1990, abandoned. This application Sep. 19, 1994, Ser. No. 308,848

Claims priority, application Japan, Sep. 20, 1989, 1-243615

Int. Cl.<sup>6</sup> G06F 12/00

U.S. Cl. 395—481



## 1. A microcomputer system including:

- a first microprocessor coupled to a first bus means for communicating ordinary data and compressed data, the first microprocessor including a first memory means for storing the ordinary data and the compressed data, a first data transfer means for transferring the ordinary data and the compressed data between the first memory means and the first bus means, and a first central processor for controlling the first memory means and the first data transfer means;
- a second microprocessor coupled to a second bus means for communicating the ordinary data and the compressed data, the second microprocessor including a second memory means for storing ordinary data and the compressed data, a second data transfer means for transferring the ordinary data and the compressed data between the second memory means and the second bus means, and a second central processor for controlling the second memory means and the second data transfer means; and,
- a semiconductor memory device which is coupled to the first bus means and to the second bus means, said semiconductor memory device including:
  - a random access memory unit including i) a memory array configured of a plurality of memory cells for storing the ordinary data and the compressed data, and ii) an input and output means coupled to the memory array and said first bus means;
  - a first circuit unit including a first serial input and output means coupled to the memory array, a second serial input and output means coupled to the memory array and the second bus means, a compression means, coupled to the first serial input and output means to the second serial input and output means, for generating the compressed data, and an expansion means, coupled to the first serial input and output means and to the second serial input and output means, for generating the ordinary data from the compressed data; and
  - control means for controlling operations of the random

access memory unit and the first circuit unit wherein both the compressed data and the ordinary data are stored in the random access memory unit after communication through the first circuit unit.

5,440,719

# METHOD SIMULATING DATA TRAFFIC ON NETWORK IN ACCORDANCE WITH A CLIENT/SEWER PARADIGM

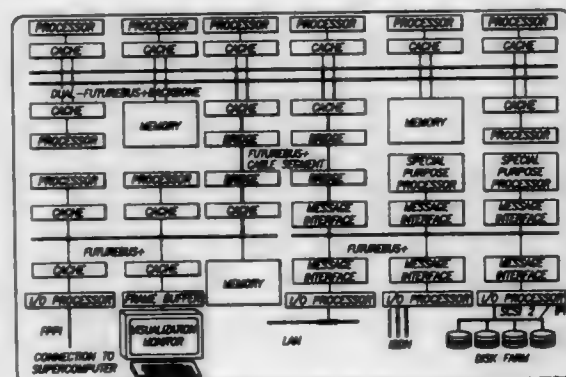
Charles F. Hanes, San Jose, and Colin K. Mick, Palo Alto, both of Calif., assignors to Cadence Design Systems, Inc., San Jose, Calif.

Filed Oct. 27, 1992, Ser. No. 967,636

Int. Cl.<sup>6</sup> G06F 9/455

U.S. Cl. 395—500

18 Claims



## 1. A method of simulating data traffic being transmitted over a network among a plurality of nodes interconnected by the network, the data traffic comprising a plurality of conversations among the plurality of nodes, one or more of the plurality of nodes being a client node and one or more of the plurality of nodes being a server node, said method comprising the steps of:

- providing a model representative of the network;
- characterizing one or more of the plurality of conversations as a series of one or more request/response interactions, each of the one or more interactions comprising transmission of a request message from one of the one or more client nodes to one of the one or more server nodes, and wherein none, some or all of the one or more interactions further comprise transmission of a response message associated with the request message, the associated response message transmitted from the one server node back to the one client node in response to receiving the request message; and
- generating data representative of the one or more interactions of each of the characterized conversations, said step of generating further comprising the steps of:
  - inputting the generated data for each of the interactions into the network model to determine when the associated response message of each of the interactions having one are received by the one client; and
  - when the request message of one of the interactions is dependent on the one client node's receipt of the response message associated with a previously generated request message, delaying the inputting of the data representative of the dependent interaction into the network model until the response message associated with the previously generated request message is received by the one client node as determined by the network model.

5,440,720

# ARCHITECTURE AND METHOD FOR DATA REDUCTION IN A SYSTEM FOR ANALYZING GEOMETRIC DATABASES

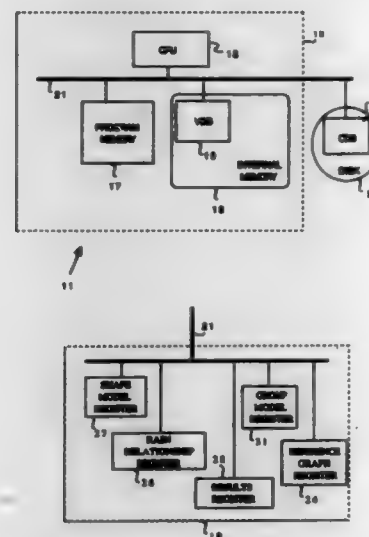
Allen Balsuck, San Jose, Calif.; Richard L. Fairbank, Schenectady, N.Y.; Walter K. Gowen, III, Troy, N.Y.; Jon R. Henriksen, Latham, N.Y.; William W. Hoover, III, Ballston Lake, N.Y.; Judith A. Huckabay, Union City; Eric Rogoyaki, Los Gatos, both of Calif., and Anton G. Salecker, Clifton Park, N.Y., assignors to Cadence Design Systems, Inc., San Jose, Calif.

Filed Sep. 20, 1993, Ser. No. 124,330

Int. Cl.<sup>6</sup> G06F 17/50

U.S. Cl. 395—500

8 Claims



## 1. A method for data storage requirement reduction in a system for analyzing a geometric database, wherein the method comprises the steps of:

- (a) reading a listing of group models comprising the geometric database;
- (b) performing a design rule verification upon a set of shape models referenced by a first group model within the listing with respect to a specific design rule, thereby generating an in-group result where the in-group result is derived from the set of shape models found within the first group model;
- (c) determining whether a rain relationship exists, the rain relationship existing when a spatial relationship between a shape model within the first group model invalidates a lower-level verification result; and
- (d) creating an override result if a rain relationship exists wherein the override result references a shape model created during a design rule verification performed upon the shape models causing the rain relationship, wherein those shape models not changed as a result of a design rule verification result are not duplicated in said geometric database.

5,440,721

# METHOD AND APPARATUS FOR CONTROLLING SIGNAL TIMING OF CASCADED SIGNAL PROCESSING UNITS

O. F. Morgan, San Jose; Michael Polatnick, Oakland, and Andrew Leary, Palo Alto, all of Calif., assignors to Sony Electronics, Inc., Park Ridge, N.J.

Filed Mar. 24, 1992, Ser. No. 856,580

Int. Cl.<sup>6</sup> G06F 7/38, 12/00

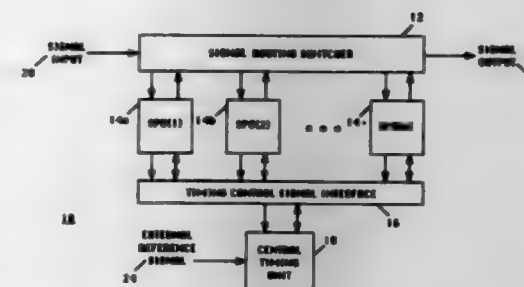
U.S. Cl. 395—550

22 Claims

1. In a signal processing unit of a digital signal processing system comprising signal processing circuits, a method for

advancing and controlling signal timing of said signal processing circuits, said method comprising the steps of:

- a) receiving a reference signal from an external source, said reference signal comprising at least one timing component;
- b) generating a plurality of clock pulses and at least one timing offset;



- c) detecting a load signal corresponding to said at least one timing component within said reference signal;
- d) counting a number of said plurality of clock pulses after detecting said load signal; and
- e) providing a timing signal to at least one of said signal processing circuits when the number of said counted clock pulses reaches a limit that is derived by a function of at least one timing offset.

5,440,722

# SYSTEM BUS MONITOR FOR COMPILING DATA REGARDING USE OF A SYSTEM BUS

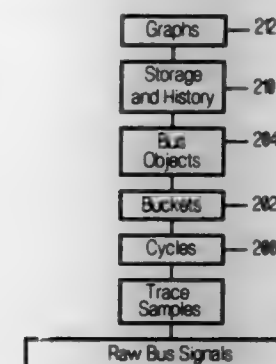
Adrian T. VanderSpek, Worcester; Edward A. Bennett, Upton; Dana M. Richmond, Hopkinton; Christopher A. Ramos, Acton, and Joseph V. Aurelio, Mendon, all of Mass., assignors to Banyan Systems, Inc., Westboro, Mass.

Continuation-in-part of Ser. No. 733,023, Jul. 22, 1991, abandoned. This application Jul. 22, 1992, Ser. No. 918,863

Int. Cl.<sup>6</sup> G06F 11/34

U.S. Cl. 395—183.19

11 Claims



- 10. A method of monitoring use of a bus by devices connected to said device comprising the steps of:
  - acquiring raw bus signals from said bus and storing said signals in a buffer memory;
  - parsing the bus signals stored in said buffer memory into bus cycles;
  - grouping statistics relating to said bus cycles into buckets defined by a user of said devices and bus;
  - gathering together all buckets relating to a device.

5,440,723

# AUTOMATIC IMMUNE SYSTEM FOR COMPUTERS AND COMPUTER NETWORKS

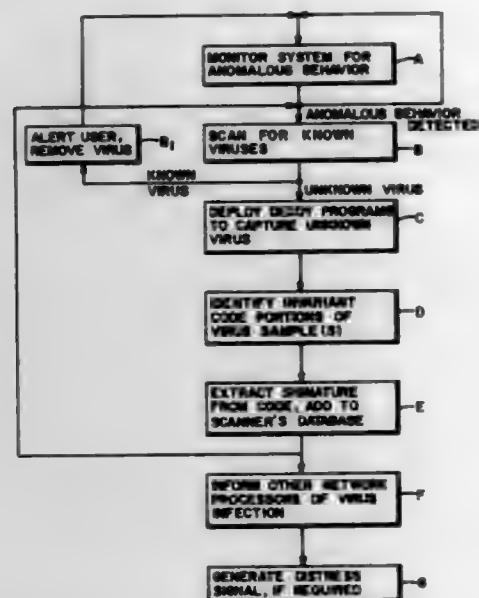
William C. Arnold, Mahopac; David M. Chess, Mohegan Lake; Jeffrey O. Kephart, Yorktown Heights, and Steven R. White, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 19, 1993, Ser. No. 4,872

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—181

46 Claims U.S. Cl. 371—22.5



1. A method for providing computational integrity for a digital data processing system, comprising the computer-executed steps of:

- detecting, with a data processor, an anomalous behavior of a digital data processing system during program execution, the anomalous behavior being indicative of an undesirable informational state of the digital data processing system that may result from the presence of an undesirable software entity;
- scanning, with the data processor, one or more portions of an informational state history of the digital data processing system to detect, if present, at least one known type of undesirable software entity;
- in response to the detection of a known type of undesirable software entity, taking remedial action;
- else, if a known type of undesirable software entity is not detected by the step of scanning, detecting, with the data processor, a previously unknown type of undesirable software entity;
- extracting, with the data processor, an identifying signature from the detected undesirable software entity;
- storing the identifying signature so as to enable a future detection of the undesirable software entity as a known type of undesirable software entity; and
- taking remedial action; wherein the step of extracting includes the data processor executed steps of obtaining at least one sequence of bytes from the detected undesirable software entity, determining likelihoods that the at least one sequence of bytes is also found in program code that may be run on a digital data processing system which is to be protected from the undesirable software entity, and selecting as the extracted identifying signature a plurality of bytes from the at least one sequence that have a high likelihood of reliably identifying a future occurrence of the undesirable software entity.

5,440,724

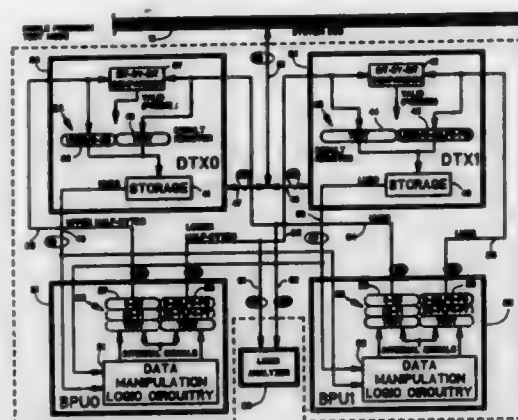
# CENTRAL PROCESSING UNIT USING DUAL BASIC PROCESSING UNITS AND COMBINED RESULT BUS AND INCORPORATING MEANS FOR OBTAINING ACCESS TO INTERNAL BPU TEST SIGNALS

Donald C. Boothroyd, Phoenix, and Bruce E. Flocken, Glendale, both of Ariz., assignors to Bull HN Information Systems Inc.

Filed Jan. 17, 1993, Ser. No. 78,389

Int. Cl.<sup>6</sup> H04B 17/00

3 Claims



1. In a central processor including a first and a second basic processing unit (BPU), said first and second BPUs each being implemented on a single very large scale integrated (VLSI) chip on which the number of input/output terminals is limited, with each BPU chip executing the same computer instruction on the same data concurrently to produce the same result, said first and second BPUs being capable of performing single and double precision data manipulation operations, said BPUs producing a single data word of result signals when performing a single precision data manipulation operation and a double data word of result signals when performing a double precision operation and of storing the result signals of each such operation in a cache memory means, each of said first and second BPUs including a source of internal test signals; and a multiplexed data buffer register for selectively issuing signals of a single data word result, and a double data word result, said buffer register being divided into sections, a first section for temporarily storing signals of a data word result produced in executing a single precision data manipulation operation and a double data word of result signals of the two data word result produced in executing a double precision data manipulation operation; and a second section for storing signals of the second data word of the two data word result produced in executing said double data precision data manipulation operation, each of said buffer register sections being divided into two half sections, with each half section storing the signals of a different half of the signals of the data word stored therein; a first and a second half a data word wide result bus for transmitting signals stored in different ones of said half sections of the multiplexed data buffer register of the first BPU to the cache memory means for storage therein, and a third and a fourth half a data word wide result bus for transmitting signals stored in different ones of said half sections of the multiplexed data buffer register of the second BPU to the cache memory means for storage therein; wherein the improvements comprise: providing the multiplexed data buffer register of each of the BPUs with a third section for temporarily storing up to half a data word of test signals produced by each BPU, each of said third sections having a test mode of operation in which the test signals stored in the third section of the data buffer register of the first BPU is issued to the second half a data word result bus; and the test signals stored in the third section of the data buffer register of the second BPU is issued to the third half a data word result bus; and first and second half a data word wide test busses connected

respectively to the second and third half a data word wide result busses, said first and second half a data word wide test busses being accessible to external test equipment; said multiplexed data buffer registers, when the BPUs are storing result signals of a double precision data manipulation operation in the cache means, being prohibited from operating in the test mode of operation; whereby no I/O terminals of the VLSI chips of said BPUs are used exclusively for issuing test signals to external test equipment.

5,440,725

# MICROPROCESSOR CIRCUIT ARRANGEMENT WITH WATCHDOG CIRCUIT

Hugo Weller, Oberriexingen; Peter Tauber, Renningen; Knut Balzer, Ludwigsburg-Pflugfelden, and Wilfried Burger, Hemmingen, all of Germany, assignors to Robert Bosch GmbH, Germany

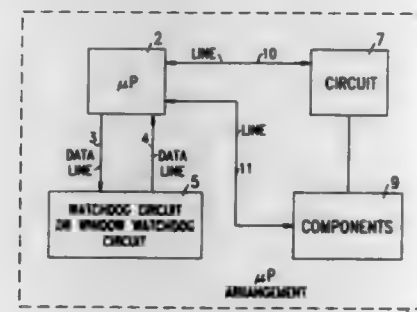
Continuation of Ser. No. 768,652, Oct. 2, 1991, abandoned. This application May 18, 1994, Ser. No. 245,514

Claims priority, application Germany, Jun. 24, 1989, 39 20 696.3

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—185.08

12 Claims



1. A microprocessor system for resetting a microprocessor upon detection of malfunctions, the microprocessor system comprising:

- a microprocessor, the microprocessor monitoring the microprocessor system and detecting whether at least one malfunction has occurred in the microprocessor system, the microprocessor outputting trigger pulses at a first rate when no malfunction is detected, the microprocessor outputting trigger pulses at a predetermined second rate different from the first rate when a malfunction is detected;
- a watchdog circuit coupled to the microprocessor, the watchdog circuit receiving the trigger pulses from the microprocessor, the watchdog circuit sending a reset signal to the microprocessor when the trigger pulses from the microprocessor are not received at the first rate.

5,440,726

# PROGRESSIVE RETRY METHOD AND APPARATUS HAVING REUSABLE SOFTWARE MODULES FOR SOFTWARE FAILURE RECOVERY IN MULTI-PROCESS MESSAGE-PASSING APPLICATIONS

Wesley K. Fuchs, Mahomet, Ill.; Yennun Huang, Bridgewater, N.J.; Chandra M. Kintala, Warren, N.J., and Yi-Min Wang, Berkeley Heights, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jun. 22, 1994, Ser. No. 263,916

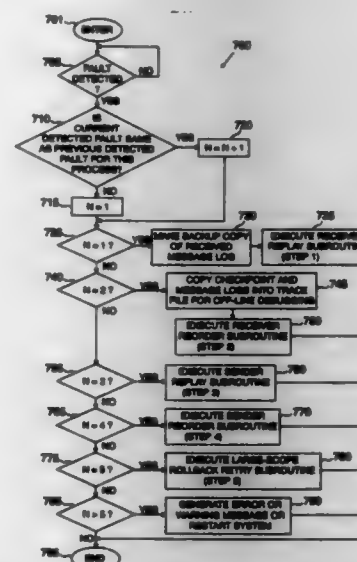
Int. Cl.<sup>6</sup> G06F 11/18

U.S. Cl. 395—82.18

16 Claims

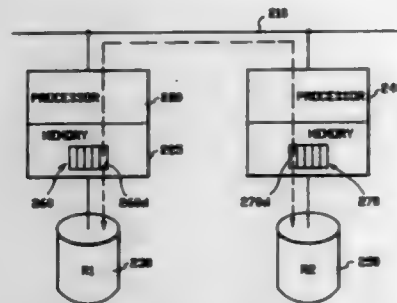
1. An apparatus for bypassing faults in an application process, said fault bypass apparatus comprising: at least one processor for executing a plurality of concurrent application processes;
- a watchdog which includes an error detection monitor for monitoring one or more of said application processes and

- a restart subsystem for executing a progressive retry recovery algorithm for bypassing a fault detected by said monitor in one of said application processes; and
- a memory device for storing a plurality of fault tolerant library functions which may be invoked from one or more of said application processes to make said application fault tolerant, said fault tolerant library including: a checkpoint function for periodically performing a checkpoint of data associated with an application process;
- a recover function for restoring the checkpointed data from the nonvolatile memory during a recovery mode;





replica being stored in said private storage of one of said processors and said secondary replica being stored in said private storage of another one of said processors; and a non-volatile log, said transaction processing system using a Write-Ahead Log protocol in which a modification to a page in said partition is not considered made until said modification is stored in said log; wherein the improvement comprises: means for generating a response indicating to a transaction requestor that a requested transaction on the primary replica has completed; means for updating said secondary replica from said primary



replica by asynchronously sending modified pages from said primary replica to said secondary replica independently of the generation of the response by the means for generating and without imposing any page sending order or timing constraint; means for keeping track of the pages of said partition which have been modified in said primary replica and not yet modified in said secondary replica; and means for making said log accessible to both said processors which are storing a replica of said partition, whereby said secondary replica is maintained without imposing delay upon the processing of transactions on said primary replica by said one processor.

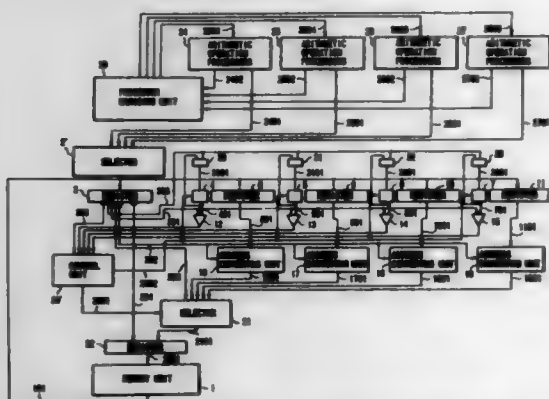
5,440,728

## INFORMATION PROCESSING APPARATUS

Yoshifumi Fujiwara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
Continuation of Ser. No. 700,429, May 15, 1991, abandoned.  
This application Aug. 18, 1994, Ser. No. 292,046  
Claims priority, application Japan, May 18, 1990, 2-129560  
Int. Cl.<sup>6</sup> G06F 11/34

U.S. Cl. 395-419

9 Claims



1. An information processing apparatus comprising: a plurality of processors for performing arithmetic operations for information processing; a memory unit to be accessed commonly by said processors; a plurality of address conversion tables for converting a logical address into a physical address; a plurality of address conversion table managing modules

each having a directory for managing a corresponding address conversion table in accordance with contents of a logical address and numbers (Nos.) of processors accessible to said address conversion tables; address conversion table control means for updating said address conversion table managing modules to update contents of said address conversion tables; processor managing means for checking whether each processor is operable; and abnormality processing means for deleting an inoperable processor number (No.) from a directory of an address conversion table managing module in accordance with abnormality information from said processors, wherein said abnormality processing means includes forced clear designating means for designating said inoperable processor No. for deletion from said plurality of address conversion table managing modules, and forced control means of an operable processor, for sending said inoperable processor No. and a directory clear request to said address conversion table control means in accordance with the designation from said forced clear designating means.

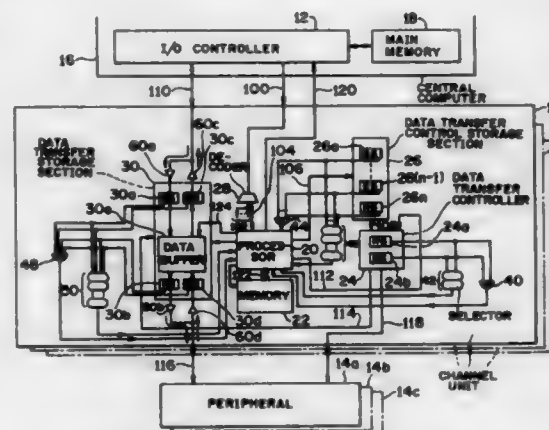
5,440,729

## METHOD FOR HANDLING ERROR INFORMATION BETWEEN CHANNEL UNIT AND CENTRAL COMPUTER

Toshio Kimura, and Tatsuhiko Tanimichi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan  
Continuation of Ser. No. 686,625, Apr. 18, 1991. This application Dec. 2, 1994, Ser. No. 353,373  
Claims priority, application Japan, Apr. 18, 1990, 2-102279  
Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395-182.07

12 Claims



1. A method for transferring error information from one of a plurality of channel units to a central computer if an error occurs in said one of said channel units, said channel units being provided between said central computer and a plurality of respective peripherals and each of said channel units including a plurality of registers for transferring data therebetween via a respective data channel, said method comprising the steps of:

- detecting said error which occurred in one of the registers, by a processor provided in said one of said channel units;
- interrupting a data transfer operation of said processor in response to the detection of the error and bringing the registers into a freezing mode, thereby rendering said one of said channel units temporarily inoperative without rendering another channel units inoperative;
- acquiring a content of each of the registers, as the error information, into a memory means provided in said one of said channel units, and advising the central computer of the error occurrence;
- receiving a first reset signal in said one of said channel

units from the central computer and releasing the freezing mode;

- receiving an instruction in said one of said channel units, from said central computer, for transferring the error information stored in said memory means;
- transferring the error information stored in said memory means to the central computer, via said respective data channel, in response to the instruction received at step (e); and
- receiving a second reset signal in said one of said channel units from said central computer at said one of said channel units and rendering said one of said channel units operative in a normal data transfer mode.

5,440,730

## TIME INDEX ACCESS STRUCTURE FOR TEMPORAL DATABASES HAVING CONCURRENT MULTIPLE VERSIONS

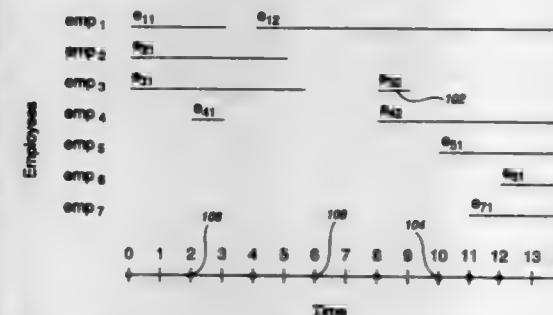
Ramez A. Elmasri, Houston, Tex., and Tzyh-Jain G. Wu, Manalapan, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 9, 1990, Ser. No. 564,881

Int. Cl.<sup>6</sup> G06F 15/40

U.S. Cl. 395-600

14 Claims



1. A computer-based temporal database management system including a time index which comprises:

- an ordered series of indexing time points defining time intervals during which at least one of a plurality of concurrent object version in said database is valid; and
- associated with each indexing point, pointer means identifying all database object versions that are valid at the time represented by said each indexing point.

5,440,731

## METHOD OF DETECTING UNJUSTIFIABLE RELOADING OF STORED DATA

Masaaki Nagashima, Kawasaki; Tadashi Yamakawa; Takayuki Sasaki, both of Yokohama; Yasuhiro Okuno, Kawasaki, and Takahiro Kurosawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1992, Ser. No. 851,206

Claims priority, application Japan, Mar. 15, 1991, 3-51272; Mar. 15, 1991, 3-51274; Mar. 15, 1991, 3-51275; Mar. 15, 1991, 3-51276; Mar. 15, 1991, 3-51278; Mar. 15, 1991, 3-51280

Int. Cl.<sup>6</sup> G06F 15/40

U.S. Cl. 395-600

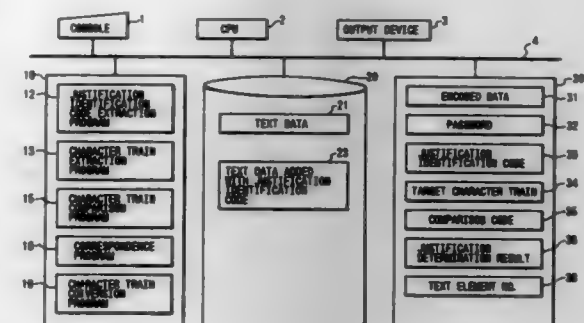
34 Claims

1. A method of discriminating, for each first level partial data, whether or not saved data, one file of which is composed of a plurality of the first level partial data and each of the first level partial data is able to include a second level partial data, has been unjustifiably rewritten, said method comprising steps of:

- at a time of saving a file, designating a first level partial data on the basis of a user instruction;
- receiving a password from a user;
- converting the received password and the designated first level partial data, which includes a second level partial

data, according to a predetermined procedure to generate a first code; and saving the file with storing of the first code to correspond to the designated first level partial data;

(B) at a time of reading the saved file, reading the saved file; designating the first level partial data on the basis of a user instruction; receiving the password from the user;



converting the received password and the designated first level partial data, which includes the second level partial data if the designated first level partial data includes the second level partial data, according to said predetermined procedure to generate a second code; comparing the generated second code with the first code stored to correspond to the designated first level partial data; and discriminating that the designated first level partial data has been unjustifiably rewritten if comparison results in a fact that the first code is not equal to the second code.

5,440,732

## KEY-RANGE LOCKING WITH INDEX TREES

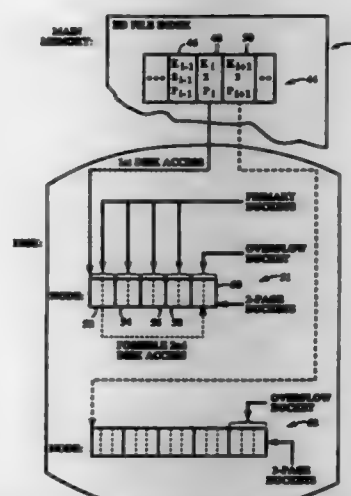
David B. Lomet, Westford, Mass., and Russell J. Green, Edinburgh, Scotland, assignors to Digital Equipment Corp., Pat. Law Gr., Maynard, Mass.

Filed Feb. 5, 1993, Ser. No. 14,181

Int. Cl.<sup>6</sup> G06F 15/40

U.S. Cl. 395-600

9 Claims



1. In a resource-management system for storing data files of data records that include key fields containing respective key values, for maintaining, for respective data files, bounded-disorder key indexes comprising index records organized into trees comprising respective hierarchies of nodes, including-leaf nodes divided into respective pluralities of buckets including

primary buckets, of leaf-node records containing respective ones of the key values contained in the data records, each primary bucket containing index records that contain key values that a hash function associates with that bucket, for performing insert and delete operations that lock key-valued lockable ranges, associated with respective key values that bound the lockable ranges with which they are associated and into which or from which the insert and delete operations respectively insert or delete values, and for performing scan operations that scan target ranges and lock the key-valued lockable ranges that overlap the target ranges, the improvement wherein a scan operation locks the key-valued lockable range associated with an existing key value in a given bucket if the range extending between that key value and the existing key value in front of it in the same bucket overlaps the scan operation's target range and an insert or delete operation that inserts or deletes in a bucket a key value in front of an existing key value in that bucket locks the key-valued lockable range associated with that existing key value without locking a key-valued lockable range associated with any intervening key value in any other bucket.

5,440,733

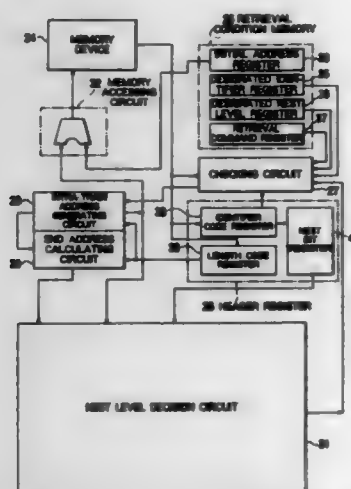
# **TOKEN TRAIN RETRIEVAL DEVICE FOR SIMULTANEOUSLY DETERMINING NEST LEVEL AND CHECKING CONDITION OF RETRIEVAL BASED ON THE DETERMINING NEST LEVEL**

Tetsuya Yamazaki, and Kousuke Takahashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan  
Filed Jul. 28, 1993, Ser. No. 98,076

Claims priority, application Japan, Jul. 28, 1992, 4-200731  
Int. Cl.<sup>6</sup> G06F 15/00, 7/04

U.S. Cl. 395—600

8 Claims



1. A token train retrieval device including a memory device for memorizing, as stored tokens, a plurality of tokens each of which starts at a starting address and ends at an end address, each of said tokens having a nest level selected from first through N-th nest levels as a selected level, where N represents a positive integer which is not less than one, said first through said N-th nest levels being a lowest through a highest nest level, respectively, each of said tokens comprising a header and a data set, said data set having a data length and being for nesting one of said tokens that has a higher nest level than said selected level, said header comprising a data length code representative of said data length and a data identifier code which includes a nest bit indicative of whether or not said one of the tokens is nested in said data set, said token train retrieval device being for retrieving said stored tokens to locate required data in said stored tokens that satisfy a retrieval condition and comprising:

retrieval condition memory means for preliminarily memorizing said retrieval condition as a stored condition, said stored condition including first through M-th designated

identifier codes different from one another and first through N-th designated nest level codes different from one another, where M represents a positive number which is not less than one, each of said designated nest level codes being indicative of a designated nest level as one of said first through said N-th nest levels;

header register means supplied as a supplied header with the header of each of selected tokens selected from said tokens for holding the data length code, the data identifier code, and the nest bit of said supplied header as a held data length code, a held data identifier code, and a held nest bit, respectively;

checking means connected to said retrieval condition memory means and said header register means and supplied with a decided nest level code and said supplied header for checking, in response to said held data identifier code, said decided nest level code, and said supplied header, whether or not said stored condition is satisfied to produce a matching signal indicative of a binary one when the stored condition is satisfied;

intra-train address generating means connected to said checking means and said header register means for generating an intra-train address variable in response to said matching signal and said held data length code to select said selected tokens from said stored tokens, said selected tokens including said required data;

end address calculating means connected to said intra-train address generating means and said header register means for calculating the end address of each of said selected tokens as a calculated address by using said intra-train address and said held data length code; and

decision means connected to said intra-train address generating means, said end address calculating means, said header register means, and said checking means for deciding a decided nest level by using said intra-train address, said calculated address, and said held nest bit, said decided nest level indicating one of said first through said N-th nest levels that is selected as said selected level, said decision means supplying said checking means with said decided nest level code representative of said decided nest level.

5,440,734

# **SYSTEM FOR MSD RADIX SORT BIN STORAGE MANAGEMENT**

Bruce A. Wagar, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Sep. 14, 1993, Ser. No. 121,812

Int. Cl.<sup>6</sup> G06F 7/06, 7/22, 7/24

U.S. Cl. 395—600

16 Claims

1. A computer-implemented method for sorting a plurality R of records according to their key fields, each said key field having a plurality D of digits of radix M, wherein R, D and M are non-zero positive integers, said method comprising the steps of:

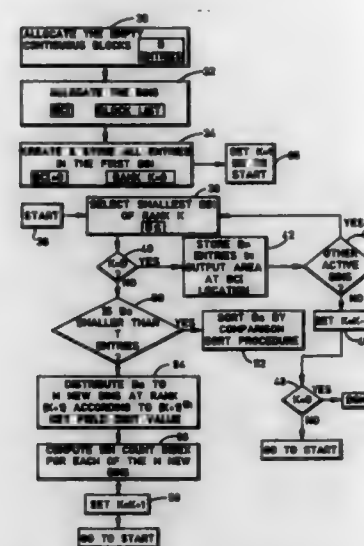
(a) recursively distributing and collecting a group of representations of said key fields, each recursion including the ordered steps of

(a.1) comparing each of said group of key fields against an extrinsic attribute and assigning said each key field to one of a plurality M of same-attribute subgroups,

(a.2) assigning to each said same-attribute subgroup a bin count index representing the number of said plurality R of records having key fields that are smaller than the minimum said key field in said each same-attribute subgroup, and

(a.3) sorting and moving the sorted key fields from each said same-attribute subgroup having a size less than a predetermined threshold T to a predetermined location in an output storage area, where said predetermined

location corresponds to said bin count index and T is a non-zero positive integer; and



(b) repeating said each recursion for the remaining undistributed said same-attribute subgroups.

5,440,735

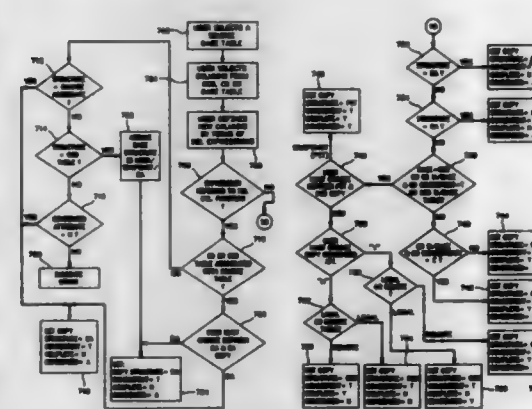
# **SIMPLIFIED RELATIONAL DATA BASE SNAPSHOT COPYING**

Robert D. Goldring, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Oct. 8, 1993, Ser. No. 134,763

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—600

14 Claims



1. A method of supporting interactive copy requests from data base management system users in a computer system to enable copying from a source data table having a first structure to a target data table having a second structure, the computer system further having a central processor, a memory unit storing a plurality of data tables and a non-volatile storage medium, the users having interactive terminals for communicating with the data base management system and generating requests for point-in-time snapshot copies of selected portions of the user tables and generating updates to the user tables that are periodically propagated to the snapshot copies, the method comprising the steps of:

defining a user table such that substantially all attributes necessary to specify the structure of the table and whether the table is consistent, complete, and condensed are specified;

resolving any ambiguity in the user table definition by interactively querying the user defining the user table;

receiving a user request for copying a source table to a target table;

automatically determining the attributes of the target table in accordance with the attributes of the source table and the copy request; and

executing the copy request.

5,440,736

# **SORTER FOR RECORDS HAVING DIFFERENT AMOUNTS OF DATA**

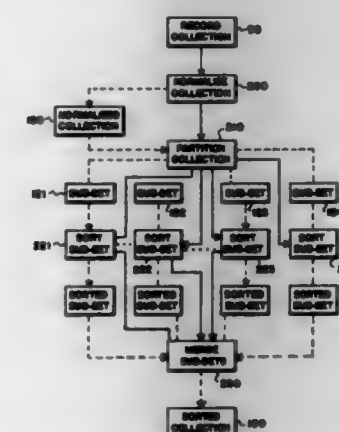
John R. Lawson, Jr., Teller County, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 24, 1993, Ser. No. 157,864

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—600

11 Claims



1. In a computer system, a method for sorting a collection of records, the records of the collection having different amounts of data, comprising the steps of:

normalizing the amount of data in each record to a value chosen from a designated set of values, the designated set of values selected from a progression of numbers;

partitioning the normalized records into a plurality of sub-sets of records, each of the partitioned sub-sets of records including records having the same amount of data;

sorting each sub-set of records; and

merging each sorted sub-set of records to arrange the records in a predetermined order.

5,440,737

# **FILE-ALLOCATION CONTROL SYSTEM FOR ALLOCATING FILES ACCORDING TO USER-PROGRAM PRIORITY AND STORAGE VOLUME PERFORMANCE**

Masako Uchinuma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
Filed Jul. 22, 1994, Ser. No. 273,154

Claims priority, application Japan, Jul. 23, 1993, 5-202833

Int. Cl.<sup>6</sup> G06F 12/02

U.S. Cl. 395—600

23 Claims

1. A file-allocation control system in a computer system having a plurality of mass storage units each storing an individual volume and comprising:

a volume group comprising a plurality of volume subgroups each including at least one volume on each mass storage unit;

a prioritized volume subgroups table listing priority values assigned to a plurality of user programs in the computer system and also listing prioritized volume subgroups corresponding to said priority values; and

a file-allocation control means for allocating, in response to a request of one of said plurality of user programs, files preferentially to volumes of prioritized volume subgroups corresponding to the priority values assigned to said plu-





cluding memory means for storage of digital data, for computing the similarity between two groups of program objects in computer system software and for implementing structural changes in said computer system software wherein the similarity between any pair of objects can be computed by a similarity function, said method being for use in software clustering, when it is known that only objects that are "near neighbors" to a given object are to be considered when computing similarity, that is, for some positive integer "Y", only the Y-nearest neighbors are to be considered, wherein for some smaller integer "X", when an object is in the same group as at least X of its Y nearest neighbors, none of the other neighbors matter, and wherein input data to be stored in said memory means comprises a set of groups containing software objects, two specific groups, A and B, and two integer values for X and Y, said method comprising:

- retrieving data from said memory for performing by said digital computer the steps following hereafter;
- for each object, identifying its X nearest neighbors, hereinafter called its x-neighbors, and storing this data in said memory means;
- for each object, identifying its Y nearest neighbors, hereinafter called its Y-neighbors, and storing this data in said memory means;
- for each pair of objects for which neither is a Y-neighbor of the other, redefining the similarity between them to be zero and storing this data in said memory means;
- for each pair of objects, each of whose X-neighbors are all in the same group as the object itself, redefining the similarity between them to be zero and storing this data in said memory means;
- outputting for use in software clustering a similarity between groups A and B, whereby said similarity is the maximum similarity between any object in A and any object in B; and
- repositioning said objects in said memory means according to said outputted similarity, whereby said objects are repositioned to better redefine membership of program modules within said computer system software.

5,440,743

## DEADLOCK DETECTING SYSTEM

Harno Yokota; Hajime Kitakami; Yasuo Noguchi, and Naoki Akaboshi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

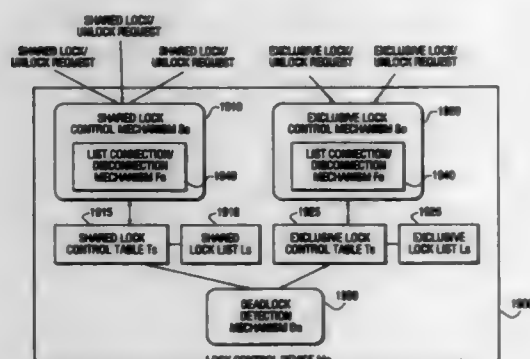
Continuation of Ser. No. 119,828, Sep. 13, 1993, abandoned, which is a continuation of Ser. No. 801,547, Dec. 2, 1991, abandoned. This application Jun. 13, 1994, Ser. No. 259,161

Claims priority, application Japan, Nov. 30, 1990, 2-329658

Int. Cl.<sup>6</sup> G06F 13/14

U.S. Cl. 395-650

22 Claims



1. A deadlock detection system in a data processor in which a plurality of resources are shared among a plurality of resource requesters, the deadlock detection system comprising: a lock control table for listing resource identities; a resource requester identifier list to each entry of said lock control table, for listing one or more resource requester

identifiers in association with respective resource identities stored in the lock control table, the one or more resource requester identifiers being listed sequentially in a requesting order in which a leading resource requester identifier corresponding to a leading resource requester, can obtain an exclusive lock on a respective resource; and lock control means for examining the lock control table and the resource requester identifier list, to determine whether a deadlock exists in which a group of resource requester identifiers which are leading resource requester identifiers for respective resources, are listed in respective requesting orders with resource requester identifiers of the group, which are not leading resource requester identifiers, and in which at least one of the leading resource requester identifiers in the group and at least one of the resource requester identifiers in the group which is not a leading resource requester identifier, are not identical for at least one requesting order, the lock control means performing control of the exclusive lock of the respective resource, based on whether the deadlock exists.

5,440,744

## METHODS AND APPARATUS FOR IMPLEMENTING SERVER FUNCTIONS IN A DISTRIBUTED HETEROGENEOUS ENVIRONMENT

Neal F. Jacobson, Nashua, N.H.; Michael J. Renzullo, Ashland, Mass., and Paul A. Reilly, Nashua, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

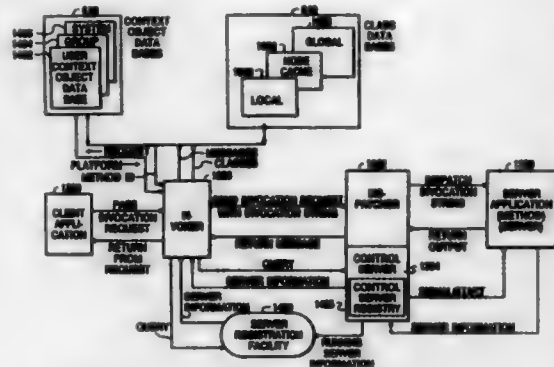
Continuation of Ser. No. 130,165, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 567,131, Aug. 14, 1990, abandoned. This application Nov. 15, 1994, Ser. No. 340,019

The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.

Int. Cl.<sup>6</sup> G06F 9/44, 13/00

U.S. Cl. 395-650

6 Claims



1. In a network containing a memory and processors connected to each other by a network bus, the memory storing a context database and a global database, the global database including methods and applications, the context database including preferences, the preferences for identifying the methods, the applications, and the processors according to a predetermined order, the processors having shared access to the context database and the global database, a process to execute the applications comprising the steps of:

referencing in the global database, by a client application executing on a client processor, a method and an application to perform the method; identifying, in response to the referencing and using the preferences, a server application to perform the method; determining if the server application is available in the network; if the server application is not available, identifying, using the preferences, a server processor, starting the server application on the server processor, and signalling the client processor that the server application is available; and

if the server application is available in the network, executing the server application to perform the method.

5,440,745

## BATCH FORMAT PROCESSING OF RECORD DATA

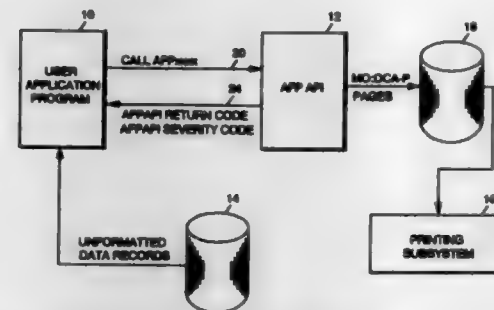
Brian G. Platte, Frisco; Jeri L. Sampson; Jamsie R. Treppendahl, both of Boulder, and Karen D. Walder, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1993, Ser. No. 54,780

Int. Cl.<sup>6</sup> G06F 9/00, 9/40

U.S. Cl. 395-700

7 Claims



1. In a batch processing printing system, a method for producing a formatted page in a document from data records having no required format commands embedded therein, said system having a user written application program (UAP) that operates interactively with an application program interface (API) without user intervention, said method comprising the computer implemented steps of:

- calling the API from the UAP and sending set-up parameters to the API;
- setting up default parameters in the API in accordance with the set-up parameters received from the UAP;
- calling the API from the UAP and sending page or page element parameters to the API;
- establishing a page or page element environment based on the default parameters and the page or page element parameters received from the UAP; and
- interactively between the UAP and the API formatting the data records in accordance with the default parameters and the page or page element parameters into paragraphs, tables or other page elements to produce a formatted page.

5,440,746

## SYSTEM AND METHOD FOR SYNCHRONIZING PROCESSORS IN A PARALLEL PROCESSING ENVIRONMENT

Derek J. Lentz, Los Gatos, Calif., assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 6, 1992, Ser. No. 972,699

Int. Cl.<sup>6</sup> G06F 15/16

U.S. Cl. 395-163

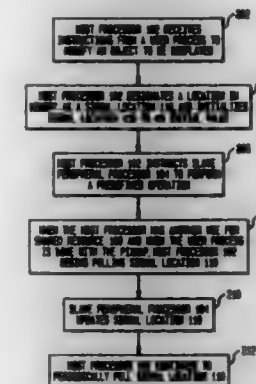
21 Claims

1. A method for allowing a host processor to control the use of a shared resource when a slave peripheral processor executes an operation in a client process requiring the use of said shared resource, comprising the steps of:

- assigning a signal location in system memory for storing a value indicative of the availability of said shared resource;
- setting an initial value at said signal location indicating that the slave peripheral processor requires the use of the shared resource to perform said operation;
- instructing the slave peripheral processor to perform said operation in said client process requiring use of the shared resource;
- determining whether the host processor has another use

for the shared resource other than said operation performed by the slave peripheral processor;

- determining whether the client process needs the shared resource for a further operation;
- updating the value at said signal location to a specified value when the slave peripheral processor no longer requires use of said shared resource in said operation; and



- checking whether said specified value is in said corresponding signal location to determine if said slave peripheral processor no longer requires said shared resource, wherein said checking step is performed when the host processor is determined in said determining step (d) to have another use for the shared resource and the client process is determined in said determining step (e) to no longer need the shared resource.

5,440,747

## DATA PROCESSOR WITH CONTROL LOGIC FOR STORING OPERATION MODE STATUS AND ASSOCIATED METHOD

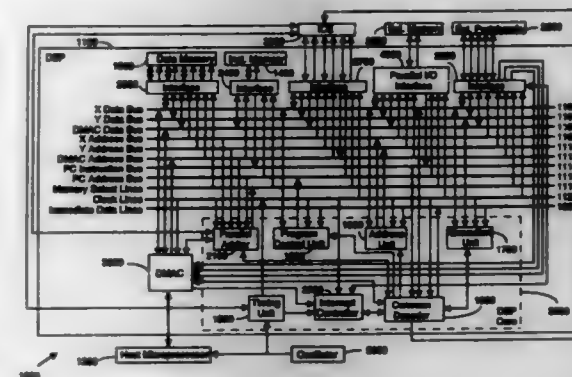
Atsushi Kiuchi, Kunitachi, Japan, assignor to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Sep. 27, 1993, Ser. No. 127,679

Int. Cl.<sup>6</sup> G06F 13/14, 1/32

U.S. Cl. 395-375

10 Claims



1. A data processor comprising: a data processing core unit for performing data processing operations; said data processing core unit including an interrupt controller for receiving interrupt signals, said received interrupt signals including a break interrupt request signal and a plurality of standard interrupt request signals; said data processing core unit including a condition code register for storing condition code values including a data processor mode control value; said data processing core unit including a condition code stacking register for storing condition code values received from said condition code register; and



a data memory including a data stacking area for storing specified data values;

said data processing core unit including mode control means coupled to said condition code register for suspending data processing operations by said data processing core unit when said data processor mode control value is set to a predefined "sleep mode" value and for enabling data processing operations by said data processing core unit when said data processor mode control value is set to a predefined "run mode" value;

said data processing core unit including an interrupt decoder, coupled to said interrupt controller, for generating condition code register control signals to operate on said data processor mode control value in accordance with each received interrupt request signal;

said interrupt decoder including a state machine for responding to a received break interrupt request signal by generating: (A) first, condition code register control signals to copy said data processor mode control value stored in said condition code register into said condition code stacking register, (B) second, condition code register control signals to set said data processor mode control value to said predefined "run mode" value;

said interrupt decoder state machine responding to a received standard interrupt request signal by generating: (A) first, condition code register control signals to set said data processor mode control value to said predefined "run mode" value; and (B), second, condition code register control signals to copy said data processor mode control value stored in said condition code register into said data stacking area;

said data processing core unit including a condition code controller for setting said data processor mode control value and copying said data processor mode control value in accordance with said condition code register control signals.

5,440,748

# COMPUTER SYSTEM CAPABLE OF CONNECTING EXPANSION UNIT

Shigeru Sekine, Kazumori Yamaki, and Nobutaka Nishigaki, all of Tokyo, Japan, assigns to Kabushiki Kaisha Toshiba, Kawasaki, Japan

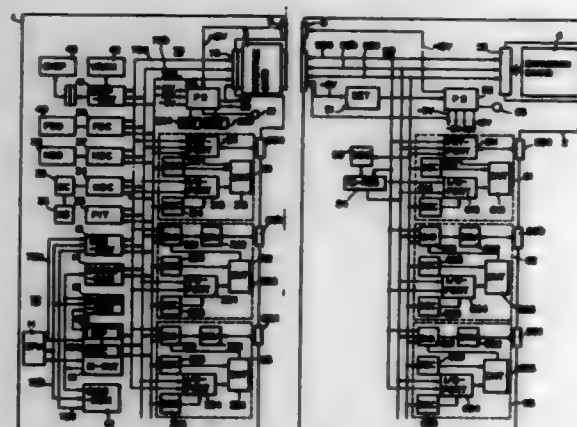
Continuation of Ser. No. 578,533, Sep. 7, 1990, abandoned. This application Jul. 6, 1993, Ser. No. 86,462

Claims priority, application Japan, Nov. 29, 1989, 1-307458; Nov. 30, 1989, 1-311331; Aug. 20, 1990, 2-218605; Aug. 20, 1990, 2-218606

Int. Cl. G06F 1/30

U.S. Cl. 395-750

17 Claims



1. Computer system comprising:  
a computer main body which has a plurality of main compo-

nents and main power supply means for supplying a plurality of first operating voltages to the main components; an expansion unit which has a plurality of expansion components and expansion power supply means for supplying a plurality of second operating voltages to the expansion components, the expansion power supply means to which a power source voltage is supplied when the expansion unit is connected to the computer main body; and interface means for electrically connecting the expansion unit to the computer main body, wherein the expansion power supply means receives the power source voltage, supplies the power source voltage to the main power supply means through the interface means when the expansion power supply means is powered on and supplies the second operating voltages to the expansion components in accordance with the power source voltage when the expansion power supply means receives a check signal, one of the second operating voltages being supplied to the interface means, and the main power supply means, when the main power supply means is powered on and when the main power supply means receives the power source voltage from the expansion power supply means, supplies the first operating voltages to the main components in accordance with the power source voltage and supplies the check signal to the expansion power supply means through the interface means.

5,440,749

# HIGH PERFORMANCE, LOW COST MICROPROCESSOR ARCHITECTURE

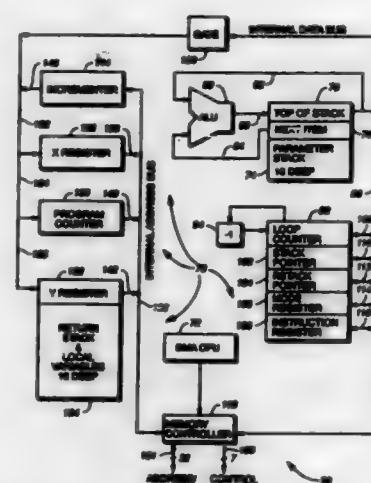
Charles H. Moore, Woodside, and Russell H. Fish, III, Mt. View, both of Calif., assigns to Nanotronics Corporation, Eagle Point, Oreg.

Filed Aug. 3, 1989, Ser. No. 389,334

Int. Cl. G06F 9/22

U.S. Cl. 395-800

29 Claims



1. A microprocessor system, comprising a central processing unit integrated circuit, a memory extend of said central processing unit integrated circuit, a bus connecting said central processing unit integrated circuit to said memory, and means connected to said bus for fetching instructions for said central processing unit integrated circuit on said bus from said memory, said means for fetching instructions being configured and connected to fetch multiple sequential instructions from said memory in parallel and supply the multiple sequential instructions to said central processing unit integrated circuit during a single memory cycle, said bus having a width at least equal to a number of bits in each of the instructions times a number of the instructions fetched in parallel, said central processing unit including an arithmetic logic unit and a first push down stack connected to said arithmetic, logic unit, said first push down

stack including means for storing a top item connected to a first input of said arithmetic logic unit to provide the top item to the first input and means for storing a next item connected to a second input of said arithmetic logic unit to provide the next item to the second input, a remainder of said first push down stack being connected to said means for storing a next item to receive the next item from said means for storing a next item when pushed down in said push down stack said arithmetic logic unit having an output connected to said means for storing a top item.

5,440,750

# INFORMATION PROCESSING SYSTEM CAPABLE OF EXECUTING A SINGLE INSTRUCTION FOR WATCHING AND WAITING FOR WRITING OF INFORMATION FOR SYNCHRONIZATION BY ANOTHER PROCESSOR

Katsuyoshi Kital, Hadano; Yasuhiro Inagami, Kodaira; Yoshiko Tamaki, Kumitachi, and Yoshikazu Tanaka, Omiya, all of Japan, assigns to Hitachi, Ltd., Tokyo, Japan

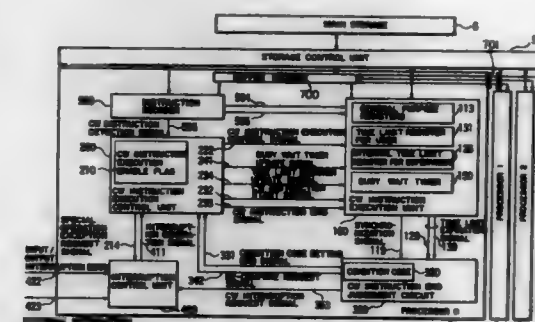
Filed Jan. 18, 1991, Ser. No. 643,121

Claims priority, application Japan, Jan. 23, 1990, 2-013207

Int. Cl. G06F 15/16

U.S. Cl. 395-800

19 Claims



1. An information processing system, comprising:

first and second processors;

a main storage shared by said first and second processors; each processor of said first and second processors including: an instruction execution circuit for executing a watching instruction issued by one program being executed by said processor, the watching instruction being for watching information for synchronization which will be written into said main storage by another program being executed by another of said first and second processors for synchronization with said one program;

said instruction execution circuit including:

- reading means responsive to the watching instruction for reading out first data from a location within said main storage designated by the watching instruction, the location being one which said information for synchronization will be written by said another program;
- comparing means for comparing the first data as read out by said reading means to second data for synchronization held within said processor and for outputting a signal indicative of accomplishment of synchronization when a predetermined result of comparison has been obtained;
- repeating means connected to said comparing means and responsive to said watching instruction for causing said reading means to repeat reading operations in cases where a result of comparison by said comparing means does not match said predetermined result of comparison, so that said first data held in said location is repetitively read out and supplied to said comparing means for repetitive comparison with said second data, until a match with said predetermined result of comparison is obtained by said comparing means;
- limiting means for holding a preset upper limit for

limiting continued performance of a repetitive reading operation;

- detecting means connected to said repeating means and said limiting means and responsive to said watching instruction for detecting whether a repeated reading operation has reached said preset upper limit; and
- terminating means connected to said detecting means and said comparing means for terminating execution of said watching instruction either when a match with a said predetermined result has been obtained by said comparing means before said repeated reading operation has reached said preset upper limit, or when said repeated reading operation has reach said preset upper limit before a match with said predetermined result of comparison has been obtained by said comparing means.

5,440,751

# BURST DATA TRANSFER TO SINGLE CYCLE DATA TRANSFER CONVERSION AND STROBE SIGNAL CONVERSION

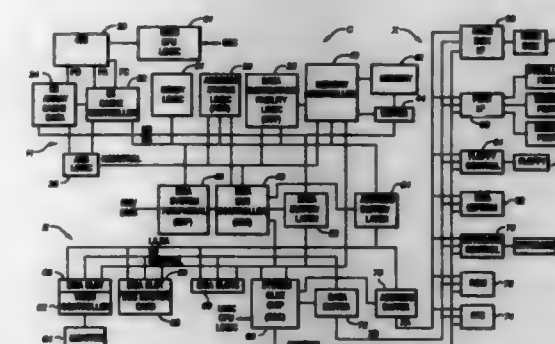
Paul Santeler, Cypress, and Gary W. Thome, Houston, both of Tex., assigns to Compaq Computer Corp., Houston, Tex.

Filed Jun. 21, 1991, Ser. No. 718,805

Int. Cl. G06F 5/06

U.S. Cl. 395-800

4 Claims



1. An apparatus for converting burst mode transfers into single cycle mode transfers in a computer system, the apparatus comprising:

- a system bus;
- a first device connected to said system bus and executing burst transfers on said system bus, wherein the first device generates a first address strobe signal and a plurality of address signals at the beginning of said burst transfer and no address strobe signals thereafter during the burst transfer, wherein a first number of said plurality of address signals are provided to said system bus, and wherein the first device generates signals indicative of said burst transfer size at the beginning of said burst transfer;
- a second device having a first number and a second number of address signal inputs and being connected to said system bus and only capable of receiving single cycle mode transfers with an address strobe for each transfer, wherein said first number of said plurality of address signal inputs are connected to said first number of said address signals on said system bus provided by said first device and said second number of said address signal inputs are connected to said system bus and wherein said first number is greater than said second number;
- means coupled to said system bus and to said first device for receiving a second number of address signals from said first device and for receiving said first address strobe signal from said first device and storing said second number of address signals;
- means coupled to said second number of address signal storing means for incrementing said second number of address signals, wherein said incrementing means incre-



means said second number of address signals for each cycle comprising said burst transfer after the first transfer; means coupled to said second device for providing an additional address strobe signal to said second device for each cycle comprising said burst transfer except the first transfer; means coupled to the system bus, said additional address strobe means and said address signal incrementing means for providing said incremented second number of address signals to the system bus approximately contemporaneously with providing said additional address strobe signal, wherein said second number of address signals are provided to said system bus to correspond to said second number of address signal inputs of said second device; and means coupled to the first device and said additional address strobe means for terminating providing of additional address strobes when the number of additional address strobes provided indicates that, based on size of the burst transfer as indicated by the first device, the last additional address strobe has been provided.

5,440,752

# MICROPROCESSOR ARCHITECTURE WITH A SWITCH NETWORK FOR DATA TRANSFER BETWEEN CACHE, MEMORY PORT, AND IOU

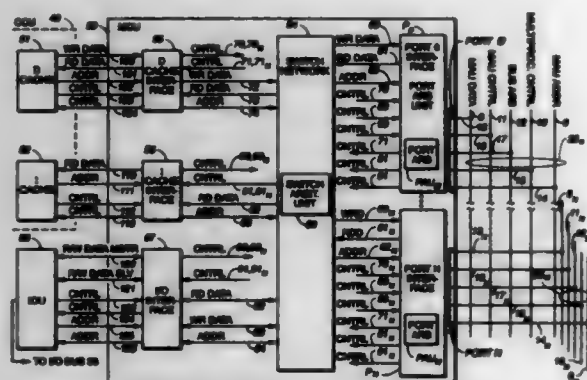
Derek J. Lentz, Los Gatos; Yasuaki Hagiwara, Santa Clara; Te-Li Lam, Palo Alto; Cheng-Long Tang, San Jose, and Le Trong Nguyen, Monte Sereno, all of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 8, 1991, Ser. No. 726,893

Int. Cl. G06F 13/00, 13/38, 13/40

U.S. Cl. 395-800

35 Claims



1. In a multiprocessor system having a plurality of microprocessors, each of said microprocessors having a cache, a memory port, and an input/output unit (IOU), a memory control unit (MCU) in each of said microprocessors comprising:

- a switch network;
- a cache interface circuit;
- means for coupling said cache interface circuit between said cache and said switch network;
- an I/O interface circuit;
- means for coupling said I/O interface circuit between said IOU and said switch network;
- a memory port interface circuit;
- means for coupling said memory port interface circuit between said memory port and said switch network;
- switch arbitration means for arbitrating for said switch network;
- port arbitration means for arbitrating for said memory port;
- means for transferring to said port arbitration means a request to transfer data between one of said cache and said IOU and said memory port through said switch network and said port interface circuit;
- means for transferring a port available signal from said port arbitration means to said switch arbitration means when

said port interface circuit is free to process said request; and means responsive to said port available signal for transferring a switch available signal from said switch arbitration means to the source of said request and to said port arbitration means when said switch network is free to process said request whereby data is enabled to be transferred between said one of said cache and said IOU and said memory port.

5,440,753

# VARIABLE LENGTH STRING MATCHER

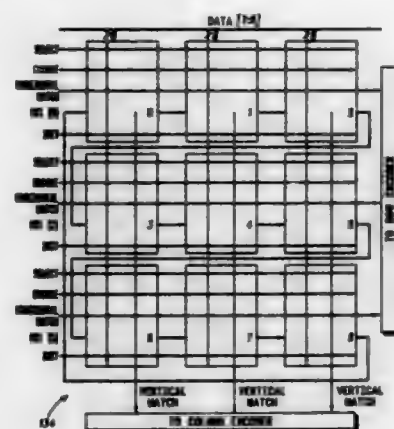
Brian T. Hou, Freehold, N.J.; Craig D. Cohen, Merrick, N.Y.; James A. Pasco-Anderson, Needham, and Michael Gutman, Newton, both of Mass., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 976,298, Nov. 13, 1992, Pat. No. 5,329,405. This application Mar. 11, 1994, Ser. No. 209,812

Int. Cl. G06F 7/00

U.S. Cl. 395-800

4 Claims



1. An encoder/decoder having a variable length string matching apparatus for finding, within a stored first sequence of data elements, a longest string of stored data elements that matches a string of a second sequence of given data elements, comprising:

- encoding means, operably coupled to a storage, for generating a logical sequence of control signals to the variable length string matching apparatus, and the variable length string matching apparatus, comprising:
- the storage, operably coupled to the encoding means, for storing said first sequence of data elements,
- comparison circuitry for comparing a single data element of said second sequence with multiple data elements of said first sequence, and for issuing match signals when matches are found, and

control circuitry for causing said comparison circuitry to operate iteratively, each iteration comprising a simultaneous comparison of a data element of said second sequence with the stored multiple data elements, said control circuitry being responsive to said match signals for determining the longest string of said stored data elements that matches a string of said second sequence immediately when the match occurs, based on when an iteration does not result in issuance of a match signal by said comparison circuitry,

wherein each of a plurality of cells includes at least the storage and the comparison circuitry, the cells are associated by signals between adjacent cells, the cells are provided in parallel each iteration with the data element of the second sequence for comparison and wherein said storage comprises locations each for holding one of said data elements of said first sequence, said comparison circuitry comprises a series of comparators each in a different respective one of said cells for comparing one of said data elements of said first sequence with a

given data element of said second sequence and for issuing a match signal when a match is found, and delay circuitry for storing said match signal issued by a said comparator temporarily each in a different respective one of said cells for use in a next iteration on the next data element in said second sequence, wherein the variable length string matcher finds a longest match and produces a codeword in response to the logical sequence of control signals.

5,440,754

# WORK STATION AND METHOD FOR TRANSFERRING DATA BETWEEN AN EXTERNAL BUS AND A MEMORY UNIT

Anton Goepfel, Burgau, Germany, and Edward C. King, Fremont, Calif., assignors to NCR Corporation, Dayton, Ohio

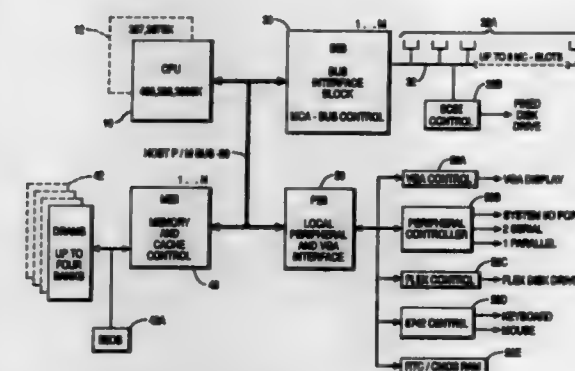
Filed Aug. 30, 1991, Ser. No. 752,407

Claims priority, application United Kingdom, Aug. 31, 1990, 9019023

Int. Cl. G06F 13/00

U.S. Cl. 395-800

17 Claims



2. A work station comprising:
    - a central processing unit (CPU);
    - a memory connected to a memory interface circuit; a device connected to a microchannel bus for controlling asynchronous transfer of an address and consecutive data elements to said microchannel bus;
    - a bus interface circuit, connected between said microchannel bus and CPU, enabling data transfer between said device and said memory unit;
    - a system clock providing a timing signal to said CPU and first interface circuit, said timing signal defining consecutive time slots, each time slot equal to a single clock cycle; and
    - a local bus connecting said interface circuits, CPU and memory unit;
- wherein said local bus includes a control line group for controlling the transfer, over said local bus, of a starting address in a first time slot and consecutive data elements in consecutive time slots, said control line group including:
- a BURST line for presenting a BURST signal generated by said bus interface circuit as a bus master and received by said memory interface circuit as a slave indicating a continuous data transfer (burst mode) to follow;
  - a LOCK line for locking said local bus for said continuous data transfer for the duration of the burst mode;
  - an EADS line for transmitting a signal from said first interface circuit to said CPU indicating a burst mode data transfer between said bus interface circuit and said memory interface circuit and adapted to invalidate any data contained in a cache memory of said CPU;
- wherein an active to inactive transition of said BURST signal temporarily halts a transfer of data in the burst mode whilst maintaining a communication between said bus master and said slave; and
- a multiplexer/demultiplexer connected on one side to said

bus interface circuit and on the other side to both an address line group and a data line group of said local bus; a control line extending between said bus interface circuit and said multiplexer/demultiplexer; wherein said multiplexer/demultiplexer is switched from said address line group to said data line group under control of said bus interface circuit through said control line.

5,440,755

# COMPUTER SYSTEM WITH A PROCESSOR-DIRECT UNIVERSAL BUS CONNECTOR AND INTERCHANGEABLE BUS TRANSLATOR

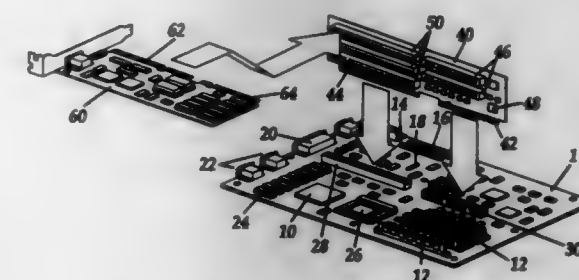
John J. Harwer, Laguna Niguel, and Jimmy D'Jen, Irvine, both of Calif., assignors to Accelerated Systems, Inc., Robbinsville, N.J.

Filed Apr. 6, 1992, Ser. No. 862,989

Int. Cl. G06F 13/42, 13/40, 13/38, 15/20

U.S. Cl. 395-800

13 Claims



1. A computer comprising:
  - a microprocessor subsystem module, wherein said microprocessor subsystem module further comprises:
    - a central processor unit (cpu) having cpu address signal lines, cpu data signal lines and cpu control signal lines which form a central processor unit protocol independent superset of processor-direct signal lines wherein a subset of said superset of processor-direct signal lines includes cpu address signal lines, CPU data address signal lines and cpu control signal lines necessary for implementation of any one of a plurality of specific bus protocols including a first expansion bus protocol;
  - a memory section coupled to said central processor unit; and
  - a microprocessor subsystem module processor direct multi-line connector which is in direct electrical communication with said central processor unit superset of processor-direct signal lines; and
- a bus translator subsystem adapted for electrical connection to said microprocessor subsystem module via said microprocessor subsystem module processor direct multi-line connector, wherein said bus translator subsystem further comprises:
  - a bus translator subsystem processor direct multi-line connector which mates with said microprocessor subsystem module processor direct multi-line connector for communicating with said microprocessor subsystem module through said central processor unit protocol independent superset of processor-direct signal lines; and
  - a first expansion bus which communicates with said central processor unit and said memory section according to said first expansion bus protocol via said bus translator subsystem processor direct multi-line connector.





# DESIGN PATENTS

GRANTED AUG. 8, 1995

## ERRATA

For CLASS	See PATENT NO.
D008-354 .....	D 360,980
D010-032 .....	D 361,022
D008-071 .....	D 361,075
D023-208 .....	D 361,109



# DESIGNS

AUGUST 8, 1995

360,969

## FOOD PRODUCT

Myron M. Uecker, Buffalo; Ganesh Ganesan, Maple Grove; David A. Saak, Minneapolis, and Todd W. Gusek, Crystal, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.  
Filed Sep. 16, 1994, Ser. No. 28,479  
Term of patent 14 years

U.S. Cl. D1-125



360,971

## ANATOMICAL SEAT PAD FOR CYCLING SHORTS

Rachel Speth; Peter Kallen, and Chris Helmsworth, all of Portland, Oreg., assignors to Nike, Inc., Beaverton, Oreg.  
Filed Sep. 18, 1992, Ser. No. 948,922  
Term of patent 14 years

U.S. Cl. D2-705

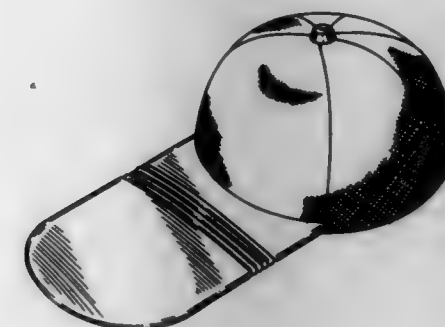


360,972

## CAP WITH EXTENDED AND FOLDABLE BILL

James L. Bennett, Jr., 3556 Elmwood Ct., Riverside, Calif. 92506  
Filed Feb. 24, 1994, Ser. No. 19,184  
Term of patent 14 years

U.S. Cl. D2-865

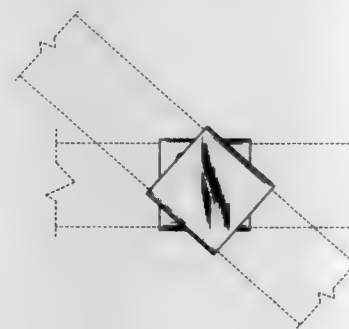


360,970

## BUCKLE FOR A SHOULDER STRAP AND LAP BELT

Roger A. Gates, and Margaret D. Gates, both of Rte. 1 Box 730-U, Webster, Fla. 33597  
Filed Dec. 23, 1993, Ser. No. 16,710  
Term of patent 14 years

U.S. Cl. D2-639



360,973

## SHOE UPPER

Catherine M. Bailey, San Francisco, Calif., assignor to Nike, Inc., Beaverton, Oreg.  
Filed Dec. 7, 1994, Ser. No. 31,858  
Term of patent 14 years

U.S. Cl. D2-969



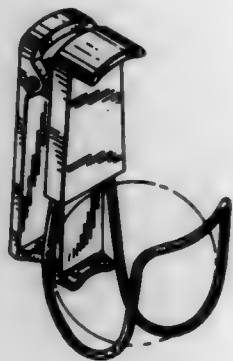
360,974

**CLIP-ON GOLF BALL HOLDER**

Robert S. Stalling, P.O. Box 3022, Westport, Conn. 06880  
Filed Mar. 21, 1994, Ser. No. 20,141

Term of patent 14 years

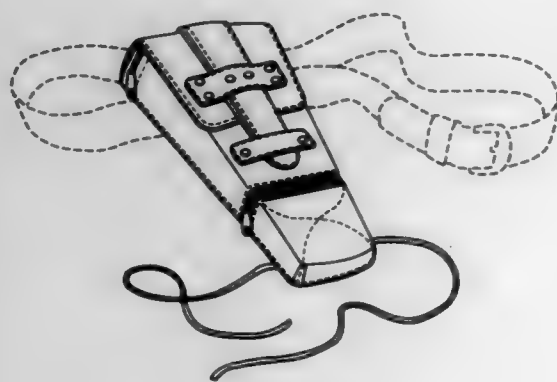
U.S. Cl. D3—221

360,975  
**PURSE**

Abram W. Smith, 40825 Avenida Calafia, Palm Desert, Calif.  
92260

Filed Jul. 6, 1993, Ser. No. 10,290  
Term of patent 14 years

U.S. Cl. D3—226



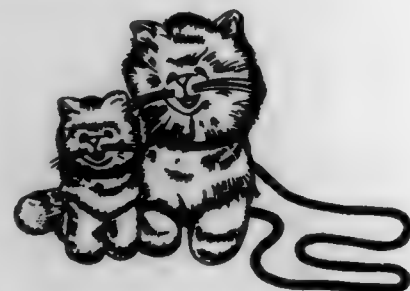
360,976

**COMBINED PLUSH ANIMAL HANDBAG SET**

Maria E. Beltempo, 276 Essex St., Brooklyn, N.Y. 11208  
Filed Jan. 4, 1994, Ser. No. 17,043

Term of patent 14 years

U.S. Cl. D3—235



360,977

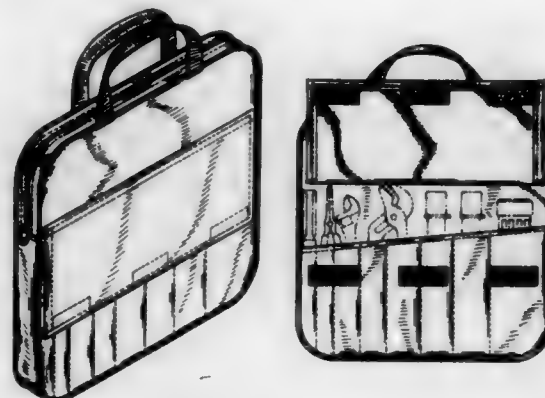
**TOOL ORGANIZER**

Kenneth L. Katz, Granger, Ind., assignor to Adco Products  
Incorporated, Mishawaka, Ind.

Filed Apr. 8, 1994, Ser. No. 21,043

Term of patent 14 years

U.S. Cl. D3—276



360,978

**LAPTOP COMPUTER CASE**

Bruce Willard, Santa Barbara, and Jay Holland, San Francisco,  
both of Calif., assignors to The Territory Ahead, Santa Bar-  
bara, Calif.

Filed Feb. 3, 1994, Ser. No. 18,313

Term of patent 14 years

U.S. Cl. D3—301



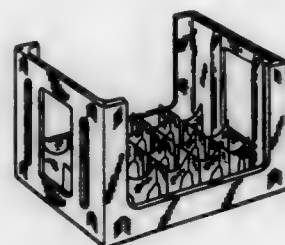
360,979

**BOTTLE CRATE**

Sigurd O. Steffensen, Ovre Terrasse 5, 7500 Stjördal, Norway  
Filed Apr. 8, 1994, Ser. No. 21,078

Term of patent 14 years

U.S. Cl. D3—3 B



360,980

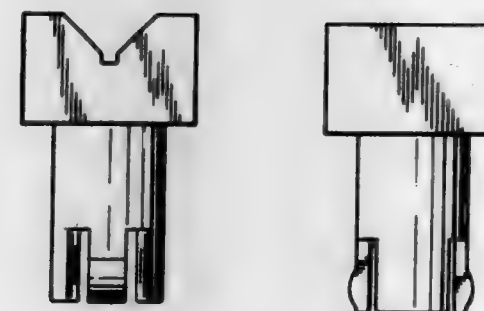
**WORKPIECE HOLDER FOR A WORKBENCH**

Zbigniew Noniewicz, Kempenich, Germany, assignor to Wolf-  
craft GmbH, Weibern, Germany

Filed Sep. 19, 1994, Ser. No. 28,564

Term of patent 14 years

U.S. Cl. D8—354



360,982

**BATH BRUSH**

Paul D. Coffman, 106 Polk St., Box 9, Sheldahl, Iowa 50243  
Filed Apr. 30, 1993, Ser. No. 7,677

Term of patent 14 years

U.S. Cl. D4—102



360,981

**TOOTHBRUSH**

Robert Moskovich, East Brunswick, N.J., and Stanley R. Car-  
ter, Transvaal, South Africa, assignors to Colgate-Palmolive  
Company, New York, N.Y.

Filed Nov. 17, 1992, Ser. No. 1,172

Term of patent 14 years

U.S. Cl. D4—104



360,983

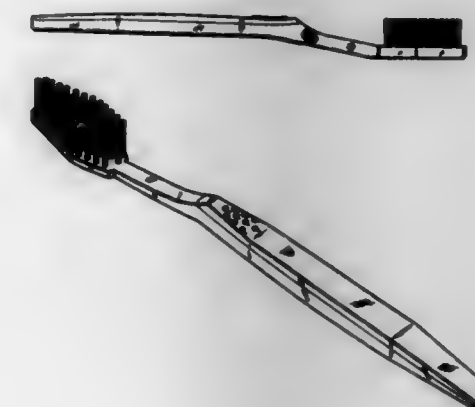
**TOOTHBRUSH**

Adam Sherman, Brooklyn, N.Y.; Robert Moskovich, East  
Brunswick, N.J., and James Petronio, New York, N.Y., as-  
signors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 41, Oct. 5, 1992. This  
application Mar. 30, 1993, Ser. No. 6,492The portion of the term of this patent subsequent to Mar. 28,  
2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D4—104

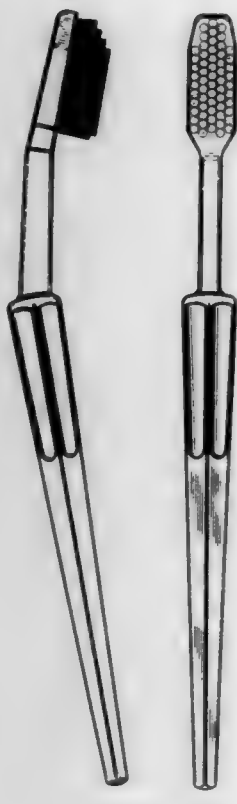




360,984  
TOOTHBRUSH

John J. Sullivan, IV, 52 Governor Dr., Westfield, Mass. 01085  
Filed Feb. 16, 1993, Ser. No. 4,889  
Term of patent 14 years

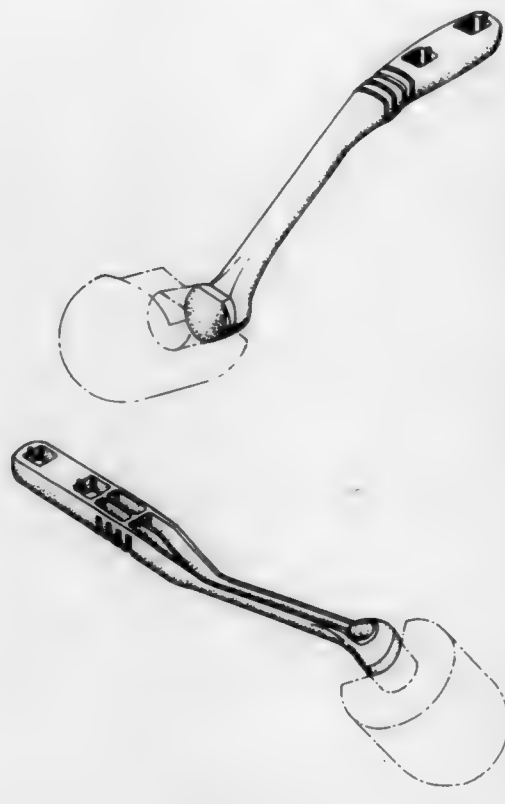
U.S. Cl. D4—104



360,986  
BOWL CLEANER BRUSH HANDLE

Mary M. Hongland, Cincinnati, Ohio, assignor to Vining Industries, Inc., Springfield, Ohio  
Filed Jan. 11, 1993, Ser. No. 3,623  
Term of patent 14 years

U.S. Cl. D4—138



360,985  
WASHABLE PAINTBRUSH

John Geigle, 3200 NE, 44th St., Vancouver, Wash. 98663  
Filed Dec. 10, 1993, Ser. No. 16,230  
Term of patent 14 years

U.S. Cl. D4—132



360,987  
PAINT ROLLER HANDLE

Gregg R. Sorenson, West Allis, Wis., assignor to Newell Operating Company, Freeport, Ill.  
Filed Apr. 1, 1994, Ser. No. 20,755  
Term of patent 14 years

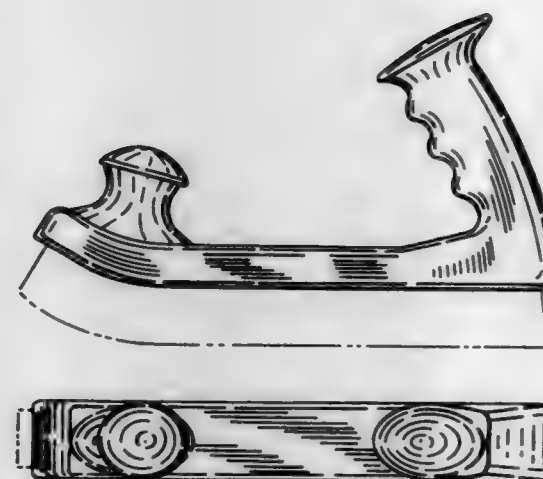
U.S. Cl. D4—138



360,988  
PLANE SCRATCH BRUSH HANDLE

Fred H. Laubach, III, Wooster; Gordon F. Masch, West Salem; Bruce Bochak, Wooster; Thomas G. Purdy, Orrville, and William P. Camp, Jr., Millersburg, all of Ohio, assignors to The Wooster Brush Company, Wooster, Ohio  
Filed Jul. 1, 1993, Ser. No. 10,209  
Term of patent 14 years

U.S. Cl. D4—138



360,990  
FABRIC

Mike Eskimo, Maui, HI., assignor to WSC Windsurfing Chiemsee Produktions und Vertriebs GmbH, Grabenstatt, Germany  
Filed Apr. 25, 1994, Ser. No. 21,831  
Claims priority, application Germany, Nov. 30, 1993, M 93 09 461.2

Term of patent 14 years

U.S. Cl. D5—64

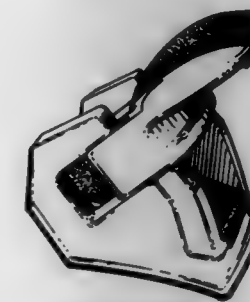


360,991  
BOOSTER CAR SEAT

James M. Kain, Tipp City, Ohio, assignor to Lisco, Inc., Tampa, Fla.

Filed Sep. 23, 1993, Ser. No. 13,399  
Term of patent 14 years

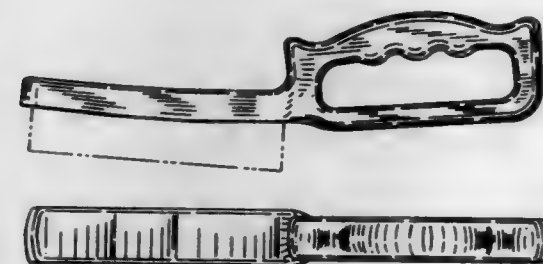
U.S. Cl. D6—333



360,989  
SCRATCH BRUSH HANDLE

Fred H. Laubach, III, Wooster; Richard K. Bukovitz, Orrville, and William P. Camp, Jr., Millersburg, all of Ohio, assignors to The Wooster Brush Company, Wooster, Ohio  
Filed Jul. 1, 1993, Ser. No. 10,214  
Term of patent 14 years

U.S. Cl. D4—138

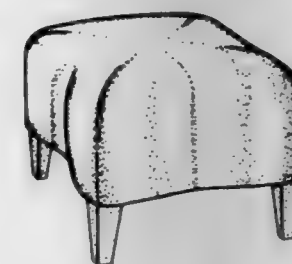


360,992  
OTTOMAN

John Hutton, New York, N.Y., assignor to Donghia Furniture, New York, N.Y.

Filed Apr. 29, 1994, Ser. No. 22,102  
Term of patent 14 years

U.S. Cl. D6—349



360,993  
SOFA

Robert L. White, Greensboro, N.C., assignor to The Lane Company, Inc., Altavista, Va.

Filed Apr. 5, 1994, Ser. No. 20,939

Term of patent 14 years

U.S. Cl. D6—369



360,994  
SOFA

Gary R. McCray, Davidson, N.C., assignor to The Lane Company, Inc., Altavista, Va.

Filed May 5, 1994, Ser. No. 22,451

Term of patent 14 years

U.S. Cl. D6—369



360,995  
SETTEE

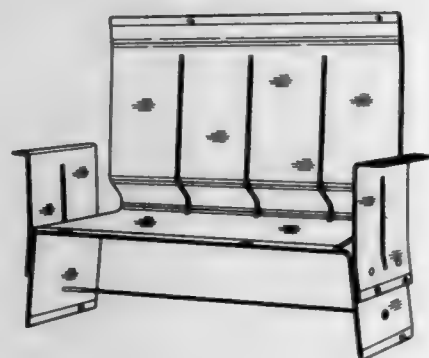
William Podersen, 7 W. 81st St., New York, N.Y. 10024

Filed Feb. 17, 1994, Ser. No. 18,923

The portion of the term of this patent subsequent to Apr. 18, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—371



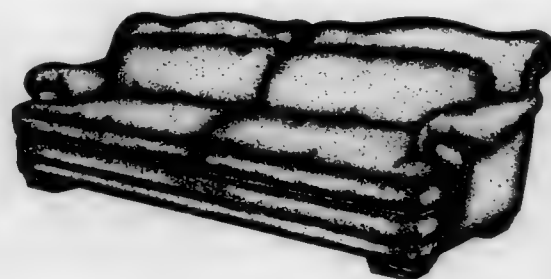
360,996  
SOFA

Darrell G. Lowman, Hickory, N.C., assignor to Lexington Furniture Industries, Inc., Lexington, N.C.

Filed Jul. 28, 1993, Ser. No. 11,151

Term of patent 14 years

U.S. Cl. D6—381



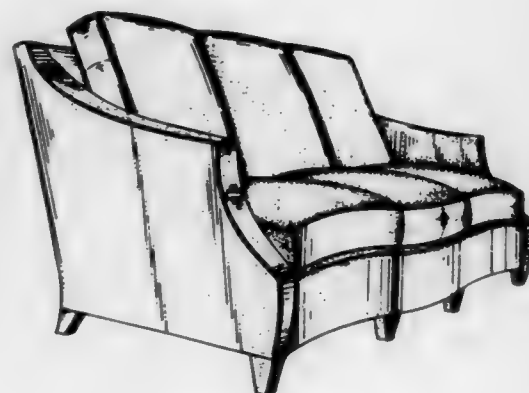
360,997  
OGEE SOFA

John Hutton, New York, N.Y., assignor to Donghia Furniture, New York, N.Y.

Filed Dec. 9, 1993, Ser. No. 16,178

Term of patent 14 years

U.S. Cl. D6—381



360,998  
SOFA

Darrell G. Lowman, Hickory, N.C., assignor to Lexington Furniture Industries, Inc., Lexington, N.C.

Filed Jul. 28, 1993, Ser. No. 11,157

Term of patent 14 years

U.S. Cl. D6—381



360,999  
SOFA

Darrell G. Lowman, Hickory, N.C., assignor to Lexington Furniture Industries, Inc., Lexington, N.C.

Filed Jul. 27, 1993, Ser. No. 11,121

Term of patent 14 years

U.S. Cl. D6—381



361,001

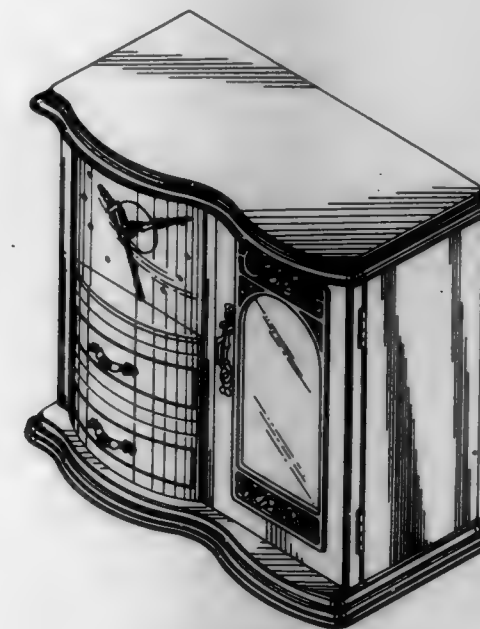
JEWELRY CABINET

Chen-Yuan Wang, No. 50, Sec. 5, An-Ho Rd., An-Nan Dist., Tainan City, Taiwan

Filed Nov. 23, 1993, Ser. No. 15,660

Term of patent 14 years

U.S. Cl. D6—441



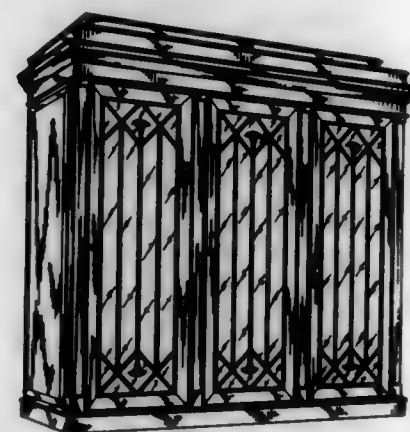
361,000  
GLASS CASE

Michael D. Tatum, Dallas, Tex., and Robert W. Purdom, deceased, late of Washington, D.C. by Richard E. Cytowic, Executor, assignors to Kimball International, Inc., Jasper, Ind.

Filed Jun. 11, 1993, Ser. No. 9,410

Term of patent 14 years

U.S. Cl. D6—436



361,002

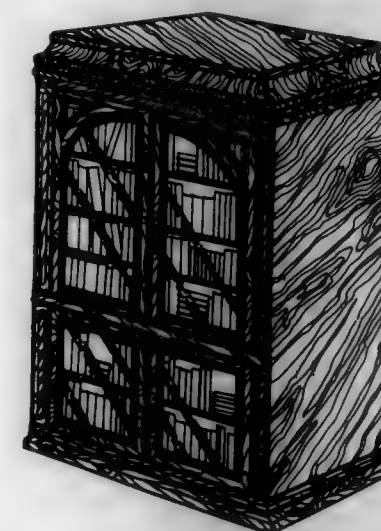
ENTERTAINMENT CENTER

Darrell C. Ferguson, Charleston, S.C., assignor to Lineage Home Furnishings, Inc., High Point, N.C.

Filed May 19, 1992, Ser. No. 885,408

Term of patent 14 years

U.S. Cl. D6—446





361,003

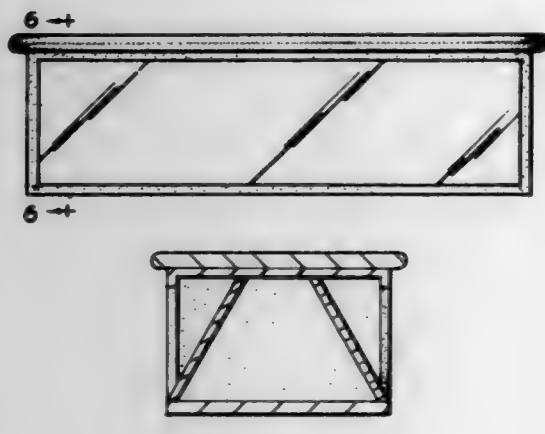
**MIRRORED RETAIL DISPLAY PLATFORM**

Diane Keller, Copiague, N.Y.; Frank Keller, Asbury, and Charles Better, Port Monmouth, both of N.J., assignors to Kinney Shoe Corporation, New York, N.Y.

Filed Oct. 29, 1993, Ser. No. 14,717

Term of patent 14 years

U.S. Cl. D6-449



361,005

**BATHROOM TISSUE HOLDER**

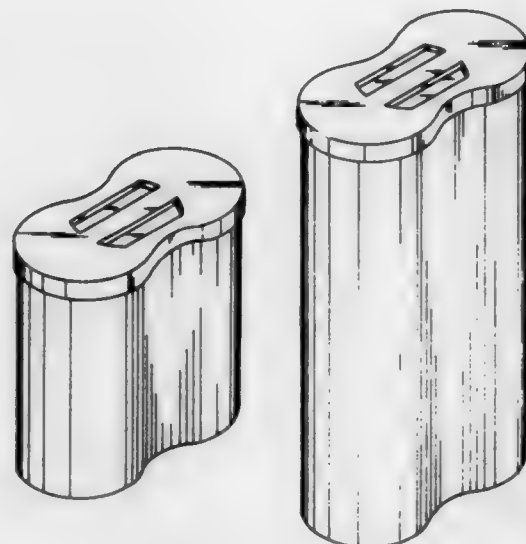
Vickie M. Traver, 6501 Red Hook Plz., Suite 201, St. Thomas, Virgin Islands (U.S.) 00802-1306

Filed Jan. 12, 1994, Ser. No. 17,554

The portion of the term of this patent subsequent to May 2, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6-520

361,004  
TABLE

Michael J. Pass, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.

Filed Mar. 24, 1994, Ser. No. 20,399

Term of patent 14 years

U.S. Cl. D6-477



361,006

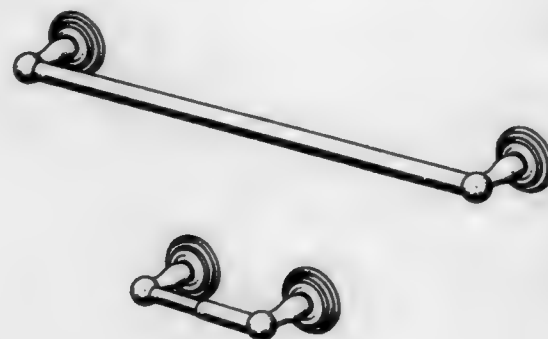
**BATHROOM ACCESSORY FIXTURE**

Norton Sharpe, Los Angeles, Calif., assignor to Franklin Brass Manufacturing Company, Los Angeles, Calif.

Filed Aug. 23, 1993, Ser. No. 12,129

Term of patent 14 years

U.S. Cl. D6-524



361,007

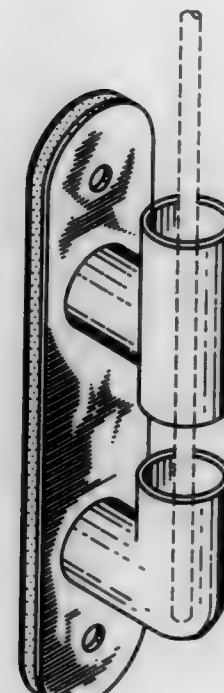
**MULTI-PURPOSE DUAL AFFIXING DEVICE AND ORNAMENT HOLDER**

Willie E. McGlothlin, 6669 Batesville Blvd., Pleasant Plains, Ark. 72568

Filed Oct. 25, 1993, Ser. No. 14,486

Term of patent 14 years

U.S. Cl. D6-567



361,009

**LOUVER FOR VERTICAL BLIND**

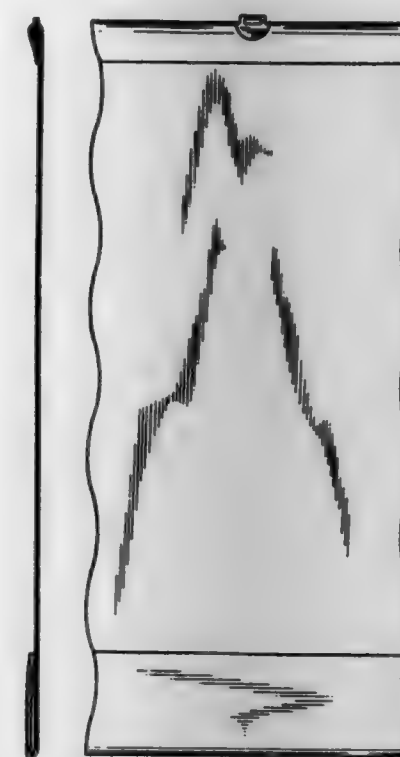
Kenneth J. Potts, Hartlepool, England, assignor to Sunmaster Blinds Limited, England

Filed Jan. 4, 1994, Ser. No. 17,042

Claims priority, application United Kingdom, Jul. 8, 1993, 2032233

Term of patent 14 years

U.S. Cl. D6-577

361,008  
SHELF

Axel Eathoven, Wijnegem, Belgium, assignor to American Standard Inc., Piscataway, N.J.

Filed Sep. 20, 1993, Ser. No. 13,207

Claims priority, application Hague Agreement, Mar. 13, 1993, DM/025574

Term of patent 14 years

U.S. Cl. D6-574



361,010

**HEAD RAIL FOR BLINDS**

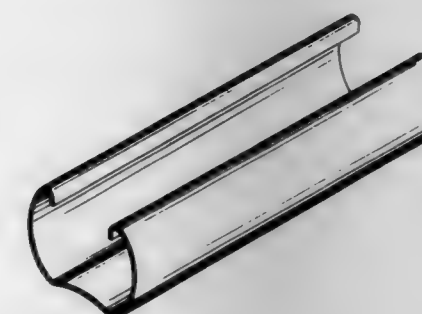
Jens Ove Heegaard, Hestehøjvej 130, Odense S, Denmark 5260

Filed Jan. 13, 1993, Ser. No. 3,521

Claims priority, application Denmark, Jul. 14, 1992, 675/92

Term of patent 14 years

U.S. Cl. D6-580



361,011

**COMPACT DISC STORAGE CONTAINER**

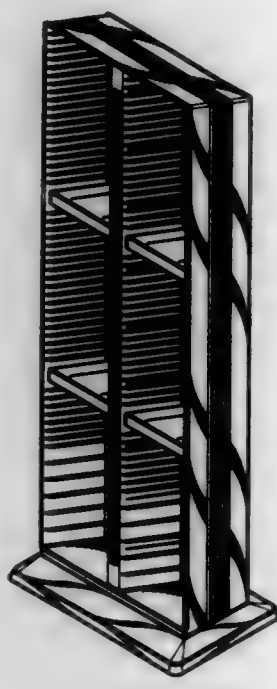
James T. Weisburn, Massillon, and Christopher G. Gallagher, Johnson Cheng, 3F., No. 282, Chung-San 2 Rd., Lu-Chou, Akron, both of Ohio, assignors to Alpha Enterprises, Inc., Shiang, Taipei Hsien, North Canton, Ohio

Filed Jul. 1, 1994, Ser. No. 25,420

The portion of the term of this patent subsequent to May 23, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6-629



361,013

**KETTLE**

Johnson Cheng, 3F., No. 282, Chung-San 2 Rd., Lu-Chou, Shiang, Taipei Hsien, Filed May 24, 1994, Ser. No. 23,407

Term of patent 14 years

U.S. Cl. D7-302



361,014

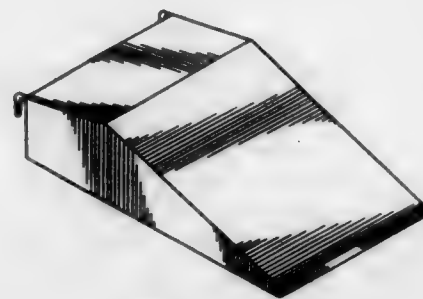
**CANOPY FOR USE ON AN OUTDOOR GRILL**

Joseph L. Baribeau, 96 Hope St., Niantic, Conn. 06357

Filed Oct. 20, 1993, Ser. No. 14,307

Term of patent 14 years

U.S. Cl. D7-402



361,012

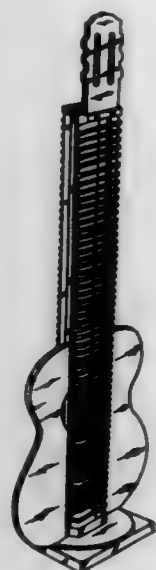
**TWO-SIDED STORAGE RACK**

Shahriar Dardashti, 236 Oakhurst Dr., Beverly Hills, Calif. 90212

Filed Jan. 4, 1994, Ser. No. 17,035

Term of patent 14 years

U.S. Cl. D6-629



361,015

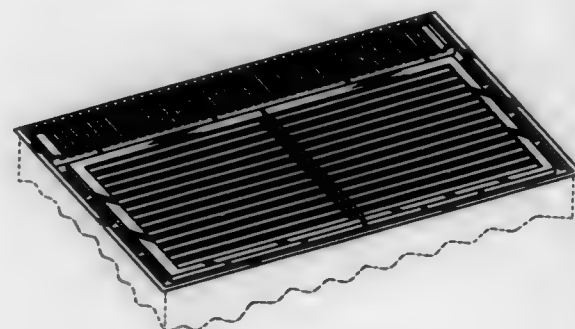
**STOVE TOP**

Roger F. Doty, Connorsville, and Mark A. Pickering, Lebanon, both of Ind., assignors to Maytag Corporation, Newton, Iowa Division of Ser. No. 794,482, Nov. 19, 1991, Pat. No. 5,287,799, which is a continuation-in-part of Ser. No. 704,644, May 23, 1991. This application Dec. 15, 1993, Ser. No. 16,448

The portion of the term of this patent subsequent to Feb. 22, 2008, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7-407



361,016

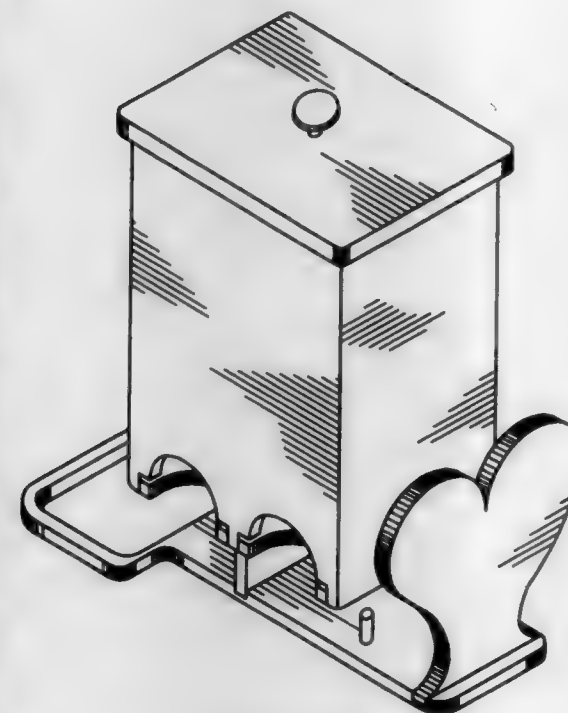
**HOLDER FOR SUGAR AND SUGAR SUBSTITUTE PACKETS**

Don F. Henthorn, 203 Ramona, Smithville, Tex. 78957, assignor to Don F. Henthorn, Smithville, Tex.

Filed Sep. 10, 1990, Ser. No. 580,298

Term of patent 14 years

U.S. Cl. D7-589



361,018

**COASTER**

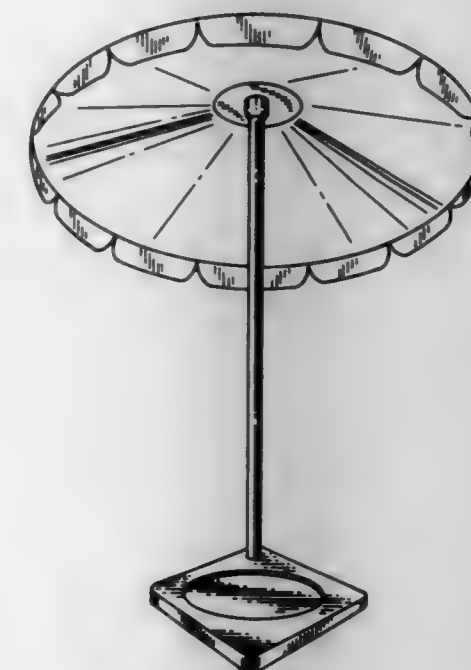
Per Drape, Kantorgatan 42, 754 24 Uppsala, and Lars Johansson, Vikingagatan 4, 753 34 Uppsala, both of Sweden

Filed Dec. 28, 1993, Ser. No. 16,855

Claims priority, application Sweden, Jan. 28, 1993, 93-1489

Term of patent 14 years

U.S. Cl. D7-619



361,019

**TRIANGULAR SHAPED NAPKIN/SERViette HOLDER**

Christopher Voglis, P.O. Box 300, Fairfield 3078 Victoria, Australia

Filed Oct. 7, 1992, Ser. No. 331

Claims priority, application Australia, Apr. 8, 1992, 878/92

Term of patent 14 years

U.S. Cl. D7-633



361,017

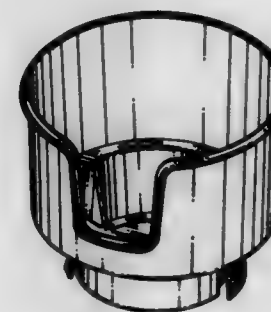
**COMBINED CUP/BEVERAGE HOLDER AND ADAPTER**

Russell Keven, San Jose, Calif., assignor to Integrity Marketing Group, San Jose, Calif.

Filed Jan. 6, 1994, Ser. No. 17,134

Term of patent 14 years

U.S. Cl. D7-619





361,020

**HOLDER FOR TURNING KEYS**

Jalie A. Hegstrum, 300 N. Dakota St., Apt. 212, Sioux Falls, S. Dak. 57102

Filed May 23, 1994, Ser. No. 23,359

Term of patent 14 years

U.S. Cl. D8-14



361,022

**WRISTWATCH**

Yukiko Hayashi, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Jun. 21, 1994, Ser. No. 24,820

Term of patent 14 years

U.S. Cl. D10-32



361,023

**COMPACT TOOL TO UNSCREW TWIST OFF BOTTLE CAPS**

Raymond P. Tipp, P.O. Box 3778, Missoula, Mont. 59806

Filed Oct. 18, 1993, Ser. No. 14,257

Term of patent 14 years

U.S. Cl. D8-40



361,024

**HAND OPERATED OPENER FOR FOLD OPEN TYPE CARTON SPOUTS**

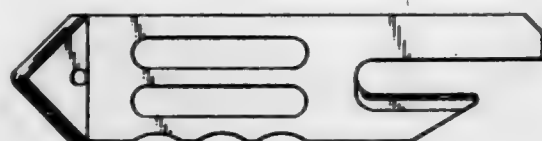
Anthony A. Chuck, 13 Dundalk Ct., St. Catharines, Ontario, Canada L2M 3M7

Filed Apr. 4, 1994, Ser. No. 20,819

Claims priority, application Canada, Oct. 22, 1993, 22-10-93-3

Term of patent 14 years

U.S. Cl. D8-40



361,021

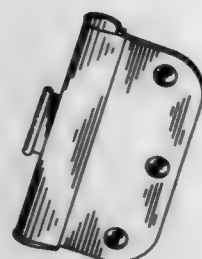
**DOOR HINGE PAINT MASK**

Jack D. Harper, 2424 W. Dudley, Fresno, Calif. 93728

Filed Jun. 28, 1994, Ser. No. 25,157

Term of patent 14 years

U.S. Cl. D8-14



361,025

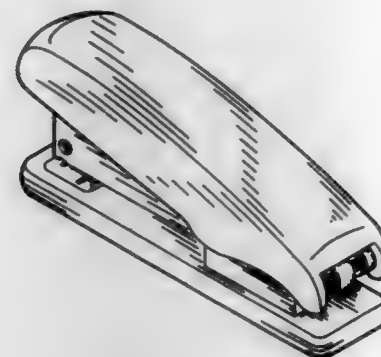
**STAPLER**

Hai-Chiun Ho, No. 9, Sec. 1, Guo Guang Road, Da Li City, Taichung Hsien, Taiwan

Filed Nov. 15, 1994, Ser. No. 31,237

Term of patent 14 years

U.S. Cl. D8-50



361,026

**PATTERNED SCISSORS**

Charles S. Ramsey, Wausau, Wis., assignor to Fiskars Inc., Wausau, Wis.

Continuation-in-part of Ser. No. 462, Oct. 15, 1992, Pat. No. Des. 350,466, which is a continuation-in-part of Ser. No. 523,179, May 24, 1990, Pat. No. Des. 353,087. This application

Jan. 14, 1994, Ser. No. 17,518

Term of patent 14 years

U.S. Cl. D8-57



361,027

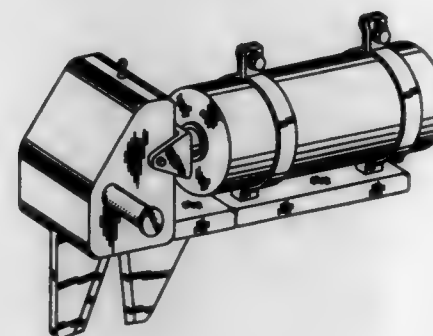
**HYDRAULIC CUTTER FOR A GRATING**

Gerald Striffler, Box 20, Kent, Minn. 56553

Filed Aug. 22, 1994, Ser. No. 27,449

Term of patent 14 years

U.S. Cl. D8-61



361,028

**ANGLE HEAD DIE GRINDER**

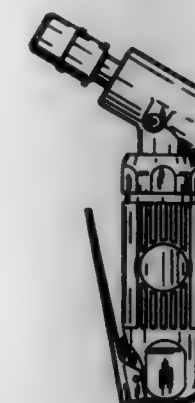
Osamu Izumisawa, 352-2, Muro, Kamiminochi, Nagano Pref. 389-12, Japan

Continuation-in-part of Ser. No. 18,621, Feb. 10, 1994. This application Mar. 31, 1994, Ser. No. 20,802

The portion of the term of this patent subsequent to May 2, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D8-68



361,029

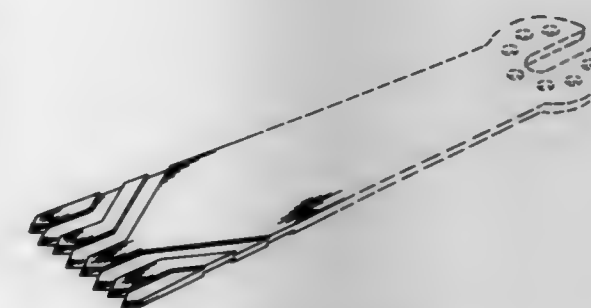
**SAGITTAL SAW BLADE**

Gregory A. Goris, Ojai, Calif., assignor to Hall Sagittal, Carpenteria, Calif.

Filed Feb. 7, 1994, Ser. No. 18,466

Term of patent 14 years

U.S. Cl. D8-70



361,030

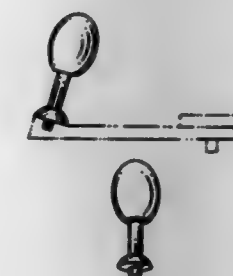
**ERGONOMIC HANDLE**

Brian P. Beasette, and William T. Guyette, both of Burlington, Vt., assignors to Custom Controls, Inc., Williston, Vt.

Filed Nov. 24, 1993, Ser. No. 15,672

Term of patent 14 years

U.S. Cl. D8-307



361,031

**KEY WITH REMOVABLE COVER**

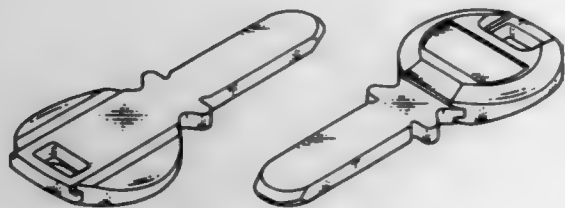
Ednard Marthaler, Adetswil, Switzerland, assignor to Bauer Kaba AG, Wetzikon, Switzerland

Filed May 9, 1994, Ser. No. 22,597

Claims priority, application WIPO, Nov. 9, 1993, DM/027820

Term of patent 14 years

U.S. Cl. D8—347



361,034

**SLEEVE HEAD OF A CONNECTING ELEMENT FOR A SCAFFOLDING FRAMEWORK ROD**

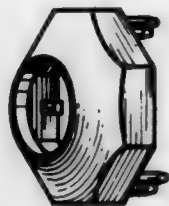
Marcel Sträule, Kirchberg, Switzerland, assignor to Syma Intercontinental AB, Kirchberg, Switzerland

Filed Dec. 27, 1993, Ser. No. 16,823

Claims priority, application Hague Agreement, Jun. 25, 1993, DMA/007200

Term of patent 14 years

U.S. Cl. D8—397



361,035

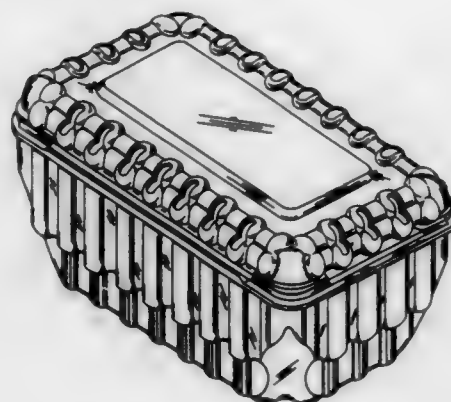
**BERRY BOX**

Calvin S. Krupa, Medina, Minn., assignor to Ultra Pac, Inc., Rogers, Minn.

Filed Jun. 13, 1994, Ser. No. 24,458

Term of patent 14 years

U.S. Cl. D9—424



361,036

**BERRY BOX**

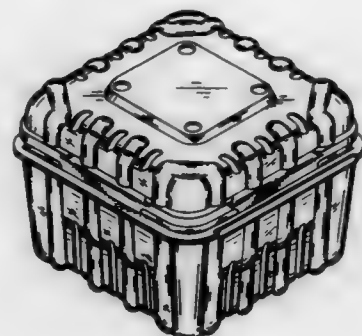
Calvin S. Krupa, Medina, Minn., assignor to Ultra Pac, Inc., Rogers, Minn.

Filed Oct. 25, 1993, Ser. No. 14,482

The portion of the term of this patent subsequent to Jan. 25, 2011, has been disclaimed.

Term of patent 14 years

U.S. Cl. D9—424



361,033

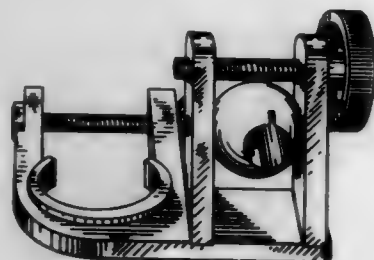
**CLAMP**

Maurits J. Van Beveren, 33 Brich Tree Rd., Plainville, Conn. 06062, and Maximillian J. Van Beveren, 291 Park St., Bristol, Conn. 06011

Filed May 7, 1993, Ser. No. 8,072

Term of patent 14 years

U.S. Cl. D8—396



361,037

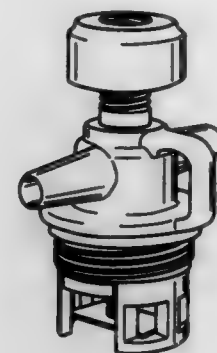
**SAFETY FUEL-DISPENSING BOTTLE CAP**

Erik Jonsson, Trangsviken, Sweden, assignor to Trangia AB, Trangsviken, Sweden

Filed Feb. 17, 1994, Ser. No. 18,933

Term of patent 14 years

U.S. Cl. D9—447



361,038

**PERFUME BOTTLE**

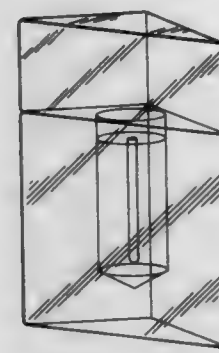
Hartwig Klappert, Hauptstrasse 31, D-10827 Berlin, Germany

Filed Mar. 4, 1994, Ser. No. 19,538

Claims priority, application Germany, Sep. 8, 1993, M9307098.5

Term of patent 14 years

U.S. Cl. D9—529



361,039

**BOTTLE**

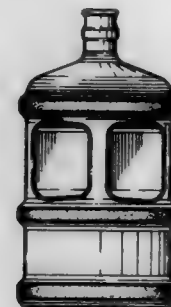
B. Joseph Rokus, Arcadia, Calif., assignor to Reid Plastics, Inc., Arcadia, Calif.

Filed Aug. 10, 1993, Ser. No. 11,626

The portion of the term of this patent subsequent to Feb. 14, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D9—531



361,040

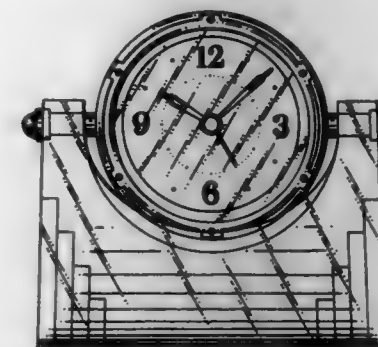
**CLOCK**

Minako Shinozaki, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Mar. 16, 1994, Ser. No. 20,017

Term of patent 14 years

U.S. Cl. D10—23



361,041

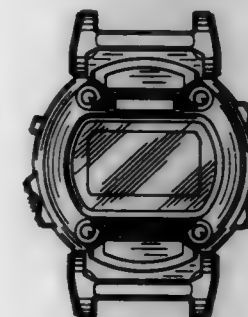
**WATCHCASE WITH STRAP ATTACHMENTS FOR A DIGITAL WRISTWATCH**

John T. Houlihan, Southbury, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed Dec. 6, 1993, Ser. No. 19,892

Term of patent 14 years

U.S. Cl. D10—30



361,042

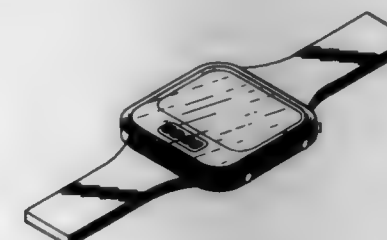
**COMBINED WRISTWATCH AND PAGER WITH BAND PORTIONS**

Lakdas Nannayakkara, 22822 Pine Wood Ct., Boca Raton, Fla. 33433

Filed Jan. 16, 1994, Ser. No. 17,221

Term of patent 14 years

U.S. Cl. D10—31





361,043

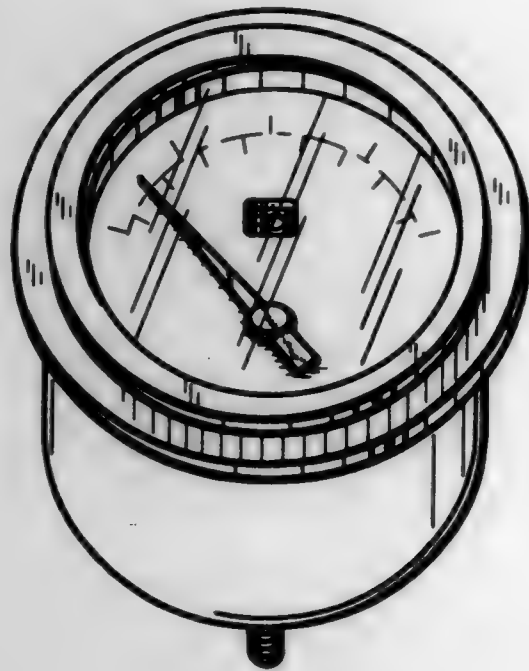
## SIGNALLING PANEL METER

Henry G. Grilk, Lancaster, Pa., assignor to Datcon Instrument Company, Inc., East Petersburg, Pa.

Filed Feb. 25, 1994, Ser. No. 19,208

Term of patent 14 years

U.S. Cl. D10-85



361,045

## WATCH BAND

Ryuhei Ishizaki, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Jun. 23, 1993, Ser. No. 9,851

Term of patent 14 years

U.S. Cl. D11-3



361,046

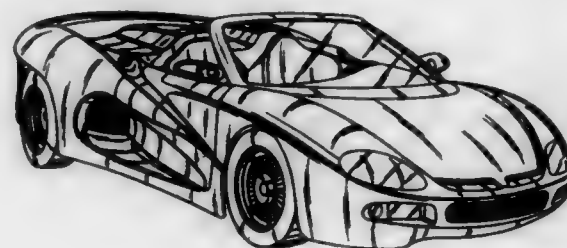
## AUTOMOTIVE VEHICLE

D. Barrett Watkins, 17251 17th St., Ste. D, Tustin, Calif. 92680; Giotto Bizzarrini, Livorno, Italy, and Luis M. Romo, 28391 Romeo, Mission Viejo, Calif. 92692, assignors to D. Barrett Watkins and Luis M. Romo

Filed Jul. 30, 1993, Ser. No. 11,552

Term of patent 14 years

U.S. Cl. D12-92



361,044

## SPEEDOMETER FOR A BICYCLE

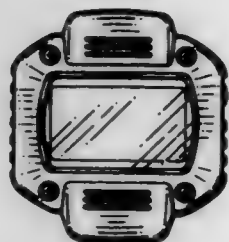
Takashi Ueda, Izumi, Japan, assignor to Catey Co., Ltd., Osaka, Japan

Filed Aug. 3, 1994, Ser. No. 26,000

Claims priority, application Japan, Jul. 28, 1994, 6-22920

Term of patent 14 years

U.S. Cl. D10-98



361,047

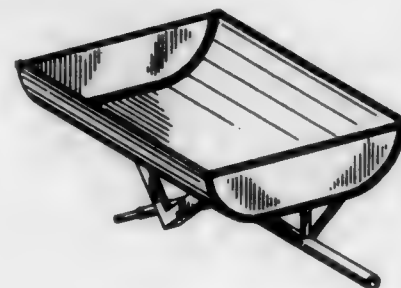
## TRAILER

Neil D. Repke, Box 326, Palmer, Mich. 49871

Filed Aug. 13, 1993, Ser. No. 11,722

Term of patent 14 years

U.S. Cl. D12-101



361,048

## LOW RIDER BICYCLE FORK

Alexander W. LaRiviere, 702 S. First St., San Jose, Calif. 95113

Filed Nov. 30, 1992, Ser. No. 2,001

Term of patent 14 years

U.S. Cl. D12-118



361,050

## WALKER

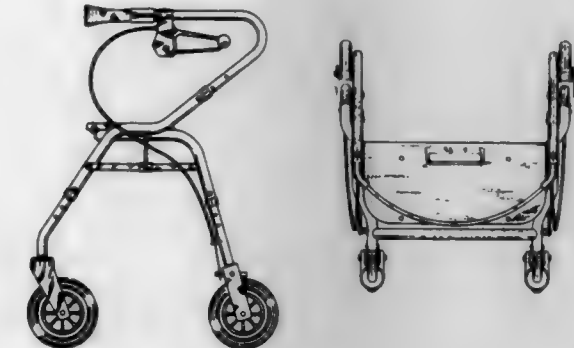
Douglas D. Macmillan, Nepean, Canada, assignor to Dana Douglas Medical, Inc., Nepean, Canada

Filed Jul. 6, 1994, Ser. No. 25,584

Claims priority, application Canada, May 12, 1994, 75684-1

Term of patent 14 years

U.S. Cl. D12-130



361,051

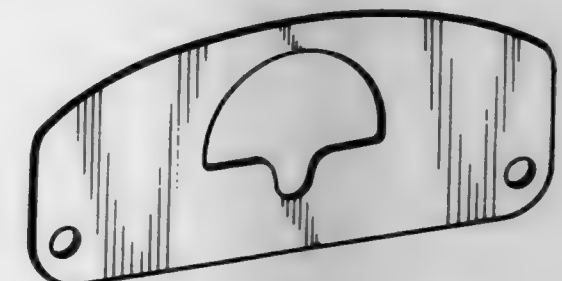
## DISC BRAKE SHIM

Gustav J. Steinke, and Starla D. Huffer, both of Lima, Ohio, assignors to International Brake Industries, Inc., Lima, Ohio

Filed Mar. 2, 1994, Ser. No. 19,430

Term of patent 14 years

U.S. Cl. D12-190



361,049

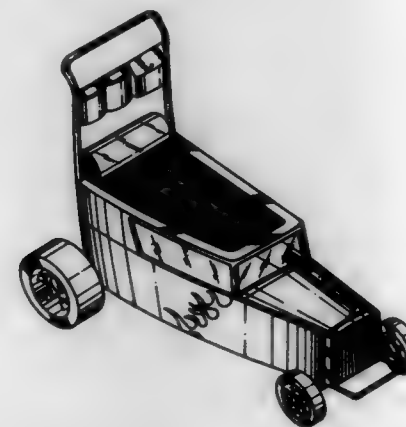
## STROLLER FOR AN INFANT

William P. Beckman, 6032 Gettysburg Pl. #11, Stockton, Calif. 95207

Filed Jul. 6, 1994, Ser. No. 25,177

Term of patent 14 years

U.S. Cl. D12-129



361,052

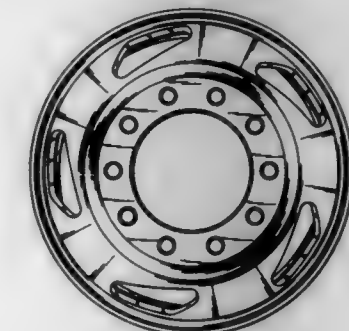
## VEHICLE WHEEL

Roger F. Clements, Hudson, and Ralph C. Botterman, Strongsville, both of Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 23, 1994, Ser. No. 19,091

Term of patent 14 years

U.S. Cl. D12-209



361,053

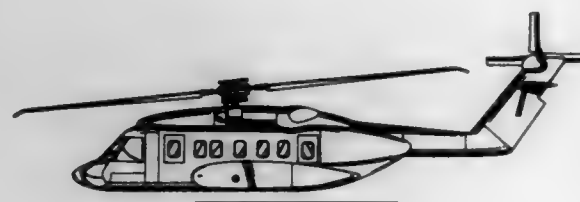
## HELICOPTER

Andrew C. Whyte, Norwalk; Trevor H. Fox, Stratford; Robert S. Blanch, Shelton, and William E. Gallagher, Stratford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 23, 1994, Ser. No. 27,635

Term of patent 14 years

U.S. Cl. D12-327



361,054

## HELICOPTER

Wendy P. McCaw, P.O. Box 636, Medina, Wash. 98039  
Filed Jun. 16, 1994, Ser. No. 24,568

Term of patent 14 years

U.S. Cl. D12-327



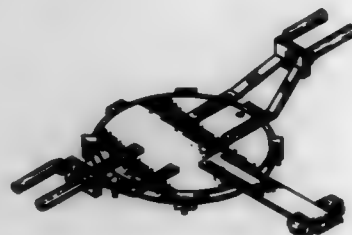
361,055

## ROTATABLE AIRPLANE PARKING ANCHOR

Franco Godina, 850 Ocean Dr., Miami, Fla. 33139  
Filed Jul. 25, 1994, Ser. No. 26,325

Term of patent 14 years

U.S. Cl. D12-345



361,056

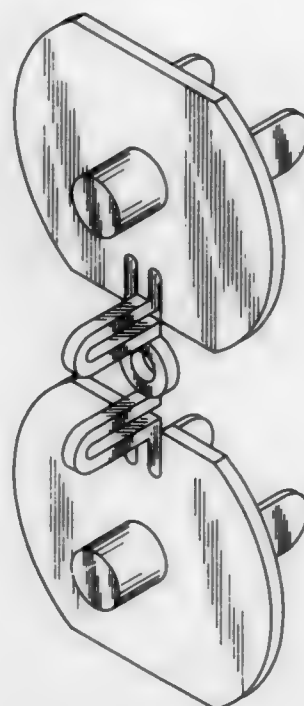
## DOUBLE SOCKET COVER

Daniel C. Barry, P.O. 64, Decker's Point, Rd., Dixonville, Pa. 15734

Filed Sep. 20, 1994, Ser. No. 28,705

Term of patent 14 years

U.S. Cl. D13-156



361,057

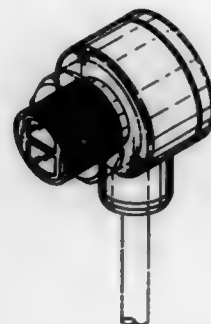
## HOUSING FOR PHOTOELECTRIC CONTROL

Robert W. Fayfield, 6005 Christmas Lake Rd., Shorewood, Minn. 55331

Filed Oct. 7, 1993, Ser. No. 13,962

Term of patent 14 years

U.S. Cl. D13-165



361,058

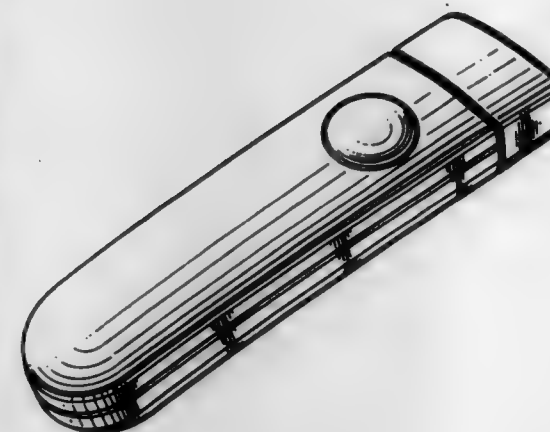
## REMOTE CONTROL UNIT FOR OPERATING WINDOW BLINDS

Douglas R. Domel, Chatsworth, Calif., and James C. Dow, Fort Collins, Colo., assignors to Harmonic Design, Inc., Chatsworth, Calif.

Filed Apr. 28, 1994, Ser. No. 22,002

Term of patent 14 years

U.S. Cl. D13-168



361,060

## COMPUTER

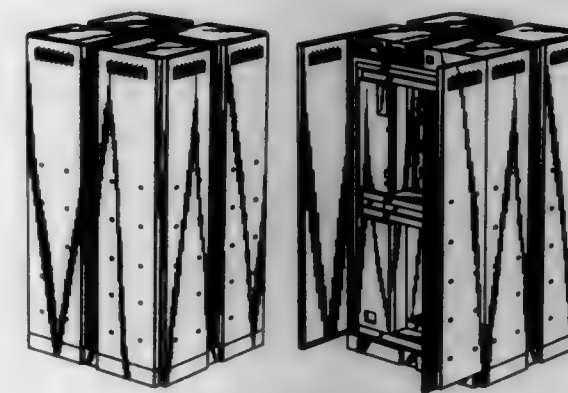
Kenetsa Kumagaya, Tokyo; Yutaka Yonezawa, Hachioji; Jyun Furuya, Kokubunji; Toshiyuki Utsuki, Tachikawa; Takashi Yamamoto, Kodaira; Hiroshi Takahashi, Kanagawa; Tamotsu Tsukaguchi, Kanagawa; Shigeru Koizumi, Kanagawa, and Fumio Kishida, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1994, Ser. No. 25,207

Claims priority, application Japan, May 20, 1994, 6-14228

Term of patent 14 years

U.S. Cl. D14-100



361,061

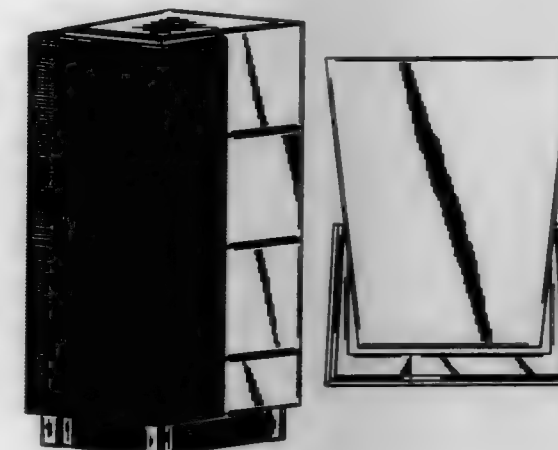
## CABINET FOR ELECTRONIC DATA PROCESSING EQUIPMENT

Donald E. Moodie, Marblehead, Mass., and Maya Lin, New York, N.Y., assignors to Thinking Machines Corporation, Cambridge, Mass.

Filed Jul. 2, 1992, Ser. No. 908,238

Term of patent 14 years

U.S. Cl. D14-102



361,059

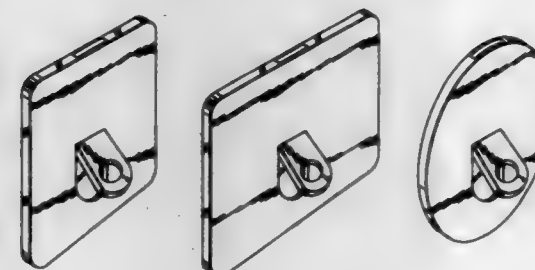
## ELECTRICAL OUTLET BOX COVER

Peter De Waal, 4013 W. Burbank Blvd., Burbank, Calif. 91505

Filed Mar. 30, 1994, Ser. No. 20,732

Term of patent 14 years

U.S. Cl. D13-177





361,062

**ELECTRONIC COMPUTER**

Masaki Iino, Yokohama, and Ryoichi Ishiura, Matsudo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 15, 1993, Ser. No. 12,978

Claims priority, application Japan, Mar. 17, 1993, 5-7427

Term of patent 14 years

U.S. Cl. D14—106



361,063

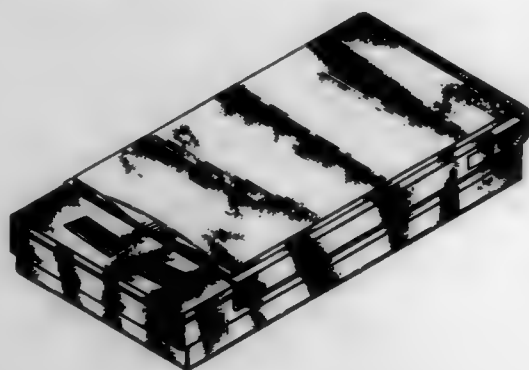
**DOCUMENT SCANNER**

James R. Stewart, San Jose, and Timothy J. L. Parsey, Palo Alto, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 23, 1992, Ser. No. 3,071

Term of patent 14 years

U.S. Cl. D14—107



361,064

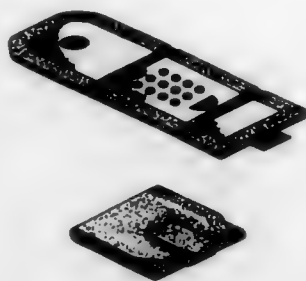
**HANDSET**

Linda Fellingner, 703 Polo Cir., Bryn Mawr, Pa. 19010

Filed Apr. 12, 1993, Ser. No. 6,959

Term of patent 14 years

U.S. Cl. D14—138



361,065

**PORTABLE PHONE**

Richard K. Kornfeld; Gina M. Lombardi, both of San Diego; John K. M. Lee, Ramona; Daniel H. Weber, San Diego; Ty Aberle, Lemon Grove; Steven A. Mergenthaler, Encinitas; David Waldburger, La Jolla; Michael L. Aronson; Charles S. Curbun, both of Lencadia, and Lawrence Gach, San Diego, all of Calif., assignors to Qualcomm Incorporated, San Diego, Calif.

Filed Jan. 14, 1994, Ser. No. 17,464

The portion of the term of this patent subsequent to Mar. 21, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—138



361,066

**HEADSET**

Karsten H. Langhorn, Broenshoej, Denmark, and Melissa J. Akers, Glenview, Ill., assignors to GN Netcom, Inc., Eden Prairie, Minn.

Filed Jun. 2, 1994, Ser. No. 23,881

Term of patent 14 years

U.S. Cl. D14—142



361,067

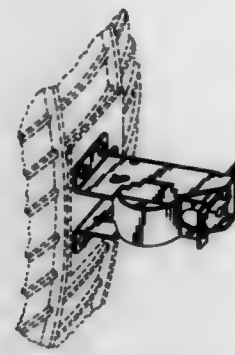
**FIXED-POSITION ANTENNA-MOUNTING BRACKET ASSEMBLY**

Todd G. Brehmer, San Jose; A. Warren Berg, Newark, and Allen F. Podell, Palo Alto, all of Calif., assignors to Pacific Monolithics, Inc., Sunnyvale, Calif.

Filed Apr. 25, 1994, Ser. No. 21,888

Term of patent 14 years

U.S. Cl. D14—238



361,068

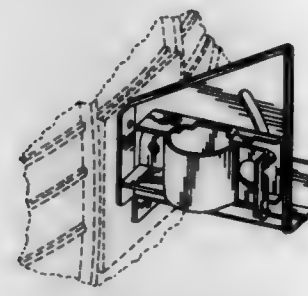
**ADJUSTABLE-ANGLE ANTENNA-MOUNTING BRACKET ASSEMBLY**

Todd G. Brehmer, San Jose; A. Warren Berg, Newark, and Allen F. Podell, Palo Alto, all of Calif., assignors to Pacific Monolithics, Inc., Sunnyvale, Calif.

Filed Apr. 25, 1994, Ser. No. 21,887

Term of patent 14 years

U.S. Cl. D14—238



361,069

**STAND FOR A PORTABLE TELEPHONE**

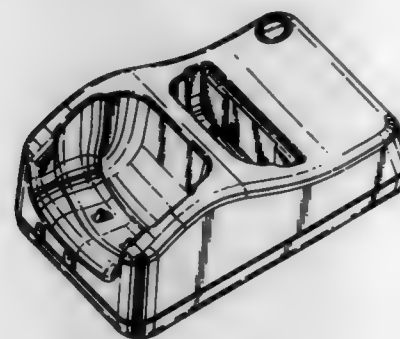
Robert Heiler, and Tomek Rudkiewicz, both of Turku, Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

Filed Jan. 21, 1994, Ser. No. 24,810

Claims priority, application United Kingdom, Dec. 22, 1993, 2035992

Term of patent 14 years

U.S. Cl. D14—253



361,070

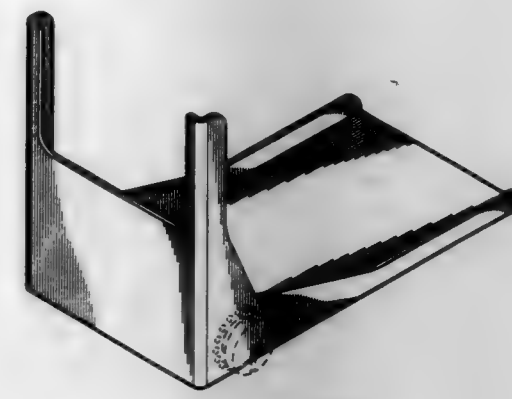
**STAND FOR A RADIOTELEPHONE**

Eugene J. Wall, La Grange; Bruce D. Hiller, Hawthorn Woods, and Bradford F. Butts, Des Plaines, all of Ill., assignors to Motorola, Schaumburg, Ill.

Filed Sep. 30, 1993, Ser. No. 13,690

Term of patent 14 years

U.S. Cl. D14—253



361,071

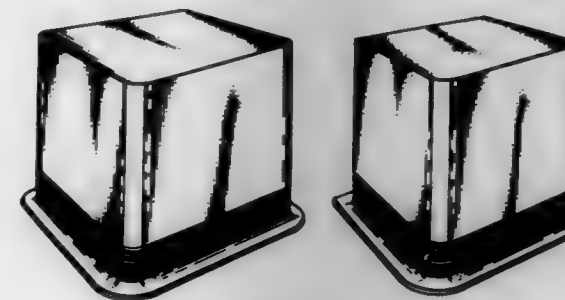
**LOUDSPEAKER**

Steven D. Mark, Lemon Heights, Calif., assignor to Spheric Audio Laboratories, Inc., Santa Ana, Calif.

Filed Jan. 5, 1994, Ser. No. 17,097

Term of patent 14 years

U.S. Cl. D14—211



361,072

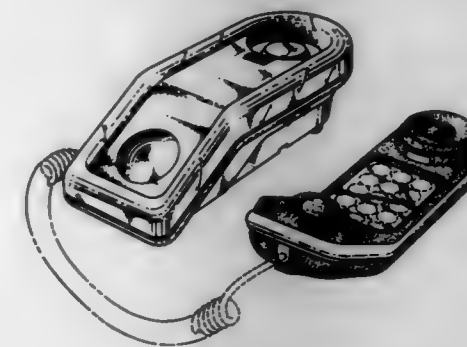
**TELEPHONE**

Gerald Huang, 16010 Carmenita Rd., Cerritos, Calif. 90701

Filed Jan. 5, 1994, Ser. No. 17,162

Term of patent 14 years

U.S. Cl. D14—149



361,073

**MICROWAVE RADIO ENCLOSURE**

David S. Walters, Los Altos Hills; Duane M. Salbushian, Sr., Pacifica, both of Calif.; Hugh T. Greenlee, Gates Mills; Daniel F. Caffaro, Seven Hills, both of Ohio, and Mario G. Acevedo, San Lorenzo, Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Mar. 1, 1994, Ser. No. 19,359

Term of patent 14 years

U.S. Cl. D14-240



361,075

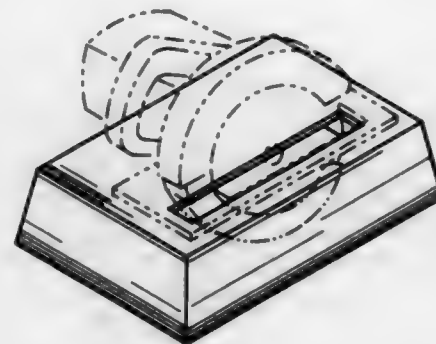
**STAND FOR A CIRCULAR SAW**

Thomas J. Jones, 3007 Crone Rd., Borden, Ind. 47106

Filed Jul. 5, 1994, Ser. No. 25,574

Term of patent 14 years

U.S. Cl. D6-71



361,076

**CHUCK**

Louis M. Shadeck, Anderson; Robert O. Huff, Piedmont, and Valerie D. Owens, Townville, all of S.C., assignors to Power Tool Holders Incorporated, Wilmington, Del.

Filed Jun. 3, 1994, Ser. No. 23,910

Term of patent 14 years

U.S. Cl. D15-140



361,074

**FLOWER SHREDDER**

Nobuyuki Takahashi, and Shintaro Hara, both of Fuchu, Japan, assignors to Ryobi Limited, Hiroshima, Japan

Filed Jul. 26, 1994, Ser. No. 26,368

Claims priority, application Japan, Feb. 3, 1994, 6-2466

Term of patent 14 years

U.S. Cl. D15-10



361,077

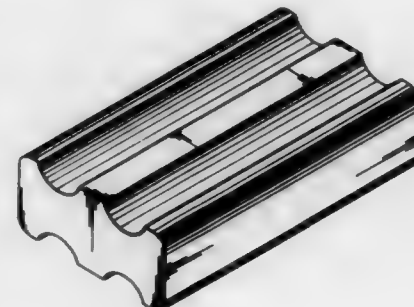
**SOLID LUBRICANT BLOCK**

Warren E. Jamison, Edmonds, Wash., assignor to E/M Corporation, West Lafayette, Ind.

Filed Mar. 9, 1992, Ser. No. 848,328

Term of patent 14 years

U.S. Cl. D15-150



361,078

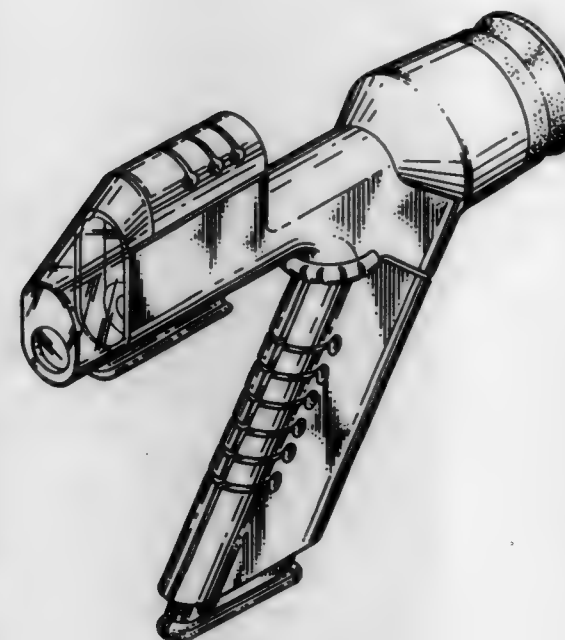
**HAND-HELD MICROSCOPE**

George C. Atamian, Upland, Calif., assignor to Educational Insights, Inc., Dominguez Hills, Calif.

Filed Dec. 29, 1993, Ser. No. 16,917

Term of patent 14 years

U.S. Cl. D16-131



361,080

**TRANSPARENCY ILLUMINATOR**

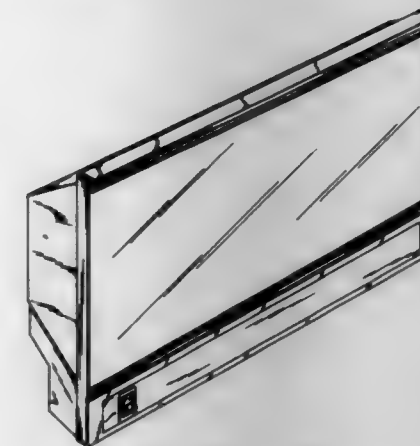
Frederick Collins, London; Roger L. Beale, Ruislip, and Sidney Grant, London, all of United Kingdom, assignors to Medivance Instruments Limited, London, England

Filed Jan. 5, 1994, Ser. No. 17,141

Claims priority, application United Kingdom, Jul. 5, 1993, 2032160

Term of patent 14 years

U.S. Cl. D16-225



361,081

**FASTENER ARRANGEMENT FOR DIVE MASK STRAP**  
Guillermo P. Pardini, 509 Burton Ave., Highland Park, Ill. 60035

Filed Aug. 9, 1993, Ser. No. 11,577

Term of patent 14 years

U.S. Cl. D16-339



361,082

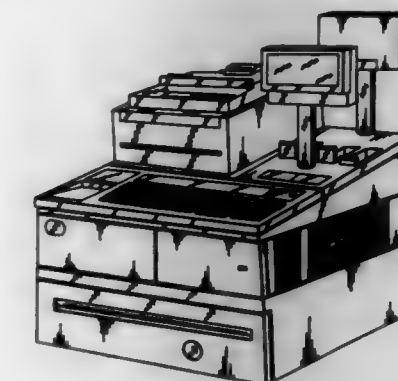
**COMBINED POINT OF SALE TERMINAL**

Ronald A. Smith, Apex, N.C.; Toshitaka Imai, and Kazuo Nakada, both of Sagami, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1993, Ser. No. 8,499

Term of patent 14 years

U.S. Cl. D16-4



361,079

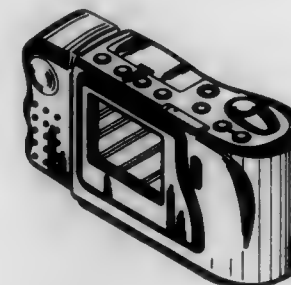
**ELECTRONIC STILL CAMERA WITH MONITOR DISPLAY**

Junichi Ono, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1994, Ser. No. 21,792

Term of patent 14 years

U.S. Cl. D16-202





361,083

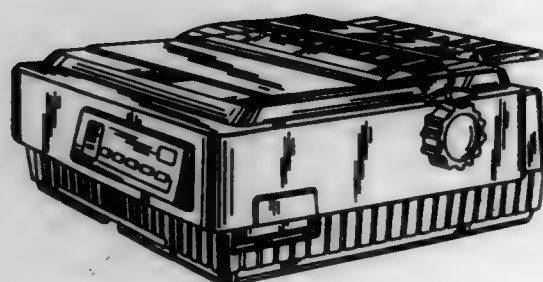
**DOT MATRIX PRINTER**

Jae K. Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 26, 1994, Ser. No. 18,003

Claims priority, application Rep. of Korea, Sep. 2, 1993, 17816  
Term of patent 14 years

U.S. Cl. D18—50



361,085

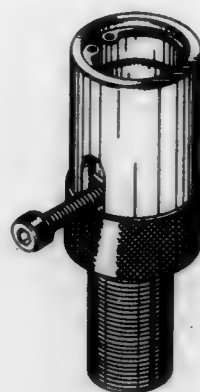
**SPINDLE FOR AN ENGRAVING MACHINE**

Stanley E. Rose, Phoenix, Ariz., assignor to Western Engravers Supply, Inc., Phoenix, Ariz.

Filed Oct. 29, 1993, Ser. No. 14,704

Term of patent 14 years

U.S. Cl. D18—57



361,086

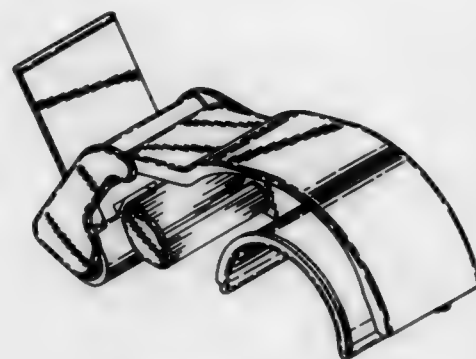
**ROLL-ON BOX SEALING HAND APPLICATOR**

Craig D. Thompson, and Robert E. Davenport, Jr., both of Inver Grove Heights, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1993, Ser. No. 12,398

Term of patent 14 years

U.S. Cl. D19—69

361,084  
**PRINTER**

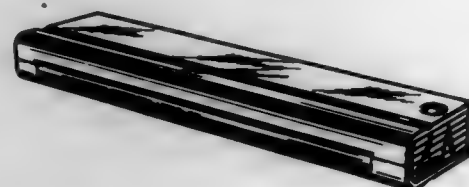
Toshimasa Yamazaki, and Jun Kitera, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1994, Ser. No. 21,372

Claims priority, application Japan, Oct. 16, 1993, 5-31485;  
Mar. 14, 1994, 6-6670

Term of patent 14 years

U.S. Cl. D18—50



361,087

**TAPE DISPENSER**

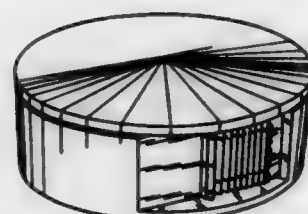
Bruno N. van Eijben, Delft; Wolfram Peters, and Peter Krouwel, both of Leiden, all of Netherlands, assignors to Randstad Dienstengroep Nederland B.V., Netherlands

Filed Oct. 15, 1993, Ser. No. 14,214

Claims priority, application Hague Agreement, May 17, 1993, DM/026166

Term of patent 14 years

U.S. Cl. D19—69



361,088

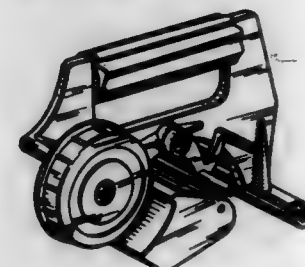
**HAND HELD MASKING MACHINE**

Dan B. Poole, 14645 N. 15 Dr., Phoenix, Ariz. 85029

Filed Jan. 27, 1994, Ser. No. 18,020

Term of patent 14 years

U.S. Cl. D19—69



361,089

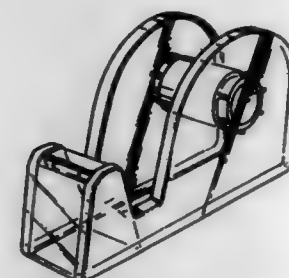
**ADHESIVE TAPE DISPENSER**

Wen-cheng Teng, 45 Ming-teh Rd., Chung-li, Taoyuan, Taiwan

Filed Jul. 15, 1994, Ser. No. 25,897

Term of patent 14 years

U.S. Cl. D19—69



361,090

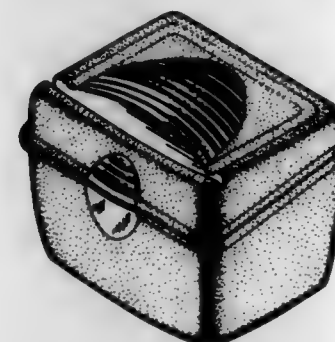
**FILE BOX**

Kent W. Murphy, Wooster, Ohio, assignor to Berol Corporation, Brentwood, Tenn.

Filed Dec. 3, 1993, Ser. No. 16,010

Term of patent 14 years

U.S. Cl. D19—75



361,091

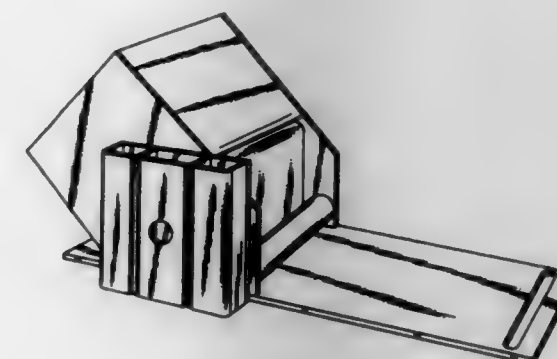
**ROLL PAPER NOTE PAD**

Richard P. Scholfield, 4608 Eastlake Cir., Sarasota, Fla. 34232

Filed Sep. 9, 1993, Ser. No. 12,731

Term of patent 14 years

U.S. Cl. D19—78



361,092

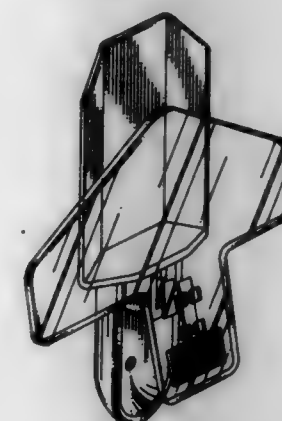
**BOOK HOLDER**

Jay D. Batson, 1849 E. Rhea Rd., Tempe, Ariz. 85284

Filed Mar. 19, 1993, Ser. No. 6,218

Term of patent 14 years

U.S. Cl. D19—91



361,093

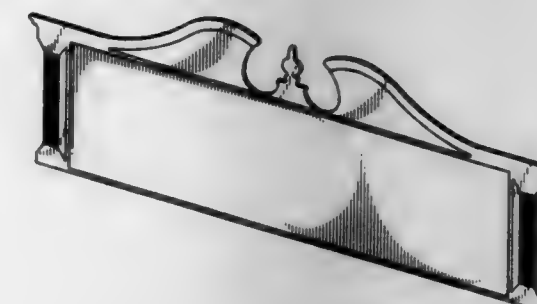
**WALL MOUNTED ADDRESS PLAQUE**

Carl E. Pitts, 12210 W. 101st St., Lenexa, Kans. 66215

Filed Oct. 28, 1994, Ser. No. 30,401

Term of patent 14 years

U.S. Cl. D20—17



361,094  
TAG

John A. Calkins, Montague, Mich.; John J. Chiffers, Bloxham, England, and Leo C. Moore, Muskegon, Mich., assignors to International Master Products Corporation, Montague, Mich.  
Filed Jul. 15, 1994, Ser. No. 25,916  
Term of patent 14 years

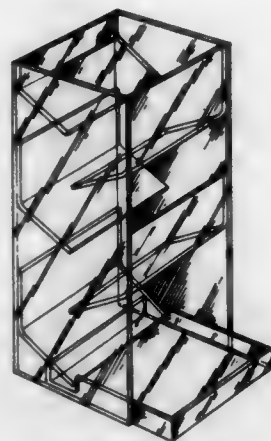
U.S. Cl. D20—26



361,096  
DICE TUMBLER

Glenn P. Shenk, 5222 La Luna, La Palma, Calif. 90623, and Thomas L. Starbird, Redlands, Calif., assignors to Glenn P. Shenk, La Palma, Calif.  
Filed Jun. 14, 1994, Ser. No. 24,425  
Term of patent 14 years

U.S. Cl. D21—41

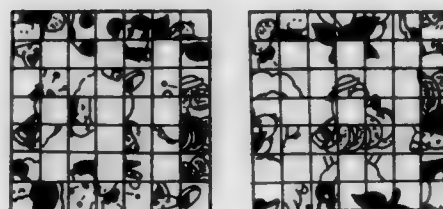
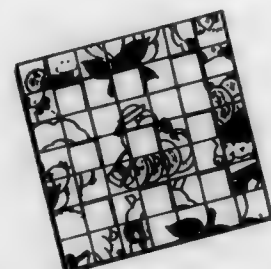


361,097

MAGIC GAME PAPER

Ju H. Yan, 4-1, Lane 264, Wu Chyuan South Road, Taichung, Taiwan, R.O.C., assignor to Ju H. Yan, Taichung, Taiwan, R.O.C.  
Filed Jun. 3, 1994, Ser. No. 23,918  
Term of patent 14 years

U.S. Cl. D21—104

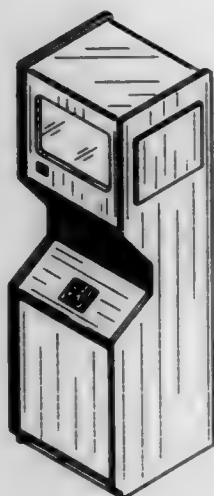


361,098

COMBINED TOY BEAM AND END BLOCKS

Kenneth P. Glynn, Raritan Township, Hunterdon County, N.J., assignor to Ideal Ideas, Inc., Flemington, N.J.  
Filed Mar. 22, 1994, Ser. No. 20,279  
Term of patent 14 years

U.S. Cl. D21—108



361,095

VIDEO CABINET

Thomas J. O'Donnell, Westlake, Ohio, assignor to Ohio Mattress Company Licensing and Components Group, Cleveland, Ohio

Filed Apr. 14, 1994, Ser. No. 21,328  
Term of patent 14 years

U.S. Cl. D21—13

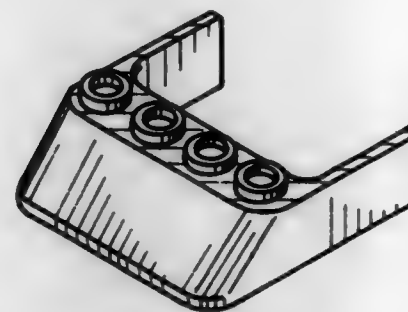
361,099

TOY BUILDING ELEMENT

Ib T. Skov, Billund, Denmark, assignor to Interlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,102  
Term of patent 14 years

U.S. Cl. D21—108



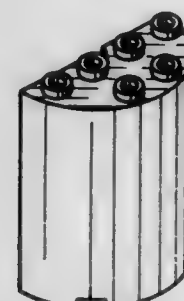
361,100

TOY BUILDING ELEMENT

Ib T. Skov, and Kim Pagel, both of Billund, Denmark, assignors to Interlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,105  
Term of patent 14 years

U.S. Cl. D21—108



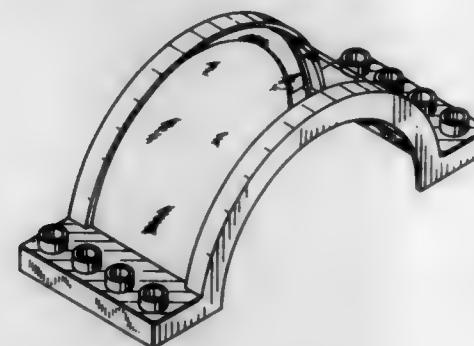
361,101

TOY BUILDING ELEMENT

Eileen Clark, Copenhagen, assignor to Interlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,134  
Term of patent 14 years

U.S. Cl. D21—108



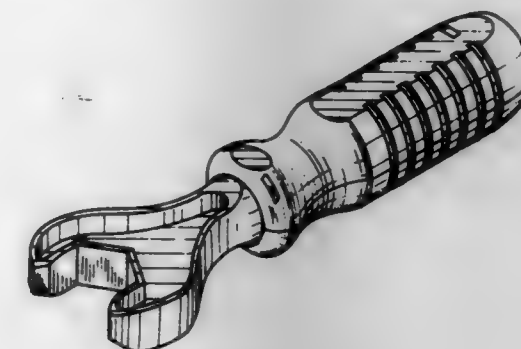
361,102

TOY WRENCH

Jorgen H. Larsen, Store Heddinge, Denmark, assignor to Interlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,138  
Term of patent 14 years

U.S. Cl. D21—120



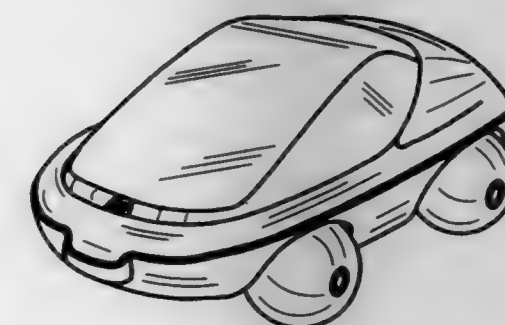
361,103

TOY CAR

Ronald R. Klawitter, Berger, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.

Filed Feb. 2, 1994, Ser. No. 18,260  
Term of patent 14 years

U.S. Cl. D21—136



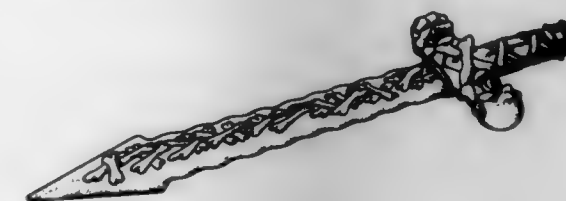
361,104

TOY SWORD

Chung-Hing Choi, Hong Kong, Hong Kong, assignor to Hing Fat Toys Manufacturer Ltd., Hong Kong

Filed Oct. 19, 1994, Ser. No. 29,912  
Term of patent 14 years

U.S. Cl. D21—145





361,105

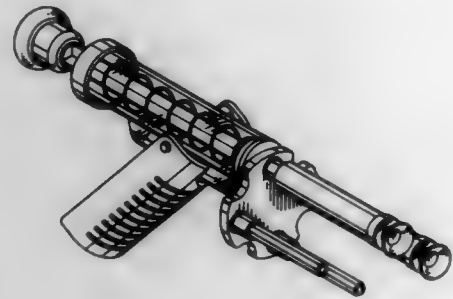
**REPEAT FIRING TOY PROJECTILE LAUNCHER**

David R. Griffin, Morning View, Ky., assignor to Tonka Corporation, Pawtucket, R.I.

Filed May 2, 1994, Ser. No. 22,261

Term of patent 14 years

U.S. Cl. D21-147



361,106

**STUFFED TOY DOLL**

Mardell E. Alberico, 190 Capay Ave., Hamilton City, Calif. 95951

Filed Oct. 28, 1994, Ser. No. 30,425

Term of patent 14 years

U.S. Cl. D21-171



361,107

**PHYSICAL EXERCISE APPARATUS**

Flo Meyer, Wald, Switzerland, assignor to Bioengineering AG, Wald, Switzerland

Continuation of Ser. No. 873,730, Apr. 27, 1992, abandoned.

This application Jan. 12, 1994, Ser. No. 19,351

Claims priority, application Hague Agreement, Dec. 6, 1991, DM/021,368

Term of patent 14 years

U.S. Cl. D21-191



361,108

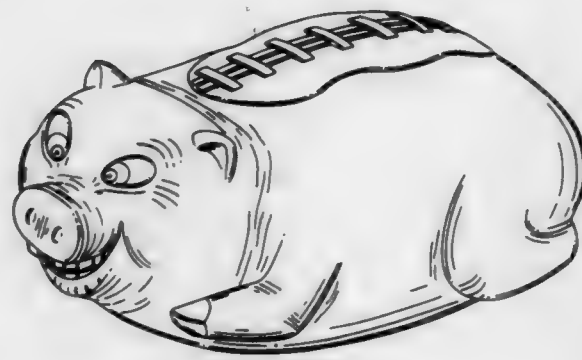
**TOY BALL**

Peter L. Schneider, Wyckoff, N.J., assignor to Direct Connect International, Midland Park, N.J.

Filed Jul. 19, 1994, Ser. No. 25,198

Term of patent 14 years

U.S. Cl. D21-204



361,109

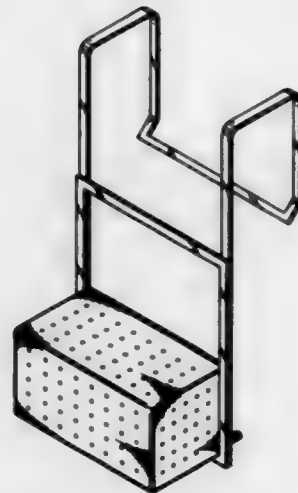
**TOILET CLEANER DISPENSER**

Herman Davis, Jr., 523 Hannon St., Petersburg, Va. 23803

Filed Jun. 23, 1993, Ser. No. 9,768

Term of patent 14 years

U.S. Cl. D23-208



361,110

**GOLF CLUB GRIP**

James B. Koeman, Mesa; Alexander D. Stewart, III, Phoenix, and Michael J. Kuzel, Tempe, all of Ariz., assignors to Royal Grip, Inc., Tempe, Ariz.

Filed May 25, 1994, Ser. No. 23,427

Term of patent 14 years

U.S. Cl. D21-222



361,112

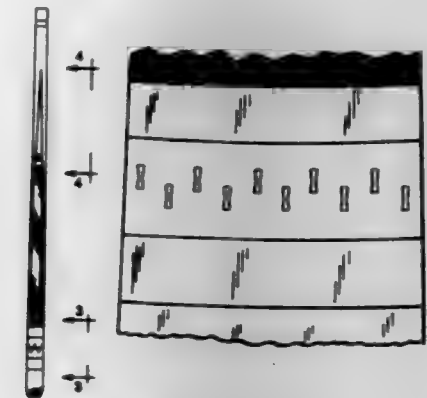
**CUE STICK**

Daniel Janes, Towson, Md., assignor to Brunswick Bowling &amp; Billiards, Muskegon, Mich.

Filed Jul. 20, 1993, Ser. No. 10,899

Term of patent 14 years

U.S. Cl. D21-232



361,113

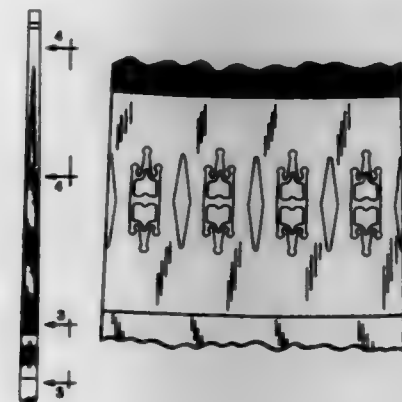
**CUE STICK**

Daniel Janes, Towson, Md., assignor to Brunswick Bowling &amp; Billiards, Muskegon, Mich.

Filed Jul. 20, 1993, Ser. No. 10,900

Term of patent 14 years

U.S. Cl. D21-232



361,111

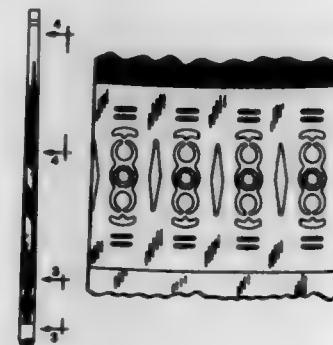
**CUE STICK**

Daniel Janes, Towson, Md., assignor to Brunswick Bowling &amp; Billiards, Muskegon, Mich.

Filed Jul. 20, 1993, Ser. No. 10,898

Term of patent 14 years

U.S. Cl. D21-232



361,114

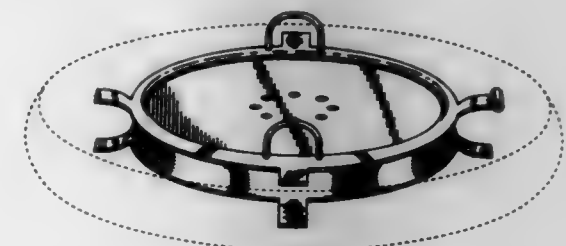
**INNER TUBE INSERT**

Clyde A. Shepherd, Box 277, Petoskey, Id. 83855

Filed Dec. 27, 1993, Ser. No. 16,819

Term of patent 14 years

U.S. Cl. D21-237



361,115

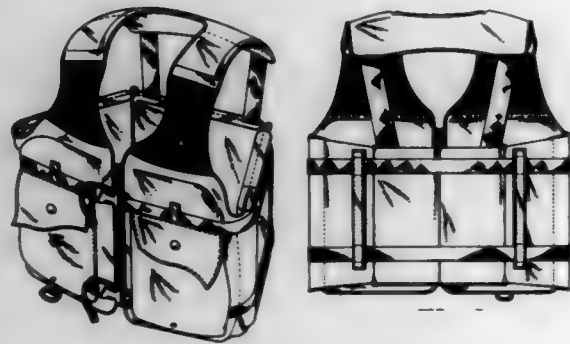
**LIFE VEST FOR WATER SKIERS**

John H. Lucius, Athens, Ga., assignor to Wellington Leisure Products, Inc., Madison, Ga.

Filed Jul. 29, 1994, Ser. No. 26,498

Term of patent 14 years

U.S. Cl. D21-238

361,117  
SWING

Elizabeth M. Leek, 2319 Kimball Pl., Silver Spring, Md. 20910

Filed May 16, 1994, Ser. No. 22,998

Term of patent 14 years

U.S. Cl. D21-246



361,116

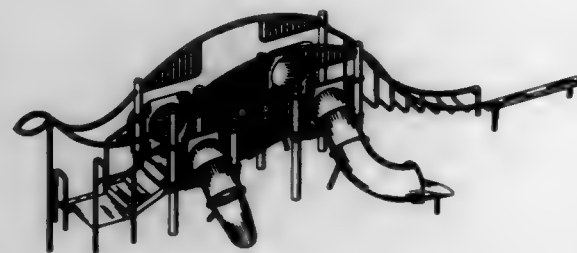
**COMBINED CLIMBER AND SLIDER**

Dwight C. Shaneour, Hillsdale, Mich., assignor to Recreation Creations, Inc., Hillsdale, Mich.

Filed Feb. 7, 1994, Ser. No. 18,464

Term of patent 14 years

U.S. Cl. D21-244



361,118

**DINOSAUR-SHAPED SEAT FOR PLAYGROUND APPARATUS**

Robin L. Hammel, Allen, Mich., assignor to Recreation Creations, Inc., Hillsdale, Mich.

Filed Feb. 7, 1994, Ser. No. 18,467

Term of patent 14 years

U.S. Cl. D21-247



361,119

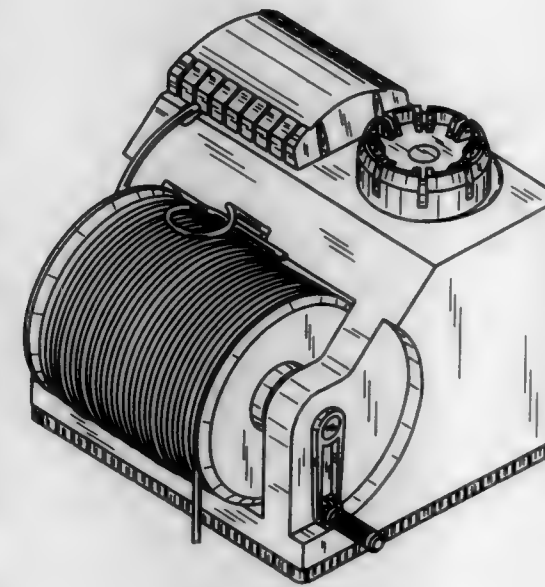
**PORTABLE SPRAYING UNIT**

Bill J. Hawks, Jr., 8253 Greenbriar Ct., Wichita, Kans. 67226

Filed Sep. 14, 1992, Ser. No. 948,733

Term of patent 14 years

U.S. Cl. D23-213



361,121

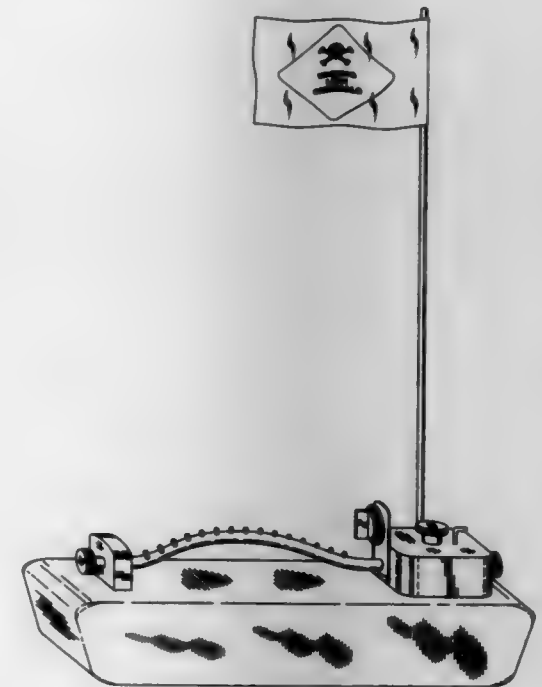
**COMBINED LAWN SPRINKLER AND SIGNAL FLAG THEREFOR**

Leonard W. Sellers, 8047 S. Christina, Chicago, Ill. 60652

Filed Jan. 31, 1994, Ser. No. 18,122

Term of patent 14 years

U.S. Cl. D23-214



361,122

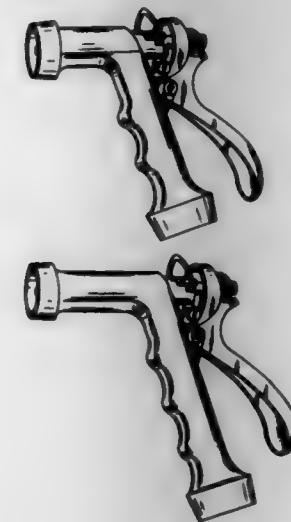
**HOSE NOZZLE**

John W. Goodin, Coto De Caza, Calif., assignor to L. R. Nelson Corporation, Peoria, Ill.

Filed May 12, 1994, Ser. No. 22,788

Term of patent 14 years

U.S. Cl. D23-226



361,120

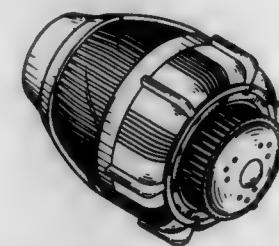
**SHOWER HEAD**

Chen-Yueh Fan, 3Fl., No. 2, Alley 2, Lane 88, Sec. 2, Shui Yuan Rd., Hsin Chih Chen, Taipei Hsien,

Filed Oct. 28, 1994, Ser. No. 30,370

Term of patent 14 years

U.S. Cl. D23-213



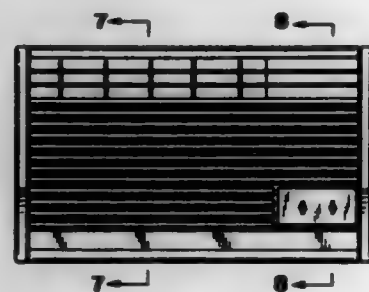
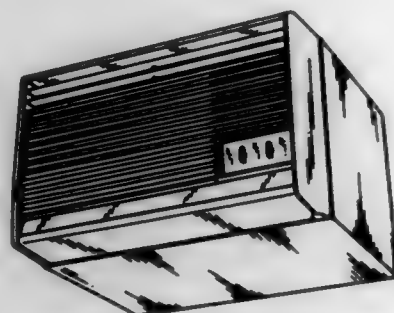


361,123

**AIR CONDITIONER**

Yoshimi Okamoto, Ota, and Kouichiro Seki, Oizumi, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan  
 Filed Nov. 14, 1994, Ser. No. 31,209  
 Claims priority, application Japan, Jul. 19, 1994, 6-21668  
 Term of patent 14 years

U.S. Cl. D23—353

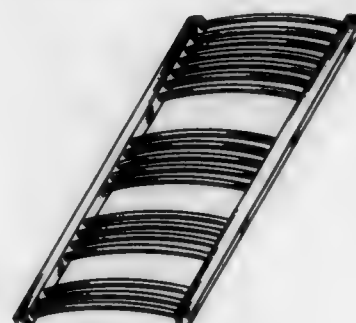


361,125

**BATHROOM RADIATOR**

Theo Wolf, Münster, Germany, assignor to Kermi GmbH, Pfaffing, Germany  
 Filed May 10, 1993, Ser. No. 8,121  
 Claims priority, application Germany, Nov. 12, 1992, DM/024 414  
 Term of patent 14 years

U.S. Cl. D23—330

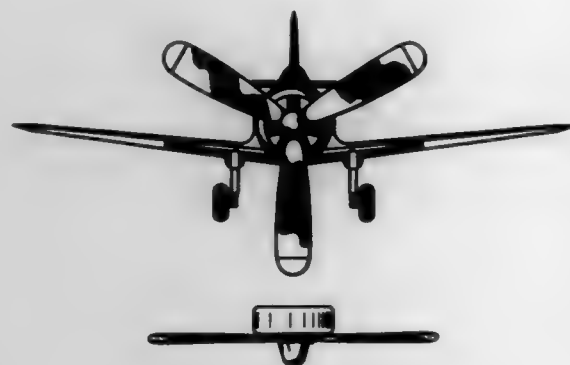


361,124

**COMBINED CEILING FAN AND DECORATIVE DECAL FOR ATTACHMENT TO A CEILING**

Richard A. Pearce, Memphis, Tenn., assignor to Hunter Fan Company, Memphis, Tenn.  
 Continuation-in-part of Ser. No. 621,568, Nov. 30, 1990, abandoned. This application Jan. 5, 1993, Ser. No. 7,082  
 Term of patent 14 years

U.S. Cl. D23—328

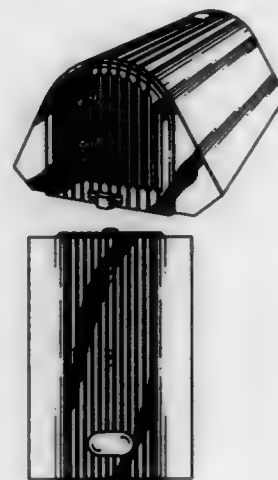


361,126

**AIR FRESHENER DISPENSER**

Rokuro Fukada, Otsu, Japan, assignor to Eikosha Co., Ltd., Kyoto, Japan  
 Filed Oct. 19, 1994, Ser. No. 29,903  
 Term of patent 14 years

U.S. Cl. D23—366



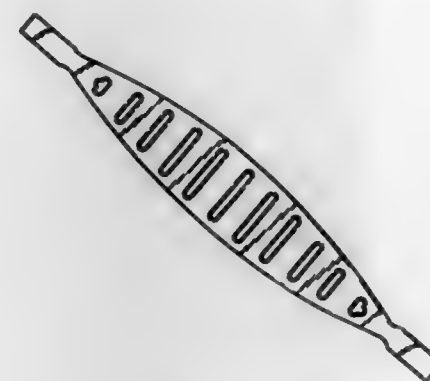
361,127

**SUPPORT BELT FOR A HEADBAND FOR EAR NOISE REDUCTION**

Bo G. Lönnstedt, Kvarnbergsvägen 23, S-141 45 Huddinge, Sweden  
 Filed May 11, 1993, Ser. No. 8,281

Claims priority, application Sweden, Jan. 28, 1993, 93-0213  
 Term of patent 14 years

U.S. Cl. D24—106

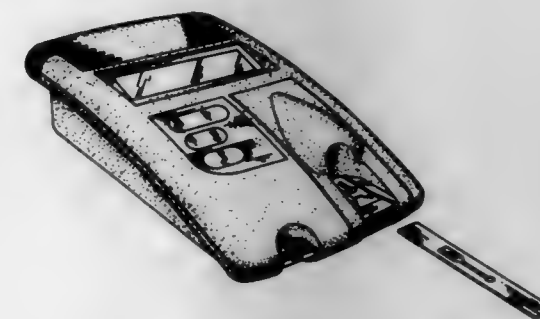


361,129

**COMBINED BLOOD COAGULATION MEASURING INSTRUMENT AND TEST STRIP**

Rick L. Collins, Cicero; Martin T. Gerber, Carmel; Daniel L. Kennedy; Brett S. Lewis, both of Indianapolis, all of Ind.; James D. Morrow, Oakpark, Ill.; Peter L. Sebastian, Worms, Germany; David E. Storvick, Indianapolis, and Charles L. Thomeczek, Jr., Fishers, both of Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.  
 Filed Nov. 2, 1993, Ser. No. 14,881  
 Term of patent 14 years

U.S. Cl. D24—169



361,130

**COMBINED INTEGRATED CYLINDRICAL HEAT EXCHANGER AND SQUARE OXYGENATOR**

Richard P. Goldhaber, Lake Forest, Ill.; Paul D. Brinda, Robbinsdale, and Ulf-Eiel F. Bach, Mound, both of Minn., assignors to Minntech Corporation, Minneapolis, Minn.  
 Filed Mar. 23, 1994, Ser. No. 20,316  
 Term of patent 14 years

U.S. Cl. D24—169



361,128

**LINIMENT APPLICATOR**

Philip A. Frizzell, P.O. Box 456, Woodstock, Vt. 05091  
 Filed Feb. 14, 1994, Ser. No. 18,679  
 Term of patent 14 years

U.S. Cl. D24—119

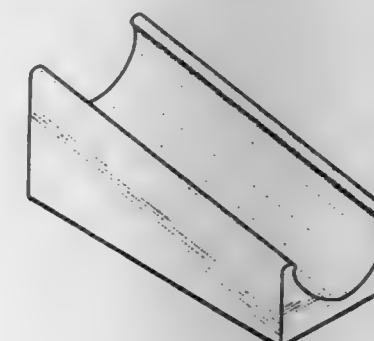


361,131

**BOTTLE SUPPORT**

Robin S. Leopold, 1750 W. Greenlawn La., Appleton, Wis. 54914  
 Filed Sep. 30, 1994, Ser. No. 29,197  
 Term of patent 14 years

U.S. Cl. D24—199

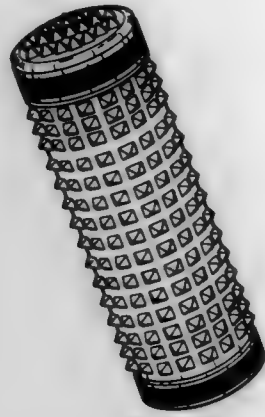


361,132

**ACCU-PRESSURE MASSAGER**

Jae A. Lee, 6900 Aragon Cir., Ste. 5, Buena Park, Calif. 90620  
Filed Apr. 13, 1994, Ser. No. 21,256  
Term of patent 14 years

U.S. Cl. D24—200

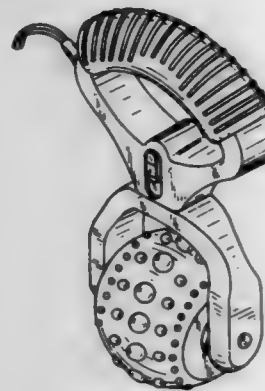


361,133

**ROLLING SWIVEL HANDGRIP MASSAGER**

Jim Robertson, Chicago, Ill.; Ira Hajjar, Hattiesburg, and Donald Ivy, Waynesboro, both of Miss., assignors to Sunbeam Corporation, Fort Lauderdale, Fla.  
Filed Sep. 29, 1994, Ser. No. 29,124  
Term of patent 14 years

U.S. Cl. D24—211

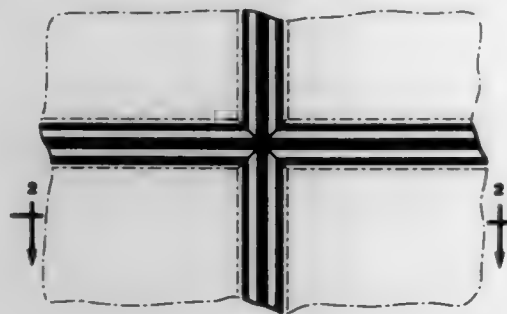


361,134

**COVER UNIT FOR CEILING RAILS**

Wesley T. K. Bischel, Elizabethtown, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.  
Filed Mar. 22, 1993, Ser. No. 6,149  
Term of patent 14 years

U.S. Cl. D25—55

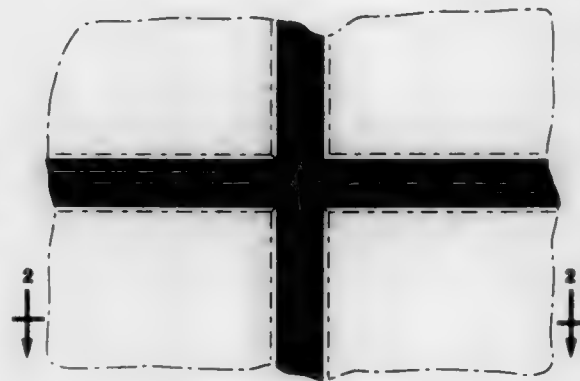


361,135

**COVER UNIT FOR CEILING RAILS**

Wesley T. K. Bischel, Elizabethtown, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.  
Filed Mar. 22, 1993, Ser. No. 6,150  
Term of patent 14 years

U.S. Cl. D25—55

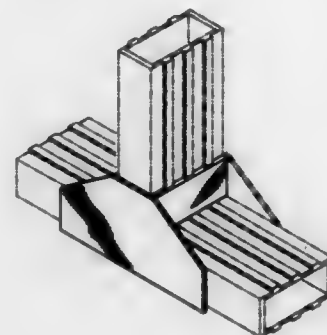


361,136

**FRAME CONNECTOR**

Raymond D. Parkinson, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Pleasanton, Calif.  
Filed Feb. 4, 1994, Ser. No. 18,356  
Term of patent 14 years

U.S. Cl. D25—61



361,137

**COMBINED GLASS DOOR PANEL AND TRIM**

John M. Parkhurst, Minnetonka, Minn., assignor to Cole Sewell Corporation, St. Paul, Minn.  
Filed Mar. 15, 1994, Ser. No. 19,970  
Term of patent 14 years

U.S. Cl. D25—103

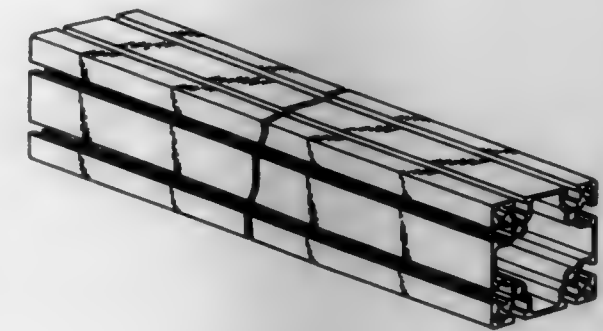


361,139

**FRAME BAR FOR CONSTITUTING A FRAME STRUCTURE**

Ryoichi Nomura, Toyama, Japan, assignor to NIC Autotec Co., Ltd., Toyama, Japan  
Filed Jun. 3, 1994, Ser. No. 23,939  
Term of patent 14 years

U.S. Cl. D25—122



361,140

**WINDOW COMPONENT EXTRUSION**

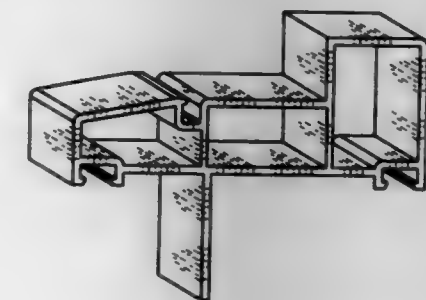
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.

Filed Jun. 21, 1993, Ser. No. 9,782

The portion of the term of this patent subsequent to Jun. 29, 2007, has been disclaimed.

Term of patent 14 years

U.S. Cl. D25—124



361,138

**EXTRUDED UTILITY TRIM FOR SIDING AND SOFFIT**

Sylvia S. Moore, Thomas A. Gates, and Daniel W. King, all of Sidney, Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 30, 1994, Ser. No. 27,811

Term of patent 14 years

U.S. Cl. D25—119



361,141

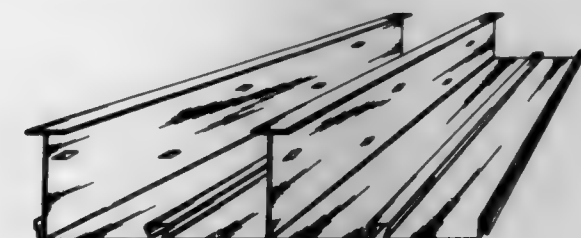
**BUILDING PANEL**

Katsuo Ueki, Tachikawa, Japan, assignor to Ueki Koukan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1994, Ser. No. 22,064

Term of patent 14 years

U.S. Cl. D25—125



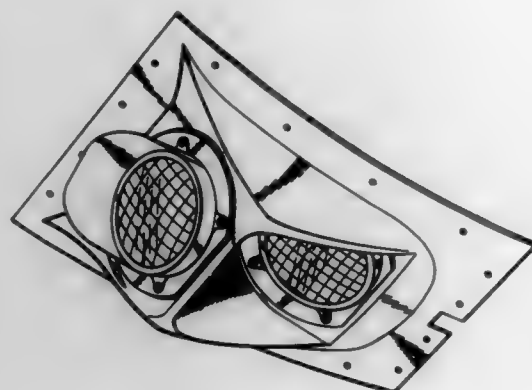


361,142

**LIGHTING FIXTURE FOR HELICOPTERS**

Charles N. Allred, 3476 Springrun Dr., Decatur, Ga. 30032  
 Filed Sep. 12, 1994, Ser. No. 28,326  
 Term of patent 14 years

U.S. Cl. D26—28

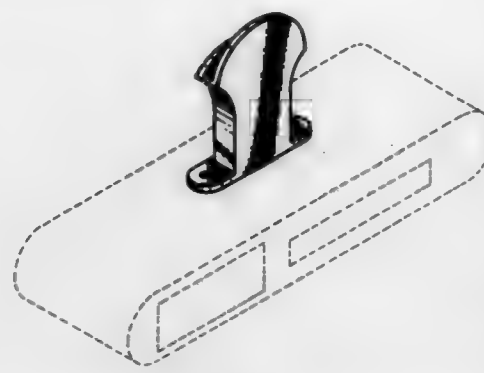


361,143

**CLOCK RADIO ACTIVATED LIGHT**

Gary Rosentreter, 25950 W. Shandon Dr., Ingleside, Ill. 60041  
 Filed Feb. 16, 1994, Ser. No. 18,839  
 Term of patent 14 years

U.S. Cl. D26—52



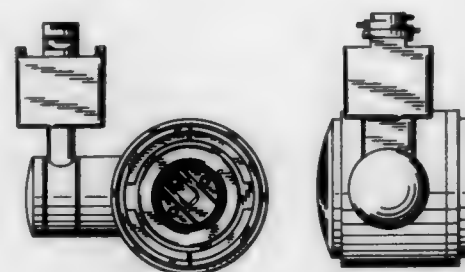
361,146

**UNIVERSAL TRACK LAMPHOLDER**

Alice M. Jandrisits, Chicago, and Giacinto C. D'Ercoli, Rolling Meadows, both of Ill., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 15, 1993, Ser. No. 12,977  
 Term of patent 14 years

U.S. Cl. D26—63

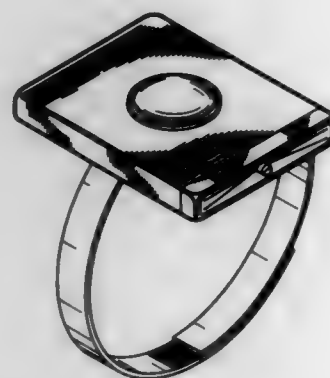


361,143

**ADJUSTABLE WRIST-MOUNTABLE FLASHLIGHT**

Harold L. Helvey, 6202 Randy Jay St., Schofield, Wis. 54476  
 Filed Jun. 29, 1993, Ser. No. 10,078  
 Term of patent 14 years

U.S. Cl. D26—39



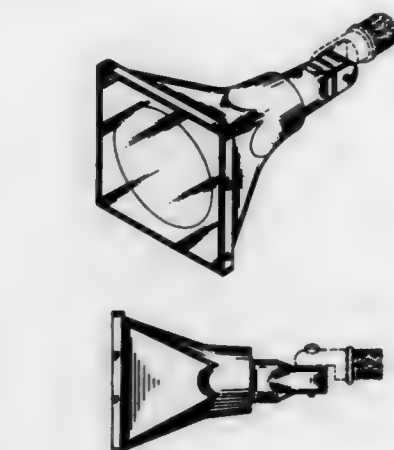
361,147

**QUARTZ HALOGEN FLOOD LIGHT**

Mark T. Wedell, Germantown, Tenn., and J. D. McIngvale, Hernando, Miss., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Jul. 22, 1994, Ser. No. 26,190  
 Term of patent 14 years

U.S. Cl. D26—63

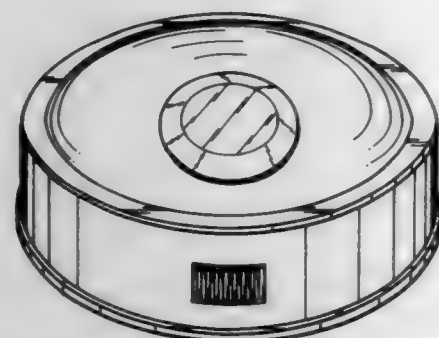


361,144

**PORTABLE, ADJUSTABLE LAMP**

Chris H. Loiselet, 104 W. Mt. Ida Ave., Alexandria, Va. 22305  
 Filed Mar. 1, 1994, Ser. No. 19,358  
 Term of patent 14 years

U.S. Cl. D26—44

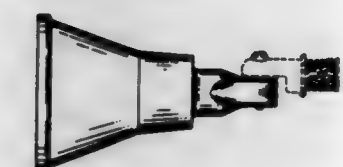
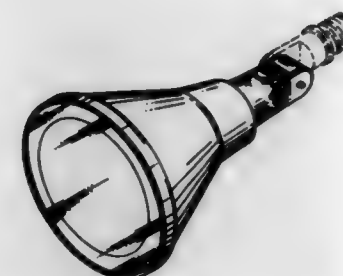


361,148

**QUARTZ HALOGEN FLOOD LIGHT**

Mark T. Wedell, Germantown, Tenn., assignor to Thomas & Betts Corporation, Memphis, Tenn.  
 Filed Jul. 22, 1994, Ser. No. 26,257  
 Term of patent 14 years

U.S. Cl. D26—63

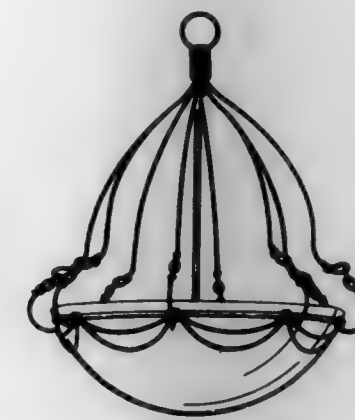


361,151

**HANGING LAMP**

Thomas R. Corbett, 5505 Wameta, Dallas, Tex. 75209  
 Filed May 16, 1994, Ser. No. 22,987  
 Term of patent 14 years

U.S. Cl. D26—90

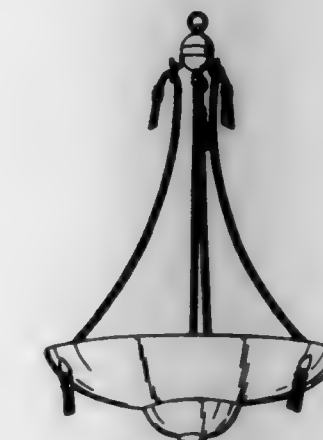


361,152

**HANGING LAMP**

Thomas R. Corbett, 5505 Wameta, Dallas, Tex. 75209  
 Filed May 16, 1994, Ser. No. 22,992  
 Term of patent 14 years

U.S. Cl. D26—90



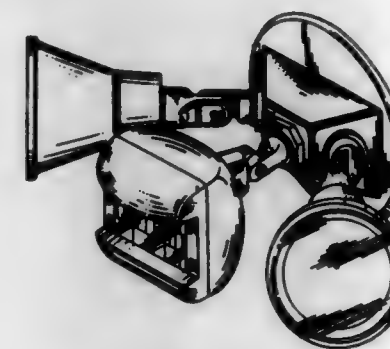
361,149

**COMBINED QUARTZ HALOGEN FLOOD LIGHT ASSEMBLY AND SENSOR HOUSING**

Mark T. Wedell, Germantown, Tenn., assignor to Thomas & Betts Corporation, Memphis, Tenn.

Filed Jul. 22, 1994, Ser. No. 26,258  
 Term of patent 14 years

U.S. Cl. D26—63



361,150

**DECORATIVE EXTERIOR LAMP**

Thomas J. Messina, Jr., 20 Villa Rose Ter., Woodmont, Conn. 06460

Filed Jan. 8, 1994, Ser. No. 24,108  
 Term of patent 14 years

U.S. Cl. D26—67

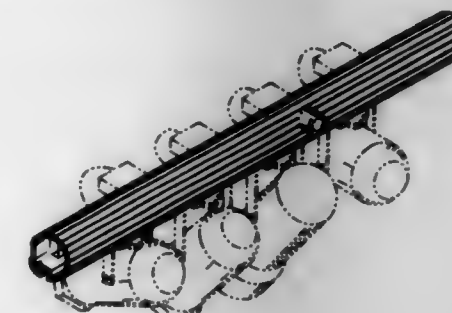


361,153

**SUPPORT BAR FOR FLOODLIGHTS**

Mark Fernandez, P.O. Box 197164, Louisville, Ky. 40259  
 Filed Mar. 25, 1993, Ser. No. 6,366  
 Term of patent 14 years

U.S. Cl. D26—138



361,154

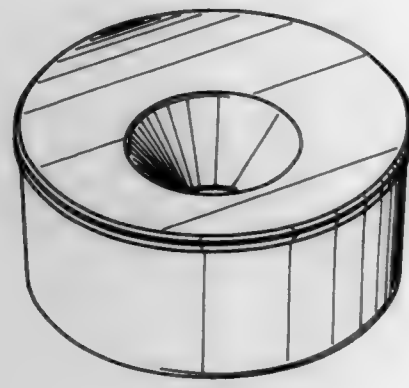
## ODORLESS ASHTRAY

Mikko W. Makinen, 1304 W. Indies Way Apt. 8E, Palm Beach, Fla. 33462

Continuation-in-part of Ser. No. 930,752, Aug. 14, 1992, abandoned. This application Feb. 2, 1994, Ser. No. 18,264

Term of patent 14 years

U.S. Cl. D27—135



361,157

## COMBINED DENTAL FLOSSER AND TOOTHPICK

Paul A. Carl, 4928 S. 98th St., Omaha, Nebr. 68127, and Robert S. Potter, 6611 Glenwood Rd., Omaha, Nebr. 68132

Filed Oct. 14, 1993, Ser. No. 14,150

Term of patent 14 years

U.S. Cl. D28—64



361,158

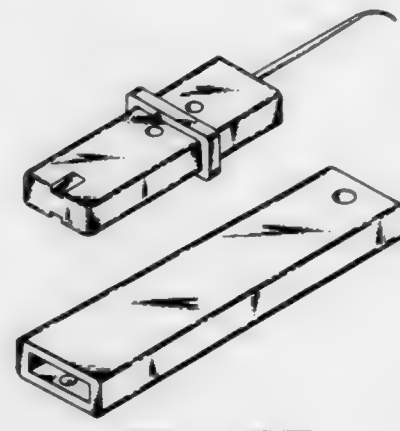
## COMBINED DENTAL PICK AND SHEATH

Raymond P. Tipp, P.O. Box 3778, Missoula, Mont. 59806

Filed May 17, 1994, Ser. No. 20,184

Term of patent 14 years

U.S. Cl. D28—64



361,155

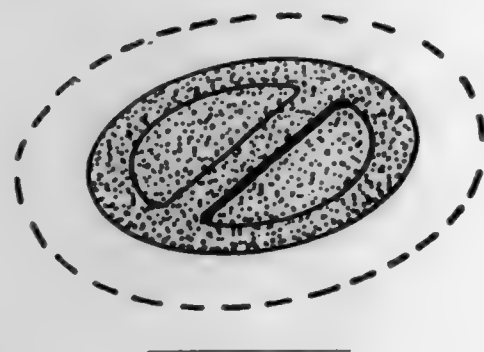
## HANDLE FOR A DEVICE FOR APPLYING POWDER

William Ostrower, 12 Grace La., Oyster Bay Cove, N.Y. 11771

Filed Jan. 13, 1992, Ser. No. 820,210

Term of patent 14 years

U.S. Cl. D28—8



361,159

## LIPSTICK CASE

Wu S. Feng, P.O. Box 82-144, Taipei, Taiwan

Filed May 5, 1994, Ser. No. 22,432

Term of patent 14 years

U.S. Cl. D28—87



361,156

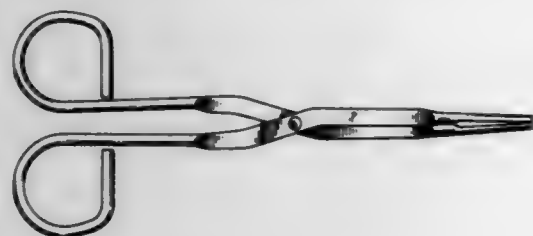
## NAIL-TIP SETTER

Calvert W. Billings, 1 Argonaut, Aliso Viejo, Calif. 92656

Filed Feb. 16, 1994, Ser. No. 18,814

Term of patent 14 years

U.S. Cl. D28—57



361,160

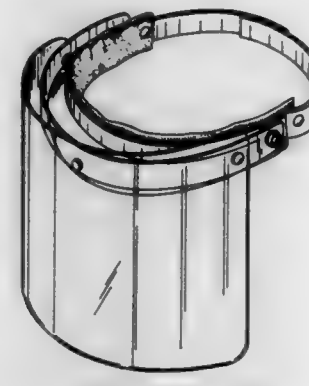
## FACE PROTECTOR WITH PIVOTING FACE SHIELD AND STOP

John P. Russell, Center Point, Ala., assignor to Infection Control Products, Inc., Gardendale, Ala.

Continuation-in-part of Ser. No. 933,510, Aug. 24, 1992, and a continuation-in-part of Ser. No. 933,522, Aug. 24, 1992. This application Sep. 7, 1993, Ser. No. 12,577

Term of patent 14 years

U.S. Cl. D29—110



361,161

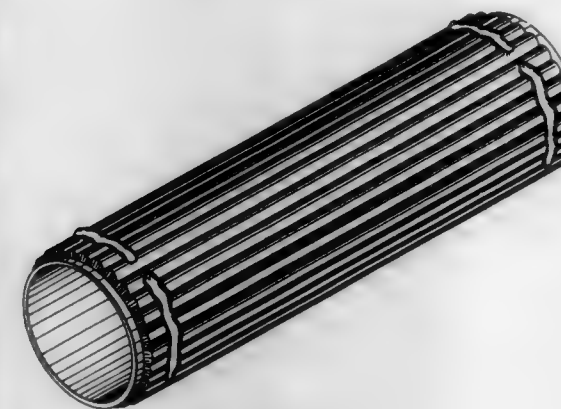
## KNEE PROTECTOR

Jane Dama, 3602 N. Meridian Rd., Tallahassee, Fla. 32312-1206

Filed Oct. 14, 1992, Ser. No. 409

Term of patent 14 years

U.S. Cl. D29—121



361,162

## KNEE PAD

David P. Fierek, Duluth, Minn., assignor to Portable Products, Inc., St. Paul, Minn.

Filed May 17, 1994, Ser. No. 23,048

Term of patent 14 years

U.S. Cl. D29—121



361,163

## PROTECTIVE ELBOW CUSHION

Ting-Hsing Chen, Tainan, Taiwan, assignor to Far Great Plastics Industrial Co., Ltd., Tainan, Taiwan

Filed Jul. 22, 1994, Ser. No. 26,247

Term of patent 14 years

U.S. Cl. D29—121



361,164

## AQUARIUM TANK

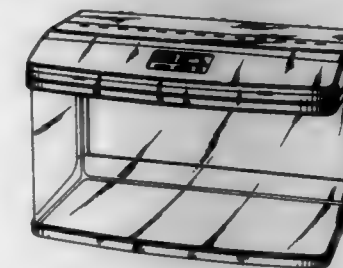
Minoru Ichikawa, Tokyo, Japan, assignor to Nisso Industry Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1993, Ser. No. 13,015

Claims priority, application Japan, Mar. 16, 1993, 5-7313

Term of patent 14 years

U.S. Cl. D30—101



361,165

## AQUARIUM TANK

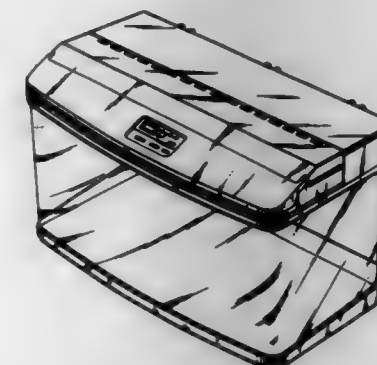
Minoru Ichikawa, Tokyo, Japan, assignor to Nisso Industry Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1993, Ser. No. 13,017

Claims priority, application Japan, Mar. 19, 1993, 5-7651

Term of patent 14 years

U.S. Cl. D30—101





361,166

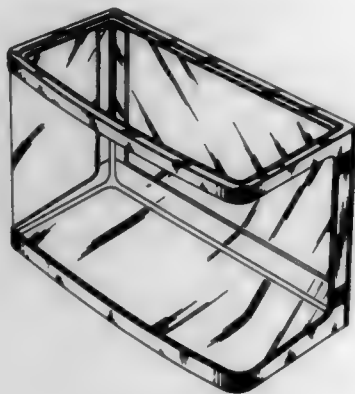
## AQUARIUM TANK

Toshihiro Tsuchiya, Kashiwa, Japan, assignor to Nisso Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1993, Ser. No. 16,205

Term of patent 14 years

U.S. Cl. D30-101



361,169

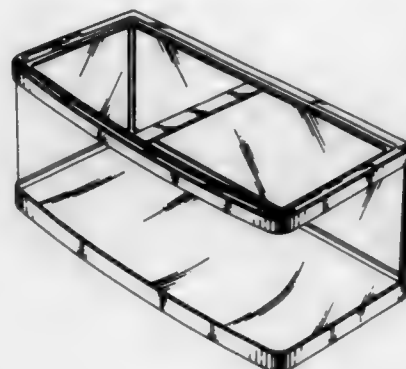
## AQUARIUM TANK

Minoru Ichikawa, Tokyo, Japan, assignor to Nisso Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1993, Ser. No. 16,233

Term of patent 14 years

U.S. Cl. D30-101



361,167

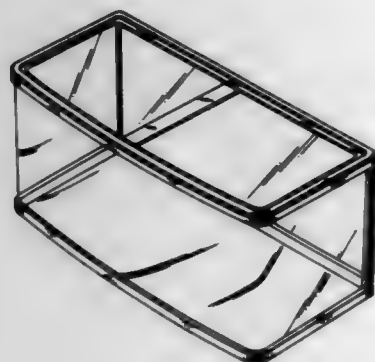
## AQUARIUM TANK

Minoru Ichikawa, Tokyo, Japan, assignor to Nisso Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1993, Ser. No. 16,226

Term of patent 14 years

U.S. Cl. D30-101



361,170

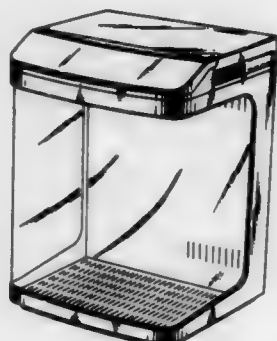
## AQUARIUM TANK

Hiroaki Hashimoto, Showamachi, Japan, assignor to Nisso Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1993, Ser. No. 16,241

Term of patent 14 years

U.S. Cl. D30-101



361,168

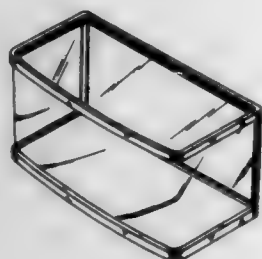
## AQUARIUM TANK

Minoru Ichikawa, Tokyo, Japan, assignor to Nisso Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1993, Ser. No. 16,229

Term of patent 14 years

U.S. Cl. D30-101



361,171

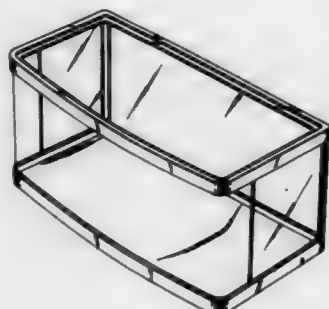
## AQUARIUM TANK

Minoru Ichikawa, Tokyo, Japan, assignor to Nisso Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1993, Ser. No. 16,242

Term of patent 14 years

U.S. Cl. D30-101



361,172

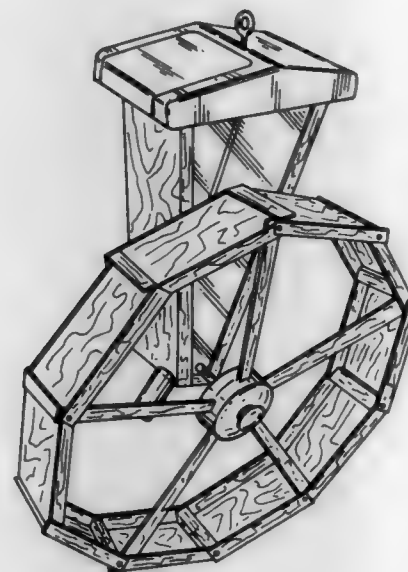
## ACTUATED FEEDER FOR BIRDS AND SMALL ANIMALS

Christopher Gates, Manlius, N.Y., assignor to Pratique, Inc., Chittenango, N.Y.

Filed Aug. 8, 1993, Ser. No. 12,716

Term of patent 14 years

U.S. Cl. D30-124



361,174

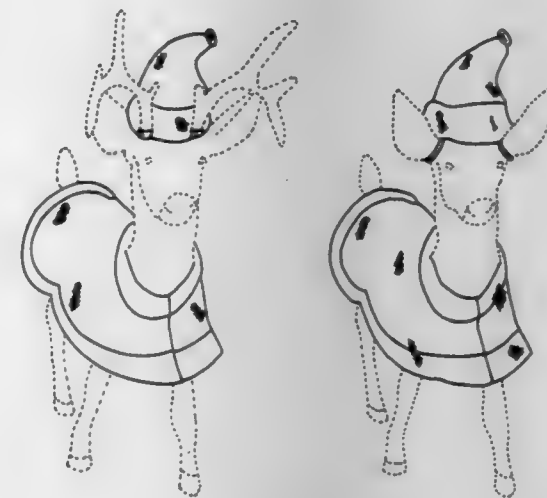
## ENSEMBLE FOR CONCRETE YARD DEER

Rebekah Karlen, 7187 Renken Rd., Dorsey, Ill. 62021

Filed Nov. 9, 1992, Ser. No. 1,313

Term of patent 14 years

U.S. Cl. D30-145



361,173

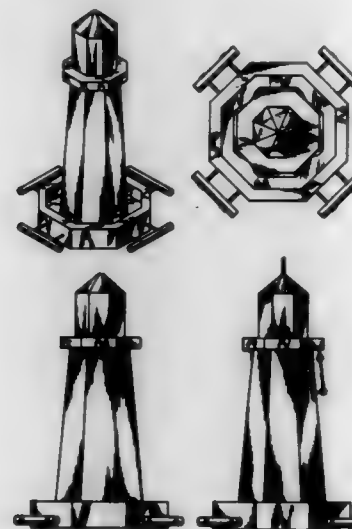
## BIRD FEEDER

Donna Bownes, and Cameron Kashani, both of 3308 Leritz La., Edgewater, Md. 21037

Filed Jun. 21, 1994, Ser. No. 24,805

Term of patent 14 years

U.S. Cl. D30-125



361,175

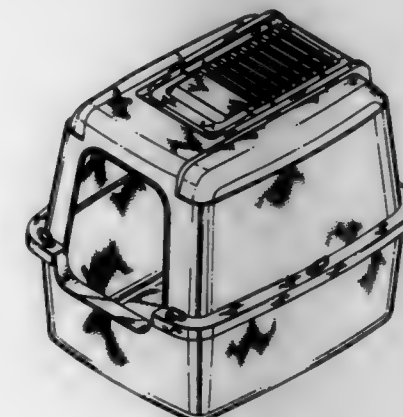
## FELINE LITTER PAN

Ralph VanSkiver, Arlington, Tex., assignor to Doekocil Manufacturing Company, Inc., Arlington, Tex.

Filed May 25, 1994, Ser. No. 23,442

Term of patent 14 years

U.S. Cl. D30-161

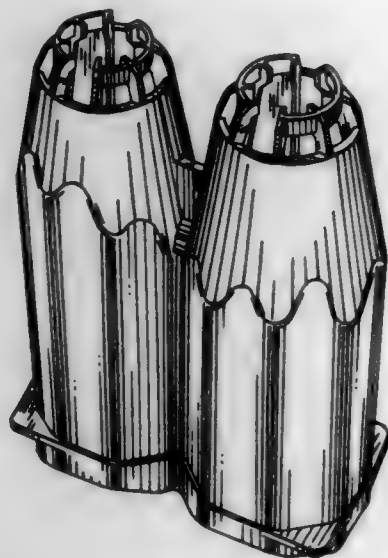


361,176

**BOTTLE POCKET FOR USE IN BOTTLE WASHING MACHINE**

Dean P. Schoenke, Menomonee Falls, Wis., assignor to D&L Manufacturing Company, Inc., Menomonee Falls, Wis.  
Filed May 20, 1993, Ser. No. 8,616  
Term of patent 14 years

U.S. Cl. D32—3

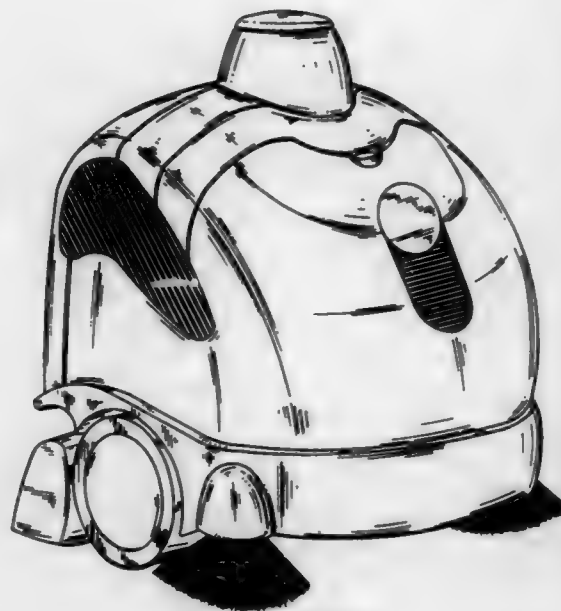


361,178

**ELECTRIC VACUUM CLEANER**

Philippe Piret, Iffs, France, assignor to Moulinex (Societe Anonyme), Bagnole, France  
Filed Jun. 2, 1994, Ser. No. 23,915  
Claims priority, application France, Dec. 9, 1993, 93 6450  
Term of patent 14 years

U.S. Cl. D32—21

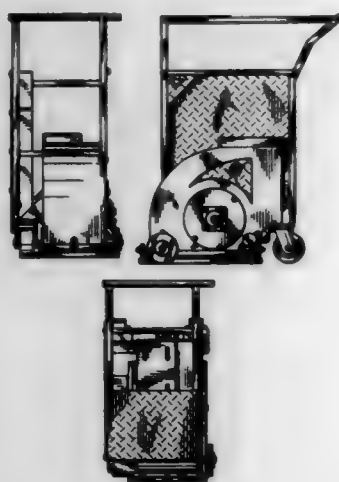


361,177

**SURFACE CLEANING APPARATUS**

Robert E. Hoover, 2837 Elsie Ave., Toledo, Ohio 43613  
Division of Ser. No. 517, Oct. 16, 1992. This application Mar. 2, 1994, Ser. No. 19,401  
Term of patent 14 years

U.S. Cl. D32—15



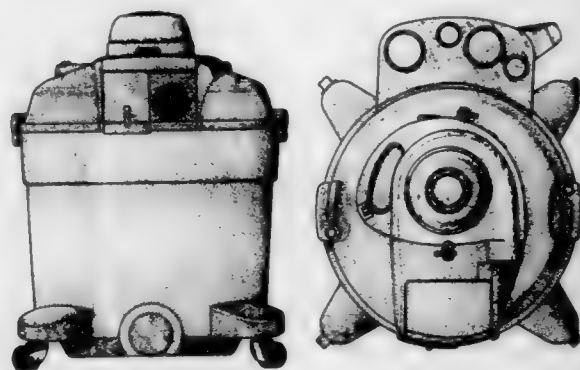
361,179

**COMBINED WET AND DRY VACUUM CLEANER**

David W. Moine, North Canton; Darwin T. McKnight, Louisville; Ronald J. Stephens, Rittman, and Richard A. Wareham, North Canton, all of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed May 19, 1993, Ser. No. 8,532  
Term of patent 14 years

U.S. Cl. D32—23



361,180

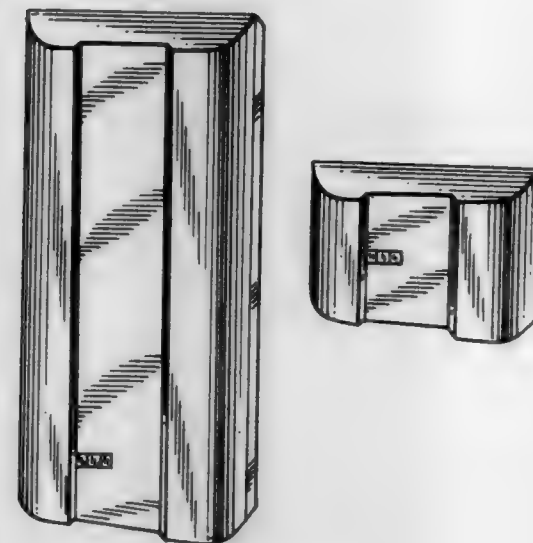
**COMBINED FOAM CLEANING AND DISINFECTING DISPENSER**

Hugo Van Der Zwan, Veenendaal, and Robert D. Hartoog, Woerden, both of Netherlands, assignors to Henkel-Ecolab B.V., Nieuwegein, Netherlands  
Filed Apr. 12, 1993, Ser. No. 7,023

Claims priority, application Benelux TM/Des. Off., Oct. 9, 1992, 68093-04; Oct. 9, 1992, 68093-05

Term of patent 14 years

U.S. Cl. D32—30



361,182

**COMBINED SQUEEGEE AND ICE SCRAPER**

Renald J. Ellul, 4015 Sashabaw, Waterford, Mich. 48329  
Filed Jul. 9, 1993, Ser. No. 10,541

Term of patent 14 years

U.S. Cl. D32—42



361,181

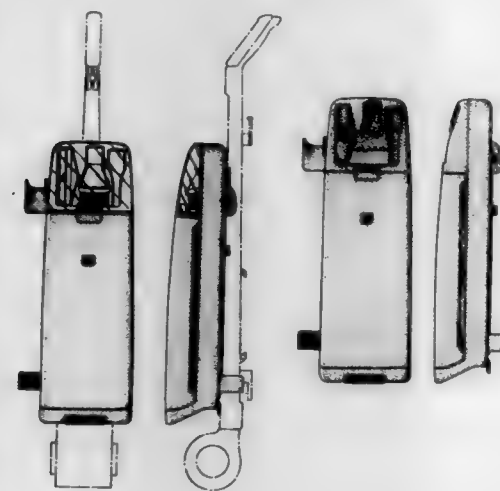
**VACUUM CLEANER UPPER PORTION**

Richard A. Wareham, North Canton, and Ronald J. Stephens, Rittman, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Mar. 22, 1994, Ser. No. 20,236

Term of patent 14 years

U.S. Cl. D32—31



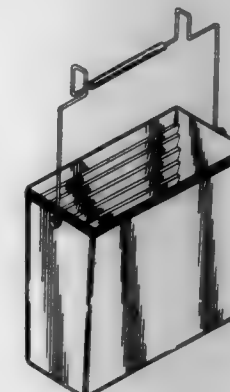
361,183

**UTILITY CONTAINER**

Craig Pilney, 7105 Eleanor Pl., Darien, Ill. 60561  
Filed Mar. 9, 1994, Ser. No. 19,732

Term of patent 14 years

U.S. Cl. D32—53

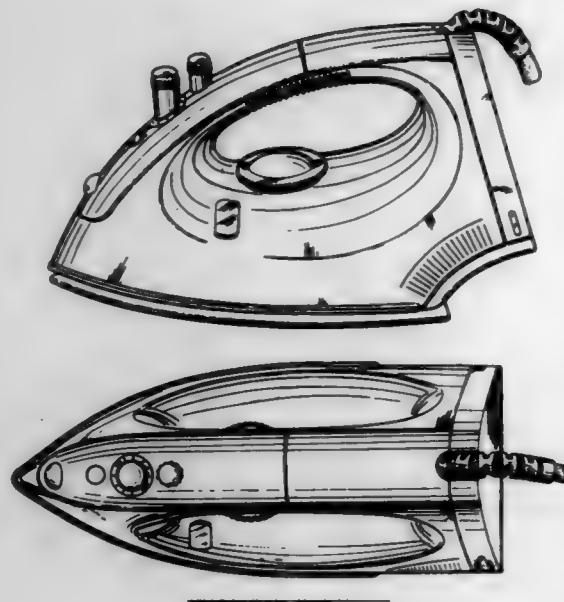




**361,184**  
**IRON**

Francisco G. Casuso Fuente, Valle De Trápaga, Spain, assignor to Oficina De Investigacion AG Rupada, S.A., Elbar, Spain  
Filed Jan. 21, 1993, Ser. No. 3,873  
Claims priority, application Spain, Jul. 21, 1992, 128.091  
Term of patent 14 years

U.S. Cl. D32—70



**361,186**  
**FRAME FOR A CART**

John A. Kowalski, Stephens City, and Thomas Perelli, Winchester, both of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.  
Filed Aug. 1, 1994, Ser. No. 26,577  
Term of patent 14 years

U.S. Cl. D34—12

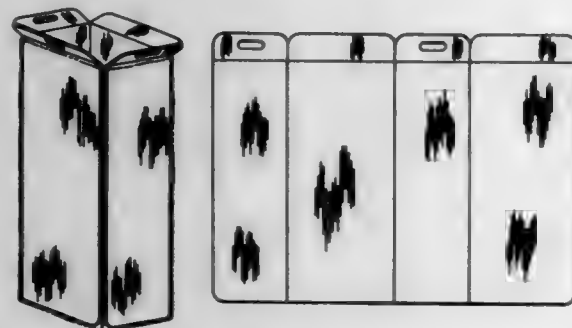


**361,185**

**BAG SUPPORT INSERT WITH FUNNEL TOP**

John R. Seiler, Des Peres, and Paul D. Benson, Grover, both of Mo., assignors to Seiler Plastics Corporation, Fenton, Mo.  
Filed Aug. 12, 1994, Ser. No. 27,057  
Term of patent 14 years

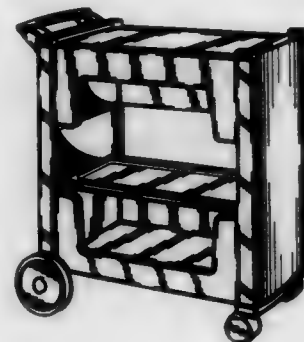
U.S. Cl. D34—05



**361,187**  
**SERVICE CART**

Rusty B. Snell, Maryville, Tenn., assignor to Rubbermaid Office Products Inc., Maryville, Tenn.  
Filed Jul. 7, 1994, Ser. No. 25,610  
Term of patent 14 years

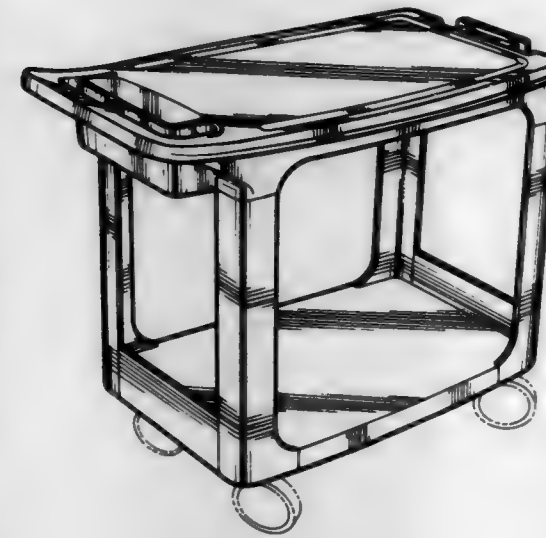
U.S. Cl. D34—21



**361,188**  
**CART**

Thomas Perelli, Winchester, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.  
Filed Aug. 19, 1994, Ser. No. 27,373  
Term of patent 14 years

U.S. Cl. D34—21

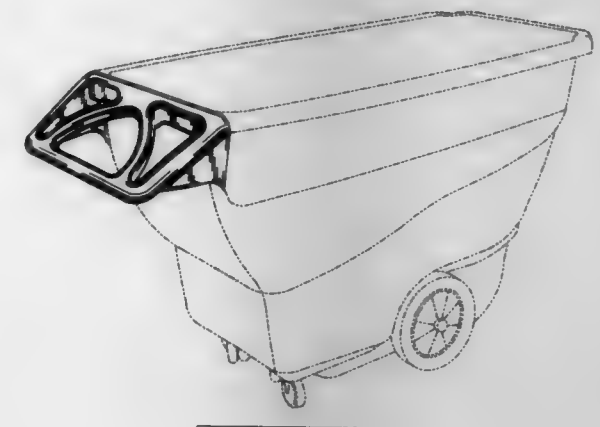


**361,190**

**HANDLE PORTION FOR A TILT TRUCK**

Eric Gingras, and Glen E. Tomblin, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.  
Filed Apr. 4, 1994, Ser. No. 20,848  
Term of patent 14 years

U.S. Cl. D34—27



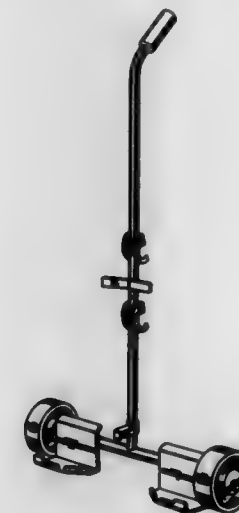
**361,189**

**HAND TROLLEY FOR A BARREL, CRATES OR A STACK OF CHAIRS, FOR EXAMPLE**

Jan Smeitink, Veenray, Netherlands, assignor to Business to Business Innovations B.V., Rotterdam, Netherlands  
Filed Apr. 22, 1994, Ser. No. 21,752  
Claims priority, application Hague Agreement, Oct. 22, 1993, 69178-02

Term of patent 14 years

U.S. Cl. D34—26



**361,191**

**TILT TRUCK**

John A. Kowalski, Stephens City, and Thomas Perelli, Winchester, both of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.  
Filed Aug. 1, 1994, Ser. No. 26,579  
Term of patent 14 years

U.S. Cl. D34—27



361,192

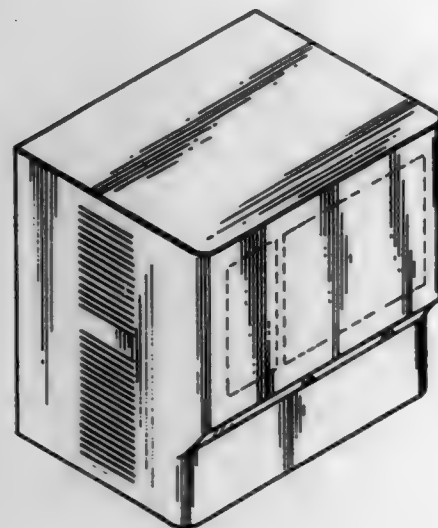
**AUTOMATIC TELLER MACHINE CABINET**

Ernest R. Dailman, Zionsville, and Franklin W. Wehr, Indianapolis, both of Ind., assignors to Dailman Industrial Corporation, Indianapolis, Ind.

Filed May 10, 1994, Ser. No. 22,639

Term of patent 14 years

U.S. Cl. D99—28



361,194

**TERMINAL FOR PNEUMATIC TUBE SYSTEM**

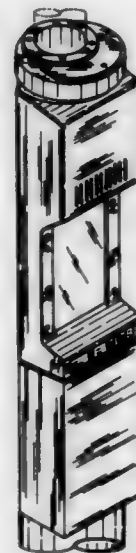
Leo J. Grosswiller, East Canton; Walter G. Anders, and Robert J. Beck, both of North Canton, all of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed Jun. 9, 1993, Ser. No. 9,219

The portion of the term of this patent subsequent to Nov. 2, 2007, has been disclaimed.

Term of patent 14 years

U.S. Cl. D99—35



361,195

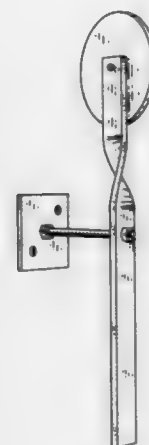
**AUTOMATIC UNIVERSAL MAIL BOX FLAG**

Robert Suta, 107 Wedgewood Ter., Hot Springs, Ark. 71901

Filed Jul. 19, 1994, Ser. No. 26,091

Term of patent 14 years

U.S. Cl. D95—43



361,193

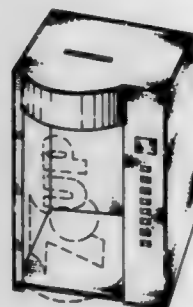
**COIN BANK**

William J. Stringfellow, Roselle, Ill., assignor to R-O International, Inc., Roselle, Ill.

Filed Apr. 19, 1994, Ser. No. 21,491

Term of patent 14 years

U.S. Cl. D99—34

**LIST OF PATENTEEES**

TO WHOM

**PATENTS WERE ISSUED ON THE 8TH DAY OF AUGUST, 1995**

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A.E. Bishop Associates PTY Limited: See—  
Bishop, Arthur E., 5,439,412, Cl. 451-227.000.
- A. P. Green Industries, Inc.: See—  
Wade, James A., 5,438,813, Cl. 52-747.130.
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Brock, Richard L.; and Abernethy, Tony, 5,439,083, Cl. 192-70.200.
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- Wyland, David C., 5,440,715, Cl. 395-435.000.
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- Aerospace Corporation, The: See—  
Dybdal, Robert B.; and Ott, Randolph H., 5,440,308, Cl. 342-17.000.
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Hunniger, Heinrich; and Drechsler, Walter, 5,440,370, Cl. 355-55.000.
- AGFA-Gevaert N. V.: See—  
Tack, Henri M.; and Govaert, Renee R., 5,440,684, Cl. 395-164.000.
- Agfa-Gevaert, N.V.: See—  
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- Agostini, Giorgio; Christiaens, Leon E. E.; Frank, Uwe E.; Materne, Thierry F. E.; Tadino, Vincent L. A.; Vial, Friedrich; and Zimmer, Rene J., to Goodyear Tire & Rubber Company, The Process for the preparation of organosilicon disulfide compounds, 5,440,064, Cl. 556-427.000.
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- Agui, Toshiaki: See—  
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- Ahlkog, Chris V. Control station cover, 5,439,127, Cl. 220-3.700.
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- Ahn, Kwang-Hyun: See—  
Villacorta, Gilberto M.; Ahn, Kwang-Hyun; and Lippard, Stephen J., 5,440,062, Cl. 556-33.000.
- Ahn, Sung Ae; and Lee, Young Deug, to Ahn, Sung Ae. Process for manufacturing gasified candy. 5,439,698, Cl. 426-572.000.
- Ahr, Nicholas A.: See—  
Noel, John R.; and Ahr, Nicholas A., 5,439,458, Cl. 604-378.000.
- Ahuja, Om. Apparatus for protecting, monitoring, and managing an AC/DC electrical line or a telecommunication line using a micro-processor. 5,440,441, Cl. 361-62.000.
- Aichi Machine Industry Co., Ltd.: See—  
Yamada, Masahiko; Onuki, Wataru; Okahara, Hirofumi; and Mochizuki, Nobuaki, 5,439,419, Cl. 474-18.000.
- Aicho Electric Co., Ltd.: See—  
Higuchi, Mitsuhiro; Mizoguchi, Shigeru; Yamashita, Naoki; and Adachi, Takayoshi, 5,438,711, Cl. 4-243.300.
- Aigo, Takashi: See—  
Tachikawa, Akiyoshi; Jono, Aiji; Aigo, Takashi; and Moritani, Akihiro, 5,438,951, Cl. 117-84.000.
- Aimpoint AB: See—  
Montelin, Per; and Stenberg, Lars, 5,440,387, Cl. 356-251.000.
- Air Products and Chemicals, Inc.: See—  
Richards, Robin E.; Iampietro, Robert L.; and Dyer, Paul N., 5,439,706, Cl. 427-244.000.
- Air Turbine Technology, Inc.: See—  
Bowser, Gregory A.; and McCollough, Edward C., 5,439,346, Cl. 415-18.000.
- Aisin Seiki Kabushiki Kaisha: See—  
Mizuno, Sadao; and Hoshino, Akinori, 5,439,293, Cl. 384-9.000.
- Ajinomoto Co., Inc.: See—  
Yokota, Tadahiko; Sakata, Hiroyuki; Hirai, Kiyomiki; and Takeuchi, Koji, 5,439,977, Cl. 525-113.000.
- Akaboshi, Naoki: See—  
Yokota, Haruo; Kitakami, Hajime; Noguchi, Yasuo; and Akaboshi, Naoki, 5,440,743, Cl. 395-650.000.
- Akade, Masanori: See—  
Ito, Yoshikazu; Akade, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 5,439,872, Cl. 503-227.000.
- Akahoshi, Haruo: See—  
Miyazaki, Masashi; Akahoshi, Haruo; Nohara, Shozo; Kikuta, Kenji; and Ishimaru, Toshiaki, 5,438,751, Cl. 29-847.000.
- Akamaru, Hidefumi, to Shibuya Kogyo Co., Ltd. Apparatus for automatic remodelling of article processing system. 5,440,494, Cl. 164-461.000.
- Akasaka, Hideki: See—  
Sato, Masatoshi; Saito, Jun; and Akasaka, Hideki, 5,440,531, Cl. 369-13.000.
- Akashi, Reiko: See—  
Iwasaki, Hitoshi; and Akashi, Reiko, 5,439,754, Cl. 428-692.000.
- Akbar, Sheikh A.; Azad, Abdul M.; and Younkman, Lora B., to Ohio State University, The. Solid-state gas sensor for carbon monoxide and hydrogen. 5,439,580, Cl. 204-425.000.
- Akhavan-Tafii, Hashem, to Lumigen, Inc. Polymeric phosphonium salts providing enhanced chemiluminescence from 1,2-dioxetanes. 5,439,617, Cl. 252-700.000.
- Akiyama, Daisaku; and Maki, Yoshiro, to MEC Co., Ltd. Composition for treating copper or copper alloys. 5,439,783, Cl. 430-331.000.
- Akiyama, Masaki: See—  
Onitsuka, Shigenori; Ichiki, Masayoshi; Inazumi, Chikashi; Watanabe, Takanobu; Fukuj, Atsushi; Akiyama, Masaki; Sairyu, Yuki; and Kobayashi, Hidetsugu, 5,439,868, Cl. 502-415.000.
- Akiyama, Ryota; Hasebe, Takayuki; and Yoshioka, Makoto, to Fujitsu Limited. Information distribution system wherein storage medium storing ciphered information is distributed. 5,440,631, Cl. 380-4.000.
- Akiyama, Tadahiko, to Nippon Communication Industrial Co., Ltd. Personal-servicing communication system. 5,440,625, Cl. 379-216.000.
- Aktiebolaget Astra: See—  
Briving, Carin; Carlsson, Stig; Carter, Robert; Elebring, Marie; Kuhler, Thomas; Nordberg, Peter; Starke, Ingemar; and Svensson, Arne, 5,439,917, Cl. 514-300.000.
- Aktiebolaget Electrolux: See—  
Aronson, Tore; and Donnerdal, Ove, 5,438,965, Cl. 123-198.00E.
- Akzo Nobel N.V.: See—  
Cheron, Teresa M.; Hanna, Paul K.; and Peterson, Claude B., 5,440,010, Cl. 528-392.000.
- Alappat, Kuriappan P.; Ayerill, Edward E.; and Larsen, James G., to Tektronix, Inc. Raster scan waveform display rasterizer with pixel intensity gradation. 5,440,676, Cl. 395-143.000.
- Alattar, Adnan; and Keith, Michael, to Intel Corporation. Mode selection for method and system for encoding images. 5,440,346, Cl. 348-420.000.
- Albajar, Manuel: See—  
Pastor, Henri; Allibert, Colette; Ottavi, Laurent; Albajar, Manuel; and Castro-Fernandez, Francisco, 5,439,499, Cl. 75-232.000.
- Albert-Frankenthal Aktiengesellschaft: See—  
Knoll, Wolfgang; and Mages, Klaus, 5,438,924, Cl. 101-153.000.
- Albert, Michael, to Deutsche IFT Industries GmbH. Clock-generating circuit for clock-controlled logic circuits. 5,440,250, Cl. 326-97.000.
- Albright & Wilson Limited: See—  
Archer, Adrian; and Zakikhani, Mohsen, 5,439,999, Cl. 526-278.000.
- Alcan International Limited: See—  
Sivilotti, Olivo G., 5,439,563, Cl. 204-70.000.
- Alcatel Cit: See—  
Barthod, Benoit; Chicherie, Jean-Pierre; and Perrillat-Amede, Denis, 5,439,357, Cl. 417-410.300.
- Morin, Stephane; and Giraud, Franck, 5,440,113, Cl. 250-205.000.
- Alcatel Components Limited: See—  
Weiss, Christopher J.; and van Emmerik, David L., 5,439,388, Cl. 439-417.000.
- Alcatel N.V.: See—  
Denissen, Frank L., 5,440,548, Cl. 370-60.000.
- Sevenhans, Joannes M. J.; and Van Paemel, Mark G. S. J., 5,440,264, Cl. 327-553.000.
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Hall, John C.; and Petersen, Lee B., Jr., 5,439,342, Cl. 414-545.000.
- Allen, Peter A., to Unique Products, Inc. Method for removing chemical contaminants from material and apparatus for same. 5,439,597, Cl. 210-767.000.
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- Allibert, Colette: See—  
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- Allied-Signal Inc.: See—  
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- Allvine, Elmer C., Jr. Composite magnet brushless DC motor. 5,440,185, Cl. 310-156.000.
- Almatec Technische Innovationen GmbH: See—  
Budde, Dirk, 5,438,913, Cl. 92-98.00R.
- Almen, Torsten; Berg, Arne; Dugstad, Harald; Klaveness, Jo; Krautwurst, Klaus D.; and Rongved, Pal, to Nycomed Imaging AS. Heterocyclic chelating agents. 5,439,668, Cl. 424-9.361.
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- Wood, Irwin B.; and Pankavich, John A., 5,439,934, Cl. 514-450.000.
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- American Greetings Corporation: See—  
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- American Harvest, Inc.: See—  
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- American Tectrade Enterprises, Inc.: See—  
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- AMF Bowling, Inc.: See—  
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- Amp Plus, Inc.: See—  
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- Amrhein, Gerald T.: See—  
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- Amsted Industries Incorporated: See—  
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- Amtech Corporation: See—  
Clarke, Richard E., 5,438,713, Cl. 4-663.000.
- Analog Devices Inc.: See—  
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- Analytical Technology, Inc.: See—  
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- Andersen Corporation: See—  
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- Andersen, Erik; and Quinn, David G., to Corpak, Inc. Pre-formed member for percutaneous catheter. 5,439,444, Cl. 604-96.000.
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- Anderson, James R., to Evergreen Tool Company, Inc. Belt and buckle combination including dual ring fastener. 5,438,734, Cl. 24-170.000.
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- Apple Computer, Inc.: See—  
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- Wilson, David F.; and Heyl, Lawrence F., 5,440,643, Cl. 381-119.000.
- Appling, William M.: See—  
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- Appolonia, John: See—  
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- APV Chemical Machinery Inc.: See—  
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- Aqua Buoyz, Inc.: See—  
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- Arai, Masatoshi: See—  
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- Araya, Yukihiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated comparator circuit. 5,440,253, Cl. 327-69.000.
- Archer, Adrian; and Zakikhani, Mohsen, to Albright & Wilson Limited. Bulk polymerisation process and product. 5,439,999, Cl. 526-278.000.
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Spindel, Eliot R.; Nagalla, Srinivasa R.; Vijayaraghavan, Srinivasa; and Archibong, Anthony, 5,439,884, Cl. 514-12.000.
- Arco Chemical Technology, L.P.: See—  
Wong, Tim T.; and Candela, Lawrence M., 5,439,657, Cl. 423-54.000.
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- Arita, Hitoshi: See—  
Ito, Yoshikazu; Akade, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 5,439,872, Cl. 503-227.000.
- Arita, Koji: See—  
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Anshel, Michael M.; Gertner, Izidor C.; Goldfeld, Dorian; and Klebansky, Boris A., 5,440,640, Cl. 380-46.000.
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- Arthurs, Scott A.: See—  
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- Art, David W., to Rolls-Royce, plc. Heat pipes. 5,439,351, Cl. 416-95.000.
- Asahi Glass Company, Ltd.: See—  
Ito, Haruki; Maeda, Kenzo; Miyazaki, Nobuyuki; Unoki, Masao; Sagawa, Chiaki; and Kamba, Motoi, 5,439,896, Cl. 525-107.000.
- Asahi Kogaku Kabushiki Kaisha: See—  
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- Asai, Akira: See—  
Nakagawa, Susumu; Asai, Akira; Kuroyanagi, Satoru; Ishihara, Makoto; and Tanaka, Yoshiharu, 5,440,049, Cl. 549-49.000.
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- Ashcraft, David N.: See—  
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- Asmus, Robert A.: See—  
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- Bergano, Neal S.; and Kim, Kwang S., 5,440,659, Cl. 385-100.000.
- Boyle, Valerie Y.; Martin, Ronald B.; and Swanson, Robert A., 5,440,626, Cl. 379-219.000.
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- Caccuro, John A.; and Slusky, Ronald D., 5,440,615, Cl. 379-67.000.
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- Fuentes, James J., 5,440,613, Cl. 379-60.000.
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- Jalloul, Amer; and Mayo, John S., 5,440,317, Cl. 343-791.000.
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- Kaplow, Wesley K.; and Pimpinella, Richard J., 5,440,655, Cl. 385-25.000.
- Laukzemis, Daniel A., 5,439,395, Cl. 439-668.000.
- MacDowell, Alastair A.; and White, Donald L., 5,439,781, Cl. 430-311.000.
- Magdaleno, Jose L., 5,439,396, Cl. 439-716.000.
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- North, Robert R., 5,439,634, Cl. 264-334.000.
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- Sukkar, Rafid A., 5,440,662, Cl. 395-2.450.
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- ATA Bygg-och Markprodukter AB: See—  
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- Athena Design Systems, Inc.: See—  
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- ATI Technologies Inc.: See—  
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- Atlantek, Inc.: See—  
Nardone, Edward A.; Follett, Paul S.; Schofield, Harry D.; Caron, Paul R.; and Rothwell, Chris S., 5,440,328, Cl. 347-173.000.
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- Dey-Sarkar, Samir K.; Foster, Douglas J.; Smith, Steven W.; and Swan, Herbert W., 5,440,525, Cl. 367-52.000.
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- Pathak, Saroj; and Payne, James E., 5,440,508, Cl. 365-154.000.
- Atochem: See—  
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- Attig, Thomas G.: See—  
Blackman, Marc W.; Cesa, Mark C.; and Attig, Thomas G., 5,440,068, Cl. 558-435.000.
- Atwood, Gregory E.: See—  
Fazio, Albert; Atwood, Gregory E.; and Mi, James Q., 5,440,505, Cl. 365-45.000.
- Audit, Thomas E.; and West, Jon K., to EV Energy Systems, Ltd. Apparatus for making an electrical energy storage device. 5,439,488, Cl. 29-730.000.
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- Auer, Wolfgang: See—  
Lipsius, Johann M.; and Auer, Wolfgang, 5,438,932, Cl. 105-168.000.
- Lipsius, Johann M.; and Auer, Wolfgang, 5,438,933, Cl. 105-168.000.
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Ellis, William H.; and Hopper, Scott R., 5,439,386, Cl. 439-322.000.
- Augros, Jacques J., to S S P L Safe Sex Products Licensing Societe Anonyme. Pharmaceutical composition for the prevention of sexually transmitted diseases. 5,439,685, Cl. 424-430.000.
- Augustine, Kurt E.; Neeley, James Edward, Sr.; and Strole, Norman Clark, to International Business Machines Corporation. Communication network access method and system. 5,440,633, Cl. 380-23.000.
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- Autrata, Jochen: See—  
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- Avery Dennison Corp.: See—  
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- Avid Technology, Inc.: See—  
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- AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik mbH Prof. Dr.Dr.h.c.Hans List: See—  
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- Avon Plastics, Inc.: See—  
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- Ayerill, Edward E.: See—  
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- Azad, Abdul M.: See—  
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- Azuma, Junzou: See—  
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- B.J. Driessen & Zn. B.V.: See—  
Driessen, Johannes W. J., 5,439,148, Cl. 222-402.100.
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- Bailey, Thomas W.: See—  
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- Baker Hughes Incorporated: See—  
Kennedy, Brian S.; Zimmerman, Patrick; and Emerson, Alan B., 5,439,051, Cl. 166-50.000.
- Baker, Michael V. Memory tuning system for stringed instruments. 5,438,902, Cl. 84-312.00R.
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- Baldwin, John J.: See—  
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- Bauer Industries, Inc.: See—  
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- Bauer Kaba AG: See—  
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- Bull HN Information Systems Inc.: See—  
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- Bull, John: See—  
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Evans, Joseph T., Jr.; and Bullington, Jeff A., 5,440,173, Cl. 257-751.000.

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Bumgardner, James A.: See—  
Case, Michael B.; La Joie, Michael L.; Klappert, Walter R.; and Bumgardner, James A., 5,440,677, Cl. 395-154.000.

Bunyard, Marc R.: See—  
Jimison, Walter L.; Barker, Craig S.; and Bunyard, Marc R., 5,439,355, Cl. 417-63.000.

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Weller, Hugo; Tauber, Peter; Balzer, Knut; and Burger, Wilfried, 5,440,725, Cl. 395-185.080.

Burke, David W. Surface mounted collapsible mooring cleat and housing. 5,438,944, Cl. 114-218.000.

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Little, Roger G.; and Burke, Edward A., 5,440,187, Cl. 310-303.000.

Burklund, Sidney A.; and Olson, Terry D., to Filtercorp Partners L.P. Method of filtering using a commercial filtering system. 5,439,601, Cl. 2115-798.000.

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Snyder, Solomon H.; Burnett, Arthur L.; Lowenstein, Charles J.; Bredt, David S.; and Chang, Thomas S. K., 5,439,938, Cl. 514-565.000.

Burns, Stanley G.; and Weber, Robert J., to Iowa State University Research Foundation, Inc. Non-crystalline silicon active device for large-scale digital and analog networks. 5,440,150, Cl. 257-57.000.

Burr, Lynn E. Process for treatment of volcanic igneous rocks to recover gold, silver and platinum. 5,439,503, Cl. 75-421.000.

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Spence, Hugh F.; Burris, Daniel P.; and Houston, Robert A., 5,440,566, Cl. 374-41.000.

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Mar, Craig E.; Pless, Benjamin D.; and Bush, M. Elizabeth, 5,439,485, Cl. 607-119.000.

McEtchin, Stanley D.; Romke, D. Scott; and Bush, M. Elizabeth, 5,439,391, Cl. 439-518.000.

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Butterfield, Robert D.; and Drzewiecki, Gary M., to IVAC Corporation. Flexible diaphragm tonometer. 5,439,001, Cl. 128-672.000.

Buyach, Hans-Josef; Schon, Norbert; Kuhling, Steffen; and Hahnsen, Heinrich, to Bayer Aktiengesellschaft. Process for splitting polycarbonates. 5,440,066, Cl. 558-277.000.

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Martin, Paul C.; and Buzak, Thomas S., 5,440,201, Cl. 313-582.000.

Byron, David: See—  
Bassell, Marvin; Byron, David; and Catanzaro, Robert J., 5,438,895, Cl. 81-451.000.

C & K Systems, Inc.: See—  
Mueller, Dennis R.; and Sandell, Donald R., 5,438,869, Cl. 73-431.000.

Cabeza, Antonio B.: See—  
Kelly, Bernard J.; and Cabeza, Antonio B., 5,438,718, Cl. 5-477.000.

Caccuro, John A.; and Slusky, Ronald D., to AT&T Corp. Language selection for voice messaging system. 5,440,615, Cl. 379-67.000.

Cadence Design Systems, Inc.: See—  
Baisuck, Allen; Fairbank, Richard L.; Gowen, Walter K., III; Henriksen, Jon R.; Hoover, William W., III; Huckabay, Judith A.; Rogoyaki, Eric; and Salecker, Anton G., 5,440,720, Cl. 395-500.000.

Hanes, Charles F.; and Mick, Colin K., 5,440,719, Cl. 395-500.000.

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Gehin, Guy M.; and Caillault, Oliver A. G., 5,439,599, Cl. 210-748.000.

Caille, Jean-Claude: See—  
Wagner, Adalbert; Henning, Rainer; Gerhards, Hermann; Scholtens, Bernhard; Vever, Jean-Paul; and Caille, Jean-Claude, 5,440,046, Cl. 548-322.500.

Cain, Frederick W.; Hughes, Adrian D.; and Slager, Hendrikus, to Van den Bergh Foods Co., Division of Conopco, Inc. Non-hydrogenated coating fat. 5,439,700, Cl. 426-607.000.

Cain, John L.; Relue, Michael P.; Costabile, Michael E.; and Marsh, William P., to VLSI Technology, Inc. Plasma processing apparatus. 5,439,524, Cl. 118-723.000.

CalComp Inc.: See—  
Stevens, Wayne R., 5,440,327, Cl. 346-46.000.

Caldwell, Bruce D.; and Duncan, Paul D., to Oceaneering International, Inc. Apparatus for storing and delivering liquid cryogen and apparatus and process for filling same. 5,438,837, Cl. 62-50.100.

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Sherbondy, Ann M.; and Vanderpool, Daniel P., 5,439,611, Cl. 252-180.000.

California Amplifier: See—  
Raymond, Joel J.; and Crawford, Lawrence G., 5,440,319, Cl. 343-833.000.

Calsonic Corporation: See—  
Fukae, Yasuo, 5,438,828, Cl. 60-302.000.

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Caprara, Paolo; and Camerlenghi, Emilio, 5,440,510, Cl. 365-185.000.

Camiener, Gerald W. Method for preserving tissue for microscopic examination using an osmotically controlled glyoxal solution. 5,439,667, Cl. 435-40.500.

Campas, Jean-Jacques, to Sollac (Societe anonyme). Method and device for calibrating an apparatus for measuring the thickness of a sheet of material. 5,440,386, Cl. 356-243.000.

Campbell, Carolyn E.: See—  
Richards, Geoffrey N.; and Campbell, Carolyn E., 5,439,893, Cl. 514-53.000.

Campbell, Samuel. Extendable carrier rack for pick-up trucks. 5,439,152, Cl. 224-405.000.

Camplin, Kenneth R.: See—  
Geier, Daniel P.; and Camplin, Kenneth R., 5,439,157, Cl. 228-9.000.

Camus, Patrick P.: See—  
Kelly, Thomas F.; Camus, Patrick P.; Larson, David J.; Holzman, Louis M.; and Bajkar, Sateeshchandra S., 5,440,124, Cl. 250-309.000.

Canadian Boomstick Company Ltd.: See—  
MacKenzie, Kirk J.; and Liang, William W. G., 5,439,315, Cl. 405-60.500.

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Duck, Thomas S., 5,440,106, Cl. 235-3.000.

Candela, Lawrence M.: See—  
Wong, Tim T.; and Candela, Lawrence M., 5,439,657, Cl. 423-54.000.

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Cann, Peter E., to Zoom Telephonics, Inc. Voice, data and facsimile modem with modified ringback answering. 5,440,619, Cl. 379-97.000.

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Aoki, Akio, 5,440,432, Cl. 360-32.000.

Baba, Yoshinobu; Amano, Yasuko; and Itabashi, Hitoshi, 5,439,771, Cl. 430-106.600.

Fukui, Hajime, 5,440,212, Cl. 318-116.000.

Kashiwazaki, Akio; Suga, Yuko; and Takaida, Aya, 5,439,514, Cl. 106-20.000.

Kawada, Haruki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Noe, Hiroyasu, 5,439,777, Cl. 430-270.000.

Kisu, Hiroki, 5,440,374, Cl. 355-219.000.

Kobayashi, Katsuyuki; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; and Tokioka, Masaki, 5,438,872, Cl. 73-597.000.

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Mouri, Akihiro; Toyono, Tsutomu; Kaneko, Shuzo; Inaba, Yutaka; and Kanbe, Junichiro, 5,440,412, Cl. 359-56.000.

Nagashima, Masaaki; Yamakawa, Tadashi; Sasaki, Takayuki; Okuno, Yasuhiro; and Kurosawa, Takahiro, 5,440,731, Cl. 395-600.000.

Noguchi, Hiromichi, 5,439,956, Cl. 522-92.000.

Noe, Noriyuki; Saito, Kenji; and Amemiya, Mitsuaki, 5,440,394, Cl. 356-384.000.

Okamura, Ryuji; Otsu, Hirokazu; and Takei, Tetsuya, 5,439,715, Cl. 427-575.000.

Ono, Kazuya; and Yamane, Yukio, 5,440,397, Cl. 356-401.000.

Ono, Takeo; and Nitta, Jun, 5,440,581, Cl. 372-96.000.

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Sakaguchi, Kiyofumi; Yonehara, Takao; and Miyawaki, Mamoru, 5,439,843, Cl. 437-71.000.

Sakai, Akira, 5,439,844, Cl. 437-83.000.

Suda, Yasuo, 5,440,367, Cl. 354-402.000.

Sugishima, Kiyohisa, 5,440,410, Cl. 358-502.000.

Takeda, Kenji, 5,440,380, Cl. 355-271.000.

Tamura, Hideo; and Murakami, Keichi, 5,439,554, Cl. 216-16.

Taya, Masaaki; Kohtaki, Takaaki; Unno, Makoto; and Doujo, Tadashi, 5,439,770, Cl. 430-106.000.

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Haynes, Joel; Klein, Michel H.; Rovinski, Benjamin; and Cao, Shi X., 5,439,809, Cl. 435-69.300.

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Carangelo, Robert M.; and Wright, David D., to On-Line Technologies, Inc. Folded-path optical analysis gas cell. 5,440,143, Cl. 250-573.000.

Card, Roger J.; Feraud, Jean-Pierre; and Howard, Paul R., to Dowell, a Division of Schlumberger Technology Corp. Control of particulate flowback in subterranean wells. 5,439,055, Cl. 166-280.000.

Cardello, John: See—  
Ciecwis, Richard A.; and Cardello, John, 5,440,295, Cl. 340-573.000.

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Hendrickson, Dennis L.; Dimmitt, Dan C.; Williams, Mark S.; Skultety, Paul F.; and Baltezer, Michael J., 5,439,689, Cl. 424-490.000.

Cardinal IG Company: See—  
Larsen, James E., 5,439,716, Cl. 428-34.000.

Cari-All Inc.: See—  
Trubiano, Antoine, 5,439,253, Cl. 280-801.100.

Carl Freudenberg, Firma: See—  
Kurr, Klaus; Spies, Karl-Heinz; and Meinig, Uwe, 5,438,969, Cl. 123-549.000.

Carlisle Coatings & Water Proofing, Incorporated: See—  
Flanagan, Roy C.; and Stauffer, G. Richard, 5,439,319, Cl. 405-152.000.

Carlisle, Steven N.: See—  
Grimsley, Richard L.; and Carlisle, Steven N., 5,439,441, Cl. 604-26.000.

Carlisle, William D., to BP Chemicals (Additives) Limited. Lubricating oil additives, their preparation and use. 5,439,603, Cl. 252-51.50A.

Carlson, David A.: See—  
Borovsky, Dov; and Carlson, David A., 5,439,821, Cl. 435-240.400.

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Anderson, Matts; Carlsson, Lennart; and Isberg, Erik, 5,440,496, Cl. 364-474.050.

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Briving, Carin; Carlsson, Stig; Carter, Robert; Elebring, Marie; Kuhler, Thomas; Nordberg, Peter; Starke, Ingemar; and Svensson, Arne, 5,439,917, Cl. 514-300.000.

Carmeli, Shmuel: See—  
Patterson, Gregory M. L.; Moore, Richard E.; Carmeli, Shmuel; Smith, Charles D.; and Kimura, Lucille H., 5,439,933, Cl. 514-450.000.

Carmichael, James: See—  
Manganaro, James L.; Sacks, Martin E.; and Carmichael, James, 5,439,663, Cl. 423-521.000.

Carmichael, Tim; Padmanabhan, Gobi; Yee, Abraham; and Yeh, Stanley, to LSI Logic Corporation. Non-rectangular MOS device configurations for gate array type integrated circuits. 5,440,154, Cl. 257-206.000.

CarnaudMetalBox plc: See—  
Brownbill, Thomas D., 5,439,126, Cl. 215-344.000.

Carnegie Mellon University: See—  
Bianchini, Ronald P., Jr.; and Kim, Hyong S., 5,440,546, Cl. 370-60.000.

Caron, Paul R.: See—  
Nardone, Edward A.; Follett, Paul S.; Schofield, Harry D.; Caron, Paul R.; and Rothwell, Chris S., 5,440,328, Cl. 347-173.000.

Carondelet Foundry Company: See—  
Fesler, Dennis J., 5,439,751, Cl. 428-614.000.

Carpio, Ronald A., to Sematech, Inc. Concentration measurement and control of hydrogen peroxide and acid/base component in a semiconductor bath. 5,439,569, Cl. 204-153.100.

Carr, D. Patrick; and Hill, Kurt J., to Censcorp, Inc. Reconfigurable fixturing pallet for registering and supporting multi-board panels on the table of a programmable routing machine. 5,438,740, Cl. 29-33.00P.

Carrafiello, Michel W.; Niskala, Walter K.; and Brown, Benjamin J., to Digital Equipment Corporation, Pat. Law Group. System for minimizing underflowing transmit buffer and overflowing receive buffer by giving highest priority for storage device access. 5,440,691, Cl. 395-250.000.

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Barito, Thomas R., 5,439,360, Cl. 418-55.500.

Cahill-O'Brien, Barry P.; Nevin, Michael W.; and Sullivan, Dennis W., 5,438,841, Cl. 62-78.000.

Reynolds, Ernest F.; and Wilson, James C., 5,439,361, Cl. 418-55.600.

Waterman, Timothy J.; Rieke, Larry D.; and Keys, Delbert G., 5,439,050, Cl. 165-170.000.

Carrin, Thomas P.: See—  
Farinelli, Robert; and Carrin, Thomas P., 5,440,644, Cl. 381-81.000.

Carroll, Bill E., to AT&T Corp. Knife pen for program-controlled plotters. 5,438,896, Cl. 83-76.100.

Carroll, Douglas G.: See—  
Zapletal, Jiri, 5,440,094, Cl. 219-121.520.

Carroll Equipment Sales Corporation: See—  
Carroll, Timothy, 5,438,723, Cl. 5-620.000.

Carroll, Max L., Jr., to Eastman Chemical Company. System for determining stretch characteristics of thermoplastic articles. 5,438,878, Cl. 73-788.000.

Carroll, Timothy, to Carroll Equipment Sales Corporation. Collapsible bed and panel hinge. 5,438,723, Cl. 5-620.000.

Carter, Robert: See—  
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Sisbarro, Frederick P.; and Thomsen, Glenn W., 5,438,861, Cl. 73-40.000.

Carter, Wallace T. Display system. 5,439,043, Cl. 160-135.000.

Cartosai, Ferdinando, to Cartosai S.r.l. Method for forming a stainless steel cooking utensil with a decorated base. 5,439,165, Cl. 228-265.000.

Cartosai S.r.l.: See—  
Cartosai, Ferdinando, 5,439,165, Cl. 228-265.000.

Casara, Patrick, to Merrell Dow Pharmaceuticals Inc. Process for preparing 4-amino-5-hexenoic acid. 5,440,065, Cl. 558-6.000.

Case, Michael B.; La Joie, Michael L.; Klappert, Walter R.; and Bumgardner, James A., to Time Warner Interactive Group Inc. Method and apparatus for processing audio and graphic images to create an interleaved file suitable for use as a CD-ROM product. 5,440,677, Cl. 395-154.000.

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Gal, Roy, 5,439,740, Cl. 428-372.000.

Casey, David N.: See—  
Finney, Adrian D.; and Casey, David N., 5,440,164, Cl. 257-378.000.

Casey, Jon A.: See—  
Bezama, Raashid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Fraze, Katharine G.; Gabriels, David H.; Heron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillito, Robert M.; Sara, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.

Casio Computer Co., Ltd.: See—  
Kikuchi, Zenta; and Miyashita, Takashi, 5,440,413, Cl. 359-73.000.

Okamoto, Tetsushi, 5,440,527, Cl. 368-80.000.

Saito, Hirokazu; and Iijima, Takeshi, 5,440,451, Cl. 361-760.000.

Cass, Bryan W.: See—  
Khare, Gyanesh P.; and Cass, Bryan W., 5,439,867, Cl. 502-407.000.

Castle, George S. P.: See—  
Kodama, Jun; Foerch, Renate; McIntyre, N. Stewart; and Castle, George S. P., 5,439,984, Cl. 525-332.800.

Castonguay, Roger N.: See—  
Ferullo, David A.; Morgan, Roger J.; Rosen, James L.; DeRosier, Donna; and Castonguay, Roger N., 5,440,284, Cl. 335-202.000.

Castor, Trevor P., to Aphios Corporation. Method and apparatus for extracting taxol from source materials. 5,440,055, Cl. 549-510.000.

Castro-Fernandez, Francisco: See—  
Pastor, Henri; Allibert, Colette; Ottavi, Laurent; Albajar, Manuel; and Castro-Fernandez, Francisco, 5,439,499, Cl. 75-232.000.

Castro, Peter D., to International Integrated Communications, Ltd. Apparatus for prepayment of telecommunication connections in a telecommunication switching network without utilization of rate schedules and call cost computations. 5,440,621, Cl. 379-112.000.

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Shaw, David G.; Dawson, Eric; Cline, Daniel; and Langlois, Marc, 5,440,446, Cl. 361-301.500.

Catanzaro, Robert J.: See—  
Bassell, Marvin; Byron, David; and Catanzaro, Robert J., 5,438,895, Cl. 81-451.000.

Caterpillar Inc.: See—  
Fletcher, Rodney D.; and Cressy, David P., 5,438,774, Cl. 37-456.000.

Sahn, W. Charles; Gudat, Adam J.; and Henderson, Daniel E., 5,438,771, Cl. 37-348.000.

Simmons, Gerald P., 5,438,887, Cl. 74-335.000.

Tonsor, Andrew J., 5,438,912, Cl. 92-54.000.

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Belisle, William W.; Catone, Robert A.; McCartney, John C.; and Zeller, Robert D., 5,440,466, Cl. 362-222.000.

Caupin, Henri-Jean; and Menassa, Aim., to Elf Atochem S.A.; and Delta Agro Industries. Undecylenate deodorization of paper mill effluents. 5,439,641, Cl. 422-5.000.

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Cell Therapeutics, Inc.: See—  
Leigh, Alistair; and Underiner, Gail, 5,440,041, Cl. 544-267.000.

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Carr, D. Patrick; and Hill, Kurt J., 5,438,740, Cl. 29-33.00P.

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Nishimura, Yasunobu; Ishii, Akihiro; Morino, Yuzuru; and Kikuchi, Yoshiyuki, 5,440,047, Cl. 546-344.000.

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Meyer, George G.; Meyer, Stephen J.; and Reilly, William J., 5,439,028, Cl. 137-556.000.

Centre International de Recherches Dermatologiques Galderma (Cird Galderma): See—  
Bernardon, Jean-Michel; and Pilgrim, William R., 5,439,925, Cl. 514-353.000.

Cerdeco Aktiengesellschaft Keramische Farben: See—  
Jansen, Martin; Letschert, Hans-Peter; and Speer, Dietrich, 5,439,660, Cl. 423-263.000.

Cesa, Mark C.: See—  
Blackman, Marc W.; Cesa, Mark C.; and Attig, Thomas G., 5,440,068, Cl. 558-435.000.



- Chaback, Joseph J.; Yee, Dan; Volz, Richard F., Jr.; Seidle, John P.; and Puri, Rajen, to Amoco Corporation. Method for treating a mixture of gaseous fluids within a solid carbonaceous subterranean formation. 5,439,054, Cl. 166-252.000.
- Chabrand, Christine: See—  
Bailey, Jean-Claude; Brea, Philippe; Chabrand, Christine; and Daire, Erick, 5,439,995, Cl. 526-125.000.
- Chaffee, Rebecca J. Fiber declumper. 5,438,773, Cl. 34-61.000.
- Chambers, Harry A. Hand tools for pulling posts through computer paper printouts. 5,439,263, Cl. 294-26.000.
- Chan, Bobby. Ceiling fan having a light assembly. 5,440,459, Cl. 362-96.000.
- Chand, Naresh; Comizzoli, Robert B.; Osenbach, John W.; Rozlo, Charles B.; and Tsang, Won-Tien, to AT&T Corp. Article comprising a semiconductor laser with stable facet coating. 5,440,575, Cl. 372-49.000.
- Chanesian, Harout O. Vertical blinds with curtain attachment. 5,439,042, Cl. 160-89.000.
- Chang, Mike F.; Grasso, David G.; and Chen, Jun-Wei, to Siliconix Incorporated. Low temperature oxide layer over field implant mask. 5,439,842, Cl. 437-70.000.
- Chang, Ray; Flannagan, Stephen T.; and Jones, Kenneth W., to Motorola Inc. Delay locked loop for detecting the phase difference of two signals having different frequencies. 5,440,515, Cl. 365-194.000.
- Chang, Ray: See—  
Flannagan, Stephen T.; Chang, Ray; and Childs, Lawrence F., 5,440,514, Cl. 365-194.000.
- Chang, Thomas S. K.: See—  
Snyder, Solomon H.; Burnett, Arthur L.; Lowenstein, Charles J.; Bredt, David S.; and Chang, Thomas S. K., 5,439,938, Cl. 514-565.000.
- Chang, Warren. Method of making double-head signal connectors for use in SCSI-II/SCSI-III computer networks. 5,438,752, Cl. 29-857.000.
- Chang, Wei: See—  
Berger, Joel G.; Kozlowski, Joseph A.; and Chang, Wei, 5,440,033, Cl. 540-549.000.
- Chantot, Jean-Francois: See—  
Agouridas, Constantin; Benedetti, Yannick; Chantot, Jean-Francois; and Denis, Alexis, 5,439,889, Cl. 514-29.000.
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- Charles, Marie-Helene; Delair, Thierry; Jaubert, Monique; and Mandrand, Bernard F., to Bio Merieux. Water-soluble compounds derived from a homopolymer or copolymer of maleic anhydride, and applications of the said compounds to supporting biological molecules. 5,439,972, Cl. 525-54.100.
- Charlier, William L. Cord splitter. 5,438,760, Cl. 30-304.000.
- Chatani, Hisashi; and Haruna, Hiroyuki, to WADA Metal of America Corp. Merchandise push-out device for vending machines. 5,439,136, Cl. 221-258.000.
- Chatwin, Charles E.; and Walker, Karen S., to Thomas de la Rue & Company Limited. Signature panels. 5,438,928, Cl. 101-369.000.
- Chau, Kevin H.-L.: See—  
Fung, Clifford D.; Chau, Kevin H.-L.; Harris, P. Rowe; Panagou, John G.; and Dahrooge, Gary A., 5,438,875, Cl. 73-721.000.
- Chek-Med Systems, Inc.: See—  
Jackson, Frank W., 5,439,801, Cl. 435-12.000.
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- Embrex, Inc.: See—  
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- Emert, Jacob: See—  
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- Emhart Inc.: See—  
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- Endress + Hauser GmbH & Co.: See—  
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- Energy Savings, Inc.: See—  
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- Eugen Lagler GmbH: See—  
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- EV Energy Systems, Ltd.: See—  
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- Evans, James A.; and Kalinka, Gary T., to Stryker Corporation. Surgi-cal handpiece chuck and blade. 5,439,472, Cl. 606-176.000.
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- Evans, Michael S.: See—  
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- Evans, Wayne W. Intelligent alerting and locating communication system. 5,440,301, Cl. 340-870.110.
- Evenson, Erik E.; Lupo, Christian P.; and Wesselski, Clarence J., to United States of America, National Aeronautics and Space Adminis-tration. Connector systems for structures. 5,439,310, Cl. 403-321.000.
- Evergreen Tool Company, Inc.: See—  
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- Everhart, Dennis S.; and Meirowitz, Randy E., to Kimberly-Clark Corporation. Nonwoven fabrics having durable wettability. 5,439,734, Cl. 428-224.000.
- Ewen, John F.; and Soyuer, Mehmet, to International Business Ma-chines Corporation. VCO bias circuit with low supply and tempera-ture sensitivity. 5,440,277, Cl. 331-176.000.
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- Exxon Chemical Patents Inc.: See—  
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- Fabricant, Albert. Fastening system for body fluid collection contain-ers. 5,439,456, Cl. 604-327.000.
- Fabricius, Dietrich M.; and Weed, Gregory C., to Du Pont de Ne-mours, E. I., and Company. Thioheterocyclic near-infrared dyes. 5,440,042, Cl. 544-315.000.
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- Fairbank, Richard L.: See—  
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- Falcone, Ronald, to Hewlett-Packard Company. Patient alarm detec-tion using trend vector analysis. 5,438,983, Cl. 128-630.000.
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- Fan, Shanhu; Villeneuve, Pierre R.; Meade, Robert D.; and Joan-nopoulos, John D., to Massachusetts Institute of Technology. Three-dimensional periodic dielectric structures having photonic bandgaps. 5,440,421, Cl. 359-344.000.
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- Fanning, Alan W., to General Electric Company. Laminated electro-magnetic pump stator core. 5,440,600, Cl. 376-463.000.
- Fanuc, Ltd.: See—  
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- Karube, Norio; Fujioka, Yoshiki; and Manabe, Mitsuo, 5,440,580, Cl. 372-87.000.
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- Farooq, Shaji: See—  
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- Fazio, Albert; Atwood, Gregory E.; and Mi, James Q., to Intel Corpo-ration. Method and circuitry for storing discrete amounts of charge in a single memory element. 5,440,505, Cl. 365-45.000.
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- Fedegari Autoclavi S.p.A.: See—  
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- Fein, Howard; and Graves, Terry L., to Pressco Technology, Inc. Integrated isotropic illumination source for translucent item inspec-tion. 5,440,385, Cl. 356-240.000.
- Fekete, Marton: See—  
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- Feldmann, Larry: See—  
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- Feraud, Jean-Pierre: See—  
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- Fermann, Martin E., to IMRA America, Inc. Method and apparatus for controlling laser emission wavelength using non-linear effects. 5,440,573, Cl. 372-18.000.
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- Fewer, William R.: See—  
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- Fiakpui, Charles Y.: See—  
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- Fiberoptic Sensor Technologies, Inc.: See—  
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- Fichtel & Sachs AG: See—  
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- Filtercorp Partners L.P.: See—  
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- Findlay, Alexander, to Escalator Advertising Limited. Improvements in or relating to escalators. 5,439,090, Cl. 198-333.000.
- Finkl, Anthony W. Method and system for maintaining the efficiency of photo-voltaic cells. 5,439,531, Cl. 136-243.000.
- Finney, Adrian D.; and Casey, David N., to Zetek plc. MOS/bipolar device. 5,440,164, Cl. 257-378.000.
- Fintel, William A., to Du Pont de Nemours, E. I., and Company. Method for introducing additives into an extruder. 5,439,623, Cl. 264-40.100.
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- Fischer, Albert G. Suspensory. 5,439,007, Cl. 128-842.000.
- Fish, Russell H., III: See—  
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- Fisher, Gary; and Clark, Mark, II, to Mercer Forge Company. Process control method for improving manufacturing operations. 5,440,478, Cl. 364-188.000.
- Fishman, Avraham. Container. 5,439,128, Cl. 220-8.000.
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- Flannagan, Stephen T.; Chang, Ray; and Childs, Lawrence F., to Motorola Inc. Write control for a memory using a delay locked loop. 5,440,514, Cl. 365-194.000.
- Flannagan, Stephen T.: See—  
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- Fleet Cementers, Inc.: See—  
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- Fleischer, James F.: See—  
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- Fleisher, Alexander; Gorenshiteyn, Yan; Nakhimovich, Ilya; and Vae-lyubsvaya, Olga, to Florasynth, Inc. Recovery of maltol through aqueous extraction. 5,440,053, Cl. 549-418.000.
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- Flexstake, Inc.: See—  
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- Fliegel, Frederick M.: See—  
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- Flocken, Bruce E.: See—  
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- FMC Corporation: See—  
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- Manganaro, James L.; Sacks, Martin E.; and Carmichael, James, 5,439,663, Cl. 423-521.000.
- Focke & Co. (GmbH & Co.): See—  
Focke, Heinz, 5,439,105, Cl. 206-268.000.
- Focke, Heinz, 5,439,106, Cl. 206-273.000.
- Focke, Heinz, 5,439,166, Cl. 229-87.050.
- Focke, Heinz; and Stiller, Martin, 5,439,167, Cl. 229-160.100.
- Focke, Heinz, to Focke & Co. (GmbH & Co.) Hinge-lid pack. 5,439,105, Cl. 206-268.000.
- Focke, Heinz, to Focke & Co. (GmbH & Co.) Bundle package for cigarette packs and package blank. 5,439,106, Cl. 206-273.000.
- Focke, Heinz, to Focke & Co. (GmbH & Co.) Reclosable pack made from plastic foil. 5,439,166, Cl. 229-87.050.
- Focke, Heinz; and Stiller, Martin, to Focke & Co. (GmbH & Co.) Package made of cardboard. 5,439,167, Cl. 229-160.100.
- Foerch, Renate: See—  
Kodama, Jun; Foerch, Renate; McIntyre, N. Stewart; and Castle, George S. P., 5,439,984, Cl. 525-332.800.
- Follendore, Roy D., III: See—  
McCullough, Charles E.; and Follendore, Roy D., III, 5,440,290, Cl. 340-552.000.
- Follett, Douglas, to Telstra Corporation Limited. High speed switching architecture. 5,440,550, Cl. 370-60.000.
- Follett, Paul S.: See—  
Nardone, Edward A.; Follett, Paul S.; Schofield, Harry D.; Caron, Paul R.; and Rothwell, Chris S., 5,440,328, Cl. 347-173.000.
- Ford, Bruce, to Bentley-Harris Manufacturing Company, The. Self-gripping textile gasket. 5,438,852, Cl. 66-200.000.
- Ford, Daniel A.: See—  
Dahman, Kirby G.; Day, Kenneth F., III; Diaz, Alfredo M.; and Ford, Daniel A., 5,440,686, Cl. 395-164.000.
- Ford Motor Company: See—  
Meckstroth, Richard J.; and Toth, Gerard S., 5,439,420, Cl. 474-133.000.



Forsell, Eric A.; and Mackay, Jeffrey L., to United Technologies Automotive, Inc. Motor with isolated brush card assembly. 5,440,186, Cl. 310-239.000.

Forsvarets Forskningsanstalt: See—  
Bolander, Goran; and Nissborg, Kurt, 5,440,116, Cl. 250-216.000.

Foster, Douglas J.: See—  
Dey-Sarkar, Samir K.; Foster, Douglas J.; Smith, Steven W.; and Swan, Herbert W., 5,440,525, Cl. 367-52.000.

Foster Electric Co., Ltd.: See—  
Yamaguchi, Takuro; Wada, Yoshinori; and Armstrong, Mark A., 5,440,630, Cl. 379-437.000.

Foster, Melvin P., Jr.; and Woodward, James M., to Lockheed Corporation. Intruder detection system for passageways and the like. 5,440,291, Cl. 340-562.000.

Foster, Paul C., to GenRad Inc. System for determining the operations of an integrated circuit and processor for use therein. 5,440,568, Cl. 395-500.000.

Fournel, Richard, to SGS-Thomson Microelectronics, S.A. Circuit for the detection of a high threshold of a supply voltage. 5,440,255, Cl. 327-81.000.

Fournel, Richard P.; and Sourgen, Laurent, to SGS-Thomson Microelectronics, S.A. Voltage threshold detection circuit with very low power consumption. 5,440,263, Cl. 327-546.000.

Fox, David L.: See—  
Haggerty, Kevin C.; Fox, David L.; Fox, John L.; and Toles, Richard O., 5,439,328, Cl. 408-1.00R.

Fox, John L.: See—  
Haggerty, Kevin C.; Fox, David L.; Fox, John L.; and Toles, Richard O., 5,439,328, Cl. 408-1.00R.

Fox, Robert M.: See—  
Cox, John D.; Eisenstadt, William R.; and Fox, Robert M., 5,440,130, Cl. 250-370.090.

Foxboro Company, The: See—  
Fung, Clifford D.; Chau, Kevin H.-L.; Harris, P. Rowe; Panagou, John G.; and Dahrooge, Gary A., 5,438,875, Cl. 73-721.000.

Lewis, Brian D., 5,438,876, Cl. 73-726.000.

Fraas, Lewis M., to JX Crystals, Inc. Cylindrical electric power generator using low bandgap thermophotovoltaic cells and a regenerative hydrocarbon gas burner. 5,439,532, Cl. 136-253.000.

Frailong, Jean-Marc: See—  
Sindhu, Pradeep S.; Frailong, Jean-Marc; and Gastinel, Jean A., 5,440,698, Cl. 395-200.080.

Framatome Connectors International: See—  
Lalouna, Said; Ollivier, Jean-Francois; and Penha, Manuel, 5,439,370, Cl. 425-546.000.

Rouhier, Maurice; and Striebig, Jean-Louis, 5,439,392, Cl. 439-559.000.

France Telecom: See—  
Kazmierski, Christophe; and Robein, Didier, 5,440,147, Cl. 257-13.000.

Francis, Arthur W., Jr.: See—  
Anderson, John E.; Farrenkopf, Dennis R.; Francis, Arthur W., Jr.; Slader, Steven L.; and Snyder, William J., 5,439,373, Cl. 431-10.000.

Francis, Hubert C.; and Ksionzyk, Anne H., to Georgia-Pacific Corporation. Flyash-based compositions. 5,439,518, Cl. 106-705.000.

Frank, Uwe E.: See—  
Agostini, Giorgio; Christiaens, Leon E. E.; Frank, Uwe E.; Martner, Thierry F. E.; Tadino, Vincent L. A.; Visel, Friedrich; and Zimmer, Rene J., 5,440,064, Cl. 556-427.000.

Frantz, Irene S.: See—  
Bezama, Raschid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Frase, Katharine G.; Gabriels, David H.; Heron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillito, Robert M.; Sura, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.

Frantzides, Eleni C., to Trigonon, Inc. Inflatable laparoscopic retractor. 5,439,476, Cl. 606-192.000.

Frase, Katharine G.: See—  
Bezama, Raschid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Frase, Katharine G.; Gabriels, David H.; Heron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillito, Robert M.; Sura, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.

Frazier, Gary A., to Texas Instruments Incorporated. Error control system and method. 5,440,670, Cl. 395-22.000.

Freadman, Tommyca, to Sparkomatic Corporation. Computer speaker. 5,440,645, Cl. 381-188.000.

Freeman, David L.: See—  
Landau, John E.; Matthews, Wallace E.; and Freeman, David L., 5,440,221, Cl. 320-22.000.

Freidinger, Roger M.: See—  
Bock, Mark G.; DiPardo, Robert M.; Freidinger, Roger M.; Baldwin, John J.; and Remy, David C., 5,439,906, Cl. 514-220.000.

French, James W. L., to Stork Fibron B.V. Method of mixing meat with dried fibrous collagen. 5,439,702, Cl. 426-641.000.

French, Michael L.: See—  
Samy, Ram P.; Varonis, Orestes J.; and French, Michael L., 5,440,184, Cl. 310-90.000.

Freund, Robert: See—  
Schnurer, John H.; and Freund, Robert, 5,439,003, Cl. 128-692.000.

Frey, Teryl K.; Dominguez, Geraldina; and Wang, Chin-Yen, to Georgia State Research Foundation, Inc. DNA encoding infectious rubella virus. 5,439,814, Cl. 435-172.300.

Friry, Richard J.: See—  
Ganguly, Ashit K.; Friry, Richard J.; Schwerdt, John H.; Siegel, Marvin I.; Smith, Sidney R.; and Sybertz, Edmund J., 5,439,916, Cl. 514-293.000.

Fricke, Ulrich: See—  
Buchholz, Rainer; Fricke, Ulrich; and Mixich, Johann, 5,440,028, Cl. 536-124.000.

Friedel, Joan. Doll with an imaging heart. 5,439,407, Cl. 446-219.000.

Friedrich, Arno, to Gottlieb Guhring KG; and Konrad Friedrich KG. Extrusion tool for producing a hard metal rod or a ceramic rod with twisted internal boreholes. 5,438,858, Cl. 72-260.000.

Fritz Fuss GmbH & Co.: See—  
Fuss, Fritz H.; and Toma, Augustin, 5,439,262, Cl. 292-341.160.

Frohlich, Wolfgang: See—  
Heindl, Josef; Skuballa, Werner; Buchmann, Bernd; Frohlich, Wolfgang; Ekerdt, Roland; and Giesen, Claudia, 5,440,044, Cl. 546-301.000.

Frosch, Hans-Georg; Hoppe, Manfred; Mullers, Wolfgang; and Stohr, Frank-Michael, to Bayer Aktiengesellschaft. Process for the continuous reaction of cyanuric fluoride with amines and a reactor for carrying out this process. 5,440,039, Cl. 544-211.000.

Friend, Ian K., to Kulak Technologies Pty. Ltd. Traction mat for vehicles. 5,439,171, Cl. 238-14.000.

Frullini, Alberto: See—  
Chietti, Teresa; Frullini, Alberto; and Naim, Nerina, 5,438,775, Cl. 38-23.000.

Fryc, Oldrich; Layton, David J.; and Storhoff, Howard A., to Boeing Company, The. Double edged pressure sensitive folded tape application apparatus. 5,439,549, Cl. 156-461.000.

Fuchs, Wesley K.; Huang, Yennun; Kintala, Chandra M.; and Wang, Yi-Min, to AT&T Corp. Progressive retry method and apparatus having reusable software modules for software failure recovery in multi-process message-passing applications. 5,440,726, Cl. 395-82.180.

Fuentes, James J., to AT&T Corp. Architecture for a cellular wireless telecommunication system. 5,440,613, Cl. 379-60.000.

Fuji Electric Co., Ltd.: See—  
Tsuda, Kiichiro; Kin, Seitsu; and Kajimura, Toru, 5,439,134, Cl. 221-75.000.

Fuji Photo Film Co., Ltd.: See—  
Kato, Takashi; and Takada, Kiyohito, 5,439,789, Cl. 430-585.000.

Takahashi, Yohnosuke; Nakamura, Hideyuki; Shinozaki, Fumiaki; and Tsuno, Shinji, 5,439,775, Cl. 430-254.000.

Takehara, Hiroshi, 5,439,788, Cl. 430-569.000.

Tsujimoto, Tadahiro; Ito, Takashi; Takeuchi, Nobuo; and Takahashi, Misao, 5,439,708, Cl. 427-294.000.

Yamanouchi, Junichi; Hosoya, Yoichi; and Urabe, Shigeharu, 5,439,787, Cl. 430-567.000.

Fuji Photo Optical Co., Ltd.: See—  
Suzuki, Shigeo; and Okada, Fujio, 5,440,341, Cl. 348-256.000.

Fuji Polymertech Co. Ltd.: See—  
Nakanishi, Yutaka; and Sasaki, Yasushi, 5,439,545, Cl. 156-273.300.

Fuji Xerox Co., Ltd.: See—  
Matsui, Izuru; Kubo, Tsutomu; Furuta, Kazuya; and Takashima, Koichi, 5,439,773, Cl. 430-110.000.

Nukada, Hidemi; Sakaguchi, Yasuo; Hoshizaki, Taketoshi; Ojima, Fumio; Nishikawa, Masayuki; Yamamoto, Kohichi; and Komori, Yumiko, 5,440,029, Cl. 540-141.000.

Suga, Yoshiharu, 5,440,382, Cl. 355-317.000.

Sugino, Hajime, 5,440,406, Cl. 358-444.000.

Takagi, Seiichi; Inoue, Toyofumi; and Nagatsuka, Ikutaroh, 5,439,772, Cl. 430-106.600.

Fujii, Shuzo: See—  
Konishi, Kojo; Chizaki, Shoichi; Fujii, Shuzo; and Takashima, Yoshiyuki, 5,439,858, Cl. 502-7.000.

Fujikawa, Megumi: See—  
Tanaka, Seiichi; and Fujikawa, Megumi, 5,440,222, Cl. 322-25.000.

Fujimaki, Tohru; Futamata, Akio; and Ozawa, Yasuyuki, to Fujitsu Limited. Optical head unit having disk-shaped rotor with generally planar and common mounting surface for optical elements. 5,440,533, Cl. 369-44.180.

Fujimori, Junichi: See—  
Suzuki, Yasutake; and Fujimori, Junichi, 5,440,639, Cl. 381-17.000.

Fujimoto, Shinya: See—  
Ohuchi, Hirofumi; and Fujimoto, Shinya, 5,438,827, Cl. 60-276.000.

Fujimura, Takanao: See—  
Imabayashi, Hiroyuki; Fujimura, Takanao; and Iijima, Toshimichi, 5,440,190, Cl. 310-323.000.

Fujinuma, Kazunobu: See—  
Kanda, Takeshi; Fujinuma, Kazunobu; Naoi, Toshikatsu; Inoue, Yasuhiko; Sakashita, Yoshihiko; and Sawada, Yoshihisa, 5,439,703, Cl. 426-665.000.

Fujioka, Yoshiki: See—  
Karube, Norio; Fujioka, Yoshiki; and Manabe, Mitsuo, 5,440,580, Cl. 372-87.000.

Fujisawa, Shuji; Komaki, Susumu; Sakato, Shingo; Taniguchi, Masami; and Takeda, Hideki, to Mita Industrial Co., Ltd. Corona discharger displacing mechanism and grid electrode positioning mechanism. 5,440,375, Cl. 355-221.000.

Fujishiro, Takatsugu: See—  
Deki, Tsuyoshi; Suzuki, Minoru; Sakamoto, Koji; Noguchi, Koichi; Matsushiro, Hiroyuki; Sasaki, Eiichi; Kimura, Noriyuki; Fujishiro, Takatsugu; and Hatsuyama, Chiyoaki, 5,440,373, Cl. 355-210.000.

Fujita, Isamu: See—  
Horikoshi, Toshio; Hiraoka, Junichiro; Fujita, Isamu; Tokoro, Tohru; Kodama, Yoshikatsu; and Yokoyama, Hideaki, 5,439,680, Cl. 424-157.100.

Fujita, Minoru; Sugaya, Kenji; and Nakahara, Yoshihiko, to Kyodo Printing Co., Ltd. Magnetic recording medium comprising a magnetic recording layer, an intermediate layer, a metallic thermal recording layer and a protective layer. 5,439,755, Cl. 428-694.0BP.

Fujitsu Limited: See—  
Fujimaki, Tohru; Futamata, Akio; and Ozawa, Yasuyuki, 5,440,533, Cl. 369-44.180.

Hashimoto, Kaoru; Chiyonobu, Tatsuo; Kawano, Kyoichiro; and Watanabe, Kouji, 5,440,454, Cl. 361-790.000.

Iida, Ichiro; and Kurita, Toshihiko, 5,440,541, Cl. 370-60.100.

Ijitsu, Kenji; Yuhara, Masanobu; and Ohta, Hidenobu, 5,440,696, Cl. 395-308.000.

Kaku, Takashi; Murata, Hiroyasu; and Hira, Kyoko, 5,440,589, Cl. 375-344.000.

Kanagae, Masahide, 5,440,434, Cl. 360-65.000.

Kawashima, Shoichiro, 5,440,257, Cl. 327-100.000.

Naito, Mitsugu, 5,440,569, Cl. 371-22.300.

Nakamura, Shunji, 5,439,832, Cl. 437-31.000.

Ono, Mitsuhiro, 5,440,266, Cl. 329-307.000.

Otsuka, Kazuo, 5,440,207, Cl. 315-149.000.

Otsuka, Nobuyuki, 5,438,952, Cl. 117-84.000.

Takiyama, Shushi; Matsumoto, Hitoshi; and Koga, Yuzuru, 5,440,685, Cl. 395-164.000.

Tsuji, Kazuto; Yoneda, Yoshiyuki; and Kasai, Junichi, 5,440,170, Cl. 257-676.000.

Yamamoto, Hiroshi; Ogura, Kiyonori; and Horii, Takashi, 5,440,511, Cl. 365-189.050.

Yokota, Haruo; Kitakami, Hajime; Noguchi, Yasuo; and Akaboshi, Naoki, 5,440,743, Cl. 395-650.000.

Fujiwara, Sayuri; Hatano, Akitsugu; and Isumi, Yoshihiro, to Sharp Kabushiki Kaisha. Optical scan type display device with optical fiber melted onto a substrate. 5,440,411, Cl. 359-42.000.

Fujiwara, Yoko: See—  
Hashimoto, Yoshiyuki; Uchikawa, Shinya; and Fujiwara, Yoko, 5,440,403, Cl. 358-444.000.

Fujiwara, Yoshifumi, to NEC Corporation. Information processing apparatus. 5,440,728, Cl. 395-419.000.

Fujiwara, Yoshio: See—  
Abe, Tetsuya; Fukuda, Toshio; and Fujiwara, Yoshio, 5,439,870, Cl. 503-227.000.

Fujiyama, Shigeni: See—  
Sago, Hiroyoshi; Kumazawa, Hirotosugu; Shimai, Futoshi; Fujiyama, Shigeni; Endo, Hiroki; and Kobari, Hideya, 5,439,519, Cl. 118-52.000.

Fukae, Yasuo, to Calsonic Corporation. Manifold type catalytic converter arrangement. 5,438,828, Cl. 60-302.000.

Fukagawa, Toshihiro: See—  
Haneda, Ichiro; Sakurai, Tatsuyoshi; Yanagisawa, Mashi; Okuyama, Kohji; Niwa, Kazuo; and Fukagawa, Toshihiro, 5,439,080, Cl. 188-218.0XL.

Fukuda, Toshiro: See—  
Abe, Tetsuya; Fukuda, Toshio; and Fujiwara, Yoshio, 5,439,870, Cl. 503-227.000.

Fukui, Hajime, to Canon Kabushiki Kaisha. Control apparatus for vibration driven motor. 5,440,212, Cl. 318-116.000.

Fukui, Toshiomi: See—  
Abe, Fumio; Noda, Naomi; Hori, Makoto; and Fukui, Toshiomi, 5,439,865, Cl. 502-333.000.

Fukuju, Atsushi: See—  
Onitsuka, Shigenori; Ichiki, Masayoshi; Inazumi, Chikashi; Watanabe, Takanobu; Fukuju, Atsushi; Akiyama, Masaki; Sairyo, Yuki; and Kobayashi, Hidetsugu, 5,439,868, Cl. 502-415.000.

Fukumura, Kenichi: See—  
Haga, Kyosuke; Suzuki, Mikio; Inaguma, Yoshiharu; Fukumura, Kenichi; Kato, Hideya; and Mori, Katsuhisa, 5,439,070, Cl. 180-141.000.

Fukuoka, Morino: See—  
Koike, Hisashi; Fukuoka, Morino; Kurasawa, Yuko; Inami, Minoru; and Yamane, Masayuki, 5,439,495, Cl. 65-17.200.

Fukushima, Ikutoshi: See—  
Shiratan, Fumiyuki; Fukushima, Ikutoshi; and Hashimoto, Takeshi, 5,440,671, Cl. 395-25.000.

Fukuwa, Yasuo, to Pentax Vision Co., Ltd. Spectacle frame including self-aligning temple end piece. 5,440,356, Cl. 351-123.000.

Fulton, Paul R.: See—  
Farrand, Scott C.; Dobyns, Patrick E.; Hernandez, Thomas J.; Neyland, Ronald A.; Stupek, Richard A.; Saadeh, Said S.; Fulton, Paul R.; Mangold, Richard P.; and Miller, Andrew J., 5,440,699, Cl. 395-155.000.

Fuluhata, Naoto: See—  
Ohmura, Takao; Sumi, Akinori; Ohtani, Wataru; Fuluhata, Naoto; Takashima, Kazuya; Kamide, Kaeko; Noda, Munehiro; Kondo, Masahide; Ishikawa, Syoichi; Oohara, Kazuhiro; and Yokoyama, Kazumasa, 5,440,018, Cl. 530-363.000.

Funakura, Masami: See—  
Yoshida, Yuji; Arita, Koji; and Funakura, Masami, 5,438,849, Cl. 61-498.000.

Fung, Clifford D.; Chau, Kevin H.-L.; Harris, P. Rowe; Panagou, John G.; and Dahrooge, Gary A., to Foxboro Company, The. Removing sacrificial material through temporary channels as a method of making an overpressure-protected differential pressure sensor. 5,438,875, Cl. 73-721.000.

Funimori, Naoji: See—  
Nakahata, Hideaki; and Funimori, Naoji, 5,440,189, Cl. 310-313.00R.

Funken, Jans-Jugen: See—  
Engels, Bernd; Funken, Jans-Jugen; and Hacklander, Hans-Gerd, 5,438,732, Cl. 16-325.000.

Furui, Takashi: See—  
Okimoto, Yukihiko; Furui, Takashi; and Ohmae, Katsuhiko, 5,440,485, Cl. 364-424.050.

Furukawa, Akira; and Kato, Makoto, to Mitsubishi Paper Mills Limited. Ink jet recording medium. 5,439,739, Cl. 428-341.000.

Furukawa Electric Co., Ltd., The: See—  
Ueki, Ken; Shimizu, Takeo; and Yanagawa, Hisaharu, 5,440,656, Cl. 385-30.000.

Furukawa, Shigeaki: See—  
Yoshioka, Kazumi; Ohta, Takeo; Uchida, Masami; and Furukawa, Shigeaki, 5,439,752, Cl. 428-623.000.

Furuta, Kazuya: See—  
Matsui, Izuru; Kubo, Tsutomu; Furuta, Kazuya; and Takashima, Koichi, 5,439,773, Cl. 430-110.000.

Fuse, Akira; Tsuda, Yuji; and Nakada, Tsutomu, to Nippon Aleph Corporation. Shock detecting system. 5,440,084, Cl. 200-61.45R.

Fuse, Yasuyuki: See—  
Kumagai, Takehiko; Kikuchi, Takashi; Okubo, Takao; and Fuse, Yasuyuki, 5,440,718, Cl. 395-481.000.

Fusion Systems Corporation: See—  
Sowers, Kenneth G., 5,440,137, Cl. 250-504.00R.

Fuss, Fritz H.; and Toma, Augustin, to Fritz Fuss GmbH & Co. Locking/release mechanism for a pivot bolt of a closed-circuit door opener. 5,439,262, Cl. 292-341.160.

Futamata, Akio: See—  
Fujimaki, Tohru; Futamata, Akio; and Ozawa, Yasuyuki, 5,440,533, Cl. 369-44.180.

Fuwa, Yoshio; and Hirata, Kunimori, to Sony Corporation. Method for peeling the safety panel of a CRT. 5,439,406, Cl. 445-2.000.

G. D. Searle & Co.: See—  
Djuric, Stevan W.; Docter, Stephen H.; and Yu, Stella S., 5,439,937, Cl. 514-563.000.

Gardner, Barry L.: See—  
Burlage, Brian J.; Pauller, Steven B.; Good, Stanley R.; and Gardner, Barry L., 5,439,021, Cl. 137-84.000.

Gabis, Raymond E.: See—  
Dorri, Bizhan; Laskaris, Evangelos T.; Herd, Kenneth G.; and Gabis, Raymond E., 5,439,543, Cl. 156-184.000.

Gabriels, David H.: See—  
Bezama, Raschid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Frase, Katharine G.; Gabriels, David H.; Heron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillito, Robert M.; Sura, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.

Gacsalyi, Istvan: See—  
Reiter, nee Eazas, Klara; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Simig, Gyula; Gyertyan, Istvan; Pet, cz, Lujza; Fekete, Marton; Szemerédi, Katalin; Gacsalyi, Istvan; Giegler, Gabor; Rohacs, nee Zamkovaja, Ludmilla; Szecsey, nee Heged, s, Maria; and Szirt, nee Kiszely, Enik, 5,439,940, Cl. 514-640.000.

GAF-Huels Chemie GmbH: See—  
Grosse-Puppenthal, Thomas; and Homann, Walter K., 5,439,719, Cl. 428-35.800.

Galbi, Duane E.; Houghton, Russell J.; Kilian, Michael; and Wilson, Adam B., to International Business Machines Corporation. Off-chip driver with voltage regulated predrive. 5,440,258, Cl. 327-112.000.

Galbo, James P.: See—  
Scrima, Roberto; Zagnoni, Graziano; Ackerman, Michael H.; Galbo, James P.; and Winter, Roland A. E., 5,439,958, Cl. 524-102.000.

Galbraith, Donald L.; and Tice, Richard P., to U.S. Dent Master, Inc. Sheet metal working electrode and handpiece. 5,440,091, Cl. 219-86.210.

Galbraith, Douglas C.; El Gamal, Abbas; and Greene, Jonathan W., to Actel Corporation. Logic module with configurable combinational and sequential blocks. 5,440,245, Cl. 326-38.000.

Galbraith, John M. Trellis wire support system. 5,438,795, Cl. 47-46.000.

Galileo Electro-Optics Corporation: See—  
Bauco, Anthony S.; and Then, Alan M., 5,440,115, Cl. 250-207.000.

Gallagher, John J.; and Urkowitz, Harry, to Martin Marietta Corporation. Complementary-sequence pulse radar with matched filtering and Doppler tolerant sidelobe suppression preceding Doppler filtering. 5,440,311, Cl. 342-132.000.

Gallagher, Michael J.; and Nichols, Lawrence R., to Davidson Textron Inc. Method for molding a trim panel with integrally formed simulated leather appliques. 5,439,630, Cl. 264-263.000.

Galperin, Leonid B.; and Bricker, Jeffrey C., to UOP. Method of preparing azacycloheptanes. 5,440,034, Cl. 540-612.000.

Gambino, Richard J.: See—  
Brady, Michael J.; Braren, Bodil E.; Gambino, Richard J.; Grill, Alfred; and Patel, Vishnuhai V., 5,440,507, Cl. 365-127.000.

Ganger, David E., Sr., to Tone Trainer, Inc. Method and training device to assure sportsmen a proper grip with membrane switch. 5,439,216, Cl. 273-75.000.

Ganger, David E., Sr., to Tone Trainer, Inc. Method and training device to assure sportsmen a proper grip with membrane switch. 5,439,217, Cl. 273-75.000.



- Ganguly, Ashit K.; Friary, Richard J.; Schwerdt, John H.; Siegel, Marvin I.; Smith, Sidney R.; and Sybertz, Edmund J., to Schering Corporation. Polycyclic quinoline, naphthyridine and pyrazinopyridine derivatives. 5,439,916, Cl. 514-293.000.
- Gans, Russell S.: See—  
Ravenberg, Michael J.; Thompson, Mark A.; Green, David J.; Davis, Terry R.; Scharret, Jeffery L.; and Gans, Russell S., 5,439,246, Cl. 280-728.300.
- Gantke, Karl-Heinz: See—  
Ansmann, Achim; Breitzke, Willi; and Gantke, Karl-Heinz, 5,439,671, Cl. 424-56.000.
- Gappa, Gunther: See—  
Kubiak, Helmut; Schroter, Hans J.; Gappa, Gunther; Kalwitzki, Heinrich; and Knop, Klaus, 5,439,491, Cl. 48-99.000.
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- Goode, Joseph W., III: See—  
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- Hopper, Scott R.: See—  
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- Horn, Stephen T. Body cooling apparatus. 5,438,707, Cl. 2-69.000.
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- Houghton, Russell J.: See—  
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- Hronowski, Lucjan J.: See—  
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- Huang, Hwang-Wen, to Inteplast Corporation. Method for manufacturing polypropylene film and sheet. 5,439,628, Cl. 264-175.000.
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- Tirri, Bruce, 5,440,390, Cl. 356-364.000.
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- Hughes, Robert K., Jr., to Flexstake, Inc. Bendable marker with ribbed sleeve. 5,439,311, Cl. 404-10.000.
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- Hwang, Deog-won, to Samsung Electronics Co., Ltd. Digital FM demodulator having an address circuit for a lookup table. 5,440,269, Cl. 329-318.000.

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- Iampietro, Robert L.: See—  
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- Ichikawa, Iwao: See—  
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- Ichikawa, Norihito; Imai, Masatoshi; Hirase, Hidehiro; and Takashima, Shinji, to Sony Corporation. Image display controller having a common memory for storage of image overlay data and window identification data. 5,440,680, Cl. 395-158.000.
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- ICOS Vision Systems n.v.: See—  
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- Iijima, Masayuki: See—  
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- Iijima, Takeshi: See—  
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Tanaka, So; Inada, Hiroshi; and Iiyama, Michitomo, 5,439,875, Cl. 505-329.000.
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- Ikeda, Kazuhiko, to Hirose Electric Co., Ltd. Electric connector with a coaxial connector. 5,439,394, Cl. 439-675.000.
- Ikeda, Masaaki: See—  
Izawa, Tadashi; Nonaka, Ken; and Ikeda, Masaaki, 5,440,377, Cl. 355-245.000.
- Sugano, Masashi; Yamazaki, Yoshio; Ikeda, Masaaki; and Izawa, Tadashi, 5,440,409, Cl. 358-501.000.
- Takahashi, Toshio; Ikeda, Masaaki; Kuriyama, Satoshi; Tanaka, Koji; Sasamoto, Shuji; and Shibayama, Katsutoshi, 5,439,097, Cl. 198-803.010.
- Ikeda, Nobukazu; Morokoshi, Hiroshi; and Morimoto, Akihiro, to Kiyohara, Masako. Welding process with delayed application of full current until after start of arc. 5,440,096, Cl. 219-130.500.
- Ikeda, Takao, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Vehicle door lock device with super lock mechanism. 5,438,855, Cl. 70-279.000.
- Ikeda, Yuji, to Sony Corporation. Method for preparation of transmission electron microscope sample material utilizing sheet mesh. 5,440,123, Cl. 250-307.000.
- Ikematsu, Ryuichi: See—  
Miyamoto, Akihiro; Ikematsu, Ryuichi; Matsunaga, Haruhiko; and Ueda, Hiromi, 5,440,565, Cl. 371-20.400.
- Ikeuchi, Takashi: See—  
Nakahara, Takeichi; Hino, Hajime; Ikeuchi, Takashi; and Ogiso, Tsutomu, 5,438,820, Cl. 57-290.000.
- Ikeyama, Shuichi; Koyama, Masaru; Miyake, Masayuki; and Senoo, Masaharu, to Takeda Chemical Industries, Ltd. Monoclonal antibody, polypeptides and production thereof. 5,439,886, Cl. 514-12.000.
- Illian, Gerd; Wingen, Rainer; and Muller, Ingrid, to Hoechst Aktiengesellschaft. Cyclohexylphenylpyrimidines, process for their preparation, and their use in liquid-crystalline mixtures. 5,439,612, Cl. 252-299.610.
- Illinois Tool Works Inc.: See—  
Broskow, James A.; Weaver, William N.; and DiVietro, Victor G., 5,439,111, Cl. 206-430.000.
- Illner, Hans, legal representative: See—  
Feola, Mario; Simoni, Jan S.; and Canizaro, Peter C., deceased, 5,439,882, Cl. 514-6.000.
- Imabayashi, Hiroyuki; Fujimura, Takanao; and Iijima, Toshimichi, to Olympus Optical Co., Ltd. Ultrasonic motor. 5,440,190, Cl. 310-323.000.
- Imada, Takao: See—  
Tomasada, Kenji; Ando, Fumitaka; Kondo, Toshiro; and Imada, Takao, 5,439,244, Cl. 280-691.000.
- Imai, Keitaro; Okano, Haruo; Aoyama, Tomonori; and Okayama, Yasunori, to Kabushiki Kaisha Toshiba. Semiconductor integrated-circuit capacitor having a carbon film electrode. 5,440,157, Cl. 257-310.000.
- Imai, Masao: See—  
Suzuki, Toshiyuki; Sasagawa, Katsuyoshi; Imai, Masao; and Kanemura, Yoshinobu, 5,440,358, Cl. 351-159.000.
- Imai, Masatoshi: See—  
Ichikawa, Norihito; Imai, Masatoshi; Hirase, Hidehiro; and Takashima, Shinji, 5,440,680, Cl. 395-158.000.
- Imbruglia, Antonio; and Benenati, Giovanni, to Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno. CMOS pull-up input network. 5,440,242, Cl. 326-33.000.
- Immunomedics: See—  
Hansen, Hans J.; and Goldenberg, Milton D., 5,439,665, Cl. 424-1.490.
- Imperial Chemical Industries PLC: See—  
De Vos, Rik; and Randall, David, 5,439,948, Cl. 521-159.000.
- Fitton, John E.; and Timms, David, 5,439,815, Cl. 435-199.000.
- IMRA America, Inc.: See—  
Fermann, Martin E., 5,440,573, Cl. 372-18.000.
- Ims, Dale R.: See—  
Anderson, David G.; Ims, Dale R.; and O'Horo, Michael P., 5,440,330, Cl. 347-26.000.
- In Focus Systems, Inc.: See—  
Prince, Dennis W.; and Clifton, Benjamin R., 5,440,322, Cl. 345-58.000.
- Ina Walzager Schaeffler KG: See—  
Zernickel, Alexander; Doppling, Horst; and Scholian, Horst, 5,439,298, Cl. 384-537.000.
- Inaba, Hiroshi: See—  
Sakimura, Ritsuo; Kimura, Kazuaki; and Inaba, Hiroshi, 5,440,112, Cl. 250-203.100.
- Inaba, Yutaka: See—  
Mouri, Akihiro; Toyono, Tsutomu; Kaneko, Shuzo; Inaba, Yutaka; and Kanbe, Junichiro, 5,440,412, Cl. 359-56.000.
- Inada, Hiroshi: See—  
Tanaka, So; Inada, Hiroshi; and Iiyama, Michitomo, 5,439,875, Cl. 505-329.000.
- Inagami, Yasuhiro: See—  
Kitai, Katsuyoshi; Inagami, Yasuhiro; Tamaki, Yoshiko; and Tanaka, Yoshikazu, 5,440,750, Cl. 395-800.000.
- Inagawa, Jun; Nagumo, Masahide; and Kodama, Kunihiko, to Kabushiki Kaisha Toshiba. Disc data reproducing apparatus and signal processing unit for preventing underflow and overflow. 5,440,537, Cl. 369-48.000.
- Inaguma, Yoshiharu: See—  
Haga, Kyosuke; Suzuki, Mikio; Inaguma, Yoshiharu; Fukumura, Kenichi; Kato, Hideya; and Mori, Katsuhisa, 5,439,070, Cl. 180-141.000.
- Inami, Minoru: See—  
Koike, Hisashi; Fukuoaka, Morinao; Kurawaka, Yuko; Inami, Minoru; and Yamane, Masayuki, 5,439,495, Cl. 65-17.200.
- Inazumi, Chikashi: See—  
Onitsuka, Shigenori; Ichiki, Masayoshi; Inazumi, Chikashi; Watanabe, Takanobu; Fukuj, Atsushi; Akiyama, Masaki; Sairyo, Yuki; and Kobayashi, Hidetsugu, 5,439,868, Cl. 502-415.000.
- Inco Alloys International, Inc.: See—  
Heck, Karl A.; Moore, Melissa A.; Smith, Darrell F., Jr.; Stein, Larry I.; and Smith, John S., 5,439,640, Cl. 420-585.000.
- InControl Solutions, Inc.: See—  
Brown, Daniel R.; and Biehl, Philip D., 5,440,237, Cl. 324-601.000.
- Industrial Technology Research Institute: See—  
Lin, Chin-Lung; Yeh, Ming-Shia; Tsao, Chin-Sheng; and Shiue, Pey-Hong, 5,440,713, Cl. 395-485.000.
- Wang, Song-Tine, 5,440,714, Cl. 395-492.000.
- Ing. Erich Pfeiffer GmbH & Co. KG: See—  
Graf, Lothar; Pfeiffer, Peter; and Buhr, Ernst, 5,439,177, Cl. 239-333.000.
- Innis, Robert B.: See—  
Neumeyer, John L.; Milius, Richard A.; and Innis, Robert B., 5,439,666, Cl. 424-1.850.
- Inogutt, Kazuhiko: See—  
Hattori, Takeshi; Inogutt, Kazuhiko; Ohyama, Yukio; Nakagishi, Yutaka; and Sakaguchi, Masaaki, 5,439,712, Cl. 427-437.000.



- Inoue, Jiro: See—  
Yamashita, Muneharu; Tabota, Jun; Mizuno, Toshihiro; and Inoue, Jiro, 5,438,859, Cl. 73-1.00D.
- Inoue, Norihide; Shimura, Tetsunosuke; Kouno, Masahiro; Sonobe, Yoshiro; and Mizutani, Kazumi, to Mitsui Toatsu Chemicals, Inc. Method of polymerizing an olefin using a novel transition metal compound. 5,439,994, Cl. 526-114.000.
- Inoue, Takeshi: See—  
Ohnishi, Osamu; and Inoue, Takeshi, 5,440,195, Cl. 310-359.000.
- Inoue, Toyofumi: See—  
Takagi, Seichi; Inoue, Toyofumi; and Nagatsuka, Ikutaro, 5,439,772, Cl. 430-106.600.
- Inoue, Yasuhiko: See—  
Kanda, Takeshi; Fujinuma, Kazunobu; Naoi, Toshikatsu; Inoue, Yasuhiko; Sakashita, Yoshihiko; and Sawada, Yoshihisa, 5,439,703, Cl. 426-665.000.
- Inoue, Yasuo: See—  
Iwamatsu, Toshiaki; Yamaguchi, Yasuo; Inoue, Yasuo; and Nishimura, Tadashi, 5,440,161, Cl. 257-349.000.
- Institut fuer Rundfunktechnik GmbH: See—  
Wiese, Detlef, 5,440,584, Cl. 375-242.000.
- Integrated Device Technology, Inc.: See—  
Devanney, William L., 5,440,524, Cl. 365-230.060.
- Intel Corporation: See—  
Alattar, Adnan; and Keith, Michael, 5,440,346, Cl. 348-420.000.
- Ellis, David; and Brady, Gary, 5,440,592, Cl. 375-354.000.
- Fazio, Albert; Atwood, Gregory E.; and Mi, James Q., 5,440,505, Cl. 365-45.000.
- Golin, Stuart J., 5,440,350, Cl. 348-699.000.
- Scheer, David C., 5,440,449, Cl. 361-686.000.
- Schutz, Joseph D.; and Rash, Bill C., 5,440,520, Cl. 365-226.000.
- Intelligent Surgical Lasers: See—  
Bille, Josef F.; and Schanzlin, David, 5,439,462, Cl. 606-6.000.
- Interleaf Corporation: See—  
Huang, Hwang-Wen, 5,439,628, Cl. 264-175.000.
- Intermatic Incorporated: See—  
Shih, James C., 5,440,204, Cl. 315-94.000.
- Intermec Corporation: See—  
Wright, George C.; Gilpin, David W.; and Jones, Stanley W., deceased, 5,440,315, Cl. 343-702.000.
- International Business Machines Corporation: See—  
Ray, David S.; and Spencer, Alexander K., 5,440,703, Cl. 395-375.000.
- International Business Machines Corp.: See—  
Arnold, Alan F.; Wheeler, Arthur R.; and Tai, James, 5,440,693, Cl. 395-284.000.
- Arnold, William C.; Chess, David M.; Kephart, Jeffrey O.; and White, Steven R., 5,440,723, Cl. 395-181.000.
- Augustine, Kurt E.; Neeley, James Edward, Sr.; and Strole, Norman Clark, 5,440,633, Cl. 380-23.000.
- Bezama, Raschid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Frase, Katharine G.; Gabriels, David H.; Heron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillo, Robert M.; Sura, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.
- Bhide, Anupam K.; Copeland, George P.; Goyal, Ambuj; Hsiao, Hui-I; Jhingran, Anant D.; and Mohan, Chandrasekaran, 5,440,727, Cl. 395-444.000.
- Boegel, Mark A.; Bolstad, Douglas O.; Knight, Stephen A.; Kiel, Harvey G.; Nelson, Robert R.; and Wright, Pamela A., 5,440,697, Cl. 395-500.000.
- Brady, Michael J.; Braren, Bodil E.; Gambino, Richard J.; Grill, Alfred; and Patel, Vishnuvhai V., 5,440,507, Cl. 365-127.000.
- Coleman, Ronald G.; Advani, Deepak M.; Monroe, Owen K.; Straub, Robert M.; Gleason, Miner H.; and Huang, Yun-Pong, 5,440,687, Cl. 395-200.150.
- Dahman, Kirby G.; Day, Kenneth F., III; Diaz, Alfredo M.; and Ford, Daniel A., 5,440,686, Cl. 395-164.000.
- Day, Richard A.; Glatzel, Donald H.; Mertz, John R.; Roth, Joel L.; Russell, David J.; and Simpson, Logan L., 5,439,766, Cl. 430-18.000.
- Day, Richard A.; Glatzel, Donald H.; Russell, David J.; Gelorme, Jeffrey D.; and Mertz, John R., 5,439,779, Cl. 430-280.000.
- Eisen, Ivan; Fandrick, Frank; Murphrey, Stephen W.; and Parikh, Shrikant N., 5,440,678, Cl. 395-154.000.
- Ewen, John F.; and Soyuer, Mehmet, 5,440,277, Cl. 331-176.000.
- Galbi, Duane E.; Houghton, Russell J.; Killian, Michael; and Wilson, Adam B., 5,440,258, Cl. 327-112.000.
- Goldring, Robert D., 5,440,735, Cl. 395-600.000.
- Graf, Volker; and Mueller, Carl A., 5,439,876, Cl. 505-447.000.
- Hetzler, Steven R., 5,440,474, Cl. 360-135.000.
- Hodgson, Rodney T.; Marcus, Paul M.; and Moruzzi, Victor L., 5,440,233, Cl. 324-252.000.
- Krounbi, Mohammad T.; Lo, Jyh-Shuey J.; Taang, Ching H.; and Valletta, Robert M., 5,438,747, Cl. 29-603.000.
- Kudo, Michiharu, 5,440,681, Cl. 395-161.000.
- Moese, Gerald; Mohr, Karlheinz; and Bandara, Upali, 5,440,663, Cl. 395-264.000.
- Platte, Brian G.; Sampson, Jeri L.; Treppendahl, Jamsie R.; and Walder, Karen D., 5,440,745, Cl. 395-700.000.
- Reilly, John J.; and Ventrone, Sebastian T., 5,440,689, Cl. 395-200.080.
- Wagar, Bruce A., 5,440,734, Cl. 395-600.000.
- International Flavors & Fragrances Inc.: See—  
Butler, Jerry F.; Warren, Craig B.; Marin, Anna B.; Mookherjee, Braja D.; and Wilson, Richard A., 5,439,941, Cl. 514-690.000.
- International Integrated Communications, Ltd.: See—  
Castro, Peter D., 5,440,621, Cl. 379-112.000.
- International Paper Company: See—  
Klinger, Guenther H.; and Levit, Albert B., 5,439,786, Cl. 430-567.000.
- Nelli, Leo M.; Avni, Eitan; Slovik, Lori; and Ellis, Kevin, 5,439,707, Cl. 427-258.000.
- Inventive Technology: See—  
Roberts, Kent S.; and Roberts, Brent J., 5,439,231, Cl. 273-423.000.
- Ion Beam Applications Societe Anonyme: See—  
Jongen, Yves, 5,440,211, Cl. 315-500.000.
- Iowa State University Research Foundation, Inc.: See—  
Burns, Stanley G.; and Weber, Robert J., 5,440,150, Cl. 257-57.000.
- Ip, Hui F.: See—  
Alter, Martin J.; Sample, Lawrence R.; Ip, Hui F.; Garnett, Marty E.; and Litfin, Helmut R., 5,439,764, Cl. 430-5.000.
- Iranmanesh, Ali, to Crosspoint Solutions, Inc. Antifuse with double via contact and method of manufacture therefor. 5,440,167, Cl. 257-530.000.
- Irmer, Heimbert-Ulrich; and Scheckel, Bruno, to Siemens Aktiengesellschaft. Apparatus for contactless data and energy transmission and systems containing the apparatus. 5,440,302, Cl. 340-870.310.
- Isberg, Erik: See—  
Andersson, Matts; Carlsson, Lennart; and Isberg, Erik, 5,440,496, Cl. 364-474.050.
- Iscar Ltd.: See—  
Wertheim, Raphael, 5,439,327, Cl. 407-11.000.
- Ishida Co., Ltd.: See—  
Konishi, Hiroyuki; Utsunomiya, Michito; and Naito, Kazufumi, 5,440,077, Cl. 177-185.000.
- Ishida, Toshiharu: See—  
Miyano, Ichiro; Serizawa, Kooji; Sakaguchi, Suguru; and Ishida, Toshiharu, 5,440,171, Cl. 257-700.000.
- Ishihara, Kimio, to Jidosha Kiki Co., Ltd. Master cylinder. 5,438,833, Cl. 60-562.000.
- Ishihara, Makoto: See—  
Nakagawa, Susumu; Asai, Akira; Kuroyanagi, Satoru; Ishihara, Makoto; and Tanaka, Yoshiharu, 5,440,049, Cl. 549-49.000.
- Ishihara, Mikiya; Yamada, Takahiro; and Shimizu, Fumihiko, to Asmo Co., Ltd. Quarter window opening/closing apparatus. 5,438,801, Cl. 49-357.000.
- Ishii, Akihiro: See—  
Nishimura, Yasunobu; Ishii, Akihiro; Morino, Yuzuru; and Kikuchi, Yoshiyuki, 5,440,047, Cl. 546-344.000.
- Ishii, Kyoko: See—  
Tsunozaki, Manabu; Ishii, Kyoko; Nozaki, Koichi; Yoshioka, Hiroshi; Koyama, Yoshihisa; Udo, Shinji; Aoyagi, Hidetomo; Miyatake, Sinichi; Morino, Makoto; and Hoshida, Akihiko, 5,440,521, Cl. 365-230.030.
- Ishii, Masanori; and Arakawa, Koji, to Toko, Inc. AC-DC converter. 5,440,473, Cl. 363-21.000.
- Ishikawa Gasket Co., Ltd.: See—  
Udagawa, Tsunekazu, 5,439,234, Cl. 277-235.00B.
- Ishikawa, Shinichiro: See—  
Hinikawa, Haruo; Ishikawa, Shinichiro; Okuno, Sumio; Hattori, Morishige; and Matsumoto, Masakazu, 5,439,415, Cl. 454-70.000.
- Ishikawa, Syoichi: See—  
Ohmura, Takao; Sumi, Akinori; Ohtani, Wataru; Fuhata, Naoto; Takeshima, Kazuya; Kamide, Kaeko; Noda, Munehiro; Kondo, Masahide; Ishikawa, Syoichi; Oohara, Kazuhiro; and Yokoyama, Kazumasa, 5,440,018, Cl. 530-363.000.
- Ishikawa, Tatsuya; and Taga, Noboru, to Kabushiki Kaisha Toshiba. Demodulator for digitally modulated wave. 5,440,587, Cl. 375-332.000.
- Ishikawa, Tatsuya: See—  
Taga, Noboru; Ishikawa, Tatsuya; and Komatsu, Susumu, 5,440,268, Cl. 329-308.000.
- Ishikawa, Toshihiro; Ueda, Katsuhiko; and Sakakihara, Mikio, to Matsushita Electric Industrial Co., Ltd. Arithmetic apparatus for digital signal processor. 5,440,504, Cl. 364-736.000.
- Ishimaru, Toshiaki: See—  
Miyazaki, Masashi; Akahoshi, Haruo; Nohara, Shozo; Kikuta, Kenji; and Ishimaru, Toshiaki, 5,438,751, Cl. 29-847.000.
- Ishimatsu, Noriaki: See—  
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- Ishimizu, Hideaki: See—  
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- Ishimura, Katsuhiro; Takamoto, Hiroshi; and Aoki, Shusei, to Oki Electric Industry Co., Ltd. Method and apparatus for alarm surveillance for an optical transmission system. 5,440,418, Cl. 359-177.000.
- Ishioka, Takuji: See—  
Maruyama, Shigeru; Shimazaki, Yuichi; Kanehiro, Masaki; Ishioka, Takuji; Baba, Shigeki; and Hisaki, Takashi, 5,438,970, Cl. 123-630.000.
- Ishura, Kazushige: See—  
Kinoshita, Satoshi; Takamatsu, Hideo; Ishura, Kazushige; Masuda, Haruhisa; and Taniguchi, Shunro, 5,439,976, Cl. 525-92.000.
- Ishiwata, Shoji; Kimura, Etsuji; Naka, Michihiro; Hanaue, Yasuhiro; Wang, Yuhu; Nagahama, Shinobu; and Sawanobori, Naruhito, to

- Mitsubishi Materials Corporation. Infrared light-excited light-emitting substance. 5,439,616, Cl. 252-584.000.
- Isidoro, Alessandro L.; and Punj, Vikram, to AT&T Corp. Service circuit allocation in large networks. 5,440,563, Cl. 370-110.100.
- Isobe, Takashi: See—  
Okuno, Akira; Isobe, Takashi; and Ito, Keiichi, 5,438,942, Cl. 112-102.500.
- Isoclear, Inc.: See—  
Pankow, Mark L., 5,439,572, Cl. 204-180.100.
- Isumi, Yoshihiro: See—  
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- Itabashi, Hitoshi: See—  
Baba, Yoshinobu; Amano, Yasuko; and Itabashi, Hitoshi, 5,439,771, Cl. 430-106.600.
- Ito, Chikara: See—  
Kato, Yoichiro; Tanaka, Masaki; and Ito, Chikara, 5,439,243, Cl. 280-689.000.
- Ito, Haruki; Maeda, Kenzo; Miyazaki, Nobuyuki; Unoki, Masao; Sagawa, Chiaki; and Kamba, Motoi, to Nippon Oil and Fats Company, Limited; and Asahi Glass Company, Ltd. Thermosetting powder coating composition. 5,439,896, Cl. 525-107.000.
- Ito, Kazuhiko: See—  
Tahara, Tetsuya; Sugita, Kazushige; Ito, Kazuhiko; and Yoshioka, Nobuhisa, 5,440,205, Cl. 315-94.000.
- Ito, Keiichi: See—  
Okuno, Akira; Isobe, Takashi; and Ito, Keiichi, 5,438,942, Cl. 112-102.500.
- Ito, Kiichi; Tsunoi, Shinji; and Yamamoto, Tetsuya, to Mitsubishi Petrochemical Co., Ltd. Process for the production of highly water absorbent polymers. 5,439,993, Cl. 526-93.000.
- Ito, Noboru; Tanaka, hinichi; Wada, Hidenori; Mizuno, Sadao; and Hayashi, Hideki, to Matsushita Electric Industrial Co., Ltd. Optical disk apparatus for producing information recorded on a recording track. 5,440,536, Cl. 369-44.410.
- Ito, Norifumi; and Doi, Jun, to Ricoh Company, Ltd. Digital copier system. 5,440,372, Cl. 355-204.000.
- Ito, Takashi: See—  
Tsujimoto, Tadahiyo; Ito, Takashi; Takeuchi, Nobuo; and Takahashi, Misao, 5,439,708, Cl. 427-294.000.
- Ito, Yasui, to Toyota Jidosha Kabushiki Kaisha. Internal combustion device. 5,438,967, Cl. 123-339.120.
- Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hidechiro; and Arita, Hitoshi, to Dai Nippon Insatsu Kabushiki Kaisha. Image-receiving sheet. 5,439,872, Cl. 503-227.000.
- Itchu Fine Chemical Corporation: See—  
Uchiyama, Hiroshi, 5,439,568, Cl. 204-164.000.
- Itoh, Fumikazu: See—  
Shimase, Akira; Azuma, Junzou; Haraichi, Satoshi; Itoh, Fumikazu; and Koizumi, Yasuhiro, 5,439,763, Cl. 430-5.000.
- Itoh, Hiroyuki: See—  
Ichikawa, Fumiaki; Kobayashi, Mineo; Ohta, Masahiro; Yoshida, Yasunori; Obuchi, Shoji; and Itoh, Hiroyuki, 5,440,008, Cl. 528-361.000.
- Itoh, Yasuo: See—  
Momodomi, Masaki; Toita, Koichi; Itoh, Yasuo; Iwata, Yoshihisa; Masuoka, Fujio; Chiba, Masahiko; Endo, Tetsuo; Shiota, Rii-chiro; and Kirisawa, Ryouhei, 5,440,509, Cl. 365-185.000.
- Itoh, Yoshitaka: See—  
Wu, Jin-Jei; Uchiyama, Shoichi; Itoh, Yoshitaka; and Sonohara, Tomio, 5,440,424, Cl. 359-495.000.
- Itoi, Akito; Takenaka, Akira; and Nishi, Isao, to Kao Corporation. Process for producing polyester film. 5,439,961, Cl. 524-167.000.
- Itoi, Shigeru; and Kojima, Tetsuya, to Kiyohara, Masako. Flow rate control valve. 5,439,197, Cl. 251-95.000.
- Itomitsu, Fujio; and Yoshida, Toyohiko, to Mitsubishi Denki Kabushiki Kaisha. Data processor having branch predicting function. 5,440,704, Cl. 395-375.000.
- Itow, Takashi: See—  
Asamura, Yoshinori; Itow, Takashi; Ueda, Tomohiro; Tsunashima, Kenji; and Kurahashi, Satoshi, 5,440,344, Cl. 348-405.000.
- IVAC Corporation: See—  
Butterfield, Robert D.; and Drzewiecki, Gary M., 5,439,001, Cl. 128-672.000.
- Ivo, Argazzi, to Progetto Automazione S.R.L. Automatic distributor of stacked packages. 5,439,345, Cl. 414-797.900.
- Iwamatsu, Toshiaki; Yamaguchi, Yasuo; Inoue, Yasuo; and Nishimura, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having an SOI structure and a manufacturing method thereof. 5,440,161, Cl. 257-349.000.
- Iwamoto, Sakiko; Sano, Harunobu; Hamaji, Yukio; and Tomono, Kunisaburo, to Murata Manufacturing Co., Ltd. Dielectric ceramic composition. 5,439,857, Cl. 501-136.000.
- Iwamura, Wako; and Narahara, Yasuhiro, to Sumitomo Rubber Industries, Ltd. Pneumatic radial tire including a tread with tie bars. 5,439,040, Cl. 152-209.00R.
- Iwasaki, Hitoshi; and Akashi, Reiko, to Kabushiki Kaisha Toshiba. Ferromagnetic film, method of manufacturing the same, and magnetic head. 5,439,754, Cl. 428-692.000.
- Iwasaki, Motoya: See—  
Tsuda, Hiroki; and Iwasaki, Motoya, 5,440,267, Cl. 329-308.000.
- Iwasawa, Naozumi; and Higashi, Junichi, to Kansai Paint Co., Ltd. Positive-type photosensitive electrodepositing coating composition containing resin having ionic group and modified quinonediazidesulfone unit. 5,439,774, Cl. 430-190.000.
- Iwasawa, Yoshikazu: See—  
Tsuchiya, Yoshimi; Nomoto, Takashi; Hayashi, Masahiro; Iwasawa, Yoshikazu; Masaki, Hitoshi; Ohkubo, Mitsuru; Sakuma, Yumiko; Nagata, Yasufumi; Satoh, Toshihiko; and Kamei, Toshio, 5,439,932, Cl. 514-444.000.
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- Jacob, Steven D., to Landis & Gyr Powers, Inc. Networked fume hood monitoring system. 5,439,414, Cl. 454-61.000.
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- Jayapalan, Jay P.: See—  
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- JDS Fitel Inc.: See—  
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- Jelich, Klaus: See—  
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- Jenkins, Joseph R., Jr. Modular ladder system. 5,439,072, Cl. 182-100.000.
- Jennejahn, Rosemary J.: See—  
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- Jenoptik GmbH: See—  
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- Jerlean, Anthony. Integrated pillow case and fitted sheet. 5,438,719, Cl. 5-485.000.
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- Ishihara, Kimio, 5,438,833, Cl. 60-562.000.
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- JIT Institute of Technology, Inc.: See—  
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- Johnson, Larry E., to Ultrafab Inc. Weatherstrip assemblies. 5,438,802, Cl. 49-489.100.
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- Jones, Addison B.: See—  
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- Jones, Jeffrey S. Transparency display system. 5,440,362, Cl. 353-103.000.
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- Jones, Stanley W., deceased: See—  
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- Jorgensen, Peter, to Modulohm A/S. Safety lancet. 5,439,473, Cl. 606-182.000.
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- Joyner, Keith A.; and Hollingsworth, James B., to Texas Instruments Incorporated. Systems and methods for controlling the temperature and uniformity of a wafer during a SIMOX implantation process. 5,440,132, Cl. 250-492.210.
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- Jullien, Graham A.: See—  
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- Just, Henrietta K. Color coordinated eyeglasses. 5,440,354, Cl. 351-52.000.
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- Kabelmetal elektro GmbH: See—  
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- Kabi Pharmacia Ophthalmics, Inc.: See—  
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- Kabushiki Kaisha Kobe Seiko Sho: See—  
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- Yamazaki, Nobuto; Torihata, Minoru; and Maki, Shinji, 5,439,341, Cl. 414-676.000.
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- Inagawa, Jun; Nagumo, Masahide; and Kodama, Kunihiko, 5,440,537, Cl. 369-48.000.
- Ishikawa, Tatsuya; and Taga, Noboru, 5,440,587, Cl. 375-332.000.
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- Kawano, Shuichi; and Harigae, Masatoshi, 5,440,491, Cl. 364-443.000.
- Kitaori, Shoji, 5,440,572, Cl. 371-43.000.
- Komatsu, Michiyasu, 5,439,856, Cl. 501-97.000.
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- Murakami, Junzo, 5,440,588, Cl. 375-341.000.
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- Shimoda, Kenji, 5,440,345, Cl. 348-411.000.
- Suzuki, Shuichi, 5,439,746, Cl. 428-415.000.
- Taga, Noboru; Ishikawa, Tatsuya; and Komatsu, Susumu, 5,440,268, Cl. 329-308.000.
- Tsukamoto, Koichi, 5,440,567, Cl. 371-22.300.
- Kadooka, Humberto T.; Moreno, Ricardo P.; and Da Costa, Olavo N., to Metagal Industria E Comercio LTDA. Rearview mirror with heater for defrosting and defogging. 5,440,425, Cl. 359-512.000.
- Kadota, Toshimi: See—  
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- Kadwell, Brian J., to Robertshaw Controls Company. Control device and methods of making and operating the same. 5,440,443, Cl. 361-155.000.
- Kagawa, Tamaki: See—  
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- Kahl, Maria I.: See—  
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- Kaigler, William: See—  
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- Kakimoto, Hiroshi. Lock nut. 5,439,337, Cl. 411-240.000.
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- Kalapudas, Arja M.: See—  
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- Kalinka, Gary T.: See—  
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- Kallenbach, Rainer: See—  
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- Kalra, Krishan L.: See—  
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- Kalsep Limited: See—  
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- Kalwar, Klaus. Apparatus for and method of restoring a damaged coating of a drum. 5,439,548, Cl. 156-350.000.
- Kalwitzki, Heinrich: See—  
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- Kalz, Katherine L.: See—  
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- Kamada, Shinya: See—  
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- Kamba, Motoi: See—  
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- Kamei, Toshio: See—  
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- Kamide, Kaeko: See—  
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- Kamijima, Koichi; Tai, Seiji; and Tanaka, Hiroyuki, to Hitachi Chemical Company, Ltd. Resin composition and antifouling paint. 5,439,512, Cl. 106-18.320.
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- Kamiyama, Takao; Yokoshima, Yasuhiro; and Endoh, Shigeru, to Shonan Gosei-Jushi Seisakusho K.K.; Yokoshima & Company; and Get Inc. Method of lining a branch pipe. 5,439,033, Cl. 138-98.000.
- Kamo, Masaharu: See—  
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- Kamyu, Inc.: See—  
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- Kanbara, Yutaka: See—  
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- Kanbe, Junichiro: See—  
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- Kanda, Takeshi; Fujinuma, Kazunobu; Naoi, Toshikatsu; Inoue, Yasuhiko; Sakashita, Yoshihiko; and Sawada, Yoshihisa, to Kabushiki Kaisha Kobe Seiko Sho. Pressure Processing method for food materials. 5,439,703, Cl. 426-665.000.
- Kanebo Ltd.: See—  
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- Kanegae, Masahide, to Fujitsu Limited. Reproduced waveform equalizing circuit for thin-film magnetic head. 5,440,434, Cl. 360-65.000.
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- Kaneko, Hiroaki, to NEC Corporation. Microprocessor including device for detecting predetermined instruction and generating bus cycle. 5,440,700, Cl. 395-375.000.
- Kaneko, Kiyoshi: See—  
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- Kaneko, Setsuo: See—  
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- Kaneko, Shuzo: See—  
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- Kannegundla, Ram, to Eastman Kodak Company. Logic system and method for controlling any one of different charge coupled device image sensors to provide video image signals in accordance with a television standard. 5,440,342, Cl. 348-294.000.
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- Kapil, Randhir S.; Zutshi, Usha; Bedi, Kasturi L.; Singh, Gurbax; Johri, Ramesh K.; Dhar, Santosh K.; Kaul, Jawahar L.; Sharma, Subhash C.; Pahwa, Gurcharan S.; Kapoor, Naveen; Tickoo, Ashok K.; Tickoo, Manoj K.; Kaul, Uma; Singh, Surjeet; Zutshi, Ram K.; and Singh, Rajinder, 5,439,891, Cl. 514-31.000.



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- Kashima, Yukio: See—  
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- Kasuga, Masao, to Seiko Instruments Inc. Ultrasonic motor. 5,440,192, Cl. 310-323.000.
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Boston, David R.; Kausch, William L.; Martino, Elio; Morrison, Eric D.; and Valsecchi, Alberto, 5,439,785, Cl. 430-530.000.
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- Kawai, Shingo, to Nadek Co., Ltd. Welding controller and/or pinching force controller. 5,440,092, Cl. 219-110.000.
- Kawakami, Atsushi: See—  
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- Kawashima, Shoichi, to Fujitsu Limited. Edge-detecting pulse generator. 5,440,257, Cl. 327-100.000.
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Ifitkar, Syed H.; Thompson, Herbert E.; Kay, Teong-Hoe; and Guerini, Albert J., 5,440,436, Cl. 360-99.120.
- Kayaba Industry Co., Ltd.: See—  
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- Kayan, Helmut L.: See—  
Kieturakis, Maciej J.; and Kayan, Helmut L., 5,439,455, Cl. 604-264.000.
- Kazarinov, Rudolf F.: See—  
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- Kazmark, Eugene A., Jr., to Remin Laboratories, Inc. Cart and luggage handle assembly with an actuator and release apparatus. 5,438,731, Cl. 16-115.000.
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- Keable, Jack B.: See—  
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- Keating, Richard D.: See—  
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- Keefer, Philip A.: See—  
Barnes, Keith W.; Bauman, Donald R.; Brace, Howard N.; Keefer, Philip A.; and Mihelich, Michael E., 5,440,759, Cl. 455-15.000.
- Keiper Recaro GmbH & Co.: See—  
Engels, Bernd; Funken, Jans-Jugen; and Hacklander, Hans-Gerd, 5,438,732, Cl. 16-325.000.
- Keith, Michael: See—  
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- Keller Products Incorporated: See—  
Steinberg, Richard; and Decknick, James J., 5,439,280, Cl. 312-184.000.
- Keller, Randy C.: See—  
Chen, Zhongtai; Shell, Ronald G.; Keller, Randy C.; and Spall, J. Michael, 5,439,506, Cl. 95-19.000.

- Kellogg Company: See—  
Guzman, Miguel; and Sousa, George, Jr., 5,439,692, Cl. 426-321.000.
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- Kelly, Peter C.; Hoefler, Daniel L.; Johnson, Russell L.; Hammerberg, Barry S.; Stillahn, R. Bradley; and Kalz, Katherine L., to Productive Solutions, Inc. Flowable loose packing dunnage. 5,439,730, Cl. 428-156.000.
- Kelly, Thomas F.; Camus, Patrick P.; Larson, David J.; Holzman, Louis M.; and Bajikar, Sateeshchandra S., to Wisconsin Alumni Research Foundation. High mass resolution local-electrode atom probe. 5,440,124, Cl. 250-309.000.
- Kelly, Thomas J.: See—  
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- Kemp, Richard A. Oligomerization catalyst and process. 5,439,862, Cl. 502-121.000.
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- Kemsley, Evelyn E. K., to British Technology Group Ltd. Optical probe heads. 5,440,126, Cl. 250-339.120.
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- Kephart, Jeffrey O.: See—  
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- Khan, Riaz A.; Smith, Keith; Pelter, Andrew; and Zhao, Jin, to Tate & Lyle Public Limited Co. Process for the preparation of sucrose 6-esters. 5,440,026, Cl. 536-115.000.
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- Kikuchi, Yutaka: See—  
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- Kim, Dong-ha, to Samsung Electronics Co., Ltd. Projection lens system for rear type projection television. 5,440,429, Cl. 359-649.000.
- Kim, Hyong S.: See—  
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- Kimura, Kohichi: See—  
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- Kimura, Lucille H.: See—  
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- Kimura, Noriyuki: See—  
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- Kimura, Toshio; and Tanimichi, Tatsuhiko, to NEC Corporation. Method for handling error information between channel unit and central computer. 5,440,729, Cl. 395-182.070.
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Ross, Brian D.; and Kingsley, Peter B., 5,439,803, Cl. 435-14.000.
- Kinkel, Joachim: See—  
Mack, Margot; and Kinkel, Joachim, 5,439,979, Cl. 525-218.000.
- Kinnersley, Alan, to Plant Growth Development Corporation. Method for stimulating plant growth using GABA. 5,439,873, Cl. 504-158.000.
- Kinoshita, Akira; and Kashima, Yukio, to Matsushita Electric Industrial Co., Ltd. Electromagnetic radiation converter. 5,440,279, Cl. 333-26.000.
- Kinoshita, Hidehiko, to Mitsubishi Denki Kabushiki Kaisha. Direction detecting apparatus and method thereof. 5,440,303, Cl. 340-901.000.
- Kinoshita, Kyoichi; and Yamada, Tomoaki, to Nippon Telegraph and Telephone Corporation. Method for preparing copper oxide superconductor containing carbonate radicals. 5,439,878, Cl. 505-491.000.
- Kinoshita, Satoshi; Takamatsu, Hideo; Ishiura, Kazushige; Masuda, Haruhisa; and Taniguchi, Shunro, to Kuraray Company Ltd. Polyester composition and process for producing the same. 5,439,976, Cl. 525-92.000.
- Kintala, Chandra M.: See—  
Fuchs, Wesley K.; Huang, Yennun; Kintala, Chandra M.; and Wang, Yi-Min, 5,440,726, Cl. 395-82.180.
- Kioritz Corporation: See—  
Masuda, Isao, 5,440,083, Cl. 181-240.000.
- Kipchidze, Nodar N.: See—  
Karsanov, Nikolai V.; Selikhova, Evgenia V.; Kipchidze, Nodar N.; and Guchua, Eteri I., 5,439,883, Cl. 514-6.000.
- Kiraly, Odon: See—  
Varga, Laszlo; Sztanyik, Laszlo B.; Kanyar, Bela; Kiraly, Odon; Brucher, Erno; Emri, Jozsef; Gyori, Bela; and Kovacs, Zoltan, 5,440,031, Cl. 540-465.000.
- Kiritawa, Ryouhei: See—  
Momodomi, Masaki; Toita, Koichi; Itoh, Yasuo; Iwata, Yoshihisa; Masuoka, Fujio; Chiba, Masahiko; Endo, Tetsuo; Shiota, Rii-chiro; and Kiritawa, Ryouhei, 5,440,509, Cl. 365-185.000.
- Kirschner, Lawrence, to Church & Dwight Co., Inc. Abrasive coating remover and process for using same. 5,439,493, Cl. 51-309.000.
- Kirschner, Mark J.; and Lee, Ron C., to BOC Group, Inc., The. Refrigeration device. 5,438,845, Cl. 62-172.000.
- Kirschner, Mark J.: See—  
Sethna, Rustam H.; Kirschner, Mark J.; and Potthoff, Richard W., 5,439,556, Cl. 162-30.110.
- Kirsten, Rolf: See—  
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- Kishida, Takahito: See—  
Oka, Takeshi; Kishida, Takahito; Kawakami, Atsushi; Ohata, Masashi; and Matsumura, Akira, 5,439,582, Cl. 205-135.000.
- Kishimoto, Mitsuru: See—  
Andou, Hirokazu; Kishimoto, Mitsuru; Ishimizu, Hideaki; Umezawa, Yoichi; and Asaka, Toshiyuki, 5,439,302, Cl. 400-124.070.
- Kishioka, Hiroshi: See—  
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- Kishita, Hirofumi: See—  
Yamaguchi, Hiromasa; Yamamoto, Yasushi; and Kishita, Hirofumi, 5,439,962, Cl. 524-267.000.
- Kisu, Hiroki, to Canon Kabushiki Kaisha. Charging device, image forming apparatus and process cartridge detachably mountable to image forming apparatus. 5,440,374, Cl. 355-219.000.
- Kitahara, Akira, to Kitahara, Akira. Surface mount components and semiconductors thereof. 5,440,452, Cl. 361-773.000.
- Kitai, Katsuyoshi; Inagami, Yasuhiro; Tamaki, Yoshiko; and Tanaka, Yoshikazu, to Hitachi, Ltd. Information processing system capable of

executing a single instruction for watching and waiting for writing of information for synchronization by another processor. 5,440,750, Cl. 395-800.000.

Kitakami, Hajime: See—

Yokota, Haruo; Kitakami, Hajime; Noguchi, Yasuo; and Akaboshi, Naoki, 5,440,743, Cl. 395-650.000.

Kitamori, Takahiko: See—

Sakashita, Hajime; Kishioka, Hiroshi; Konishi, Shohei; Swada, Tsuguo; and Kitamori, Takahiko, 5,439,830, Cl. 436-534.000.

Kitamura, Tsutomu: See—

Yamazaki, Masao; and Kitamura, Tsutomu, 5,440,353, Cl. 348-806.000.

Kitao, Shoji, to Kabushiki Kaisha Toshiba. Digital signal decoding apparatus and a method thereof having a function of initializing a pass metric for at least one compression block. 5,440,572, Cl. 371-43.000.

Kitayama, Azuyasu, to Nippon Thompson Co., Ltd. Nonmagnetic raceway assembly. 5,439,297, Cl. 384-492.000.

Kitchen, Chris D., to Mountainland Support, Inc. Variable yielding mining crib support column. 5,439,325, Cl. 405-288.000.

Kitschen, Leo: See—

Beyzavi, Ali-Naghi; Kitschen, Leo; Rosenstock, Friedrich; and Dittmann, Horst, 5,439,115, Cl. 209-167.000.

Kiuchi, Atsushi, to Hitachi America, Ltd. Data processor with control logic for storing operation mode status and associated method. 5,440,747, Cl. 395-375.000.

Kiyasu, Senya; and Ninomiya, Takanori, to Hitachi, Ltd. Method of and apparatus for inspection of external appearance of a circuit substrate, and for displaying abnormality information thereof. 5,440,649, Cl. 382-147.000.

Kiyohara, Masako: See—

Ikeeda, Nobukazu; Morokoshi, Hiroshi; and Morimoto, Akihiro, 5,440,096, Cl. 219-130.500.

Itoi, Shigeru; and Kojima, Tetsuya, 5,439,197, Cl. 251-95.000.

Kiyomiya, Akira: See—

Kurusu, Keiji; Watanabe, Yoshiyuki; Sugiyama, Keikichi; and Kiyomiya, Akira, 5,439,676, Cl. 424-70.600.

Klappert, Walter R.: See—

Case, Michael B.; La Joie, Michael L.; Klappert, Walter R.; and Bumgardner, James A., 5,440,677, Cl. 395-154.000.

Klasell, Thomas A.; and Miller, Leland R., to Andersen Corporation. Composite wood structure. 5,439,749, Cl. 428-537.100.

Klaveness, Jo: See—

Almen, Torsten; Berg, Arne; Dugstad, Harald; Klaveness, Jo; Krautwurst, Klaus D.; and Rongved, Pal, 5,439,668, Cl. 424-9.361.

Klebansky, Boris A.: See—

Anshel, Michael M.; Gertner, Izidor C.; Goldfeld, Dorian; and Klebansky, Boris A., 5,440,640, Cl. 380-46.000.

Kleber, Heinrich: See—

Sitte, Hellmuth; Neumann, Klaus; Edelmann, Ludwig; Haessig, Helmut; and Kleber, Heinrich, 5,438,838, Cl. 62-55.500.

Klebl, Wolfram; and Metz, Jens, to Kabelmetal elektro GmbH. Process for controlling the welding current as a function of welding speed in arc welding equipment. 5,440,097, Cl. 219-130.210.

Kledzik, Kenneth J.: See—

Mart, Chase S.; and Kledzik, Kenneth J., 5,440,519, Cl. 365-226.000.

Kleefisch, Mark S.: See—

Bhattacharyya, Alakananda; Kleefisch, Mark S.; and Udovich, Carl A., 5,439,861, Cl. 502-84.000.

Klein, Frank E.: See—

Sigler, Gerald F.; Walter, Charles F.; Durant, Charles E.; Giancy, Todd; Klein, Frank E.; and Dorn, Allan R., 5,439,798, Cl. 435-7.700.

Klein, Larry L.; Yeung, Clinton M.; and Li, Leping, to Abbott Laboratories. 9-deoxotaxane compounds. 5,440,056, Cl. 549-510.000.

Klein, Michel: See—

Loomore, Sheena; Zealey, Gavin; Yacoub, Reza; and Klein, Michel, 5,439,810, Cl. 435-69.300.

Klein, Michel H.: See—

Haynes, Joel; Klein, Michel H.; Rovinski, Benjamin; and Cao, Shi X., 5,439,809, Cl. 435-69.300.

Kleinewefers GmbH: See—

Conrad, Hans-Rolf; Autrata, Jochen; and Hille, Albert, 5,439,366, Cl. 425-151.000.

Kleinhaeny, Arno, to Bauer Kaba AG. Lock cylinder and key as well as key blank with matched security device. 5,438,857, Cl. 70-493.000.

Klerka, Thomas M.; Thayer, Robert S.; Willard, G. Fred; Dunton, Thomas P.; and Young, John H. C., to General Electric Company. Multilayer container of polycarbonate and amorphous polyamide of improved barrier and stress crack resistant properties. 5,439,718, Cl. 428-35.700.

Klinger, Guenther H.; and Levit, Albert B., to International Paper Company. Photographic emulsions and materials with reduced pressure sensitivity. 5,439,786, Cl. 430-367.000.

Klose, Norbert: See—

Goerlich, Steffen; Merker, Wolfgang; Voigt, Peter; Klose, Norbert; Moehr, Klaus; and Wieser, Joachim, 5,440,140, Cl. 250-559.240.

Klug, Gunter; Ooms, Pieter; and Rasp, Christian, to Bayer Aktiengesellschaft. Thermoreactive recording material of particular stability. 5,439,869, Cl. 503-208.000.

Kluksdahl, Harris E.: See—

Robinson, Richard C.; Jacobson, Robert L.; Kluksdahl, Harris E.; Blanton, William A.; Holtermann, Dennis L.; and Field, Leslie A., 5,439,583, Cl. 208-62.000.

Klumperman, Lubertus; Boyens, Joseph P. H.; and Geesink, Johannes H., to DSM N.V. Process for preparing intrinsically foamed thermoplastic polymer. 5,439,946, Cl. 521-77.000.

Kneepkens, Franciscus A.; and Lokhoff, Gerardus C. P., to U.S. Philips Corporation. Transmitter, receiver and record carrier in a digital transmission system. 5,440,596, Cl. 375-240.000.

Knickerbocker, John U.: See—

Bezama, Raschid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Frase, Katharine G.; Gabriels, David H.; Heron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillito, Robert M.; Sura, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.

Knickerbocker, Sara H.: See—

Bezama, Raschid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Frase, Katharine G.; Gabriels, David H.; Heron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillito, Robert M.; Sura, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.

Knight, Alex; and Walsworth, Richard L., to Harris Corporation. Phase differential measurement circuit. 5,440,251, Cl. 327-3.000.

Knight, Arthur M., to Ecosmart, Inc. Non-hazardous pest control. 5,439,690, Cl. 424-687.000.

Knight, Stephen A.: See—

Boegel, Mark A.; Bolstad, Douglas O.; Knight, Stephen A.; Kiel, Harvey G.; Nelson, Robert R.; and Wright, Pamela A., 5,440,697, Cl. 395-500.000.

Knoll, Wolfgang; and Mages, Klaus, to Albert-Frankenthal Aktiengesellschaft. Rotogravure inking system. 5,438,924, Cl. 101-153.000.

Knop, Klaus: See—

Kubiak, Helmut; Schroter, Hans J.; Gappa, Gunther; Kalwitzki, Heinrich; and Knop, Klaus, 5,439,491, Cl. 48-99.000.

Knorr-Bremse AG: See—

Baumgartner, Hans; and Bieker, Dieter, 5,439,078, Cl. 188-73.450.

Knowles, John H., Jr.; and Yabusaki, DeeAnn I., to LittlePoint Corporation. Volumetric measurement device for a dispensing container. 5,438,886, Cl. 73-865.800.

Knox, Benjamin H.: See—

Bennett, James P.; Knox, Benjamin H.; and Schafluetzel, Dennis R., 5,439,626, Cl. 264-103.000.

Knox, Charles R.: See—

Chen, Fatchi; Eduarte, Jose A.; Knox, Charles R.; Lisle, Ronald J.; and Weeks, Raymond W., 5,440,740, Cl. 395-650.000.

Kobari, Hideya: See—

Sago, Hiroyoshi; Kumazawa, Hirotugu; Shimai, Futoshi; Fujiyama, Shigemi; Endo, Hiroki; and Kobari, Hideya, 5,439,519, Cl. 118-52.000.

Kobayashi, Hidetsugu: See—

Onitsuka, Shigenori; Ichiki, Masayoshi; Inazumi, Chikashi; Watanabe, Takanobu; Fukui, Atsushi; Akiyama, Masaki; Sairoy, Yuki; and Kobayashi, Hidetsugu, 5,439,868, Cl. 502-415.000.

Kobayashi, Katsuyuki; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; and Tokioka, Masaki, to Canon Kabushiki Kaisha. Measuring method and apparatus using a lamb wave. 5,438,872, Cl. 73-597.000.

Kobayashi, Kenji. Golf club head. 5,439,223, Cl. 273-169.000.

Kobayashi, Masahiko; and Takahashi, Nobuyuki, to Anelva Corporation. Method for successive formation of thin films. 5,439,574, Cl. 204-192.120.

Kobayashi, Mineo: See—

Ichikawa, Fumiaki; Kobayashi, Mineo; Ohta, Masahiro; Yoshida, Yasunori; Obuchi, Shoji; and Itoh, Hiroyuki, 5,440,008, Cl. 528-361.000.

Kobayashi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Personal jet propelled watercraft. 5,438,946, Cl. 114-270.000.

Kobayashi, Norio: See—

Okada, Kinjiro; Shiraiishi, Hiromasa; Yokosawa, Hirokazu; Takehana, Shinichi; and Kobayashi, Norio, 5,438,725, Cl. 15-97.100.

Koch, Christof: See—

Mathur, Bimal P.; and Koch, Christof, 5,440,079, Cl. 178-18.000.

Koch, Klaus; and Skubich, Rolf, to Hermann Berstorff Maschinenbau GmbH. Process for a uniform heating, pasteurization and sterilization of products by means of microwave. 5,440,104, Cl. 219-700.000.

Kochte, Werner W., to Steris Corporation. Cutter for opening sterilant reagent cups. 5,439,654, Cl. 422-292.000.

Koda, Yuzo: See—

Saito, Keishi; Matsuyama, Jinsho; Kariya, Toshimitsu; Matsuda, Koichi; Koda, Yuzo; and Okada, Naoto, 5,439,533, Cl. 136-258.000.

Kodama, Jun; Foerch, Renate; McIntyre, N. Stewart; and Castle, George S. P. Plasma treatment of polymer powders. 5,439,984, Cl. 525-332.800.

Kodama, Kunihiko: See—

Inagawa, Jun; Nagumo, Masahide; and Kodama, Kunihiko, 5,440,537, Cl. 369-48.000.

Kodama, Yoshikatsu: See—

Horikoshi, Toshio; Hiraoka, Junichiro; Fujita, Isamu; Tokoro, Tohru; Kodama, Yoshikatsu; and Yokoyama, Hideaki, 5,439,680, Cl. 424-157.100.

Kodas, Toivo T.; Ward, Timothy L.; and Glicksman, Howard D., to Du Pont de Nemours, E. I., and Company; and University of New Mexico. Method for making silver powder by aerosol decomposition. 5,439,502, Cl. 75-365.000.

Koenig & Bauer Aktiengesellschaft: See—

Schoeps, Martin H., 5,438,923, Cl. 101-147.000.

Koga, Yuzuru: See—

Takiyama, Shushi; Matsumoto, Hitoshi; and Koga, Yuzuru, 5,440,685, Cl. 395-164.000.

Kohama, Tokio: See—

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Kohtaki, Takaaki: See—

Taya, Masaaki; Kohtaki, Takaaki; Unno, Makoto; and Doujo, Tadashi, 5,439,770, Cl. 430-106.000.

Koide, Kunihiko; and Yajima, Tamotsu, to Tokyo Yogyo Kabushiki Kaisha. Sensor probe for measuring hydrogen concentration in molten metal. 5,439,579, Cl. 204-422.000.

Koike, Hisashi; Fukuoka, Morimao; Kurasawa, Yuko; Inami, Minoru; and Yamane, Masayuki, to Olympus Optical Co., Ltd. Solution doping of sol gel bodies to make graded index glass articles. 5,439,495, Cl. 65-17.200.

Koike, Shin'ichi, to NEC Corporation. Decision feedback equalizer with second-order recursive filter controlled with two feedback coefficients. 5,440,583, Cl. 375-233.000.

Koivukunnas, Pekka; and Lipponen, Juhani, to Valmet Paper Machinery Inc. Method for calendaring a paper or an equivalent web material and a calendar that makes use of the method. 5,438,920, Cl. 100-38.000.

Koiwa, Mitsuru: See—

Murata, Shigemi; Sawazaki, Nobuyuki; Koiwa, Mitsuru; and Ohashi, Yutaka, 5,438,971, Cl. 123-634.000.

Koizumi, Yasuhiro: See—

Shimase, Akira; Azuma, Junzou; Haraichi, Satoshi; Itoh, Fumikazu; and Koizumi, Yasuhiro, 5,439,763, Cl. 430-5.000.

Kojima, Hideki, to Toko Kabushiki Kaisha. Core for coil device such as power transformers, choke coils used in switching power supply. 5,440,225, Cl. 323-359.000.

Kojima, Kouichi: See—

Torii, Takeshi; Suzuki, Katsunori; Sonoda, Tetsuo; and Kojima, Kouichi, 5,439,565, Cl. 204-129.100.

Kojima, Shinichi: See—

Okuda, Tetsuya; and Kojima, Shinichi, 5,440,402, Cl. 358-406.000.

Kojima, Tetsuya: See—

Itoi, Shigeru; and Kojima, Tetsuya, 5,439,197, Cl. 251-95.000.

Kok, Piet; Dewanckele, Jean-Marie; Locuffier, Johan; Michiels, Eddy; and Michiels, Frank, to Agfa-Gevaert, N.V. Modified gelatin types and hydrophilic elements containing them. 5,439,791, Cl. 430-622.000.

Kokeguchi, Akira; and Nakayama, Yoshikazu, to Takata Corporation. Inflator for air bag device. 5,439,250, Cl. 280-736.000.

Kolb, Andreas, to TRW Repa GmbH. Inflatable gas bag for a vehicular restraining system. 5,439,247, Cl. 280-730.200.

Komaki, Susumu: See—

Fujisawa, Shuji; Komaki, Susumu; Sakato, Shingo; Taniguchi, Masami; and Takeda, Hideki, 5,440,375, Cl. 355-221.000.

Komamura, Takeo. Frame. 5,438,778, Cl. 40-156.000.

Komatsu, Michiyasu, to Kabushiki Kaisha Toshiba. High thermal conductive silicon nitride sintered body and method of producing the same. 5,439,856, Cl. 501-97.000.

Komatsu, Susumu: See—

Taga, Noboru; Ishikawa, Tatsuya; and Komatsu, Susumu, 5,440,268, Cl. 329-308.000.

Komori Corporation: See—

Okuda, Tetsuya; and Kojima, Shinichi, 5,440,402, Cl. 358-406.000.

Komori, Yumiko: See—

Nukada, Hidemi; Sakaguchi, Yasuo; Hoshizaki,



Koning, Herman E. J.: See—  
Czaplewski, Steven J.; and Koning, Herman E. J., 5,440,069, Cl. 800-200.000.

Konishi, Hiroyuki; Utsunomiya, Michito; and Naito, Kazufumi, to Ishida Co., Ltd. Combined weighting and displacement sensor and weighing apparatus using the same. 5,440,077, Cl. 177-185.000.

Konishi, Kozo; Chizaki, Shoichi; Fujii, Shuzo; and Takashima, Yoshiyuki, to Denka Consultant and Engineering Co., Ltd. Hydrated granular carrier prepared from polyvinyl alcohol and activated charcoal for biological treatment apparatus. 5,439,858, Cl. 502-7.000.

Konishi, Shohei: See—  
Sakashita, Hajime; Kishioka, Hiroshi; Konishi, Shohei; Swada, Tsuguo; and Kitamori, Takahiko, 5,439,830, Cl. 436-534.000.

Konishi, Toshiharu: See—  
Nakamura, Koichi; Matsuoka, Naoki; Konishi, Toshiharu; Sano, Kenji; and Wada, Hiroshi, 5,439,748, Cl. 428-511.000.

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Lee, Sung J.; Konishi, Yoshitaka; Macina, Orest T.; Kondo, Kigen; and Yu, Dingwei T., 5,439,895, Cl. 514-63.000.

Konrad Friedrichs KG: See—  
Friedrichs, Arno, 5,438,858, Cl. 72-260.000.

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Kontos, Stavros B., to Boston Scientific Corporation. Support catheter assembly. 5,439,445, Cl. 604-96.000.

Koopersmith, Craig A.: See—  
Scalliet, Robert M.; Ruth, Raymond R.; and Koopersmith, Craig A., 5,439,489, Cl. 44-281.000.

Kopatz, Nelson: See—  
Houck, David L.; Kopatz, Nelson; Paliwal, Muktesh; and Sampath, Sanjay, 5,439,638, Cl. 419-30.000.

Kordun, Ltd.: See—  
Gvoich, Ned; and Belacazar, Andreas, 5,439,225, Cl. 273-186.100.

Korea Institute of Science and Technology: See—  
Han, Kyoung Ran, 5,439,851, Cl. 501-12.000.

Korhonen, Matt A.: See—  
Li, Che-Yu; Borgesen, Peter; and Korhonen, Matt A., 5,439,731, Cl. 428-209.000.

Kornreich, Wayne D.; Hernandez, Jean-Francois; Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. CRF analogs. 5,439,885, Cl. 514-12.000.

Korpmann, Ralf, to Permaseal. Cured thermoplastic high tack pressure sensitive adhesive. 5,439,963, Cl. 524-271.000.

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Tabata, Yasushi; Numako, Norio; and Kosako, Kosei, 5,440,369, Cl. 354-432.000.

Kosuth Lajos Tudományegyetem: See—  
Varga, Laszlo; Sztanyik, Laszlo B.; Kanyar, Bela; Kiraly, Odon; Brucher, Erno; Emri, Jozsef; Gyori, Bela; and Kovacs, Zoltan, 5,440,031, Cl. 540-465.000.

Kostoff, Ronald N.; Miles, David L.; and Eberhart, Henry J., to United States of America, Navy. System and method for database tomography. 5,440,481, Cl. 364-419.080.

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Inoue, Norihide; Shiomura, Tetsunosuke; Kouno, Masahiro; Sonobe, Yoshiho; and Mizutani, Kazumi, 5,439,994, Cl. 526-114.000.

Kovacs, Zoltan: See—  
Varga, Laszlo; Sztanyik, Laszlo B.; Kanyar, Bela; Kiraly, Odon; Brucher, Erno; Emri, Jozsef; Gyori, Bela; and Kovacs, Zoltan, 5,440,031, Cl. 540-465.000.

Koval, Carl A.: See—  
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Kowalczyk, James E.; and Loomans, Bernard A., to APV Chemical Machinery Inc. Methods of constructing drive elements including paddle and shaft assemblies for twin screw mixer and/or processors and the resulting apparatus. 5,439,286, Cl. 366-97.000.

Koya, Kazuo: See—  
Mori, Tsuneo; and Koya, Kazuo, 5,440,420, Cl. 359-341.000.

Koyama, Katsumi: See—  
Sakai, Hitoshi; and Koyama, Katsumi, 5,439,385, Cl. 439-79.000.

Koyama, Masaru: See—  
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Tsunoaki, Manabu; Ishii, Kyoko; Nozaki, Koichi; Yoshioka, Hiroshi; Koyama, Yoshihisa; Udo, Shinji; Aoyagi, Hidetomo; Miyatake, Sinichi; Morino, Makoto; and Hoshida, Akihiko, 5,440,521, Cl. 365-230.030.

Kozah, Ghassan F.; and Donoghue, Charles M. Kinetically positioned data acquisition apparatus and method. 5,440,492, Cl. 364-454.000.

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Kozlowski, Joseph A.: See—  
Berger, Joel G.; Kozlowski, Joseph A.; and Chang, Wei, 5,440,033, Cl. 540-549.000.

Kraft, Douglas R.: See—  
Gruender, Eugene H., Jr.; and Kraft, Douglas R., 5,440,181, Cl. 307-156.000.

Kraft General Foods, Inc.: See—  
Hasenhuettl, Gerry, 5,440,027, Cl. 536-115.000.

Kramer, Herbert J.; and Egan, Betty L. Candle with attached ignitor. 5,439,376, Cl. 281-287.000.

Kramer, Norbert. Method and apparatus for the automatic checking and quality determination of tablets or pills. 5,439,036, Cl. 141-1.000.

Kramer, Wolfgang: See—  
Dutzmann, Stefan; Dehne, Heinz-Wilhelm; Kuck, Karl-Heinz; Brandes, Wilhelm; and Kramer, Wolfgang, 5,439,926, Cl. 514-383.000.

Kranenberg, Christian F. Table balanced, adjustable moment of inertia, vibrationally tuned putter. 5,439,222, Cl. 273-167.00G.

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Laurent, Henry; Esperling, Peter; Elger, Walter; and Krattenmacher, Rolf, 5,439,902, Cl. 514-179.000.

Krause, David A., to Mitsubishi Semiconductor America, Inc. Method of and system for laying out bus cells on an integrated circuit chip. 5,440,497, Cl. 364-491.000.

Krautwurst, Klaus D.: See—  
Almen, Torsten; Berg, Arne; Dugstad, Harald; Klaveness, Jo; Krautwurst, Klaus D.; and Rongved, Pal, 5,439,668, Cl. 424-9.361.

Krebs, Ronald R.: See—  
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Kreppel, Kenneth J.: See—  
Steffen, James E.; Esch, Jay A.; Mattila, Robert J.; Donaldson, Eric J.; Vraa, Timothy S.; Nelson, Owen L.; Potts, John E.; Edwards, Jathan D.; Kreppel, Kenneth J.; and Hoffman, Joseph A., 5,440,146, Cl. 250-580.000.

Krieger, Neil R.: See—  
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Krishnamurthy, V.: See—  
Lucas, Bennie M.; Krishnamurthy, V.; and Bonser, John R., 5,439,949, Cl. 522-157.000.

Kristy, Stephen H.: See—  
Parulski, Kenneth A.; Kristy, Stephen H.; and O'Brien, Donald E., 5,440,401, Cl. 358-342.000.

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Krohne Messtechnik GmbH & Co. KG.: See—  
van der Pol, Ronald, 5,438,867, Cl. 73-290.00V.

Kroll, Mark W.: See—  
Adams, Theodore P.; and Kroll, Mark W., 5,439,482, Cl. 607-5.000.

Kropf, Keith E., to Maytag Corporation. Unbalance switch mechanism. 5,440,086, Cl. 200-61.620.

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Abe, Fumio; Noda, Naomii; Hori, Makoto; and Fukui, Toshimi, 5,439,865, Cl. 502-333.000.

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Balzer, Julian; Feustel, Michael; Krull, Matthias; and Reimann, Werner, 5,439,981, Cl. 525-282.000.

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Settles, Steven R.; Krupp, Eric J.; and Buccinna, Frank, 5,440,646, Cl. 381-188.000.

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Lents, Norbert; and Witt, Karl-Heinz, 5,439,095, Cl. 198-480.100.

Ksionzyk, Anne H.: See—  
Francis, Hubert C.; and Ksionzyk, Anne H., 5,439,518, Cl. 106-705.000.

Ku, David N.: See—  
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Kudo, Michiharu, to International Business Machines Corporation. Method and apparatus for display and interactive modification of the tasks in a production plan. 5,440,681, Cl. 395-161.000.

Kuester, Willi: See—  
Probst, Willi; Blum, Richard; Groh, Hans-Michael; Kuester, Willi; and Herr, Klaus-Jürgen, 5,439,282, Cl. 312-321.500.

Kuffer, Max, to Keystone International Holdings Corp. Steam conditioning butterfly valve. 5,439,619, Cl. 261-41.400.

Kuhfuss, Runwalt, to De La Rue Giori S.A. Counting station for counting the notes of value, in particular banknotes, of a banded pack of notes. 5,440,601, Cl. 377-8.000.

Kuhler, Thomas: See—  
Briving, Carin; Carlsson, Stig; Carter, Robert; Elebring, Marie; Kuhler, Thomas; Nordberg, Peter; Starke, Ingemar; and Svensson, Arne, 5,439,917, Cl. 514-300.000.

Kuhling, Steffen: See—  
Buysch, Hans-Josef; Schon, Norbert; Kuhling, Steffen; and Hahnen, Heinrich, 5,440,066, Cl. 558-277.000.

Kulak Technologies Pty. Ltd.: See—  
Fruend, Ian K., 5,439,171, Cl. 238-14.000.

Kulik, William M.: See—  
Barber, Thomas A., III; Apollonia, John; and Kulik, William M., 5,438,840, Cl. 62-64.000.

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Kumagai, Takehiko; Kikuchi, Takashi; Okubo, Takao; and Fuse, Yasuyuki, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Single semiconductor substrate RAM device utilizing data compressing/expanding mechanism in a multi-microprocessor environment. 5,440,718, Cl. 395-481.000.

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Sago, Hiroyoshi; Kumazawa, Hirotugu; Shimai, Futoshi; Fujiyama, Shigemori; Endo, Hiroki; and Kobari, Hideya, 5,439,519, Cl. 118-52.000.

Kuminski, Arthur J.: See—  
Weinerman, Lee S.; Kuminski, Arthur J.; Hollingsworth, James L.; and Arthurs, Scott A., 5,439,260, Cl. 292-48.000.

Kumobayashi, Hidenori: See—  
Saito, Takao; Kumobayashi, Hidenori; and Murahashi, Shunichi, 5,440,030, Cl. 540-357.000.

Kunugi, Masanao, to Seiko Epson Corporation. Developing method and system. 5,439,769, Cl. 430-102.000.

Kunz, Horst; Braun, Gunther; and Braun, Peter, to Hoechst Aktiengesellschaft. Carboxylate protective groups, a process for their preparation, their coupling to a functional group, and their use. 5,439,806, Cl. 435-68.100.

Kupferberg, Minel. Exhaust fan apparatus. 5,439,349, Cl. 415-212.100.

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Kurahashi, Satoshi: See—  
Asamura, Yoshinori; Itow, Takashi; Ueda, Tomohiro; Tsunashima, Kenji; and Kurahashi, Satoshi, 5,440,344, Cl. 348-405.000.

Kuraishi, Tadayuki: See—  
Yamazaki, Kazuo; Adegawa, Shigeru; Ogawa, Yoichiro; Matsuda, Hideaki; and Kuraishi, Tadayuki, 5,440,036, Cl. 544-105.000.

Kuramatsu, Hiroyasu, to NEC Corporation. Paging receiver having data rate detector for continuing address receiving mode. 5,440,298, Cl. 340-825.440.

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Kinoshita, Satoshi; Takamatsu, Hideo; Ishiura, Kazushige; Masuda, Haruhisa; and Taniguchi, Shunro, 5,439,976, Cl. 525-92.000.

Kurasawa, Yuko: See—  
Koike, Hisashi; Fukuoka, Morinao; Kurasawa, Yuko; Inami, Minoru; and Yamane, Masayuki, 5,439,495, Cl. 65-17.200.

Kurata, Yukio: See—  
Miyake, Takahiro; Yoshida, Yoshio; and Kurata, Yukio, 5,440,427, Cl. 359-566.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: See—  
Ohba, Hiroyuki; Hirose, Kazuhiko; Tanaka, Hideaki; and Hisazumi, Nobuyuki, 5,439,745, Cl. 428-412.000.

Kurematsu, Masayuki; and Goto, Nobutaka, to Konica Corporation; and Sanyo Electric Co., Ltd. Low pressure evaporation concentrating apparatus for a photographic process waste disposal. 5,439,560, Cl. 202-186.000.

Kurita, Toshihiko: See—  
Iida, Ichiro; and Kurita, Toshihiko, 5,440,541, Cl. 370-60.100.

Kuriyama, Minoru: See—  
Enokido, Kazunori; Mishima, Hidehiko; Marusue, Toshihisa; Mizobe, Tatsutoshi; Nagayama, Shigeru; Sumimoto, Takayuki; Kuriyama, Minoru; and Kamada, Shinya, 5,439,427, Cl. 477-130.000.

Kuriyama, Satoshi: See—  
Takahashi, Toshiro; Ikeda, Masaaki; Kuriyama, Satoshi; Tanaka, Koji; Sasamoto, Shuji; and Shibayama, Katsutoshi, 5,439,097, Cl. 198-803.010.

Kurokawa, Yasuhiro: See—  
Hirose, Kazuhiko; Kurokawa, Yasuhiro; Yamamoto, Tomohiko; Matsunishi, Masaru; and Nawata, Yoshihiro, 5,440,032, Cl. 540-540.000.

Kurosawa, Takahiro: See—  
Nagashima, Masaaki; Yamakawa, Tadashi; Sasaki, Takayuki; Okuno, Yasuhiro; and Kurosawa, Takahiro, 5,440,731, Cl. 395-600.000.

Kurosu, Shigetaka: See—  
Suzuki, Chikatsu; Kurosu, Shigetaka; and Miura, Kazunobu, 5,440,381, Cl. 355-309.000.

Kuroyanagi, Satoru: See—  
Nakagawa, Susumu; Asai, Akira; Kuroyanagi, Satoru; Ishihara, Makoto; and Tanaka, Yoshiharu, 5,440,049, Cl. 549-49.000.

Kurr, Klaus; Spies, Karl-Heinz; and Meinig, Uwe, to Carl Freudenberg. Firma. Heating module for an internal combustion engine. 5,438,969, Cl. 123-549.000.

Kurusu, Keiji; Watanabe, Yoshiyuki; Sugiyama, Keikichi; and Kiyomiya, Akira, to Lion Corporation. cAMP derivatives and use thereof for preventing or restoring grayed hair to its natural color. 5,439,676, Cl. 424-70.600.

Kushibashi, Shigenobu; and Sakamoto, Hiroshi, to Japan Tobacco Inc. Device for guiding the travel of tobacco rod in a cigarette manufacturing apparatus. 5,439,009, Cl. 131-84.100.

Kutchie, Steven A. Snowmobile ski wheels. 5,439,237, Cl. 280-11.000.

Kutsukake, Masaki: See—  
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hidechiro; and Arita, Hitoshi, 5,439,872, Cl. 503-227.000.

Kuusama, Juha, to Nokia Technology GmbH. Active noise cancellation system. 5,440,641, Cl. 381-71.000.

Kuwabara, Shigeaki: See—  
Tsunoda, Masaki; Kuwabara, Shigeaki; and Shidara, Sadafumi, 5,438,963, Cl. 123-54.400.

Kwong, Joseph Y.: See—  
Tran, Dich C.; Liu, Yiu T.; Lui, Stanley Y. W.; Kwong, Joseph Y.; and Yan, Junqi, 5,440,108, Cl. 235-381.000.

Kyodo Printing Co., Ltd.: See—  
Fujita, Minoru; Sugaya, Kenji; and Nakahara, Yoshihiko, 5,439,755, Cl. 428-694.0BP.

Kyorin Pharmaceutical Co., Ltd.: See—  
Miyachi, Hiroyuki; Segawa, Mitsuru; Tagami, Emiko; and Okubo, Hideo, 5,439,919, Cl. 514-316.000.

Kyoto Daiichi Kagaku Co., Ltd.: See—  
Yagi, Yuji; Kagawa, Tamaki; Tamura, Hiroshi; and Ota, Tetsuya, 5,439,827, Cl. 436-66.000.

Kyowa Hakko Kogyo Co., Ltd.: See—  
Katsumata, Ryoichi; and Takano, Yutaka, 5,439,822, Cl. 435-252.320.

Sakashita, Hajime; Kishioka, Hiroshi; Konishi, Shohei; Swada, Tsuguo; and Kitamori, Takahiko, 5,439,830, Cl. 436-534.000.

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Bordeleau, Joseph R. L.; Hastings, David J.; and McGarrity, Michael J., 5,439,693, Cl. 426-330.400.

Labelle, James L.: See—  
Lewis, Garrett W.; Jablon, Jeffrey M.; and Labelle, James L., 5,439,038, Cl. 141-64.000.

Laboratoire L. Lafon: See—  
Laurent, Philippe, 5,439,920, Cl. 514-317.000.

Labowsky, Michael J. Method for eliminating noise and artifact peaks in the deconvolution of multiply charged mass spectra. 5,440,119, Cl. 250-282.000.

Labunos, Nellie M.: See—  
Lusterio, Decorosa D.; Suizo, Franklin G.; Labunos, Nellie M.; Valledor, Marietta N.; and Ueda, Shinta, 5,439,816, Cl. 435-209.000.

Lach, Olivier; and Schenck, Serge, to Societe Nationale Industrielle et Aerospatiale. Antenna reflector reconfigurable in service. 5,440,320, Cl. 343-915.000.

Lach, Patrick: See—  
Barbier, Bruno; Favot, Jean-Jacques; Lach, Patrick; and Perbet, Jean-Noel, 5,440,114, Cl. 250-206.200.

Lackie, Edward J. Compartmentalized tool box. 5,439,108, Cl. 206-373.000.

LaClair, Christa M.: See—  
Commons, Thomas J.; LaClair, Christa M.; and Christman, Susan, 5,439,915, Cl. 514-292.000.

Lagler, Eugen, to Eugen Lagler GmbH. Floor working machine. 5,439,413, Cl. 451-353.000.

Lahary, Pierre-Yves; and Coquard, Jean, to Rhone-Poulenc Chimie. Semi-crystalline, semi-aromatic copolyamides. 5,440,006, Cl. 528-349.000.

Lahde, Matti A.: See—  
Karjalainen, Arto J.; Pelkonen, Reino O.; Sodervall, Marja-Liisa; Lahde, Matti A.; Lammintausta, Risto A. S.; Karjalainen, Arja L.; and Kalapudas, Arja M., 5,439,928, Cl. 514-400.000.

Laine, Richard M., to Washington Research Foundation. Ion conducting polymers. 5,440,011, Cl. 528-425.000.

Lainiere de Picardie: See—  
Paire, Christian, 5,439,733, Cl. 428-219.000.

Trabelsi, Mohamed F., 5,439,737, Cl. 428-317.700.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—  
Barbe, Christian; and Brugerolle, Jean-Renaud, 5,439,507, Cl. 95-23.000.



- La Joie, Michael L.: See—  
Case, Michael B.; La Joie, Michael L.; Klappert, Walter R.; and Bumgardner, James A., 5,440,677, Cl. 395-154.000.
- Lalaouna, Said; Olivier, Jean-Francois; and Penha, Manuel, to Framatome Connectors International. Device for molding plastic material ferrule for optical fiber connectors. 5,439,370, Cl. 425-546.000.
- Lambert, L. Q., Jr., to Raytheon Company. Fiber optic switching system. 5,440,654, Cl. 385-17.000.
- Lambur, James A. K. Lateral eye shielding device. 5,438,706, Cl. 2-13.000.
- Lammintausta, Risto A. S.: See—  
Karjalainen, Arto J.; Pelkonen, Reino O.; Sodervall, Marja-Liisa; Lahde, Matti A.; Lammintausta, Risto A. S.; Karjalainen, Arja L.; and Kalapudas, Arja M., 5,439,928, Cl. 514-400.000.
- Lanard Toys Limited: See—  
Brevelli, Virginio, 5,439,139, Cl. 222-79.000.
- Landau, John E.; Matthews, Wallace E.; and Freeman, David L., to Benchmark Microelectronics, Inc. Method and apparatus for monitoring battery capacity with charge control. 5,440,221, Cl. 320-22.000.
- Landesman, David: See—  
Bubley, Henry J.; and Landesman, David, 5,438,922, Cl. 101-123.000.
- Landis & Gyr Powers, Inc.: See—  
Jacob, Steven D., 5,439,414, Cl. 454-61.000.
- Landmann, David W. Building sign system. 5,438,781, Cl. 40-584.000.
- Landreville, Charles, to 832276 Ontario Inc. Fence bracket. 5,439,201, Cl. 256-65.000.
- Lane, Parley C., Jr.: See—  
Yi, Kong S.; Tenney, Linwood P.; Lane, Parley C., Jr.; Wessel, John V.; and Marchant, Nancy S., 5,439,992, Cl. 526-73.000.
- Lang, Michael: See—  
Grant, Richard L.; Lang, Michael; Churchill, Philip J.; and Lawrence, W. Thompson, 5,439,156, Cl. 227-179.000.
- Lang, Richard A.: See—  
Walters, Eric H.; Lang, Richard A.; and Mincer, Earl L., 5,440,334, Cl. 348-6.000.
- Lang, Robert J.: See—  
Welch, David F.; Lang, Robert J.; Osinski, Julian S.; Dzurko, Kenneth M.; Mehuys, David G.; and Waarts, Robert G., 5,440,576, Cl. 372-50.000.
- Langlois, Marc: See—  
Shaw, David G.; Dawson, Eric; Cline, Daniel; and Langlois, Marc, 5,440,446, Cl. 361-301.500.
- Lankford, Alan D. Low profile mounting apparatus, for gas masks or other devices. 5,439,194, Cl. 248-309.100.
- Lansdorf, Peter M.: See—  
Richards, Adrian J.; and Lansdorf, Peter M., 5,439,586, Cl. 210-222.000.
- Lanzide Technology Company, L.P.: See—  
Rosenthal, Allan B., 5,439,855, Cl. 501-97.000.
- Lanzide Technology Company, LP: See—  
Claar, Terry D.; Ravi, Vilupanur A.; and Roach, Philip J., 5,439,744, Cl. 428-408.000.
- Lapauw, Romain. Industrial ironing machine and method for manufacturing a bed used in such machine. 5,438,776, Cl. 38-47.000.
- Lapp, John: See—  
Hasler, Stephen P.; Johnson, Stephen P.; and Lapp, John, 5,440,287, Cl. 337-168.000.
- Lari, Ferdinando: See—  
Siligoni, Marco, deceased; and Lari, Ferdinando, 5,440,612, Cl. 379-27.000.
- Larrick, James W.: See—  
Wu, Chu-tse; Tu, Qiang; He, Fu-chu; and Larrick, James W., 5,440,022, Cl. 530-399.000.
- Larsen, Bradley J.; Randazzo, Todd A.; and Gongwer, Geoffrey S., to Atmel Corporation. Single layer polysilicon EEPROM having uniform thickness gate oxide/capacitor dielectric layer. 5,440,159, Cl. 257-318.000.
- Larsen, James E., to Cardinal IG Company. Multiple pane insulating glass unit with insulative spacer. 5,439,716, Cl. 428-34.000.
- Larsen, James G.: See—  
Alappat, Kuriappan P.; Ayerill, Edward E.; and Larsen, James G., 5,440,676, Cl. 395-143.000.
- Larson, Bruce E. Apparatus and method for real-time extraction and display of musical chord sequences from an audio signal. 5,440,756, Cl. 395-800.000.
- Larson, David J.: See—  
Kelly, Thomas F.; Camus, Patrick P.; Larson, David J.; Holzman, Louis M.; and Bajikar, Sateeshchandra S., 5,440,124, Cl. 250-309.000.
- Larson, John A.: See—  
Pikul, Henry; Droho, Joseph S.; Larson, John A.; and McClurg, Dale C., 5,440,286, Cl. 336-160.000.
- Larson, Svante, to SL Innovation AB. Polishing drum. 5,439,410, Cl. 451-28.000.
- Laskaris, Evangelos T.: See—  
Dorri, Bizhan; Laskaris, Evangelos T.; Herd, Kenneth G.; and Gabis, Raymond E., 5,439,543, Cl. 156-184.000.
- Laaker, Sigmund E. Organometallic diphenyl hydrantions and uses thereof. 5,439,903, Cl. 514-184.000.
- Lau, Te-Li: See—  
Lentz, Derek J.; Hagiwara, Yasuaki; Lau, Te-Li; Tang, Cheng-Long; and Nguyen, Le Trong, 5,440,752, Cl. 395-800.000.
- Lau, Tim O.; Huang, Alexander; and Lo, Douglas P., to NeXT, Inc. Housing cooling system. 5,440,450, Cl. 361-695.000.
- Laubach, Victor: See—  
Brantly, Mark; and Laubach, Victor, 5,439,824, Cl. 435-320.100.
- Lauk, Urs, to Ciba-Geigy Corporation. Triphenyldioxazines, their preparation and the use thereof. 5,439,486, Cl. 8-532.000.
- Laukzemis, Daniel A., to AT&T Corp. DSX jack. 5,439,395, Cl. 439-668.000.
- Laurent, Henry; Esperling, Peter; Elger, Walter; and Krattenmacher, Rolf, to Schering Aktiengesellschaft. 14 $\alpha$ , 16 $\alpha$ -ethanoand 14 $\alpha$ , 16 $\alpha$ -etheno-estratrienes. 5,439,902, Cl. 514-179.000.
- Laurent, Philippe, to Laboratoire L. Lafon. 1,2,5,6-tetrahydropyridine derivative, process for preparing it and its applications in therapy. 5,439,920, Cl. 514-317.000.
- Lautenschlager, Horst, to MEPLA-Werke Lautenschlager GmbH & Co. KG. System for fastening drawer bottoms. 5,439,285, Cl. 312-348.100.
- Lautzenheiser, Terry L., to Steelcase Inc. Task light. 5,440,467, Cl. 362-222.000.
- Lawrence, Anna C.: See—  
Chown, Philip K.; Clarke, Simon; Green, Eric C.; MacFarlane, Anthony S.; Medicott, Philip A. C.; and Lawrence, Anna C., 5,439,588, Cl. 210-350.000.
- Lawrence, W. Thompson: See—  
Grant, Richard L.; Lang, Michael; Churchill, Philip J.; and Lawrence, W. Thompson, 5,439,156, Cl. 227-179.000.
- Laws, Peter G., to Plessey Semiconductors Limited. Integrated circuit amplifier arrangements. 5,440,271, Cl. 330-252.000.
- Lawson, John R., Jr., to Digital Equipment Corporation. Sorter for records having different amounts of data. 5,440,736, Cl. 395-600.000.
- Lawson Screen Products, Inc.: See—  
Bubley, Henry J.; and Landesman, David, 5,438,922, Cl. 101-123.000.
- Layton, David J.: See—  
Frye, Oldrich; Layton, David J.; and Storhoff, Howard A., 5,439,549, Cl. 156-461.000.
- Layton, Ken S.; Suttle, Mark L.; and Tisch, Brett L., to Halliburton Company. High pressure regulating valve. 5,439,027, Cl. 137-513.500.
- Leach, David C.; and Barnes, John, to ICI Composites, Inc. Process for pretreatment of non-isotropic cylindrical products. 5,439,632, Cl. 264-313.000.
- Leary, Andrew: See—  
Morgan, O. F.; Polatrack, Michael; and Leary, Andrew, 5,440,721, Cl. 395-550.000.
- Lechleider, Joseph W., to Bell Communications Research, Inc. Method and apparatus for joint optimization of transmitted pulse shape and receiver timing in digital systems. 5,440,594, Cl. 375-354.000.
- Lee, Ivan M.: See—  
Harrington, Daniel A.; Higgins, Maura E.; Lee, Ivan M.; Remson, Joseph D.; and Waln, Kenneth E., 5,440,616, Cl. 379-88.000.
- Lee, Jae S.: See—  
Chung, Yun C.; Lee, Jae S.; and DiGiovanni, David J., 5,440,417, Cl. 359-134.000.
- Lee, James: See—  
Chuntharapai, Anan; Hebert, Caroline; Kim, Kyung J.; and Lee, James, 5,440,021, Cl. 530-388.220.
- Lee, James A.: See—  
Bayer, Jeffrey A.; and Lee, James A., 5,439,330, Cl. 408-1.00R.
- Lee, Kun-Ming, to Acer Peripherals, Inc. State machine with hysteresis for detecting frequency of an input signal. 5,440,252, Cl. 327-47.000.
- Lee, Kwang J., to Goldstar Co., Ltd. Method for optical exposure in a color video printed utilizing LCD. 5,440,399, Cl. 358-300.000.
- Lee, Robert T.: See—  
Dornbush, David A.; Alseth, Steven; Erickson, Chad S.; Reh-meyer, Theodore H.; Sked, N. Philip; and Lee, Robert T., 5,438,916, Cl. 99-448.000.
- Lee, Ron C.: See—  
Kirschner, Mark J.; and Lee, Ron C., 5,438,845, Cl. 62-172.000.
- Lee, Steven P. Vehicle safety system for correcting simultaneous actuation of brake and acceleration pedals. 5,439,429, Cl. 477-207.000.
- Lee, Sung J.; Konishi, Yoshitaka; Macina, Orest T.; Kondo, Kigen; and Yu, Dingwei T., to Ono Pharmaceutical Co., Ltd. 4-aminoquinazoline derivatives. 5,439,895, Cl. 514-63.000.
- Lee, Whay C.: See—  
Morales, Javier; Lee, Whay C.; Hluchyj, Michael G.; and Humblet, Pierre A., 5,440,741, Cl. 395-650.000.
- Lee, William B.: See—  
Pierce, Harold D.; Jacobsen, Stephen C.; and Lee, William B., 5,440,526, Cl. 368-63.000.
- Lee, Young Deug: See—  
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- Maier, Michael; and Benoit, Eric, to Deutsche Thomson-Brandt GmbH. Method and facility for time/voltage conversion. 5,440,307, Cl. 341-152.000.
- Maiti, Samarendra N.; Flakpi, Charles Y.; Reddy, Andhe V. N.; Czajkowski, David P.; and Micetich, Ronald G., to Synphar Laboratories, Inc. 2-spiro(2'-spirocycloalkyl)cyclopropyl cephalosporin sulfones as antiinflammatory and antitumor agents. 5,439,904, Cl. 514-200.000.
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- Mandl, Peter: See—  
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- Marcato, Forrest C., to Rainline Corporation. The. Method for applying a night-visible traffic stripe to a road. 5,439,312, Cl. 404-12.000.
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- Marcioni, Maria L., legal representative: See—  
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- Mark IV Transportation Products Corp.: See—  
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- Markison, Timothy W.: See—  
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- Marks, David J.: See—  
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- Marks, Martin R.: See—  
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- Markus, Richard; and Deimold, Manfred, to United States Surgical Corporation. Video comparator system. 5,440,396, Cl. 356-394.000.
- Marlin, Gerald M. Method of forming an abutment post. 5,439,380, Cl. 433-172.000.
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- Mitchell, Paul; and Treadwell, Peter J., to Pitney Bowes plc. Settable printing apparatus. 5,440,500, Cl. 364-559.000.
- Mitchell, Stephen C.: See—  
Ravenhall, Richard; Wojciechowski, Charles R.; Mitchell, Stephen C.; Mercer, Gary D.; Kelly, Thomas J.; Schobert, Melvin A.; and MacLin, Harvey M., 5,439,750, Cl. 428-614.000.
- Mitel Corporation: See—  
Mile, Thomas A., 5,440,628, Cl. 379-422.000.
- Yamaguchi, Takuro; Wada, Yoshinori; and Armstrong, Mark A., 5,440,630, Cl. 379-437.000.
- Mitsubishi Corporation: See—  
Maeda, Yutaka, 5,439,620, Cl. 261-97.000.



Mitsubishi Denki Kabushiki Kaisha: See—  
 Araya, Yukihiko, 5,440,253, Cl. 327-69,000.  
 Asamura, Yoshimori; Ito, Takashi; Ueda, Tomohiro; Tsunashima, Kenji; and Kurahashi, Satoshi, 5,440,344, Cl. 348-405,000.  
 Itomitsu, Fujio; and Yoshida, Toyohiko, 5,440,704, Cl. 395-375,000.  
 Iwamatsu, Toshiaki; Yamaguchi, Yasuo; Inoue, Yasuo; and Nishimura, Tadashi, 5,440,161, Cl. 257-349,000.  
 Kinoshita, Hidehiko, 5,440,303, Cl. 340-901,000.  
 Mitsunaga, Kazumasa; Motonami, Kaoru; and Yoshida, Hisaaki, 5,440,165, Cl. 257-408,000.  
 Miyashita, Motoharu; Hayafuji, Norio; and Mihashi, Yutaka, 5,439,723, Cl. 428-66,700.  
 Murata, Shigemi; Sawazaki, Nobuyuki; Koiwa, Mitsuru; and Ohashi, Yutaka, 5,438,971, Cl. 123-634,000.  
 Nakamishi, Tetsuya, 5,440,203, Cl. 315-5,410.  
 Nishimura, Hisayuki; Maegawa, Shigetoshi; and Maeda, Shigenobu, 5,440,168, Cl. 257-640,000.  
 Ohuchi, Hirofumi; and Fujimoto, Shinya, 5,438,827, Cl. 60-276,000.  
 Okimoto, Yukihiko; Furi, Takashi; and Ohmae, Katsuhiko, 5,440,485, Cl. 364-424,050.  
 Sugimoto, Masaki, 5,440,711, Cl. 395-433,000.  
 Sugita, Kazuya, 5,440,603, Cl. 377-20,000.  
 Tanaka, Seichi; and Fujikawa, Megumi, 5,440,222, Cl. 322-25,000.  
 Tomita, Yoshihiro; and Abe, Shunichi, 5,440,169, Cl. 257-667,000.  
 Yoshida, Toyohiko, 5,440,757, Cl. 395-800,000.  
 Mitsubishi Gas Chemical Company, Inc.: See—  
 Abe, Takafumi; Ebata, Shuji; Sugamura, Kazuhiro; Matsuzaki, Taiji; and Higuchi, Hirofumi, 5,439,661, Cl. 423-373,000.  
 Doya, Masaharu; Kanbara, Yutaka; Kimizuka, Ken-ichi; and Okawa, Takashi, 5,440,004, Cl. 528-196,000.  
 Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—  
 Nakashima, Yasuhiro, 5,439,426, Cl. 477-125,000.  
 Okimoto, Yukihiko; Furi, Takashi; and Ohmae, Katsuhiko, 5,440,485, Cl. 364-424,050.  
 Mitsubishi Jukogyo Kabushiki Kaisha: See—  
 Hattori, Takeshi; Inoguti, Kazuhiko; Ohya, Yukio; Nakagishi, Yutaka; and Sakaguchi, Masaki, 5,439,712, Cl. 427-437,000.  
 Makita, Haruomi, 5,440,393, Cl. 356-384,000.  
 Mitsubishi Kasei Corp.: See—  
 Haneda, Ichiro; Sakurai, Tatsuyoshi; Yanagisawa, Masahiro; Okuyama, Kohji; Niwa, Kazuo; and Fukagawa, Toshihiro, 5,439,080, Cl. 188-218,000.  
 Sekiya, Tetsuo; Tsutsui, Mikio; Shimpuku, Tetsuro; Nagano, Tatsuo; Hayaishi, Junko; and Seino, Asami, 5,439,927, Cl. 514-399,000.  
 Mitsubishi Materials Corporation: See—  
 Ishiwata, Shoji; Kimura, Etsuji; Tanaka, Michihiro; Hanase, Yasuhiro; Wang, Yuhui; Nagahama, Shinobu; and Sawanobori, Naruhito, 5,439,616, Cl. 252-584,000.  
 Mitsubishi Paper Mills Limited: See—  
 Furukawa, Akira; and Kato, Masao, 5,439,739, Cl. 428-341,000.  
 Mitsubishi Petrochemical Co., Ltd.: See—  
 Ito, Kiichi; Tsunoi, Shinji; and Yamamoto, Tetsuya, 5,439,993, Cl. 526-93,000.  
 Mitsubishi Semiconductor America, Inc.: See—  
 Krause, David A., 5,440,497, Cl. 364-491,000.  
 Mitsui Kinzoku Kogyo Kabushiki Kaisha: See—  
 Ikeda, Takao, 5,438,855, Cl. 70-279,000.  
 O'Hare, Paul W., 5,439,261, Cl. 292-336,300.  
 Mitsui Mining & Smelting Co., Ltd.: See—  
 Aoki, Yoshihiro; Yamaguchi, Hisashi; and Kido, Giyu, 5,438,953, Cl. 117-223,000.  
 Mitsui Petrochemical Industries, Ltd.: See—  
 Takeuchi, Masato; Hirota, Yoshihiko; Ohmori, Hiroshi; and Yoshimura, Masaru, 5,439,534, Cl. 148-105,000.  
 Yamamoto, Sanehiro; Kimura, Toshiro; Nakagawa, Takasi; and Toyota, Akinori, 5,439,973, Cl. 525-66,000.  
 Mitsui Toatsu Chemicals, Inc.: See—  
 Ichikawa, Fumiaki; Kobayashi, Mineo; Ohta, Masahiro; Yoshida, Yasunori; Obuchi, Shoji; and Itoh, Hiroyuki, 5,440,008, Cl. 528-361,000.  
 Inoue, Norihide; Shiomura, Tetsunosuke; Kouno, Masahiro; Sonobe, Yoshiho; and Mizutani, Kazumi, 5,439,994, Cl. 526-114,000.  
 Suzuki, Toshiyuki; Sasagawa, Katsuyoshi; Imai, Masao; and Kanemura, Yoshinobu, 5,440,358, Cl. 351-159,000.  
 Mitsunaga, Kazumasa; Motonami, Kaoru; and Yoshida, Hisaaki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device with means for suppressing electric fields, 5,440,165, Cl. 257-408,000.  
 Mitutoyo Corporation: See—  
 Shimomura, Toshihiko; Adachi, Satoshi; Yaku, Toru; Matsura, Tatsuhiko; and Kawatoko, Osamu, 5,440,501, Cl. 364-560,000.  
 Miura, Hiroshi: See—  
 Kawai, Kazunari; and Miura, Hiroshi, 5,438,860, Cl. 73-7,000.  
 Miura, Kazunobu: See—  
 Suzuki, Chikatsu; Kurosu, Shigetaka; and Miura, Kazunobu, 5,440,381, Cl. 355-309,000.  
 Yamashita, Nobuhiko; Tohyama, Junichi; Katsoka, Chiwa; and Miura, Kazunobu, 5,439,811, Cl. 435-91,530.  
 Mixich, Johann: See—  
 Buchholz, Rainer; Pricke, Ulrich; and Mixich, Johann, 5,440,028, Cl. 536-124,000.  
 Miyachi, Hiroyuki; Segawa, Mitsuru; Tagami, Emiko; and Okubo, Hideo, to Kyorin Pharmaceutical Co., Ltd. Arylglycinamide derivatives and preparative processes therefor, 5,439,919, Cl. 514-316,000.

Miyagi, Kunihiko; and Chikama, Toshio, to Machida Endoscope Co., Ltd. Distal tip of endoscope having spirally coiled control wires, 5,438,975, Cl. 600-109,000.  
 Miyake, Masayuki: See—  
 Ikeyama, Shuichi; Koyama, Masaru; Miyake, Masayuki; and Senoo, Masaharu, 5,439,886, Cl. 514-12,000.  
 Miyake, Takahiro; Yoshida, Yoshio; and Kurata, Yukio, to Sharp Kabushiki Kaisha. Optical pick-up device having an optical diffraction grating element, 5,440,427, Cl. 359-566,000.  
 Miyamoto, Akihiro; Ikematsu, Ryuchi; Matsunaga, Haruhiko; and Ueda, Hiromi, to NEC Corporation. Test method and apparatus capable of testing reception of a desired cell through a virtual path, 5,440,565, Cl. 371-20,400.  
 Miyano, Ichiro; Serizawa, Kooji; Sakaguchi, Suguru; and Ishida, Toshiharu, to Hitachi, Ltd. Semiconductor device with reinforcement, 5,440,171, Cl. 257-700,000.  
 Miyashita, Motoharu; Hayafuji, Norio; and Mihashi, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Substrate for producing semiconductor wafer, 5,439,723, Cl. 428-66,700.  
 Miyashita, Takashi: See—  
 Kikuchi, Zenta; and Miyashita, Takashi, 5,440,413, Cl. 359-73,000.  
 Miyata, Shin'ichi; Toyokawa, Tetsuo; Sakai, Koichi; and Hisaki, Hiroshi, to Nippon Zeon Co., Ltd. Balloon catheter, 5,439,443, Cl. 604-96,000.  
 Miyatake, Simichi: See—  
 Tsunozaki, Manabu; Ishii, Kyoko; Nozaki, Koichi; Yoshioka, Hiroshi; Koyama, Yoshihisa; Udo, Shinji; Aoyagi, Hidetomo; Miyatake, Sinichi; Morino, Makoto; and Hoshida, Akihiko, 5,440,521, Cl. 365-230,030.  
 Miyawaki, Mamoru: See—  
 Sakaguchi, Kiyofumi; Yonehara, Takao; and Miyawaki, Mamoru, 5,439,843, Cl. 437-71,000.  
 Miyazaki, Masashi; Akahoshi, Haruo; Nohara, Shozo; Kikuta, Kenji; and Ishimaru, Toshiaki, to Hitachi, Ltd. Process for producing printed wiring board, 5,438,751, Cl. 29-847,000.  
 Miyazaki, Nobuyuki: See—  
 Ito, Haruki; Maeda, Kenzo; Miyazaki, Nobuyuki; Unoki, Masao; Sagawa, Chiaki; and Kamba, Motoi, 5,439,896, Cl. 525-107,000.  
 Miyazaki, Toshiyuki; Morimoto, Toshihisa; and Murayama, Ryuji, to Nissin Flour Milling Co., Ltd.; and Nagata Sangyo Co., Ltd. Processes of producing amylase inhibitors, 5,440,019, Cl. 530-374,000.  
 Miyazawa, Kenichi; Toh, Takehiko; Mizoguchi, Toshiaki; and Ueshima, Yoshiyuki, to Nippon Steel Corporation. Process for producing thin sheet by continuous casting in twin-roll system, 5,439,046, Cl. 164-467,000.  
 Miyota Kabushiki Kaisha: See—  
 Ozawa, Ryuji, 5,440,200, Cl. 313-422,000.  
 Mizobe, Tatsutoshi: See—  
 Enokido, Kazunori; Mishima, Hidehiko; Marusue, Toshihisa; Mizobe, Tatsutoshi; Nagayama, Shigeru; Sumimoto, Takayuki; Kuriyama, Minoru; and Kamada, Shinya, 5,439,427, Cl. 477-130,000.  
 Mizoguchi, Shigeru: See—  
 Higuchi, Mitsuhiro; Mizoguchi, Shigeru; Yamashita, Naoki; and Adachi, Takayoshi, 5,438,711, Cl. 4-243,300.  
 Mizoguchi, Toshiaki: See—  
 Miyazawa, Kenichi; Toh, Takehiko; Mizoguchi, Toshiaki; and Ueshima, Yoshiyuki, 5,439,046, Cl. 164-467,000.  
 Mizrachi, Eliahu: See—  
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 Mizuguchi, Kazunari: See—  
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 Mizuno, Sadao; and Hoshino, Akinori, to Aisin Seiki Kabushiki Kaisha. Rail construction for machine tool, 5,439,293, Cl. 384-9,000.  
 Mizuno, Sadao: See—  
 Ito, Noboru; Tanaka, hinichi; Wada, Hidenori; Mizuno, Sadao; and Hayashi, Hideki, 5,440,536, Cl. 369-44,410.  
 Mizuno, Toshihiro: See—  
 Yamauchi, Muneharu; Tabata, Jun; Mizuno, Toshihiro; and Inoue, Jiro, 5,438,859, Cl. 73-1,000.  
 Mizutani, Kazumi: See—  
 Inoue, Norihide; Shiomura, Tetsunosuke; Kouno, Masahiro; Sonobe, Yoshiho; and Mizutani, Kazumi, 5,439,994, Cl. 526-114,000.  
 Mizutani, Shuji: See—  
 Yamazoe, Hisamitsu; Kohama, Tokio; Mizutani, Shuji; and Agui, Toshiaki, 5,439,204, Cl. 267-140,140.  
 ML Laboratories: See—  
 Davies, Donald S., 5,439,892, Cl. 514-58,000.  
 Moaddeb, Shahram: See—  
 Thacker, James R.; Weinberg, Alvin H.; and Moaddeb, Shahram, 5,438,987, Cl. 128-634,000.  
 Mochizuki, Nobuaki: See—  
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 Yamada, Masahiko; Onuki, Wataru; Okahara, Hirofumi; and Mochizuki, Nobuaki, 5,439,419, Cl. 474-18,000.  
 Mock, Elmar, to Tetra Laval Holdings & Finance S.A. Closure unit on flowable product container, 5,439,124, Cl. 215-40,000.  
 Modern Technologies Corp.: See—  
 Schnurer, John H.; and Freund, Robert, 5,439,003, Cl. 128-692,000.  
 Modulohm A/S: See—  
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Mody, Tarak D.: See—  
 Seidler, Jonathan L.; Hemmi, Gregory W.; and Mody, Tarak D., 5,439,570, Cl. 204-157,150.  
 Moehr, Klaus: See—  
 Goerlich, Steffen; Merker, Wolfgang; Voigt, Peter; Klose, Norbert; Moehr, Klaus; and Wieser, Joachim, 5,440,140, Cl. 250-559,240.  
 Moens, Luc; Maetens, Daniel; Loutz, Jean-Marie; and Baudour, Michel, to U C B S.A. Carboxyl-terminated polyesters for the preparation of powder coating compositions, 5,439,988, Cl. 525-437,000.  
 Moese, Gerald; Mohr, Karlheinz; and Bandara, Upali, to International Business Machines Corporation. Computer system for speech recognition, 5,440,663, Cl. 395-264,000.  
 Mohan, Chandrasekaran: See—  
 Bhide, Anupam K.; Copeland, George P.; Goyal, Ambuj; Hsiao, Hui-I; Jhingran, Anant D.; and Mohan, Chandrasekaran, 5,440,727, Cl. 395-444,000.  
 Mohr, Karlheinz: See—  
 Moese, Gerald; Mohr, Karlheinz; and Bandara, Upali, 5,440,663, Cl. 395-264,000.  
 Mok, Cheol-Woong, to Samsung Electronics Co., Ltd. Circuit of addressing a memory buffer for error correction in a digital audio tape recorder, 5,440,571, Cl. 371-40,100.  
 Molins PLC: See—  
 Hierons, Kerry, 5,439,092, Cl. 198-347,300.  
 Moll, Richard J. Boxed pocket folding machine, 5,439,436, Cl. 493-394,000.  
 Molva, Engin; and Accomo, Roger. Compact electron gun having a microdot electron source and a semiconductor laser using said gun for electronic pumping, 5,440,579, Cl. 372-87,000.  
 Momochi, Nobuchika, to Sony Corporation. Cameras, 5,440,368, Cl. 354-415,000.  
 Momodomi, Masaki; Toita, Koichi; Itoh, Yasuo; Iwata, Yoshihisa; Masuoka, Fujio; Chiba, Masahiko; Endo, Tetsuo; Shirota, Riichi; and Kirisawa, Ryosuke, to Kabushiki Kaisha Toshiba. Electrically erasable programmable read-only memory with NAND cell structure and intermediate level voltages initially applied to bit lines, 5,440,509, Cl. 365-185,000.  
 Momona, Morihisa, to NEC Corporation. Access system, 5,440,555, Cl. 370-79,000.  
 Monett, Edward; and Blackman, Robert, to Blackman, Robert. Insect traps, 5,438,792, Cl. 43-114,000.  
 Monji, Nobuo: See—  
 Blake, James; Cole, Carol-Ann; Coleman, Patrick F.; Monji, Nobuo; and Montana, John P., 5,439,792, Cl. 435-5,000.  
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 Monroe, Owen K.: See—  
 Coleman, Ronald G.; Advani, Deepak M.; Monroe, Owen K.; Straub, Robert M.; Gleason, Miner H., III; and Huang, Yun-Pong, 5,440,687, Cl. 395-200,150.  
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 Montelin, Per; and Stenberg, Lars, to Aimpoint AB. Optical element of a parallax free sight, 5,440,387, Cl. 356-251,000.  
 Moody, Paul E., to United States of America, Navy. Slide valve assembly, 5,438,945, Cl. 114-238,000.  
 Moody, Paul E., to United States of America, Navy. Elastomeric launch system for submarines, 5,438,948, Cl. 114-319,000.  
 Mookherjee, Braja D.: See—  
 Butler, Jerry F.; Warren, Craig B.; Marin, Anna B.; Mookherjee, Braja D.; and Wilson, Richard A., 5,439,941, Cl. 514-690,000.  
 Moore, Charles H.; and Fish, Russell H., III, to Nanotronics Corporation. High performance, low cost microprocessor architecture, 5,440,749, Cl. 395-800,000.  
 Moore, Melissa A.: See—  
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 Moore, Peggy E.; Marks, Martin R.; and Crum, Michael S., to U.S. West Communications, Inc. Telephone routing system with queuing and voice messaging capabilities, 5,440,623, Cl. 379-67,000.  
 Moore, Richard E.: See—  
 Patterson, Gregory M. L.; Moore, Richard E.; Carmeli, Shmuel; Smith, Charles D.; and Kimura, Lucille H., 5,439,933, Cl. 514-450,000.  
 Moore, Richard O., Jr.: See—  
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 Moortgat, Ronald A., to Walt Disney Company, The. Method for flattening acetate-based films using steam, 5,440,361, Cl. 352-56,000.  
 Morales, Javier; Lee, Whay C.; Hluchy, Michael G.; and Humblet, Pierre A., to Motorola, Inc. Software overload control method, 5,440,741, Cl. 395-650,000.  
 Moreira, Joao; and Noichl, Bernd-Peter, to Deutsche Forschungsgemeinschaft fur Luft- und Raumfahrt e.V. Method of extracting motion errors of a carrier bearing a coherent imaging radar system from radar raw data and apparatus for carrying out the method, 5,440,309, Cl. 342-25,000.  
 Moreno, Frederick E.: See—  
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 Moreno, Ricardo P.: See—  
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 Moret, Jean-Marc, to CSEM - Centre Suisse d'Electronique et de Microtechnique S.A. Process of fabricating an elongated microstructure element on a substrate, 5,439,552, Cl. 216-2,000.  
 Morgan Crucible Company, plc. The: See—  
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 Morgan, O. F.; Polatrack, Michael; and Leary, Andrew, to Sony Electronics, Inc. Method and apparatus for controlling signal timing of cascaded signal processing units, 5,440,721, Cl. 395-550,000.  
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 Morgan, Roger J.: See—  
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 Morgan, Russell M., to Praxair S.T. Technology, Inc. Method for fluorescent measuring the volumetric capacity of a cell-engraved surface, 5,438,864, Cl. 73-149,000.  
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 Haga, Kyosuke; Suzuki, Mikio; Inaguma, Yoshiharu; Fukumura, Kenichi; Kato, Hideya; and Mori, Katsuhisa, 5,439,070, Cl. 180-141,000.  
 Mori, Kazuki, to Yamaha Hatsudoki Kabushiki Kaisha. Method of making a valve lifter for engine, 5,438,754, Cl. 29-888,430.  
 Mori, Kazuhiko; Shimoda, Kenji; and Harada, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Method for thermal spraying of an inner surface, 5,439,714, Cl. 427-446,000.  
 Mori, Tameo; and Koya, Kazuo, to Shin-Etsu Chemical Co., Ltd. Optical amplifier, 5,440,420, Cl. 359-341,000.  
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 Morin, Stephane; and Giraud, Franck, to ALCATEL CIT. Apparatus for servo-controlling the bias voltage of a light source, 5,440,113, Cl. 250-205,000.  
 Morino, Makoto: See—  
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 Moritani, Akihiro: See—  
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 Moriya, Shuji; Matsuo, Takenobu; and Wakabayashi, Tsuyoshi, to Tokyo Electron Limited. Processing apparatus and flow control arrangement therefor, 5,439,026, Cl. 137-486,000.  
 Morokoshi, Hiroshi: See—  
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 Morris, T. Richard: See—  
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 Huete, David A.; Marshall, Peter W.; Morrison, Denby G.; and Smolinski, Susan L., 5,439,060, Cl. 166-367,000.  
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 Morton International, Inc.: See—  
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 Morton, Trevor C.; Hodgkin, Jonathan H.; and Dao, Buu N., to Commonwealth Scientific & Industrial Research Organisation. Epoxy resins based on macrocyclic compounds, 5,439,989, Cl. 525-502,000.  
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 Mory Sountour Inc.: See—  
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 Mosel Vitelic, Incorporated: See—  
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- Motherwell, William B.: See—  
do Cen Goncalves da Costa, Maria; de Oliveira Baptista Marcelo Curto, Maria J. V.; de Loureiro da Silva Tavares da Rosa, Maria R.; and Motherwell, William B., 5,440,050, Cl. 549-383.000.
- Motonami, Kaoru: See—  
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- Motorola, Inc.: See—  
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Birchler, Mark A.; Jasper, Steven C.; Brailean, Karen A.; and Wilson, Timothy J., 5,440,590, Cl. 375-347.000.  
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Chang, Ray; Flanagan, Stephen T.; and Jones, Kenneth W., 5,440,515, Cl. 365-194.000.  
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- Mullaney, Julian S.: See—  
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- Murray, Andrew M., to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Hair care composition, 5,439,673, Cl. 424-70.120.
- Murray, Michael A.; Li, Li-Chun; and Tuan, Haing T., to Mosel Vitelic, Incorporated. Programmable circuit with fusible latch, 5,440,246, Cl. 326-38.000.
- Musil, Doug. Apparatus for supporting a paint stirring stick and for coupling to an electric drill, 5,439,236, Cl. 279-102.000.
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- Mycogen Corporation: See—  
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- Nadex Co., Ltd.: See—  
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- Nagahama, Shinobu: See—  
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- Nagalla, Srinivasa R.: See—  
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- Nagano, Tatsu: See—  
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- Nagaoka, Makoto; and Sugiyama, Tetsuya, to Pentel Kabushiki Kaisha. Information input device, 5,440,080, Cl. 178-18.000.
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- Nagasaki, Kazunori, to NEC Corporation. Communication apparatus with low power consumption, 5,440,595, Cl. 375-377.000.
- Nagasawa, Masahiro: See—  
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- Nagata, Yasufumi: See—  
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- Nagayama, Shigeru: See—  
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- Nagel, Dietmar: See—  
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- Nagle, David P.: See—  
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- Nagler, Werner, to Siemens Aktiengesellschaft. Method of controlling an electrical switching device in response to a signal configuration of a switching signal, 5,440,539, Cl. 370-16.000.
- Nagumo, Masahide: See—  
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- Naito, Hisato: See—  
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- Naito, Mitsugu, to Fujitsu Limited. Flip-flop circuits for testing LSI gate arrays, 5,440,569, Cl. 371-22.300.
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- Nakada, Tsutomu: See—  
Fuse, Akira; Tsuda, Yuji; and Nakada, Tsutomu, 5,440,084, Cl. 200-61.45R.
- Nakae, Yasuhiko: See—  
Tanabe, Hisake; Nakano, Shingi; Nakae, Yasuhiko; Urano, Satoshi; and Eguchi, Yoshio, 5,439,516, Cl. 106-21.00R.
- Nakagawa, Susumu; Asai, Akira; Kuroyanagi, Satoru; Ishihara, Makoto; and Tanaka, Yoshiharu, to Banyu Pharmaceutical Co., Ltd. Process for producing enyne derivatives, 5,440,049, Cl. 549-49.000.
- Nakagawa, Takasi: See—  
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- Nakagishi, Yutaka: See—  
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- Nakahara, Takeichi; Hino, Hajime; Ikeuchi, Takashi; and Ogiso, Tsutomu, to Teijin Seiki Co., Ltd. Cooling apparatus of a false texturing machine, 5,438,820, Cl. 57-290.000.
- Nakahara, Yoshihiko: See—  
Fujita, Minoru; Sugaya, Kenji; and Nakahara, Yoshihiko, 5,439,755, Cl. 428-694.0BP.
- Nakahata, Hideaki; and Funimori, Naoki, to Sumitomo Electric Industries, Ltd. Surface acoustic wave device, 5,440,189, Cl. 310-313.00R.
- Nakajima, Akio, to NEC Corporation. Interface circuit for allowing receiving serial data input after receiving serial input suspension signal, 5,440,694, Cl. 395-873.000.
- Nakajima, Hiroshi: See—  
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- Nakamura, Hideyuki: See—  
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- Nakamura, Koichi; Matsuo, Naoki; Konishi, Toshiharu; Sano, Kenji; and Wada, Hiroshi, to Nitto Denko Corporation. Water-soluble or water-dispersible pressure-sensitive adhesive tape, 5,439,748, Cl. 428-511.000.
- Nakamura, Nobutaka: See—  
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- Nakamura, Shunji, to Fujitsu Limited. Method for fabricating semiconductor device, 5,439,832, Cl. 437-31.000.
- Nakamura, Tetsuya, to Sakura Rubber Co., Ltd. Outdoor working automating system, 5,438,817, Cl. 56-10.20A.
- Nakamura, Yoshizo, to Tokai Co., Ltd. Tumbler for loosening entangled cloths, 5,438,766, Cl. 34-602.000.
- Nakanishi Metal Works Co., Ltd.: See—  
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- Nakanishi, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Energy-variable RFQ linac, 5,440,203, Cl. 315-5.410.
- Nakanishi, Yoichi; Sato, Rymichi; Sako, Kazumi; Noda, Masayuki; and Takegahara, Ikuro, to Omron Corporation. Closed type electromagnetic relay, 5,440,285, Cl. 335-78.000.
- Nakanishi, Yutaka; and Sasaki, Yasuhiro, to Fuji Polymertech Co. Ltd. Process for producing finger-touch key for manipulation switch, 5,439,545, Cl. 156-273.300.
- Nakano, Kaichiro: See—  
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- Nakano, Shingi: See—  
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- Nakashima, Yasuhiro, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Speed change control apparatus for a vehicular automatic transmission and a troubleshooting method for operating a condition detecting device, 5,439,426, Cl. 477-125.000.
- Nakatani, Seichi: See—  
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- Nakaya, Junko, to Kabushiki Kaisha Toshiba. Image recording/reproducing apparatus, 5,440,607, Cl. 378-98.200.
- Nakayama, Yoshikazu: See—  
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- Nakhimovich, Ilya: See—  
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- Nally, Robert M.; and Schafer, John C., to Cirrus Logic, Inc. Video processor multiple streams of video data in real-time, 5,440,683, Cl. 395-162.000.
- Nance, Donald A., to Westinghouse Electric Corporation. Rod and shell composite riser, 5,439,323, Cl. 405-195.100.
- Nandagiri, Arun; Abbott, Richard A.; Nardone, Renee E.; and Borish, Edward T., to Helene Curtis, Inc. Cysteamine permanent wave composition and method, 5,439,675, Cl. 424-70.510.
- Nanno, Ikuro: See—  
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- Nanotronics Corporation: See—  
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- Nantermet, Philippe G.: See—  
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- Naoi, Toshikatsu: See—  
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- Narahara, Yasuhiro: See—  
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- Narang, Subhash: See—  
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- Nardone, Edward A.; Follett, Paul S.; Schofield, Harry D.; Caron, Paul R.; and Rothwell, Chris S., to Atlantek, Inc. Single-pass multi-color thermal printer, 5,440,328, Cl. 347-173.000.
- Nardone, Renee E.: See—  
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- Narimatsu, Kiyoyuki; and Nishibayashi, Hideo, to Colin Corporation. Blood pressure monitor system, 5,439,002, Cl. 128-672.000.
- Narva, Kenneth E.; Schwab, George E.; and Payne, Jewel M., to Mycogen Corporation. Gene encoding nematode-active toxin PS63B cloned from *Bacillus thuringiensis* isolate, 5,439,881, Cl. 514-2.000.
- Nash, Jeanne L. Teeth protector for laryngoscope blade, 5,438,976, Cl. 600-186.000.
- Natarajan, Govindarajan: See—  
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- Nathan, Melvin A. Label identified planter, 5,438,796, Cl. 47-66.000.
- National Latex Products Company, The: See—  
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- National Molding Corporation: See—  
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- National Power PLC: See—  
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- National Research Development Corporation: See—  
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- National Science Council: See—  
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- National Semiconductor Corporation: See—  
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- Edem, Brian C.; Wornley, Debra J.; and Evans, Michael S., 5,440,556, Cl. 370-79.000.
- Hebert, Francois; Chen, Datong; and Bashir, Rashid, 5,439,833, Cl. 437-31.000.
- National Starch and Chemical Investment Holding Corporation: See—  
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- Natsubori, Shigeyasu: See—  
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- Naves, Neil H.: See—  
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- Nawata, Yoshihiro: See—  
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- NCR Corporation: See—  
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- Neal, Stuart: Braking system for in-line roller skates, 5,439,238, Cl. 280-11.200.
- NEC Corporation: See—  
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- Neeley, James Edward, Sr.: See—  
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- Neilson, Jim L.: Apparatus for mixing ingredients in a receptacle, 5,439,289, Cl. 366-207.000.
- Nelli, Leo M.; Avni, Eitan; Slovik, Lori; and Ellis, Kevin, to International Paper Company: Coating formulation and method of production thereof for post print waxable linerboard, 5,439,707, Cl. 427-258.000.
- Nelson, Daniel L.: See—  
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- Nelson, Gary E.: See—  
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- Nelson Irrigation Corporation: See—  
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- Nelson, John E., to Minnesota Mining and Manufacturing Company: Coil assembly for electronic article surveillance system, 5,440,296, Cl. 340-572.000.
- Nelson, Owen L.: See—  
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- Nelson, Robert R.: See—  
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- Nelson, Walter T., to Pingree Products Ltd.: Collapsible golf bag cart with seat, 5,439,241, Cl. 280-645.000.
- Nendza, Kenneth J., to Sierra Microwave Technology: Inverted pin diode switch apparatus, 5,440,283, Cl. 333-262.000.
- NeoMecs Incorporated: See—  
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- Nereau, Jean-Pierre: See—  
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- Nestec S.A.: See—  
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- Nester, Ulrich: See—  
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- NetMedia, Inc.: See—  
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- Neufeld, E. David: See—  
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- Neumann, Jurgen: See—  
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- Neumann, Klaus: See—  
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- Neumann, Rodney H.: See—  
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- Neumeyer, John L.; Milius, Richard A.; and Innis, Robert B., to Research Biochemicals Limited Partnership: Iodinated neuroprobe for mapping monoamine reuptake sites, 5,439,666, Cl. 424-1.850.
- Nevin, Michael W.: See—  
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- Newallis, Peter E.: See—  
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- NGK Insulators, Ltd.: See—  
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- Suzuki, Junichiro; Sakakibara, Shoji; Okuno, Akiyasu; and Watanabe, Masakazu, 5,439,854, Cl. 501-91.000.
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- Nippon Aleph Corporation: See—  
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- Nippon Thompson Co., Ltd.: See—  
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- Nippondenso Co., Ltd.: See—  
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- Nishimura, Yasunobu; Ishii, Akihiro; Morino, Yuzuru; and Kikuchi, Yoshiyuki, to Central Glass Company, Limited: Method of preparing 2-chloro-pyridinemethanol, 5,440,047, Cl. 546-344.000.
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- Yamada, Masahiko; Onuki, Wataru; Okahara, Hirofumi; and Mochizuki, Nobuaki, 5,439,419, Cl. 474-18.000.
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- Noel, John R.; and Ahr, Nicholas A., to Procter & Gamble Company: The Absorbent article having rapid acquiring, multiple layer absorbent core, 5,439,458, Cl. 604-378.000.
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- Ogura, Kiyonori: See—  
Yamamoto, Hiroshi; Ogura, Kiyonori; and Horii, Takashi, 5,440,511, Cl. 365-189.030.
- Ogura, Yukio, to NEC Corporation. Optical illumination instrument. 5,440,423, Cl. 359-365.000.
- O'Hare, Paul W., to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Vehicular door lock having super-lock mechanism. 5,439,261, Cl. 292-336.300.
- Ohashi, Yutaka: See—  
Murata, Shigemi; Sawazaki, Nobuyuki; Koiwa, Mitsuru; and Ohashi, Yutaka, 5,438,971, Cl. 123-634.000.
- Ohata, Masashi: See—  
Oka, Takeshi; Kishida, Takahito; Kawakami, Atsushi; Ohata, Masashi; and Matsumura, Akira, 5,439,582, Cl. 205-135.000.
- Ohba, Hiroyuki; Hirose, Kazuhiko; Tanaka, Hideaki; and Hisazumi, Nobuyuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Polyvinyl alcohol product and multi-layer product containing the same. 5,439,745, Cl. 428-412.000.
- Ohba, Katsuaki: See—  
Ohtsuka, Toshikazu; Masui, Moriyasu; Takeda, Takami; Masuko, Michio; and Ohba, Katsuaki, 5,439,911, Cl. 514-256.000.
- Ohhashi, Masayuki, to NEC Corporation. CMOS ESD protection structure. 5,440,163, Cl. 257-355.000.
- Ohio Electronic Engravers, Inc.: See—  
Holowko, Paul L.; Seitz, David R.; and Woods, Curtis, 5,440,398, Cl. 358-299.000.
- Ohio State University, The: See—  
Akbar, Sheikh A.; Azad, Abdul M.; and Younkman, Lora B., 5,439,580, Cl. 204-425.000.
- Ohkubo, Mitsuru: See—  
Tsuchiya, Yoshimi; Nomoto, Takashi; Hayashi, Masahiro; Iwasawa, Yoshikazu; Masaki, Hitoshi; Ohkubo, Mitsuru; Sakuma, Yumiko; Nagata, Yasufumi; Satoh, Toshihiko; and Kamei, Toshio, 5,439,932, Cl. 514-444.000.
- Ohmae, Katsuhiko: See—  
Okimoto, Yukihiko; Furui, Takashi; and Ohmae, Katsuhiko, 5,440,485, Cl. 364-424.050.
- Ohmi, Tadashi; and Sugiyama, Isamu, to Phmi, Tadashi. Method of producing pure water, system therefor and cleaning method therefor. 5,439,596, Cl. 210-748.000.
- Ohmi, Takashi; and Baba, Takayuki, to Tokyo Kikai Seisakuho, Ltd. Ladder for climbing up to and down from working floor of printing press. 5,438,925, Cl. 101-212.000.
- Ohmori, Hiroshi: See—  
Takeuchi, Masato; Hirota, Yoshihiko; Ohmori, Hiroshi; and Yoshimura, Masaru, 5,439,534, Cl. 148-105.000.
- Ohmura, Takao; Sumi, Akinori; Ohtani, Wataru; Fuluhta, Naoto; Takeshima, Kazuya; Kamide, Kaeko; Noda, Munehiro; Kondo, Masahide; Ishikawa, Syoichi; Oohara, Kazuhiro; and Yokoyama, Kazumasa, to Green Cross Corporation. The Recombinant human serum albumin, process for producing the same and pharmaceutical preparation containing the same. 5,440,018, Cl. 530-363.000.
- Ohnishi, Osamu; and Inoue, Takeshi, to NEC Corporation. Piezoelectric ceramic transformer. 5,440,195, Cl. 310-359.000.
- O'Horo, Michael P.: See—  
Anderson, David G.; Ins, Dale R.; and O'Horo, Michael P., 5,440,330, Cl. 347-26.000.
- Ohst, Holger; Schonfelder, Lothar; and Roth, Stefan, to Bayer Aktiengesellschaft. Thermoplastic molding compounds for the production of inorganic sintered moldings and a process for the production of inorganic sintered moldings. 5,439,964, Cl. 524-297.000.
- Ohta, Hidenobu: See—  
Iijima, Kenji; Yuhara, Masanobu; and Ohta, Hidenobu, 5,440,696, Cl. 395-308.000.
- Ohta, Masahiro: See—  
Ichikawa, Fumiaki; Kobayashi, Mineo; Ohta, Masahiro; Yoshida, Yasunori; Obuchi, Shoji; and Itoh, Hiroyuki, 5,440,008, Cl. 528-361.000.
- Ohta, Takeo: See—  
Yoshioka, Kazumi; Ohta, Takeo; Uchida, Masami; and Furukawa, Shigeaki, 5,439,752, Cl. 428-623.000.

- Ohtani, Wataru: See—  
Ohmura, Takao; Sumi, Akinori; Ohtani, Wataru; Fuluhta, Naoto; Takeshima, Kazuya; Kamide, Kaeko; Noda, Munehiro; Kondo, Masahide; Ishikawa, Syoichi; Oohara, Kazuhiro; and Yokoyama, Kazumasa, 5,440,018, Cl. 530-363.000.
- Ohtsuka, Toshikazu; Masui, Moriyasu; Takeda, Takami; Masuko, Michio; and Ohba, Katsuaki, to Shionogi & Co., Ltd. Aminopyrimidine derivatives and their production and use. 5,439,911, Cl. 514-256.000.
- Ohuchi, Hirofumi; and Fujimoto, Shinya, to Mitsubishi Denki Kabushiki Kaisha. Dual-sensor type air-fuel ratio control system for internal combustion engine and catalytic diagnosis apparatus for the same. 5,438,827, Cl. 60-276.000.
- Ohyama, Yukio: See—  
Hattori, Takeshi; Inoguti, Kazuhiko; Ohyama, Yukio; Nakagishi, Yutaka; and Sakaguchi, Masaaki, 5,439,712, Cl. 427-437.000.
- Ojima, Fumio: See—  
Nukada, Hideaki; Sakaguchi, Yasuo; Hoshizaki, Taketoshi; Ojima, Fumio; Nishikawa, Masayuki; Yamamoto, Kohichi; and Komori, Yumiko, 5,440,029, Cl. 540-141.000.
- Oka, Takeshi; Kishida, Takahito; Kawakami, Atsushi; Ohata, Masashi; and Matsumura, Akira, to Nippon Paint Co., Ltd. Process for producing multicolor display. 5,439,582, Cl. 205-135.000.
- Okada, Fujio: See—  
Suzuki, Shigeo; and Okada, Fujio, 5,440,341, Cl. 348-256.000.
- Okada, Hideaki, to Kanzaki Kokyokai Mfg. Co., Ltd. 331eldriving apparatus. 5,438,831, Cl. 60-445.000.
- Okada, Hisao, to Sharp Kabushiki Kaisha. Drive circuit for a display apparatus having signal voltage circuits selectively controlled by selection signal. 5,440,323, Cl. 345-100.000.
- Okada, Kinjiro; Shiraiishi, Hiromasa; Yokosawa, Hirokazu; Takehana, Shinichi; and Kobayashi, Norio, to Hirose Electric Co., Ltd. Apparatus for removing excessive adhesives from ferrules. 5,438,725, Cl. 15-97.100.
- Okada, Naoto: See—  
Saito, Keishi; Matsuyama, Jinsho; Kariya, Toshimitsu; Matsuda, Koichi; Koda, Yuzo; and Okada, Naoto, 5,439,533, Cl. 136-258.000.
- Okahara, Hirofumi: See—  
Yamada, Masahiko; Onuki, Wataru; Okahara, Hirofumi; and Mochizuki, Nobuaki, 5,439,419, Cl. 474-18.000.
- Okamoto, Ichiro, to Matsushita Electric Industrial Co., Ltd. Image signal compression apparatus and method using variable length encoding. 5,440,404, Cl. 358-432.000.
- Okamoto, Kimio: See—  
Taga, Jun; and Okamoto, Kimio, 5,439,259, Cl. 285-334.500.
- Okamoto, Tetsuo; and Katada, Naoto, to Yamaha Corporation. Electronic musical instrument having selectable angle-to-tone conversion. 5,440,070, Cl. 84-600.000.
- Okamoto, Tetsushi, to Casio Computer Co., Ltd. Electronic timepieces. 5,440,527, Cl. 368-80.000.
- Okamura, Ryuji; Otsu, Hirokazu; and Takei, Tetsuya, to Canon Kabushiki Kaisha. Process and apparatus for microwave plasma chemical vapor deposition. 5,439,715, Cl. 427-575.000.
- Okano, Haruo: See—  
Imai, Keitaro; Okano, Haruo; Aoyama, Tomonori; and Okayama, Yasunori, 5,440,157, Cl. 257-310.000.
- Okatani, Toru, to Minolta Camera Kabushiki Kaisha. Copying system using a card. 5,440,371, Cl. 355-203.000.
- Okawa, Shigeki: See—  
Kato, Shigemasa; Okawa, Shigeki; and Susaki, Masafumi, 5,438,943, Cl. 112-261.000.
- Okawa, Takashi: See—  
Doya, Masaharu; Kanbara, Yutaka; Kimizuka, Ken-ichi; and Okawa, Takashi, 5,440,004, Cl. 528-196.000.
- Okayama, Tsutomu: See—  
Oshima, Takafumi; and Okayama, Tsutomu, 5,440,198, Cl. 313-141.000.
- Okayama, Yasunori: See—  
Imai, Keitaro; Okano, Haruo; Aoyama, Tomonori; and Okayama, Yasunori, 5,440,157, Cl. 257-310.000.
- Oki Electric Industry Co., Ltd.: See—  
Andou, Hirokazu; Kishimoto, Mitsuru; Ishimizu, Hideaki; Umezawa, Yoichi; and Asaka, Toshiyuki, 5,439,302, Cl. 400-124.070.
- Ishimura, Katsuhiko; Takamoto, Hiroshi; and Aoki, Shusei, 5,440,418, Cl. 359-177.000.
- Okimoto, Yukihiko; Furui, Takashi; and Ohmae, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Starting apparatus of passenger protecting apparatus. 5,440,485, Cl. 364-424.050.
- Okita, Shigeru: See—  
Hirakawa, Kiyoshi; Kondo, Toichi; and Okita, Shigeru, 5,439,300, Cl. 384-625.000.
- Oko, Frederick J., to Hubbell Incorporated. Submersible pump cable test method. 5,440,235, Cl. 324-538.000.
- Okonsky, Christian G.: See—  
Stewart, Gregory N.; and Okonsky, Christian G., 5,440,448, Cl. 361-684.000.
- Okubo, Hideo: See—  
Miyachi, Hiroyuki; Segawa, Mitsuru; Tagami, Emiko; and Okubo, Hideo, 5,439,919, Cl. 514-316.000.
- Okubo, Takao: See—  
Kumagai, Takehiko; Kikuchi, Takashi; Okubo, Takao; and Fuse, Yasuyuki, 5,440,718, Cl. 395-481.000.
- Okuda, Tetsuya; and Kojima, Shimichi, to Komori Corporation. Method and apparatus for recognizing raster portion of web. 5,440,402, Cl. 358-406.000.
- Okuno, Akira; Isobe, Takashi; and Ito, Keiichi, to Nippon Denpa Co., Ltd. Turning zigzag embroidery machine. 5,438,942, Cl. 112-102.500.
- Okuno, Akiyasu: See—  
Suzuki, Junichiro; Sakakibara, Shoji; Okuno, Akiyasu; and Watanabe, Masakazu, 5,439,854, Cl. 501-91.000.
- Okuno Chemical Industries Co., Ltd.: See—  
Hattori, Takeshi; Inoguti, Kazuhiko; Ohyama, Yukio; Nakagishi, Yutaka; and Sakaguchi, Masaaki, 5,439,712, Cl. 427-437.000.
- Okuno, Sumio: See—  
Hirakawa, Haruo; Ishikawa, Shinichiro; Okuno, Sumio; Hattori, Morishige; and Matsumoto, Masakazu, 5,439,415, Cl. 454-70.000.
- Okuno, Yasuhiro: See—  
Nagashima, Masaaki; Yamakawa, Tadashi; Sasaki, Takayuki; Okuno, Yasuhiro; and Kurosawa, Takahiro, 5,440,731, Cl. 395-400.000.
- Okuwaki, Shigeru; and Tomimura, Yukio, to Borg-Warner Automotive, Inc.; and Toyota Jidosha Kabushiki Kaisha. Chain belt where load block has grooves for engagement with protrusions on link plates. 5,439,423, Cl. 474-245.000.
- Okuyama, Kohei: See—  
Haneda, Ichiro; Sakurai, Tatsuyoshi; Yanagisawa, Masahiro; Okuyama, Kohei; Niwa, Kazuo; and Fukagawa, Toshihiro, 5,439,080, Cl. 188-218.0XL.
- Oldenkamp, John L., to General Electric Company. Reversible switched reluctance motor operating without a shaft position sensor. 5,440,218, Cl. 318-701.000.
- O'Leary, Robert K.: See—  
Prewett, Annmarie B.; Stikeleather, Roger C.; Bogdanaky, Simon; and O'Leary, Robert K., 5,439,684, Cl. 424-422.000.
- Ollivier, Jean-Francois: See—  
Lalouna, Said; Ollivier, Jean-Francois; and Penha, Manuel, 5,439,370, Cl. 425-546.000.
- Olson, James J., to Massachusetts Institute of Technology. Communication system with redundant links and data bit time multiplexing. 5,440,538, Cl. 370-13.000.
- Olson, Michael D.: See—  
Braesch, Robert O.; Hong, Peter L.; Mefferd, Thomas A.; and Olson, Michael D., 5,439,200, Cl. 254-267.000.
- Olson, Terry D.: See—  
Burklund, Sidney A.; and Olson, Terry D., 5,439,601, Cl. 210-798.000.
- Olympus Optical Co., Ltd.: See—  
Imabayashi, Hiroyuki; Fujimura, Takanao; and Iijima, Toshimichi, 5,440,190, Cl. 310-323.000.
- Koike, Hisashi; Fukuoka, Morinori; Kurasawa, Yuko; Inami, Minoru; and Yamane, Masayuki, 5,439,495, Cl. 65-17.200.
- Shiratori, Fumiyuki; Fukushima, Ikutoshi; and Hashimoto, Takeshi, 5,440,671, Cl. 395-25.000.
- Takahashi, Keita, 5,440,364, Cl. 354-173.100.
- Watanabe, Hitoshi; Paz De Araujo, Carlos A.; Yoshimori, Hiroyuki; Scott, Michael C.; Mihara, Takashi; Cuchiari, Joseph D.; and McMillan, Larry D., 5,439,845, Cl. 437-130.000.
- Omori, Mamoru; and Hirai, Toshio. Mixed oxide composite ceramics and method of producing the same. 5,439,853, Cl. 501-89.000.
- Omron Corporation: See—  
Nakanishi, Yoichi; Sato, Ryuichi; Sako, Kazumi; Noda, Masayuki; and Takegahara, Ikuo, 5,440,285, Cl. 335-78.000.
- On-Line Technologies, Inc.: See—  
Carangelo, Robert M.; and Wright, David D., 5,440,143, Cl. 250-573.000.
- Ong, DeWitt: See—  
Erhart, Richard A.; and Ong, DeWitt, 5,440,256, Cl. 327-94.000.
- Ong, Helen H.; Hrib, Nicholas J.; Perez, Joseph; and Jurcak, John G., to Hoechst-Roussel Pharmaceuticals Inc. 1-piperazinyl-2-butenes and -2-butenes. 5,440,048, Cl. 548-481.000.
- Onishi, Atsuhiko; and Tanaka, Hiroshi, to Toyo Kasei Kogyo Company Limited. Method of tetrazole amine salts having improved physical properties for generating gas in airbags. 5,439,251, Cl. 280-741.000.
- Onitsuka, Shigenori; Ichiki, Masayoshi; Inazumi, Chikashi; Watanabe, Takao; Fukuj, Atsushi; Akiyama, Masaki; Sairyo, Yuki; and Kobayashi, Hidetsugu, to Hitachi Zosen Corporation; and Pollution-Related Health Damage Compensation and Prevention Association. The Absorbents for removing low-concentration nitrogen oxides. 5,439,868, Cl. 502-415.000.
- Ono, Kazuya; and Yamane, Yukio, to Canon Kabushiki Kaisha. Apparatus and method for exposure. 5,440,397, Cl. 356-401.000.
- Ono, Mitsuhiro, to Fujitsu Limited. Demodulating apparatus having quick pull-in synchronization facility at instantaneous disconnection of input signal. 5,440,266, Cl. 329-307.000.
- Ono Pharmaceutical Co., Ltd.: See—  
Lee, Sung J.; Konishi, Yoshitaka; Macina, Orest T.; Kondo, Kigen; and Yu, Dingwei T., 5,439,895, Cl. 514-63.000.
- Ono, Takeo; and Nitta, Jun, to Canon Kabushiki Kaisha. Semiconductor optical filter and an optical communication system using the same. 5,440,581, Cl. 372-96.000.
- Ono, Yoshio: See—  
Tanji, Hiroyuki; Wada, Ichiro; Ono, Yoshio; and Soga, Hiroyuki, 5,439,459, Cl. 604-385.200.
- Ontani, Yuji: See—  
Nagasaka, Takashi; Ontani, Yuji; and Saitou, Mitsuhiro, 5,439,732, Cl. 428-210.000.



- Omaki, Wataru: See—  
Yamada, Masahiko; Omaki, Wataru; Otahara, Hirofumi; and Mochizuki, Nobuaki, 5,439,419, Cl. 474-18.000.
- Oohara, Kazuhiro: See—  
Ohmura, Takao; Sumi, Akinori; Ohtani, Wataru; Fuhata, Naoto; Takashima, Kazuya; Kamide, Kaeko; Noda, Munehiro; Kondo, Masahide; Ishikawa, Syoichi; Oohara, Kazuhiro; and Yokoyama, Kazumasa, 5,440,018, Cl. 530-363.000.
- Oomori, Shuichi: See—  
Sugaya, Toshitatsu; Hara, Mitsuo; Kikuchi, Yutaka; Tanimoto, Kenichi; Sagioka, Tokujirou; and Oomori, Shuichi, 5,440,093, Cl. 219-121.500.
- Ooms, Pieter: See—  
Klug, Gunter; Ooms, Pieter; and Rasp, Christian, 5,439,869, Cl. 503-208.000.
- Orex Corporation: See—  
York, Michael E., 5,439,118, Cl. 209-553.000.
- Oregon Regional Primate Research Center: See—  
Spindel, Eliot R.; Nagalla, Srinivas R.; Vijayaraghavan, Crimivasan; and Archibong, Anthony, 5,439,884, Cl. 514-12.000.
- Orion-yhtymä Oy: See—  
Karjalainen, Arto J.; Pelkonen, Reino O.; Sodervall, Marja-Liisa; Lahde, Matti A.; Lammintausta, Risto A. S.; Karjalainen, Arja L.; and Kalapudas, Arja M., 5,439,928, Cl. 514-400.000.
- Orioka, Yukihisa; and Tanaka, Junji, to Sharp Kabushiki Kaisha. Differential amplifier, 5,440,272, Cl. 330-253.000.
- Orsini, Piero; and Heimgartner, Frederic, to Debio Recherche Pharmaceutique S.A. Process for preparing a pharmaceutical composition, 5,439,688, Cl. 424-489.000.
- Orszagos "Frederic Joliot-Curie" Sugar-biológiai és Sugaregész-segügyi Kutató Intézet: See—  
Varga, Laszlo; Szanyik, Laszlo B.; Kanyar, Bela; Kiraly, Odon; Bracher, Erno; Emri, Jozsef; Gyori, Bela; and Kovacs, Zoltan, 5,440,031, Cl. 540-465.000.
- Osaka Gas Company Limited: See—  
Yamashita, Nobuhiko; Tohyama, Junichi; Kataoka, Chiwa; and Miura, Kazunobu, 5,439,811, Cl. 435-91.530.
- Osenbach, John W.: See—  
Chand, Nareh; Comizzoli, Robert B.; Osenbach, John W.; Rozlo, Charles B.; and Tsang, Won-Tien, 5,440,575, Cl. 372-49.000.
- Oser, Zale: See—  
Green, Richard; and Oser, Zale, 5,439,439, Cl. 602-6.000.
- Oshima, Takafumi; and Okayama, Tsutomu, to NGK Spark Plug Co., Ltd. Spark plug having a noble metal firing tip bonded to a front end of a center electrode, 5,440,198, Cl. 313-141.000.
- Oshinski, John N.: See—  
Siegel, John M., Jr.; Ku, David N.; Oshinski, John N.; and Pettigrew, Roderic L., 5,438,992, Cl. 128-653.200.
- OSi Specialties, Inc.: See—  
Noda, Isao; and Tsubaki, Suguru, 5,439,674, Cl. 424-70.120.
- Osinaki, Julian S.: See—  
Welch, David F.; Lang, Robert J.; Osinski, Julian S.; Dzurko, Kenneth M.; Mehuya, David G.; and Waarts, Robert G., 5,440,576, Cl. 372-50.000.
- Osmán, Ramli B.; and Spector, George. Fixed regenerative heat exchanger, 5,439,048, Cl. 165-4.000.
- OSRAM Sylvania Inc.: See—  
Houck, David L.; Kopatz, Nelson; Paliwal, Muktesh; and Sampath, Sanjay, 5,439,638, Cl. 419-30.000.
- Osteotech, Inc.: See—  
Prewett, Annamaria B.; Stikeleather, Roger C.; Bogdanský, Simon; and O'Leary, Robert K., 5,439,684, Cl. 424-422.000.
- Osterdock, Terry N.; Westcott, David C.; and Hua, Quyen D., to Stellar GPS Corporation. GPS synchronized frequency/time source, 5,440,313, Cl. 342-352.000.
- Ostrovskaya, Rita U.: See—  
Seredenin, Sergei B.; Voronina, Tatiana A.; Gudasheva, Tatiana A.; Ostrovskaya, Rita U.; Rozantsev, Grigori G.; Skoldinov, Alexander P.; Trofimov, Sergei S.; Halikas, James A.; and Garibova, Taisija L., 5,439,930, Cl. 514-423.000.
- Ota, Osamu: See—  
Takagi, Naoyuki; and Ota, Osamu, 5,440,535, Cl. 369-44.280.
- Ota, Tetsuya: See—  
Yagi, Yuji; Kagawa, Tamaki; Tamara, Hiroshi; and Ota, Tetsuya, 5,439,827, Cl. 436-66.000.
- Otis Elevator Company: See—  
Rynaski, Richard F.; Beloin, Brian F.; and Bogli, Craig D., 5,440,617, Cl. 379-95.000.
- Skalak, Clement A.; Salmon, John K.; Traktovenko, Boris G.; and Hollowell, Richard L., 5,439,075, Cl. 187-410.000.
- Otoshi, Hirokazu: See—  
Okamura, Ryujii; Otoshi, Hirokazu; and Takei, Tetsuya, 5,439,715, Cl. 427-575.000.
- Otsuka, Kazuo, to Fujitsu Limited. Reference light source device using laser, 5,440,207, Cl. 315-149.000.
- Otsuka, Nobuyuki, to Fujitsu Limited. Method of growing a semiconductor layer and a fabrication method of a semiconductor device using such a semiconductor layer, 5,438,952, Cl. 117-84.000.
- Ott, Randolph H.: See—  
Dybdal, Robert B.; and Ott, Randolph H., 5,440,308, Cl. 342-17.000.
- Ottavi, Laurent: See—  
Pastor, Henri; Allibert, Colette; Ottavi, Laurent; Albajar, Manuel; and Castro-Fernandez, Francisco, 5,439,499, Cl. 75-232.000.
- Ottwein, Stefan: See—  
Breitenbacher, Juergen; Ottwein, Stefan; Kallenbach, Rainer; and Decker, Heinz, 5,439,245, Cl. 280-707.000.
- Ottow, Eckhard: See—  
Chwalisz, Krzysztof; Elger, Walter; Schmidt-Gollwitzer, Karin; and Ottow, Eckhard, 5,439,913, Cl. 514-277.000.
- Quintanilla, Esmarardo: See—  
Mendez, Arturo; Quintanilla, Esmarardo; Norris, John; and Garza, Juan, 5,438,705, Cl. 2-4.000.
- Ovada, Esther; Barabell, Arthur J.; and Sridhar, Manickam R., to Motorola, Inc. Data multiplexer with simultaneous multiple channel capability, 5,440,564, Cl. 370-112.000.
- Overton, Mark A., to Hewlett-Packard Company. Pixel correction and smoothing method, 5,440,407, Cl. 358-447.000.
- Ovniczek, Eugene D. Horseshoe for treatment of lame horses, 5,439,062, Cl. 168-14.000.
- Owen, Earl R. Static chair, 5,439,270, Cl. 297-452.270.
- Owens, Jeffrey T.: See—  
Scott, Christopher E.; Meyer, Max F.; Breeding, Kenneth E.; and Owens, Jeffrey T., 5,439,987, Cl. 525-425.000.
- Owens, Steve C.; Lovvorn, Richard V.; and Elder, Albert B., to Southwire Company. Magnetic support system for cable insertion tube, 5,439,363, Cl. 425-3.000.
- Oxley, Gerald K.; Renick, Chester D.; and Venable, Frederick D., to TRW Inc. Dual pivot steering column, 5,439,252, Cl. 280-775.000.
- Ozawa, Ryuji, to Miyota Kabushiki Kaisha. Cathodoluminescent apparatus having a linearly focused beam, 5,440,200, Cl. 313-422.000.
- Ozawa, Yasuyuki: See—  
Fujimaki, Tohru; Futamata, Akio; and Ozawa, Yasuyuki, 5,440,533, Cl. 369-44.180.
- Ozturk, Mehmet C.; and Sanganeria, Mahesh K., to North Carolina State University. Method for forming a layer of uniform thickness on a semiconductor wafer during rapid thermal processing, 5,439,850, Cl. 437-228.000.
- P.C.T. Inc.: See—  
Percy, George A., Jr., 5,439,076, Cl. 188-4.00R.
- Pace, Wilson D.: See—  
Uskali, Robert G.; Bell, David B.; and Pace, Wilson D., 5,440,208, Cl. 315-169.300.
- Pacesetter, Inc.: See—  
Thacker, James R.; Weinberg, Alvin H.; and Moaddeb, Shahram, 5,438,987, Cl. 128-634.000.
- Pacific Saw and Knife Company d/b/a Pacific/Hoe Saw and Knife Company: See—  
Bradstreet, Joseph R., Jr.; Hewitt, Keith H.; and Macey, David S., 5,439,039, Cl. 144-220.000.
- Packaging Corporation of America: See—  
Stone, James L., 5,439,133, Cl. 220-418.000.
- Padmanabhan, Gobi: See—  
Carmichael, Tim; Padmanabhan, Gobi; Yee, Abraham; and Yeh, Stanley, 5,440,154, Cl. 257-206.000.
- Padula, Santo A.; and Johnson, Duane R., to Allied-Signal Inc. Signal generator, 5,439,275, Cl. 303-3.000.
- Pahno, Demetrios A.; Stolpmann, James R.; Thomas, James M. C.; Ashcraft, David N.; Dalton, Roger D.; Romano, James J.; Smith, Kenneth R.; Trauernicht, Timothy R.; and Bolden, Michael V., to SSI Medical Services, Inc. Apparatus and method for managing waste from patient care, maintenance and treatment, 5,438,721, Cl. 5-604.000.
- Pahwa, Gurcharan S.: See—  
Kapil, Randhir S.; Zutshi, Usha; Bedi, Kasturi L.; Singh, Gurbax; Johri, Ramesh K.; Dhar, Santosh K.; Kaul, Jawahar L.; Sharma, Subhash C.; Pahwa, Gurcharan S.; Kapoor, Naveen; Tickoo, Ashok K.; Tickoo, Manoj K.; Kaul, Uma; Singh, Surjeet; Zutshi, Ram K.; and Singh, Rajinder, 5,439,891, Cl. 514-31.000.
- Paire, Christian, to Laniere de Picardie. Insert intended for use in the clothing industry, 5,439,733, Cl. 428-219.000.
- Paliwal, Muktesh: See—  
Houck, David L.; Kopatz, Nelson; Paliwal, Muktesh; and Sampath, Sanjay, 5,439,638, Cl. 419-30.000.
- Pall Corporation: See—  
Malbrel, Christophe A.; and Hashemi, Reza, 5,439,058, Cl. 166-300.000.
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- Gibson, Michael S., 5,440,061, Cl. 554-160.000.
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- Harrington, James A.; Abel, Todd C.; and Hirsch, Jeffrey, 5,440,664, Cl. 385-125.000.
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- Meltsch, Hans-Juergen; and Schulte, Wolfgang, 5,440,074, Cl. 174-88.00R.
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- Waugh, Gary C., 5,439,130, Cl. 220-210.000.
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- Sabett, Randy V.: See—
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- Samsung Electro-Mechanics Co., Ltd.: See—  
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- Sandford, Paul A.: See—  
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- Sasayama, Yuichi: See—  
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- Sato, Haruo, to Nikon Corporation. Five-element telescopic zooming lens. 5,440,430, Cl. 359-683.000.
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- Sayama, Takashi, to Martial Plant Corporation. Apparatus for fast fermentation treatment. 5,439,823, Cl. 435-290.000.
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- Schafer, John C.: See—  
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- Scharret, Jeffery L.: See—  
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- Scheffelin, Joseph: See—  
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- Schenck, Serge: See—  
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- Schenk, Johannes L.: See—  
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- Heindl, Josef; Skuballa, Werner; Buchmann, Bernd; Frohlich, Wolfgang; Ekerdt, Roland; and Giesen, Claudia, 5,440,044, Cl. 546-301.000.
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- Ganguly, Ashit K.; Friary, Richard J.; Schwerdt, John H.; Siegel, Marvin I.; Smith, Sidney R.; and Sybertz, Edmund J., 5,439,916, Cl. 514-293.000.
- Schertz, Paul T.: See—  
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- Scheu, Walter. Method for controlling sluggish heating and cooling systems for buildings. 5,439,049, Cl. 165-22.000.
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- Schieman, Robert G., to Reliance Electric Industrial Company. Fundamental voltmeter. 5,440,229, Cl. 324-76.440.
- Schillaci, Onofrio; Pierce, Ben; Coffelt, Steve R.; and Siu, Edward K. W., to Harris Corporation. Mechanism for controlling operation of telephone metallic loop measurement device in dependence upon rate of settling of telephone line voltage. 5,440,610, Cl. 379-24.000.
- Schilling, Jan C.: See—  
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- Schmid, Frederick; Smith, Maynard B.; and Khattak, Chandra P., to Crystal Systems, Inc. Shaped blades. 5,438,973, Cl. 125-18.000.
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- Schmidt, Martin, to Siemens Aktiengesellschaft. Detector for high-energy radiation. 5,440,129, Cl. 250-366.000.
- Schmidt, Peter; and Michalkiewicz, Peter, to Gummiwerk Kraiburg Development GmbH. Track crossing installation, molded body for a track crossing installation and method for producing a molded body for a track crossing installation. 5,439,625, Cl. 264-71.000.
- Schmidt, Ralph O. Simultaneous signals IFM receiver using plural delay line correlators. 5,440,228, Cl. 324-76.120.
- Schmidt, Robert R.: See—  
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- Schnaibel, Eberhard: See—  
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- Schneider, Paul R.; and Lindstrom, Gregory L. Process for manufacturing a grid-patterned membrane. 5,439,631, Cl. 264-293.000.
- Schneider Rundfunkwerke Aktiengesellschaft: See—  
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- Schneider, Werner, to B.A.T. Cigarettenfabriken GmbH. Coaxial filter cigarette. 5,439,011, Cl. 131-360.000.
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- Schober, Melvin A.: See—  
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- Schoeberl, Meinolf. Apparatus for the sterilization of water. 5,439,576, Cl. 204-263.000.
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- Schofield, Harry D.: See—  
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- Scholian, Horst: See—  
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- McClure, David C., 5,440,178, Cl. 327-34.000.
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- Miyake, Takahiro; Yoshida, Yoshio; and Kurata, Yukio, 5,440,427, Cl. 359-566.000.
- Okada, Hisao, 5,440,323, Cl. 345-100.000.
- Orisaka, Yukihisa; and Tanaka, Junji, 5,440,272, Cl. 330-253.000.
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- Shaw, David G.; Dawson, Eric; Cline, Daniel; and Langlois, Marc, to Catalina Coatings, Inc. Acrylate coating material. 5,440,446, Cl. 361-301.500.
- Shaw, Howard C. Means to establish and maintain an engagement chord for pliable and inflatable members in a desired plane in a measuring apparatus. 5,438,762, Cl. 33-734.000.
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- Shaw, James R.: See—  
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- Ekvall, Anders G. C.; Huete, David A.; and Brasted, Lee K., 5,439,324, Cl. 405-202.000.
- Huete, David A.; Marshall, Peter W.; Morrison, Denby G.; and Smolinski, Susan L., 5,439,060, Cl. 166-367.000.
- Wicks, Moye, III; Lester, Gregory S.; and Esparza, Joe O., 5,439,290, Cl. 366-241.000.
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- Sherbondy, Ann M.; and Vanderpool, Daniel P., to Calgon Corporation. Stabilization of hydroxyalkylidene phosphonate scale inhibitors against degradation by bromine and chlorine biocides. 5,439,611, Cl. 252-180.000.
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Sigler, Gerald F.; Walter, Charles F.; Durant, Charles E.; Glancy, Todd; Klein, Frank E.; and Dorn, Allan R., to Boehringer Mannheim Corporation. Mannimide adduct conjugates of procainamide and NAPA. 5,439,798, Cl. 435-7.700.

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- Smith, Bradley P., to Motorola Inc. SRAM with programmable preset data. 5,440,513, Cl. 365-190.000.
- Smith, Charles D.: See—  
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- Smith, Darrell F., Jr.: See—  
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- Smith, Kenneth R.: See—  
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- Smith, Maynard B.: See—  
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- Smith, Michael R.: See—  
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- Smith, Michele C.: See—  
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- Smith, Stephen A.: See—  
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- Smith, Walt. Welding complicated, difficult-to-weld metal components. 5,440,099, Cl. 219-137.00R.
- Smith & Wesson Corp.: See—  
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- Smieszak, Gary A.; and Dionne, Robert C., 5,438,783, Cl. 42-7.000.
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- Snagovski, Leonid M.; Nizhnikovskaja, Polina F.; Vasilev, Emil Y.; Taran, Juri N.; and Bol'shakova, Viktoriya A., to DMK Tek, Inc. Process for improving strength and plasticity of wear-resistant white irons. 5,439,535, Cl. 148-544.000.
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- Lhermould, Jacques C. N., 5,439,306, Cl. 403-179.000.
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- Fuwa, Yoshio; and Hirata, Kuninori, 5,439,406, Cl. 445-2.000.
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- Ikeda, Yuji, 5,440,123, Cl. 250-307.000.
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- Saito, Hitoshi, 5,440,438, Cl. 360-106.000.
- Sato, Syojiro; Umetsu, Koji; and Sasaki, Masayoshi, 5,440,220, Cl. 320-13.000.
- Takezawa, Masayuki; and Maeda, Yasuaki, 5,440,529, Cl. 369-13.000.
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- Sorensen, Neil R.: See—  
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- Sowers, Kenneth G., to Fusion Systems Corporation. Screw mechanism for radiation-curing lamp having an adjustable irradiation area. 5,440,137, Cl. 250-504.00R.
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- Sparkomatic Corporation: See—  
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- Spectra-Physics Scanning Systems, Inc.: See—  
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- SpectraScience, Inc.: See—  
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- SSDE Technologies Corporation: See—  
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- Stachowski, Russell E.: See—  
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- Stahl, Manfred: See—  
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- Steffen, James E.; Each, Jay A.; Mattila, Robert J.; Donaldson, Eric J.; Vraa, Timothy S.; Nelson, Owen L.; Potts, John E.; Edwards, Jathan D.; Krepel, Kenneth J.; and Hoffman, Joseph A., to Minnesota Mining and Manufacturing Company. Radiographic image reader. 5,440,146, Cl. 250-580.000.
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- Stevens, Wayne R., to CalComp Inc. Polychromatic pen for pen plotters with color mixing at media surface. 5,440,327, Cl. 346-46.000.
- Stewart, Gregory N.; and Okonsky, Christian G., to Dell USA, L.P. Electronic system with compact card ejector. 5,440,448, Cl. 361-684.000.
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- Stone Container Corporation: See—  
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- Stone, James L., to Packaging Corporation of America. Paperboard carton-liner assembly with balancing means. 5,439,133, Cl. 220-418.000.
- Stone, Nancy: See—  
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- Storhoff, Howard A.: See—  
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- Strickling, James E., III; Goode, Joseph W., III; and Dunn, William R., to Avionic Displays Corporation. Backlighting for liquid crystal display. 5,440,324, Cl. 345-102.000.
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- Stucker, David B.: See—  
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- Stupek, Richard A.: See—  
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- Suddath, James M., to Bellaire Industries, Inc. Flush mount fitting for gas emission sample container. 5,438,884, Cl. 73-864.620.
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- Sudor Partners: See—  
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- Suga, Yoshiharu, to Fuji Xerox Co., Ltd. Transfer material carrying controlling apparatus. 5,440,382, Cl. 355-317.000.
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- Sugai, Maureen, to Motorola, Inc. Method and apparatus for coupling a semiconductor device with a tester. 5,440,231, Cl. 324-158.100.
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- Sugano, Masashi; Yamazaki, Yoshio; Ikeda, Masaaki; and Izawa, Tadashi, to Konica Corporation. Image forming apparatus with an unapproved copy preventing means. 5,440,409, Cl. 358-501.000.
- Sugaya, Kenji: See—  
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- Sugaya, Toshikazu; Hara, Mitsuo; Kikuchi, Yutaka; Tanimoto, Kenichi; Sagisaka, Tokujiro; and Oomori, Shuichi, to Doryokuro Kakunenryo Kaihatsu Jigyodani. Structure of constrained chip for plasma jet torch, and plasma jet working method using this constrained chip. 5,440,093, Cl. 219-121.500.
- Sugimoto, Masaki, to Mitsubishi Denki Kabushiki Kaisha. Method for controlling DRAM memory in a microcomputer. 5,440,711, Cl. 395-433.000.
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- Sugita, Masahiro, to NEC Corporation. ATM cell assembling/disassembling system. 5,440,552, Cl. 370-60.000.
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- Sugiyama, Tetsuya: See—  
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- Sumigawa, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Cooling system for outboard motor. 5,439,404, Cl. 440-88.000.
- Sumika Fine Chemicals Co., Ltd.: See—  
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- Tanaka, So; Inada, Hiroshi; and Iiyama, Michitomo, 5,439,875, Cl. 505-329.000.

- Sumitomo Heavy Industries, Ltd.: See—  
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- Sumitomo Metal Industries, Ltd.: See—  
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- Sumitomo Rubber Industries, Ltd.: See—  
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- Sumitomo Wiring Systems, Ltd.: See—  
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- Matsuzawa, Susumu, 5,438,748, Cl. 29-752.000.
- Summerfield, Leslie R., to Rolls-Royce plc. Aircraft engine emergency control system. 5,440,490, Cl. 364-431.020.
- Summers, Daniel A.; and Levy, Howard. Lavage valve. 5,439,022, Cl. 137-102.000.
- Sun Chemical Corporation: See—  
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- Sun Microsystems, Inc.: See—  
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- Hayes, Norman M.; Malamy, Adam; and Patel, Rajiv N., 5,440,707, Cl. 395-403.000.
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- Sund, William. Atmosphere controlled soldering apparatus with incorporated solder pump. 5,439,158, Cl. 228-37.000.
- Sundby, James T., to Exar Corporation. Accurate low voltage detect circuit. 5,440,254, Cl. 327-79.000.
- Sunds Defibrator Industries Aktiebolag: See—  
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- Sundstrand Corporation: See—  
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- Sundstrom, Erik, to Sandvik AB. Low noise saw blade. 5,438,900, Cl. 83-835.000.
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- Supanz, Johann: See—  
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- Sura, Vivek M.: See—  
Bezama, Raschid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Frase, Katharine G.; Gabriels, David H.; Herron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillo, Robert M.; Sura, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.
- Susaki, Masafumi: See—  
Kato, Shigemasa; Okawa, Shigeki; and Susaki, Masafumi, 5,438,943, Cl. 112-261.000.
- Suslick, Kenneth S.: See—  
Desai, Neil P.; Soon-Shiong, Patrick; Sandford, Paul A.; Grinstaff, Mark W.; and Suslick, Kenneth S., 5,439,686, Cl. 424-451.000.
- Sutrina, Thomas A., to Sundstrand Corporation. Integral heat sink interface. 5,440,172, Cl. 257-712.000.
- Suttle, Mark L.: See—  
Layton, Ken S.; Suttle, Mark L.; and Tisch, Brett L., 5,439,027, Cl. 137-513.500.
- Suzuki, Chikatsu; Kurosu, Shigetaka; and Miura, Kazunobu, to Konica Corporation. Sheet conveyance apparatus for an image forming apparatus. 5,440,381, Cl. 355-309.000.
- Suzuki, Hiroshi, to NEC Corporation. Multimedia packet communication system. 5,440,551, Cl. 370-60.000.
- Suzuki, Junichiro; Sakakibara, Shoji; Okuno, Akiyasu; and Watanabe, Masakazu, to NGK Spark Plug Co., Ltd. TiC-base/SiC whisker composite ceramic cutting tools. 5,439,854, Cl. 501-91.000.
- Suzuki Kabushiki Kaisha: See—  
Arakawa, Hidetoshi, 5,439,585, Cl. 210-168.000.
- Suzuki, Katsunori: See—  
Torii, Takeshi; Suzuki, Katsunori; Sonoda, Tetsuo; and Kojima, Kouichi, 5,439,565, Cl. 204-129.100.
- Suzuki, Kazuaki: See—  
Kawatani, Norio; Ichikawa, Iwao; Suzuki, Kazuaki; and Yamada, Yukio, 5,439,161, Cl. 228-180.210.
- Suzuki, Kazuyuki: See—  
Kimura, Tsuneo; Suzuki, Kazuyuki; and Arai, Masatoshi, 5,440,002, Cl. 528-17.000.
- Suzuki, Mikio: See—  
Haga, Kyosuke; Suzuki, Mikio; Inaguma, Yoshiharu; Fukumura, Kenichi; Kato, Hideya; and Mori, Katsuhisa, 5,439,070, Cl. 180-141.000.
- Suzuki, Minoru: See—  
Deki, Tsuyoshi; Suzuki, Minoru; Sakamoto, Koji; Noguchi, Koichi; Matsushiro, Hiroyuki; Sasaki, Eiichi; Kimura, Noriyuki; Fujishiro, Takatsugu; and Hatsuyama, Chiyako, 5,440,373, Cl. 355-210.000.
- Suzuki Motor Corporation: See—  
Kato, Kiyokazu, 5,438,890, Cl. 74-501.50R.
- Suzuki, Shigeo; and Okada, Fujio, to Fuji Photo Optical Co., Ltd. Signal processing circuit for a simultaneous electronic endoscope. 5,440,341, Cl. 348-256.000.
- Suzuki, Shuichi, to Kabushiki Kaisha Toshiba. Epoxy resin-basin composite material. 5,439,746, Cl. 428-415.000.
- Suzuki, Taketoshi; and Honjo, Kazumi, to Niles Parts Co., Ltd. Lever switch assembly. 5,440,085, Cl. 200-61.540.
- Suzuki, Toshiyuki; Sasagawa, Katsuyoshi; Imai, Masao; and Kanemura, Yoshinobu, to Mitsui Toatsu Chemicals, Inc. Optical lens comprised of high surface hardness transparent resin. 5,440,358, Cl. 351-159.000.
- Suzuki, Tsuneo: See—  
Terada, Yasuharu; Suzuki, Tsuneo; Matsushima, Hideyuki; Horita, Yoshiyuki; and Izumi, Hiroaki, 5,438,736, Cl. 24-599.800.
- Suzuki, Yasutake; and Fujimori, Junichi, to Yamaha Corporation. Sound localization control apparatus. 5,440,639, Cl. 381-17.000.
- Svensson, Arne: See—  
Briving, Carin; Carlsson, Stig; Carter, Robert; Elebring, Marie; Kuhler, Thomas; Nordberg, Peter; Starke, Ingemar; and Svensson, Arne, 5,439,917, Cl. 514-300.000.
- Swada, Tsuguo: See—  
Sakashita, Hajime; Kishioka, Hiroshi; Konishi, Shohei; Swada, Tsuguo; and Kitamori, Takahiko, 5,439,830, Cl. 436-534.000.
- Swan, Herbert W.: See—  
Dey-Sarkar, Samir K.; Foster, Douglas J.; Smith, Steven W.; and Swan, Herbert W., 5,440,525, Cl. 367-52.000.
- Swanko, Jacob J., II: See—  
May, Dan P.; and Swanko, Jacob J., II, 5,439,762, Cl. 429-218.000.
- Swanson, Eric J.: See—  
Signore, Bruce D.; and Swanson, Eric J., 5,440,305, Cl. 341-120.000.
- Swanson, Robert A.: See—  
Boyle, Valerie Y.; Martin, Ronald B.; and Swanson, Robert A., 5,440,626, Cl. 379-219.000.
- Swanson, Ronald J.: See—  
McMaster, David A.; and Swanson, Ronald J., 5,438,787, Cl. 42-106.000.
- Sweet, Frederick J., to Nelson Irrigation Corporation. Nutating sprinkler. 5,439,174, Cl. 239-222.170.
- Sybertz, Edmund J.: See—  
Ganguly, Ashit K.; Friary, Richard J.; Schwerdt, John H.; Siegel, Marvin L.; Smith, Sidney R.; and Sybertz, Edmund J., 5,439,916, Cl. 514-293.000.
- Sydnor, Norma: See—  
Robertson, John M.; and Sydnor, Norma, 5,439,142, Cl. 222-164.000.
- Sykora, James H.; Khodapanah, Tofigh; Hunt, David S.; Kaplinsky, George; Scheffelin, Joseph; Liew, Amy V.; Van Veen, Mark; and Elliot, Joseph R., to Hewlett-Packard Company. Collapsible ink reservoir and ink-jet cartridge with protective bonding layer for the pressure regulator. 5,440,333, Cl. 347-87.000.
- Symbiosis Corporation: See—  
Palmer, Matthew A., 5,439,478, Cl. 606-205.000.
- Symetrix Corporation: See—  
Watanabe, Hitoshi; Paz De Araujo, Carlos A.; Yoshimori, Hiroyuki; Scott, Michael C.; Mihara, Takashi; Cuchiaro, Joseph D.; and McMillan, Larry D., 5,439,845, Cl. 437-130.000.
- Synectics Medical, Incorporated: See—  
Essen-Moller, Anders, 5,438,985, Cl. 128-633.000.
- Synphar Laboratories, Inc.: See—  
Maiti, Samarendra N.; Fiakpui, Charles Y.; Reddy, Andhe V. N.; Czajkowski, David P.; and Micetich, Ronald G., 5,439,904, Cl. 514-200.000.
- Syntex (U.S.A.) Inc.: See—  
Rose, Samuel; and Western, Linda M., 5,439,793, Cl. 435-6.000.
- Synthetic Products Company: See—  
Baker, Paulette; and Grossman, Richard F., 5,439,742, Cl. 428-389.000.
- SyQuest Technology, Inc.: See—  
Ifitkar, Syed H.; Thompson, Herbert E.; Kay, Teong-Hoe; and Guerini, Albert J., 5,440,436, Cl. 360-99.120.
- Syva Company: See—  
Kontorovich, Michael, 5,439,826, Cl. 436-50.000.
- Szecssey nee Heged s, Maria: See—  
Reiter nee Eszes, Klara; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Simig, Gyula; Gyertyan, Istvan; Pet cz, Lujza; Fekete, Marton; Szemerédi, Katalin; Gacsalyi, Istvan; Giegler, Gabor; Rohacs nee Zamkovaja, Ludmilla; Szecssey nee Heged s, Maria; and Szirt nee Kiszelly, Enik , 5,439,940, Cl. 514-640.000.
- Szemerédi, Katalin: See—  
Reiter nee Eszes, Klara; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Simig, Gyula; Gyertyan, Istvan; Pet cz, Lujza; Fekete, Marton; Szemerédi, Katalin; Gacsalyi, Istvan; Giegler, Gabor; Rohacs nee Zamkovaja, Ludmilla; Szecssey nee Heged s, Maria; and Szirt nee Kiszelly, Enik , 5,439,940, Cl. 514-640.000.
- Szirt nee Kiszelly, Enik : See—  
Reiter nee Eszes, Klara; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Simig, Gyula; Gyertyan, Istvan; Pet cz, Lujza; Fekete, Marton; Szemerédi, Katalin; Gacsalyi, Istvan; Giegler, Gabor; Rohacs nee Zamkovaja, Ludmilla; Szecssey nee Heged s, Maria; and Szirt nee Kiszelly, Enik , 5,439,940, Cl. 514-640.000.
- Sztanyik, Laszlo B.: See—  
Varga, Laszlo ; Sztanyik, Laszlo B.; Kanyar, Bela; Kiraly, Odon; Brucher, Erno; Emri, Jozsef; Gyori, Bela; and Kovacs, Zoltan, 5,440,031, Cl. 540-465.000.
- T.N. Technologies Inc.: See—  
Erb, Tom; and Springer, Thomas, 5,440,275, Cl. 331-4.000.
- TA Instruments, Inc.: See—  
Reading, Michael, 5,439,291, Cl. 374-11.000.



- Tabata, Yasuaki; Numako, Norio; and Kosako, Kosei, to Asahi Kogaku Kabushiki Kaisha. Compact camera with automatic focal length dependent exposure adjustment. 5,440,369, Cl. 354-432.000.
- Tabata, Jun: See—  
Yamashita, Muneharu; Tabata, Jun; Mizuno, Toshihiro; and Inoue, Jiro, 5,438,859, Cl. 73-1.00D.
- Tabourier, Remy, to Thomson-CSF. Device to stabilize the beam of an electronic scanning antenna rigidly fixed to a moving body. 5,440,314, Cl. 342-371.000.
- Tachikawa, Akiyoshi; Jono, Aiji; Aigo, Takashi; and Moritani, Akihiro, to Nippon Steel Corporation. Method of growing compound semiconductor on silicon wafer. 5,438,951, Cl. 117-84.000.
- Tack, Henri M.; and Govaert, Renee R., to AGFA-Gevaert N. V. Parallel to serial conversion of information data. 5,440,684, Cl. 395-164.000.
- Tackett, Wendell D.: See—  
Linkner, Herbert L., Jr.; and Tackett, Wendell D., 5,439,279, Cl. 303-119.200.
- Tadino, Vincent L. A.: See—  
Agostini, Giorgio; Christiaens, Leon E. E.; Frank, Uwe E.; Maerter, Thierry F. E.; Tadino, Vincent L. A.; Visel, Friedrich; and Zimmer, Rene J., 5,440,064, Cl. 556-427.000.
- Taetle, Raymond: See—  
Keller, Michael J.; McMorris, Trevor C.; and Taetle, Raymond, 5,439,936, Cl. 514-546.000.  
Keller, Michael J.; McMorris, Trevor C.; and Taetle, Raymond, 5,439,942, Cl. 514-691.000.
- Taga, Jun; and Okamoto, Kimio, to Taga, Jun. Coupling and method for folding back a pipe and using for it and its apparatus. 5,439,259, Cl. 285-334.500.
- Taga, Noboru; Ishikawa, Tatsuya; and Komatsu, Susumu, to Kabushiki Kaisha Toshiba. AFC circuit for QPSK demodulator. 5,440,268, Cl. 329-308.000.
- Taga, Noboru: See—  
Ishikawa, Tatsuya; and Taga, Noboru, 5,440,587, Cl. 375-332.000.
- Tagami, Emiko: See—  
Miyachi, Hiroyuki; Segawa, Mitsuru; Tagami, Emiko; and Okubo, Hideo, 5,439,919, Cl. 514-316.000.
- Tagawa, Koichi, to Mory Suntour Inc. Bicycle speed change operation assembly. 5,438,889, Cl. 74-475.000.
- Tahara, Tetsuya; Sugita, Kazushige; Ito, Kazuhiko; and Yoshikawa, Nobuhisa, to Matsushita Electric Industrial Co., Ltd. Fluorescent lamp starter having a transistor base control means. 5,440,205, Cl. 315-94.000.
- Tai, James: See—  
Arnold, Alan F.; Wheeler, Arthur R.; and Tai, James, 5,440,693, Cl. 395-284.000.
- Tai, Joseph Y.: See—  
Blake, Milan S.; Tai, Joseph Y.; Qi, Huilin L.; Liang, Shu-Mei; Hronowski, Lucjan J. J.; and Pullen, Jeffrey K., 5,439,808, Cl. 435-69.100.
- Tai, Seiji: See—  
Kamijima, Koichi; Tai, Seiji; and Tanaka, Hiroyuki, 5,439,512, Cl. 106-18.320.  
Tanaka, Hiroyuki; Tai, Seiji; and Kamijima, Koichi, 5,439,511, Cl. 106-18.320.
- Taiwan Semiconductor Manufacturing Company Ltd.: See—  
Sung-Mu, Hsu, 5,440,158, Cl. 257-314.000.
- Takada, Kiyohito: See—  
Kato, Takashi; and Takada, Kiyohito, 5,439,789, Cl. 430-585.000.
- Takagi, Katsuki, to Hitachi, Ltd. Microprocessor and storage management system having said microprocessor. 5,440,708, Cl. 395-418.000.
- Takagi, Naoyuki; and Ota, Osamu, to Sanyo Electric Co., Ltd. Method of counting tracks on disk and track counter circuit therefor. 5,440,535, Cl. 369-44.280.
- Takagi, Seichi; Inoue, Toyofumi; and Nagatsuka, Ikutaroh, to Fuji Xerox Co., Ltd. Magnetic toner and process for producing the same. 5,439,772, Cl. 430-106.600.
- Takagi, Tadao, to Nikon Corporation. Ultrasonic motor. 5,440,191, Cl. 310-323.000.
- Takahashi, Akiyoshi: See—  
Takei, Yoshio; Takahashi, Akiyoshi; Sasayama, Yuichi; and Takigawa, Masaharu, 5,440,012, Cl. 530-307.000.
- Takahashi, Keita, to Olympus Optical Co., Ltd. Film loader. 5,440,364, Cl. 354-173.100.
- Takahashi, Kousuke: See—  
Yamazaki, Tetsuya; and Takahashi, Kousuke, 5,440,733, Cl. 395-600.000.
- Takahashi, Misao: See—  
Tsujimoto, Tadahiho; Ito, Takashi; Takeuchi, Nobuo; and Takahashi, Misao, 5,439,708, Cl. 427-294.000.
- Takahashi, Nobuyuki: See—  
Kobayashi, Masahiko; and Takahashi, Nobuyuki, 5,439,574, Cl. 204-192.120.
- Takahashi, Seitaro: See—  
Tsugita, Akira; Kamo, Masaharu; Uchida, Toyooki; Nanno, Ikuo; Nomoto, Yasuhiro; and Takahashi, Seitaro, 5,439,650, Cl. 422-108.000.
- Takahashi, Toshio; Ikeda, Masaaki; Kuriyama, Satoshi; Tanaka, Koji; Sasamoto, Shuji; and Shibayama, Katsutoshi, to Tsubakimoto Chain Co. Link for conveyor chains. 5,439,097, Cl. 198-803.010.
- Takahashi, Yohnosuke; Nakamura, Hideyuki; Shinozaki, Fumiaki; and Tsuno, Shinji, to Fuji Photo Film Co., Ltd. Image formation process. 5,439,775, Cl. 430-254.000.
- Takaide, Aya: See—  
Kashiwazaki, Aki; Suga, Yuko; and Takaide, Aya, 5,439,514, Cl. 106-20.00C.
- Takamatsu, Hideo: See—  
Kinoshita, Satoshi; Takamatsu, Hideo; Ishiura, Kazushige; Masuda, Haruhisa; and Taniguchi, Shunro, 5,439,976, Cl. 525-92.000.
- Takamoto, Hiroshi: See—  
Ishimura, Katsuhiko; Takamoto, Hiroshi; and Aoki, Shusei, 5,440,418, Cl. 359-177.000.
- Takano, Atsushi: See—  
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 5,439,872, Cl. 503-227.000.
- Takano, Yutaka: See—  
Katsumata, Ryoichi; and Takano, Yutaka, 5,439,822, Cl. 435-252.320.
- Takasago International Corporation: See—  
Saito, Takao; Kumobayashi, Hidenori; and Murahashi, Shunichi, 5,440,030, Cl. 540-357.000.
- Takashima, Koichi: See—  
Matsui, Izuru; Kubo, Tsutomu; Furuta, Kazuya; and Takashima, Koichi, 5,439,773, Cl. 430-110.000.
- Takashima, Shinji: See—  
Ichikawa, Norihito; Imai, Masatoshi; Hirase, Hidehiro; and Takashima, Shinji, 5,440,680, Cl. 395-158.000.
- Takashima, Yoshiyuki: See—  
Konishi, Kozo; Chizaki, Shoichi; Fujii, Shuzo; and Takashima, Yoshiyuki, 5,439,858, Cl. 502-7.000.
- Takata Corporation: See—  
Kokeguchi, Akira; and Nakayama, Yoshikazu, 5,439,250, Cl. 280-736.000.
- Takatori, Sunao: See—  
Shou, Guoliang; Yang, Weikang; Wongwirawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,440,156, Cl. 257-296.000.  
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,440,605, Cl. 377-47.000.
- Takayama, Glenn K.: See—  
Tseung, Ken; Wong, Wai Bun; Takayama, Glenn K.; Jones, Christopher M.; and Kalra, Krishan L., 5,439,649, Cl. 422-99.000.
- Take, Seiji: See—  
Matsuo, Makoto; Utsumi, Minoru; Iijima, Masayuki; Taniguchi, Yukio; Obata, Hiroyuki; and Take, Seiji, 5,439,768, Cl. 430-56.000.
- Takeda Chemical Industries, Ltd.: See—  
Ikeyama, Shuichi; Koyama, Masaru; Miyake, Masayuki; and Senoo, Masaharu, 5,439,886, Cl. 514-12.000.
- Takeda, Hideichiro: See—  
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 5,439,872, Cl. 503-227.000.
- Takeda, Hideo: See—  
Fujisawa, Shuji; Komaki, Susumu; Sakato, Shingo; Taniguchi, Masami; and Takeda, Hideo, 5,440,375, Cl. 355-221.000.
- Takeda, Junichi: See—  
Yoshizuka, Haruo; and Takeda, Junichi, 5,439,344, Cl. 414-789.100.
- Takeda, Kenji, to Canon Kabushiki Kaisha. Imaging forming apparatus having transfer material carrying member for carrying transfer materials. 5,440,380, Cl. 355-271.000.
- Takeda, Kuninaga, to NEC Corporation. Database input/output control system having nonvolatile storing unit for maintaining the database. 5,440,712, Cl. 395-444.000.
- Takeda, Takami: See—  
Ohtsuka, Toshikazu; Masui, Moriyasu; Takeda, Takami; Masuko, Michio; and Ohba, Katsuaki, 5,439,911, Cl. 514-256.000.
- Takegahara, Ikuo: See—  
Nakanishi, Yoichi; Sato, Ryuichi; Sako, Kazumi; Noda, Masayuki; and Takegahara, Ikuo, 5,440,285, Cl. 335-78.000.
- Takehana, Shinichi: See—  
Okada, Kinjiro; Shiraishi, Hiromasa; Yokosawa, Hirokazu; Takehana, Shinichi; and Kobayashi, Norio, 5,438,725, Cl. 15-97.100.
- Takehara, Hiroshi, to Fuji Photo Film Co., Ltd. Method of manufacturing silver halide emulsion. 5,439,788, Cl. 430-569.000.
- Takei, Tetsuya: See—  
Okamura, Ryuuji; Otoshi, Hirokazu; and Takei, Tetsuya, 5,439,715, Cl. 427-575.000.
- Takei, Yoshio; Takahashi, Akiyoshi; Sasayama, Yuichi; and Takigawa, Masaharu, to Sumitomo Metal Industries, Ltd. Calcitonin and method for the preparation and use thereof. 5,440,012, Cl. 530-307.000.
- Takenaka, Akira: See—  
Ito, Akito; Takenaka, Akira; and Nishi, Isao, 5,439,961, Cl. 524-167.000.
- Takeshima, Kazuya: See—  
Ohmura, Takao; Sumi, Akinori; Ohtani, Wataru; Fuluhatu, Naoto; Takeshima, Kazuya; Kamide, Kaeko; Noda, Munehiro; Kondo, Masahide; Ishikawa, Syoichi; Oohara, Kazuhiro; and Yokoyama, Kazumasa, 5,440,018, Cl. 530-363.000.
- Takeshita, Fusayuki; Hirose, Taku; Terashima, Kanetsugu; and Sawada, Shinichi, to Chisso Corporation. Liquid crystal composition. 5,439,613, Cl. 252-299.630.
- Takeuchi, Koji: See—  
Yokota, Tadahiho; Sakata, Hiroyuki; Hirai, Kiyomiki; and Takeuchi, Koji, 5,439,977, Cl. 525-113.000.

- Takeuchi, Masaki; Yamamoto, Akira; Endo, Mikio; Kubota, Tohru; and Kubota, Yasufumi, to Shin-Etsu Chemical Company, Limited. Concurrent preparation of dimethylchlorosilane and triorganochlorosilane. 5,440,063, Cl. 556-469.000.
- Takeuchi, Masato; Hirota, Yoshihiko; Ohmori, Hiroshi; and Yoshimura, Masaru, to Mitsui Petrochemical Industries, Ltd. Method of manufacturing and applying heat treatment to a magnetic core. 5,439,534, Cl. 148-105.000.
- Takeuchi, Nobuo: See—  
Tsujimoto, Tadahiho; Ito, Takashi; Takeuchi, Nobuo; and Takahashi, Misao, 5,439,708, Cl. 427-294.000.
- Takeuchi, Takashi; and Kazuo, Sugiura, to Kabushiki Kaisha Shinkawa. Lead frame retaining apparatus. 5,439,159, Cl. 228-49.500.
- Takezawa, Masayuki; and Maeda, Yasuaki, to Sony Corporation. Audio and general digital data recording and/or reproducing apparatus having two interface circuits. 5,440,529, Cl. 369-13.000.
- Taki, Yoshihito: See—  
Watanabe, Katsuzo; and Taki, Yoshihito, 5,439,501, Cl. 75-313.000.
- Takigawa, Masaharu: See—  
Takei, Yoshio; Takahashi, Akiyoshi; Sasayama, Yuichi; and Takigawa, Masaharu, 5,440,012, Cl. 530-307.000.
- Takimoto, Kiyoshi: See—  
Kawada, Haruki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Nose, Hiroyasu, 5,439,777, Cl. 430-270.000.
- Takimoto, Masaaki; Yamamoto, Hisataki; and Kimura, Kohichi, to Nippon Paint Co., Ltd. Thermosetting coating composition. 5,439,957, Cl. 524-101.000.
- Takiyama, Eiichi: See—  
Hosogane, Tadayuki; Nakajima, Hiroshi; and Takiyama, Eiichi, 5,439,986, Cl. 525-423.000.
- Takiyama, Shushi; Matsumoto, Hitoshi; and Koga, Yuzuru, to Fujitsu Limited. Apparatus and method for controlling manipulation and storage of image data. 5,440,685, Cl. 395-164.000.
- Takizawa, Akira: See—  
Morozumi, Masayuki; and Takizawa, Akira, 5,439,728, Cl. 428-136.000.
- Takizawa, Yoshihisa: See—  
Kurabayashi, Yutaka; Aoki, Makoto; and Takizawa, Yoshihisa, 5,439,515, Cl. 106-20.00R.
- Taligent, Inc.: See—  
Davis, Mark E., 5,440,482, Cl. 364-419.130.
- Tallis, William: See—  
Colman, Derek A.; and Tallis, William, 5,439,991, Cl. 526-64.000.
- Tally Systems Corporation: See—  
Bowman, Philip B.; Cohen, Richard L.; Robichaud, Brett J.; and Muntz, Charles A., 5,440,738, Cl. 395-600.000.
- Tam, Isaac Y. Internal passage underwater vehicle. 5,438,947, Cl. 114-312.000.
- Tama Chemicals Co. Ltd.: See—  
Shimizu, Shumpei; Cho, Toshitsura; and Iiri, Shigeo, 5,439,564, Cl. 204-102.000.
- Tamaki, Yoshiko: See—  
Kitai, Katsuyoshi; Inagami, Yasuhiro; Tamaki, Yoshiko; and Tanaka, Yoshikazu, 5,440,750, Cl. 395-800.000.
- Tamura, Hideo; and Murakami, Keiichi, to Canon Kabushiki Kaisha. Liquid jet recording head fabrication method. 5,439,554, Cl. 216-16.000.
- Tamura, Hiroshi: See—  
Yagi, Yuji; Kagawa, Tamaki; Tamura, Hiroshi; and Ota, Tetsuya, 5,439,827, Cl. 436-66.000.
- Tamura, Yukio: See—  
Sato, Kyuichi; and Tamura, Yukio, 5,439,434, Cl. 483-1.000.
- Tamura, Yutaka: See—  
Yamada, Masato; Kawasaki, Makoto; and Tamura, Yutaka, 5,440,384, Cl. 356-237.000.
- Tan, Josef K. S.: See—  
Disch, Daniel; Chin, Christopher G.; and Tan, Josef K. S., 5,438,986, Cl. 128-633.000.
- Tanabe, Hisake; Nakano, Shingi; Nakae, Yasuhiko; Urano, Satoshi; and Eguchi, Yoshio, to Nippon Paint Co., Ltd. Heat sensitive color developing material. 5,439,516, Cl. 106-21.00R.
- Tanaka, Atsushi: See—  
Kobayashi, Katsuyuki; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; and Tokioka, Masaki, 5,438,872, Cl. 73-597.000.
- Tanaka, Hideaki: See—  
Ohba, Hiroyuki; Hirose, Kazuhiko; Tanaka, Hideaki; and Hisazumi, Nobuyuki, 5,439,745, Cl. 428-412.000.
- Tanaka, hinichi: See—  
Ito, Noboru; Tanaka, hinichi; Wada, Hidenori; Mizuno, Sadao; and Hayashi, Hideki, 5,440,536, Cl. 369-44.410.
- Tanaka, Hiroshi: See—  
Onishi, Atsuhiko; and Tanaka, Hiroshi, 5,439,251, Cl. 280-741.000.
- Tanaka, Hiroyuki; Tai, Seiji; and Kamijima, Koichi, to Hitachi Chemical Company, Ltd. Coating varnish composition and antifouling coating composition. 5,439,511, Cl. 106-18.320.
- Tanaka, Hiroyuki: See—  
Kamijima, Koichi; Tai, Seiji; and Tanaka, Hiroyuki, 5,439,512, Cl. 106-18.320.
- Tanaka, Junji: See—  
Orisaka, Yukihisa; and Tanaka, Junji, 5,440,272, Cl. 330-253.000.
- Tanaka, Koji: See—  
Takahashi, Toshio; Ikeda, Masaaki; Kuriyama, Satoshi; Tanaka, Koji; Sasamoto, Shuji; and Shibayama, Katsutoshi, 5,439,097, Cl. 198-803.010.
- Tanaka, Kouji, to Tsubakimoto Chain Co. Structure comprising shaft and outer member having improved play-preventing sleeve. 5,439,421, Cl. 474-206.000.
- Tanaka, Masaki: See—  
Kato, Yoichiro; Tanaka, Masaki; and Ito, Chikara, 5,439,243, Cl. 280-689.000.
- Tanaka, Michihiro: See—  
Ishiwata, Shoji; Kimura, Etsuji; Tanaka, Michihiro; Hanaue, Yasuhiro; Wang, Yuh; Nagahama, Shinobu; and Sawanobori, Naruhito, 5,439,616, Cl. 252-584.000.
- Tanaka, Seichi; and Fujikawa, Megumi, to Mitsubishi Denki Kabushiki Kaisha. Excitation control apparatus for synchronous machine. 5,440,222, Cl. 322-25.000.
- Tanaka, So; Inada, Hiroshi; and Iiyama, Michitomo, to Sumitomo Electric Industries, Ltd. Process for preparing Josephson junction device having weak link of artificial grain boundary. 5,439,875, Cl. 505-329.000.
- Tanaka, Yoshiharu: See—  
Nakagawa, Susumu; Asai, Akira; Kuroyanagi, Satoru; Ishihara, Makoto; and Tanaka, Yoshiharu, 5,440,049, Cl. 549-49.000.
- Tanaka, Yoshikazu: See—  
Kitai, Katsuyoshi; Inagami, Yasuhiro; Tamaki, Yoshiko; and Tanaka, Yoshikazu, 5,440,750, Cl. 395-800.000.
- Tandberg Data Storage A/S: See—  
Busengdal, Petter; and Dilling, Jan E., 5,440,435, Cl. 360-96.500.
- Tang, Cheng-Long: See—  
Lentz, Derek J.; Hagiwara, Yasuaki; Lau, Te-Li; Tang, Cheng-Long; and Nguyen, Le Trong, 5,440,752, Cl. 395-800.000.
- Taniguchi, Masami: See—  
Fujisawa, Shuji; Komaki, Susumu; Sakato, Shingo; Taniguchi, Masami; and Takeda, Hideo, 5,440,375, Cl. 355-221.000.
- Taniguchi, Michio: See—  
Yoichi, Kuroko; Kubota, Masami; Yoshiki, Hiroyuki; and Taniguchi, Michio, 5,440,206, Cl. 315-111.410.
- Taniguchi, Shunro: See—  
Kinoshita, Satoshi; Takamatsu, Hideo; Ishiura, Kazushige; Masuda, Haruhisa; and Taniguchi, Shunro, 5,439,976, Cl. 525-92.000.
- Taniguchi, Yukio: See—  
Matsuo, Makoto; Utsumi, Minoru; Iijima, Masayuki; Taniguchi, Yukio; Obata, Hiroyuki; and Take, Seiji, 5,439,768, Cl. 430-56.000.
- Tanimichi, Tatsuhiko: See—  
Kimura, Toshio; and Tanimichi, Tatsuhiko, 5,440,729, Cl. 395-182.070.
- Tanimizu, Koji; and Kadota, Toshimi, to Shimadzu Corporation. Blood coagulation analyzer. 5,439,646, Cl. 422-64.000.
- Tanimoto, Kenichi: See—  
Sugaya, Toshikazu; Hara, Mitsuo; Kikuchi, Yutaka; Tanimoto, Kenichi; Sagisaka, Tokujirou; and Oomori, Shuichi, 5,440,093, Cl. 219-121.500.
- Tanji, Hiroyuki; Wada, Ichiro; Ono, Yoshio; and Soga, Hiroyuki, to Uni-Charm Corporation. Disposable diaper having skin-contacting topsheet provided with elastic opening and method for making the elastic opening. 5,439,459, Cl. 604-385.200.
- Tansley, Robert: See—  
Salkeld, Paul; Gibbs, Andrew; and Tansley, Robert, 5,439,145, Cl. 222-189.090.
- Tapp, Charles O.: See—  
Quandt, William J.; and Tapp, Charles O., 5,439,019, Cl. 137-2.000.
- Taran, Juri N.: See—  
Snagovski, Leonid M.; Nizhnikovskaja, Polina F.; Vasilev, Emil Y.; Taran, Juri N.; and Bol'shakova, Viktoriya A., 5,439,535, Cl. 148-544.000.
- Tassi, Lamberto: See—  
Ballestrazzi, Aris; and Tassi, Lamberto, 5,439,550, Cl. 156-515.000.
- Tate & Lyle Public Limited Co.: See—  
Khan, Riaz A.; Smith, Keith; Pelter, Andrew; and Zhao, Jin, 5,440,026, Cl. 536-115.000.
- Tatemoto, Masayoshi: See—  
Yutani, Yuji; and Tatemoto, Masayoshi, 5,439,980, Cl. 525-276.000.
- Tatsumi, Satoshi, to NEC Corporation. Switched capacitor circuit having reduced capacitance units. 5,440,306, Cl. 341-150.000.
- Taufer, Peter: See—  
Weller, Hugo; Taufer, Peter; Balzer, Knut; and Burger, Wilfried, 5,440,725, Cl. 395-185.080.
- Taya, Masaaki; Kohtaki, Takaaki; Unno, Makoto; and Doujo, Tadashi, to Canon Kabushiki Kaisha. Toner for developing electrostatic image, image forming apparatus and process cartridge. 5,439,770, Cl. 430-106.000.
- Taylor, Gregory G. Apparatus and method to determine capacitance required to optimize power factor. 5,440,442, Cl. 361-93.000.
- Taylor, James W.; Collins, Martha J.; and Bassett, David R., to Union Carbide Chemical & Plastic Technology Corporation. Reactive polymers having pendant flexible side chains prepared from ethylenically unsaturated carbodiimides. 5,439,982, Cl. 525-293.000.
- Taylor Made Golf Company, Inc.: See—  
Vincent, Benoit, 5,439,219, Cl. 273-80.00B.
- Taylor, Scott D.: See—  
Benkovic, Stephen J.; Taylor, Scott D.; and Gibbs, Richard A., 5,439,812, Cl. 435-109.000.
- Taylor, Susan S.: See—  
Tsien, Roger Y.; Taylor, Susan S.; Adams, Stephen R.; and Ji, Ying, 5,439,797, Cl. 435-7.210.
- TDJ Group, Inc.: See—  
Rapp, D. J.; Clark, Redmond R.; and McGrew, Michael, 5,439,527, Cl. 134-7.000.



TDW Delaware, Inc.: See—  
Andrew, Bill D.; Duwe, William D.; and Wilson, Michael L., 5,439,331, Cl. 408-8.000.

TechnoCorp Inc.: See—  
Lippman, Glen W.; Rezny, James S.; and Coss, James F., 5,439,540, Cl. 156-71.000.

Technor AS: See—  
Melberg, Tollak, 5,440,460, Cl. 362-101.000.

TECSEC Incorporated: See—  
McCullough, Charles E.; and Follendore, Roy D., III, 5,440,290, Cl. 340-552.000.

Toegen, Walter, to Robert Bosch GmbH. Fuel injection nozzle with additive injection for diesel engines. 5,438,966, Cl. 123-297.000.

Teijin Limited: See—  
Chujo, Takao; Hamano, Hisashi; Nishiyama, Masanori; Saeiki, Yasuhiro; Ogawa, Tatsuya; and Endou, Kouhei, 5,439,738, Cl. 428-332.000.

Teijin Seiki Co., Ltd.: See—  
Nakahara, Takeichi; Hino, Hajime; Ikeuchi, Takashi; and Ogiso, Tsutomu, 5,438,820, Cl. 57-290.000.

Tektronix, Inc.: See—  
Alappat, Kuriappan P.; Ayerill, Edward E.; and Larsen, James G., 5,440,676, Cl. 395-143.000.

Martin, Paul C.; and Buzak, Thomas S., 5,440,201, Cl. 313-582.000.

Meggett, Adam E.; Brandt, Thomas J.; and Zimmerman, Stephen A., 5,440,329, Cl. 347-212.000.

Teledyne Industries, Inc.: See—  
Du, Tian T., 5,440,440, Cl. 361-18.000.

Telefonaktiebolaget LM Ericsson: See—  
Lindstrom, Anders O., 5,440,611, Cl. 379-24.000.

Telstra Corporation Limited: See—  
Follett, Douglas, 5,440,550, Cl. 370-60.000.

Temova Etablissement: See—  
Beckhuijsen, Gerrit J., 5,439,480, Cl. 607-1.000.

Tennessee Valley Authority: See—  
Boles, Jeffrey L., 5,439,497, Cl. 71-63.000.

Tenney, Linwood P.: See—  
Yi, Kong S.; Tenney, Linwood P.; Lane, Parley C., Jr.; Wessel, John V.; and Marchant, Nancy S., 5,439,992, Cl. 526-73.000.

Terada, Yasuhiro; Suzuki, Tsuneo; Matsushima, Hideyuki; Horita, Yoshiyuki; and Izumi, Hiroaki, to Yoshida Kogyo K.K. Swivel hook. 5,438,736, Cl. 24-599.800.

Terashima, Kanetsugu: See—  
Takeshita, Fusayuki; Hirose, Taku; Terashima, Kanetsugu; and Sawada, Sinichi, 5,439,613, Cl. 252-299.630.

Terhune, James H.: See—  
Karim-Panahi, Khosrow; Terhune, James H.; and Zimmerman, Paul J., 5,438,882, Cl. 73-862.324.

Terry Fox Laboratory of the British Columbia Cancer Agency, The: See—  
Richards, Adrian J.; and Lansdorp, Peter M., 5,439,586, Cl. 210-222.000.

Tessot, Nicole: See—  
Agouridas, Constantin; Chantot, Jean-Francois; and Tessot, Nicole, 5,439,890, Cl. 514-29.000.

Testa, Martina B.; and Smith, Robert P., to Radio Frequency Systems, Inc. Transistor mounting clamp assembly. 5,439,398, Cl. 439-801.000.

Tetra Laval Holdings & Finance SA: See—  
Hakansson, Jan, 5,439,094, Cl. 198-419.100.

Tetra Laval Holdings & Finance S.A.: See—  
Mock, Elmar, 5,439,124, Cl. 215-40.000.

Texaco Inc.: See—  
Shirodkar, Shailaja M.; Benfaremo, Nicholas; and Jennejohn, Rosemary J., 5,440,000, Cl. 526-307.300.

Texas Instruments Deutschland GmbH: See—  
Bayer, Erich, 5,440,274, Cl. 331-1.00A.

Texas Instruments Incorporated: See—  
Brown, Brian L.; and Brown, David R., 5,440,248, Cl. 326-71.000.

Cobb, Carleton M., III, 5,440,087, Cl. 200-61.880.

Frazier, Gary A., 5,440,670, Cl. 395-22.000.

Joyner, Keith A.; and Hollingsworth, James B., 5,440,132, Cl. 250-492.210.

Phillips, Jimmy R., 5,440,107, Cl. 235-10.000.

Texas Tech University Health Sciences Center: See—  
Feola, Mario; Simoni, Jan S.; and Canizaro, Peter C., deceased, 5,439,882, Cl. 514-6.000.

Thabit, Allen R.: See—  
Coulter, J. Scott; Gleason, Samuel J.; and Thabit, Allen R., 5,439,193, Cl. 248-206.300.

Thacker, James R.; Weinberg, Alvin H.; and Moaddeb, Shahram, to Pacesetter, Inc. Implantable lead for sensing a physiologic parameter of the body. 5,438,987, Cl. 128-634.000.

Thalhammer, Johann G.: See—  
Bukusoglu, Cuncet; Thalhammer, Johann G.; and Krieger, Neil R., 5,439,900, Cl. 514-170.000.

Thayer, Robert S.: See—  
Klerks, Thomas M.; Thayer, Robert S.; Willard, G. Fred; Dunton, Thomas P.; and Young, John H. C., 5,439,718, Cl. 428-35.700.

Then, Alan M.: See—  
Bauco, Anthony S.; and Then, Alan M., 5,440,115, Cl. 250-207.000.

Thiery, Valerie: See—  
Guillaumet, Gerald; Coudert, Gerard; Thiery, Valerie; Adam, Gerard; Bizot-Espiard, Jean-Guy; Pfeiffer, Bruno; and Renard, Pierre, 5,439,909, Cl. 514-253.000.

Thigpen, Michael. Device for dispensing bird seed to an elevated location. 5,438,956, Cl. 119-57.920.

Thiokol Corporation: See—  
Hinshaw, Jerald C.; and Blau, Reed J., 5,439,537, Cl. 149-22.000.

Thomas de la Rue & Company Limited: See—  
Chatwin, Charles E.; and Walker, Karen S., 5,438,928, Cl. 101-369.000.

Thomas J. Lipson Co., Division of Conopco, Inc.: See—  
Vernon, Geoffrey W.; Goodwin, James; Cleall, Andrew; and Bailey, Thomas W., 5,439,529, Cl. 156-176.000.

Thomas, James M. C.: See—  
Pahno, Demetrios A.; Stolpmann, James R.; Thomas, James M. C.; Ashcraft, David N.; Dalton, Roger D.; Romano, James J.; Smith, Kenneth R.; Trauernicht, Timothy R.; and Bolden, Michael V., 5,438,721, Cl. 5-604.000.

Thomas, Phillip M.: See—  
Burek, Denis E.; Jones, Marc D.; Jones, Wesley W.; and Thomas, Phillip M., 5,440,666, Cl. 385-135.000.

Thomcast AG: See—  
Mathews, Hans-Gunter; and Schminke, Wolfram, 5,440,202, Cl. 315-3.000.

Thome, Gary W.: See—  
Santeler, Paul; and Thome, Gary W., 5,440,751, Cl. 395-800.000.

Thompson, Darren M.: See—  
Asaoka, Leo K.; Chew, William M.; Thompson, Darren M.; and May, Douglas L., 5,438,824, Cl. 60-251.000.

Thompson, David L.: See—  
Wahlstrand, John D.; Thompson, David L.; and Nelson, Gary E., 5,438,990, Cl. 128-653.100.

Thompson, Herbert E.: See—  
Ifikar, Syed H.; Thompson, Herbert E.; Kay, Teong-Hoe; and Guerini, Albert J., 5,440,436, Cl. 360-99.120.

Thompson, Jack T., to Westech Geophysical, Inc. System and method of protecting optical elements from down-hole fluids. 5,440,081, Cl. 181-102.000.

Thompson, Keith F. M. Offshore petroleum exploration system. 5,439,800, Cl. 435-9.000.

Thompson, Mark A.: See—  
Ravenberg, Michael J.; Thompson, Mark A.; Green, David J.; Davis, Terry R.; Scharret, Jeffery L.; and Gans, Russell S., 5,439,246, Cl. 280-728.300.

Thompson Minwax Company, The: See—  
Lum, Dorey; and Prashant, Patel, 5,439,952, Cl. 523-410.000.

Thomsen, Glenn W.: See—  
Sisbarro, Frederick P.; and Thomsen, Glenn W., 5,438,861, Cl. 73-40.000.

Thomson Consumer Electronics: See—  
Micheron, Francois; Potier, Dominique; and Refregier, Philippe, 5,440,400, Cl. 358-335.000.

Thomson-CSF: See—  
Menard, Christian, 5,438,909, Cl. 91-361.000.

Tabourier, Remy, 5,440,314, Cl. 342-371.000.

Thomson, John: See—  
Bezama, Raschid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Frase, Katharine G.; Gabriels, David H.; Heron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillito, Robert M.; Sura, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.

Thornton, John A., deceased (by Thornton, Joy Crane, legal representative); Lommason, Timothy; and Rockett, Angus, to University of Illinois, Board of Trustees of the Hybrid method for depositing semi-conductive materials. 5,439,575, Cl. 204-192.250.

Thornton, Joy Crane, legal representative: See—  
Thornton, John A., deceased; Lommason, Timothy; and Rockett, Angus, 5,439,575, Cl. 204-192.250.

Thottathil, Paul: See—  
Sanduja, Mohan L.; Berlina, Irene; Horowitz, Carl; and Thottathil, Paul, 5,439,969, Cl. 524-534.000.

Thrush, Roger L.; and Snead, Kevin, to Whitaker Corporation, The. Socket having an auxiliary electrical component mounted thereon. 5,439,384, Cl. 439-69.000.

Thunderbird Technologies, Inc.: See—  
Vinal, Albert W., 5,440,160, Cl. 257-327.000.

Tice, Lee D., to Pittway Corporation. Detector supervision apparatus and method. 5,440,293, Cl. 340-568.000.

Tice, Richard P.: See—  
Galbraith, Donald L.; and Tice, Richard P., 5,440,091, Cl. 219-86.210.

Tichenor, Clyde L.; and Ginsburgh, Irwin. Balance shifted personal carriage. 5,439,240, Cl. 280-250.100.

Tickoo, Ashok K.: See—  
Kapil, Randhir S.; Zutshi, Usha; Bedi, Kasturi L.; Singh, Gurbax; Johri, Ramesh K.; Dhar, Santosh K.; Kaul, Jawahar L.; Sharma, Subhash C.; Pahwa, Gurcharan S.; Kapoor, Naveen; Tickoo, Ashok K.; Tickoo, Manoj K.; Kaul, Uma; Singh, Surjeet; Zutshi, Ram K.; and Singh, Rajinder, 5,439,891, Cl. 514-31.000.

Tickoo, Manoj K.: See—  
Kapil, Randhir S.; Zutshi, Usha; Bedi, Kasturi L.; Singh, Gurbax; Johri, Ramesh K.; Dhar, Santosh K.; Kaul, Jawahar L.; Sharma, Subhash C.; Pahwa, Gurcharan S.; Kapoor, Naveen; Tickoo, Ashok K.; Tickoo, Manoj K.; Kaul, Uma; Singh, Surjeet; Zutshi, Ram K.; and Singh, Rajinder, 5,439,891, Cl. 514-31.000.

Time Warner Interactive Group Inc.: See—  
Case, Michael B.; La Joie, Michael L.; Klappert, Walter R.; and Bumgardner, James A., 5,440,677, Cl. 395-154.000.

Timken Company, The: See—  
Samy, Ram P.; Varonis, Orestes J.; and French, Michael L., 5,440,184, Cl. 310-90.000.

Timm, Ronald E. Method for evaluating security of protected facilities. 5,440,498, Cl. 364-516.000.

Timms, David: See—  
Fittion, John E.; and Timms, David, 5,439,815, Cl. 435-199.000.

Ting, David M. T., to Athena Design Systems, Inc. Method and apparatus for preparing color separations based on n-way color relationships. 5,440,652, Cl. 382-165.000.

Ting, Yee-Ming: See—  
Bezama, Raschid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Frase, Katharine G.; Gabriels, David H.; Heron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillito, Robert M.; Sura, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.

TIR Technologies, Inc.: See—  
Gleckman, Philip L., 5,440,197, Cl. 313-110.000.

Tiret, Etienne: See—  
Vuillamy, Didier; Tiret, Etienne; and Beurain, Andre, 5,438,834, Cl. 60-753.000.

Tirri, Bruce, to Hughes Aircraft Company. Optical fiber polarimeter. 5,440,390, Cl. 356-364.000.

Tisch, Brett L.: See—  
Layton, Ken S.; Suttle, Mark L.; and Tisch, Brett L., 5,439,027, Cl. 137-513.500.

Toh, Takehiko: See—  
Miyazawa, Kenichi; Toh, Takehiko; Mizoguchi, Toshiaki; and Ueshima, Yoshiyuki, 5,439,046, Cl. 164-467.000.

Tohyama, Junichi: See—  
Yamashita, Nobuhiko; Tohyama, Junichi; Kataoka, Chiwa; and Miura, Kazunobu, 5,439,811, Cl. 435-91.530.

Toita, Koichi: See—  
Momodomi, Masaki; Toita, Koichi; Itoh, Yasuo; Yoshihisa; Masuoka, Fujio; Chiba, Masahiko; Endo, Tetsuo; Shiota, Rii-chiro; and Kirisawa, Ryouhei, 5,440,509, Cl. 365-185.000.

Tokai Co., Ltd.: See—  
Nakamura, Yoshizo, 5,438,766, Cl. 34-602.000.

Tokioka, Masaki: See—  
Kobayashi, Katsuyuki; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; and Tokioka, Masaki, 5,438,872, Cl. 73-597.000.

Toko, Inc.: See—  
Ishii, Masanori; and Arakawa, Koji, 5,440,473, Cl. 363-21.000.

Toko Kabushiki Kaisha: See—  
Kojima, Hideki, 5,440,225, Cl. 323-359.000.

Tokoro, Tohru: See—  
Horikoshi, Toshio; Hiraoaka, Junichiro; Fujita, Isamu; Tokoro, Tohru; Kodama, Yoshikatsu; and Yokoyama, Hideaki, 5,439,680, Cl. 424-157.100.

Tokuyama Corporation: See—  
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Tokyo Electron Kabushiki Kaisha: See—  
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Tokyo Electron Limited: See—  
Moriya, Shuji; Matsuo, Takenobu; and Wakabayashi, Tsuyoshi, 5,439,026, Cl. 137-486.000.

Yoichi, Kurono; Kubota, Masami; Yoshiki, Hiroyuki; and Taniguchi, Michio, 5,440,206, Cl. 315-111.410.

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Yoichi, Kurono; Kubota, Masami; Yoshiki, Hiroyuki; and Taniguchi, Michio, 5,440,206, Cl. 315-111.410.

Tokyo Kikai Seisakusho, Ltd.: See—  
Ohmi, Takashi; and Baba, Takayuki, 5,438,925, Cl. 101-212.000.

Tokyo Ohka Kogyo Co., Ltd.: See—  
Sago, Hiroyoshi; Kumazawa, Hirotosugu; Shimai, Futoshi; Fujiyama, Shigemi; Endo, Hiroki; and Kobari, Hideya, 5,439,519, Cl. 118-52.000.

Tokyo Yogyo Kabushiki Kaisha: See—  
Koide, Kunihiko; and Yajima, Tamotsu, 5,439,579, Cl. 204-422.000.

Toles, Richard O.: See—  
Haggerty, Kevin C.; Fox, David L.; Fox, John L.; and Toles, Richard O., 5,439,328, Cl. 408-1.00R.

Toma, Augustin: See—  
Fum, Fritz H.; and Toma, Augustin, 5,439,262, Cl. 292-341.160.

Tomimura, Yukio: See—  
Okuwaki, Shigeru; and Tomimura, Yukio, 5,439,423, Cl. 474-245.000.

Tomita, Kan, to Ricoh Company, Ltd. Image data processing apparatus having a digital copying function and a facsimile function and including means for distinguishing a facsimile reception sheet from a copy sheet. 5,440,408, Cl. 358-468.000.

Tomita, Seisuke: See—  
Egashira, Yoshinori; and Tomita, Seisuke, 5,439,227, Cl. 273-228.000.

Tomita, Yoshihiro; and Abe, Shunichi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device with flow prevention dimples. 5,440,169, Cl. 257-667.000.

Tomono, Kunisaburo: See—  
Iwamoto, Sakiko; Sano, Harunobu; Hamaji, Yukio; and Tomono, Kunisaburo, 5,439,857, Cl. 501-136.000.

Tomoeda, Kenji; Ando, Fumitaka; Kondo, Tohiro; and Imada, Takao, to Mazda Motor Corporation. Suspension apparatus for an automotive vehicle. 5,439,244, Cl. 280-691.000.

Tone Trainer, Inc.: See—  
Ganger, David E., Sr., 5,439,216, Cl. 273-75.000.

Ganger, David E., Sr., 5,439,217, Cl. 273-75.000.

Tonsor, Andrew J., to Caterpillar Inc. Hydraulic rotary actuator. 5,438,912, Cl. 92-54.000.

Toptech Ltd.: See—  
Eliachar, Eliahu; and Mizrahi, Eliahu, 5,438,793, Cl. 47-1.010.

Toray Industries, Inc.: See—  
Kawakami, Kenichi; Tsuchiya, Katsuhiko; and Maruhashi, Hideo, 5,439,729, Cl. 428-141.000.

Torek, Kevin: See—  
Grant, Robert W.; Ruzyllo, Jerzy; and Torek, Kevin, 5,439,553, Cl. 216-58.000.

Torihata, Minoru: See—  
Yamazaki, Nobuo; Torihata, Minoru; and Maki, Shinji, 5,439,341, Cl. 414-676.000.

Torii, Takeaki; Suzuki, Katsunori; Sonoda, Tetsuo; and Kojima, Kouichi, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing electrode foil for aluminium electrolytic capacitors. 5,439,565, Cl. 204-129.100.

Torrey, Jonathan G.; and Salibello, Cosmo, to Prio Corporation. Reflective stimulus for computer screen simulation for eye examinations. 5,440,360, Cl. 351-239.000.

Torrey Pines Institute for Molecular Studies: See—  
Blondelle, Sylvie E.; and Houghten, Richard A., 5,440,016, Cl. 530-330.000.

Toth, Gerard S.: See—  
Meckstroth, Richard J.; and Toth, Gerard S., 5,439,420, Cl. 474-133.000.

Toto Ltd.: See—  
Higuchi, Mitsuhiro; Mizoguchi, Shigeru; Yamashita, Naoki; and Adachi, Takayoshi, 5,438,711, Cl. 4-243.300.

Townsend, Wesley P.: See—  
Hammerle, William H.; MacDonald, William M.; Nijander, Casimir R.; Stimulovich, Joseph; Townsend, Wesley P.; and Wong, Yiu-Huen, 5,439,782, Cl. 430-321.000.

Toyo Kasei Kogyo Company Limited: See—  
Onishi, Atsuhiko; and Tanaka, Hiroshi, 5,439,251, Cl. 280-741.000.

Toyoda Gosei Co., Ltd.: See—  
Hadano, Katsuya, 5,439,203, Cl. 267-140.120.

Toyoda Koki Kabushiki Kaisha: See—  
Haga, Kyosuke; Suzuki, Mikio; Inaguma, Yoshiharu; Fukumura, Kenichi; Kato, Hideya; and Mori, Katsuhisa, 5,439,070, Cl. 180-141.000.

Toyokawa, Tetsuo: See—  
Miyata, Shin'ichi; Toyokawa, Tetsuo; Sakai, Koichi; and Hisaki, Hiroshi, 5,439,443, Cl. 604-96.000.

Toyono, Tautomu: See—  
Mouri, Akihiro; Toyono, Tautomu; Kaneko, Shuzo; Inaba, Yutaka; and Kanbe, Junichiro, 5,440,412, Cl. 359-56.000.

Toyota, Akinori: See—  
Yamamoto, Sanehiro; Kimura, Toshio; Nakagawa, Takasi; and Toyota, Akinori, 5,439,973, Cl. 525-66.000.

Toyota Jidosha Kabushiki Kaisha: See—  
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Mori, Kazuhiko; Shimoda, Kenji; and Harada, Hiroshi, 5,439,714, Cl. 427-446.000.

Okuwaki, Shigeru; and Tomimura, Yukio, 5,439,423, Cl. 474-245.000.

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Whitman, Timothy W., 5,439,589, Cl. 210-436.000.

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Trapasso, Michael A. Turbine water atomizer. 5,439,618, Cl. 261-25.000.

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Treadwell, Peter J.: See—  
Mitchell, Paul; and Treadwell, Peter J., 5,440,500, Cl. 364-559.000.



Treppendahl, Jamie R.: See—  
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Trigon Industries Limited: See—  
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Price, Robert E.; and Trutsch, James R., 5,439,273, Cl. 299-37.000.

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Oxley, Gerald K.; Renick, Chester D.; and Venable, Frederick D., 5,439,252, Cl. 280-775.000.

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Lin, Chin-Lung; Yeh, Ming-Shia; Tsao, Chin-Sheng; and Shue, Pey-Hong, 5,440,713, Cl. 395-485.000.

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Tsuchiya, Yoshimi; Nomoto, Takashi; Hayashi, Masahiro; Iwasawa, Yoshiaki; Masaki, Hiroshi; Ohkubo, Mitsuru; Sakuma, Yumiko; Nagata, Yasufumi; Satoh, Toshihiko; and Kamei, Toshio, to Banyu Pharmaceutical Co., Ltd. Substituted amine derivatives having anti-hyperlipemia activity. 5,439,932, Cl. 514-444.000.

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Hayashi, Yokichi; Tsukahara, Hiroshi; Ochiai, Katsumi; Yamada, Masahiro; and Watanabe, Naoyoshi, 5,440,260, Cl. 327-278.000.

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Tsukumo, Zenzaburo; and Tsukumo, Shinsuke, 5,439,185, Cl. 242-130.200.

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Tu, Dinh D.: See—  
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Wu, Chu-ise; Tu, Qiang; He, Fu-chu; and Larrick, James W., 5,440,022, Cl. 530-399.000.

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Tucker, Rodney S., to University of Melbourne. The. Semiconductor laser. 5,440,577, Cl. 372-50.000.

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Curtis, Gary L.; Johnson, Gregory A.; and Tuebo, Paula M., 5,439,335, Cl. 409-259.000.

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Spink, Donald R.; and Nguyen, Kim D., 5,439,509, Cl. 95-166.000.

Turner, Robert L.: See—  
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Twist, Peter J.: See—  
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Tyrm, Jouko; and Haverinen, Timo, to Valmet Paper Machinery Inc. Method and apparatus for eliminating the flutter of a paper web in the dryer section of a papermaking machine between two single felt configurations therein. 5,438,765, Cl. 34-456.000.

U C B S.A.: See—  
Moens, Luc; Maetens, Daniel; Loutz, Jean-Marie; and Baudour, Michel, 5,439,988, Cl. 525-437.000.

U S West Advanced Technologies, Inc.: See—  
Beveridge, Gregory J., 5,440,335, Cl. 348-13.000.

Ube Industries, Ltd.: See—  
Hirose, Kazuhiko; Kurokawa, Yasuhiro; Yamamoto, Tomohiko; Matsunishi, Masaru; and Nawata, Yoshihiro, 5,440,032, Cl. 540-540.000.

Uchida, Masami: See—  
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Uchida, Toyooki: See—  
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Uchinuma, Masako, to NEC Corporation. File-allocation control system for allocating files according to user-program priority and storage volume performance. 5,440,737, Cl. 395-600.000.

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Udovich, Carl A.: See—  
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Ueda, Shinta: See—  
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Utrabab Inc.: See—  
Johnson, Larry E., 5,438,802, Cl. 49-489.100.

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Umezawa, Yoichi: See—  
Andou, Hirokazu; Kishimoto, Mitsuru; Ishimizu, Hideaki; Umezawa, Yoichi; and Asaka, Toshiyuki, 5,439,302, Cl. 400-124.070.

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De Subijana, Joseba M.; and Michaelson, Wayne A., 5,440,604, Cl. 377-28.000.

United Microelectronics Corporation: See—  
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United Parcel Service of America, Inc.: See—  
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U.S. Dent Master, Inc.: See—  
Galbraith, Donald L.; and Tice, Richard P., 5,440,091, Cl. 219-86.210.

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Papcun, George J., 5,440,661, Cl. 395-2.410.

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Reda, Daniel C., 5,438,879, Cl. 73-800.000.

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Dombrowski, James H.; Cowen, Steven J.; and Kerr, William A., III, 5,440,660, Cl. 385-102.000.

Kersey, Alan D.; and Marrone, Michael J., 5,440,414, Cl. 359-122.000.

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Moody, Paul E., 5,438,945, Cl. 114-238.000.

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U.S. Philips Corporation: See—  
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Den Braber, Gerard P., 5,440,586, Cl. 375-327.000.

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Riegel, Maximilian; Ramsteck, Charlotte; and Haber, Hans-Joachim, 5,440,618, Cl. 379-95.000.

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U.S. West Communications, Inc.: See—  
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- Keiner, Michael J.; McMorris, Trevor C.; and Taetle, Raymond, 5,439,942, Cl. 514-691.000.
- Littman, Dan; and Xu, Hua, 5,439,819, Cl. 435-240.200.
- Tien, Roger Y.; Taylor, Susan S.; Adams, Stephen R.; and Ji, Ying, 5,439,797, Cl. 435-7.210.
- University of Chicago: See—  
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- University of Colorado, The Regents of the: See—  
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- University of Connecticut: See—  
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- University of Florida, The: See—  
Butler, Jerry F.; Warren, Craig B.; Marin, Anna B.; Mookherjee, Braja D.; and Wilson, Richard A., 5,439,941, Cl. 514-690.000.
- University of Florida Research Foundation: See—  
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- University of Hawaii: See—  
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- University of Houston-University Park: See—  
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- University of Illinois, The Board of Trustees of the: See—  
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- Kahn, Michael, 5,440,013, Cl. 530-317.000.
- Thornton, John A., deceased; Lonnemann, Timothy; and Rockett, Angus, 5,439,575, Cl. 204-192.250.
- University of Maryland: See—  
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- University of Massachusetts at Lowell: See—  
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- University of Massachusetts Lowell: See—  
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- Gross, Richard A.; Kennitzer, John E.; and McCarthy, Stephen P., 5,440,007, Cl. 528-354.000.
- University of Melbourne, The: See—  
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- University of Michigan, The Regents of the: See—  
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- University of Minnesota, Regents of the: See—  
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- University of Montana: See—  
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- University of New Mexico: See—  
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- University of Pennsylvania, Trustees of the: See—  
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- Unno, Makoto: See—  
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- Unoki, Masao: See—  
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- Rosin, Richard R.; and Bradley, Steven A., 5,439,864, Cl. 502-180.000.
- Uozumi, Tadashi, to Murata Kikai Kabushiki Kaisha. Braid structure body, 5,438,904, Cl. 87-1.000.
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- Utsumi, Minoru: See—  
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- Utsunomiya, Michito: See—  
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- Uy, Rosa: See—  
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- Vale, Wylie W., Jr.: See—  
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- Vander Sande, John B.: See—  
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- VanderSpek, Adrian T.; Bennett, Edward A.; Richmond, Dana M.; Ramos, Christopher A.; and Aurelio, Joseph V., to Banyan Systems, Inc. System bus monitor for compiling data regarding use of a system bus, 5,440,722, Cl. 395-183.190.
- van Emmerik, David L.: See—  
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- Vanlerberghe, Guy G.: See—  
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- van Roostelaar, Jan; to Eerste Nederlandse Fabriek van Weegwerktuigen Jan Molenschot BV. Weight-checking apparatus, 5,440,076, Cl. 177-50.000.
- VanSmith, Peter: See—  
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- Van Veen, Mark: See—  
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- Varga, Laszlo; Sztanyik, Laszlo B.; Kanyar, Bela; Kiraly, Odon; Brucher, Erno; Emri, Jozsef; Gyori, Bela; and Kovacs, Zoltan, to Orszagos "Frederic Joliot-Curie" Sugar-biológiai és Sugaregészegységi Kutató Intézet; and Kossuth Lajos Tudományegyetem, 1,4,10,13-tetraoxa-7,16-diazacyclooctadecane derivatives, pharmaceutical compositions containing them and their use for the removal of toxic metal ions and radioactive isotopes from living organism, 5,440,031, Cl. 540-465.000.
- Varonis, Orestes J.: See—  
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- Vasilev, Emil Y.: See—  
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- Vaughn, William J., to Midas Rex Pneumatic Tools, Inc. Surgical instrument with telescoping sleeve, 5,439,005, Cl. 128-755.000.
- Venable, Frederick D.: See—  
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- Mar, Craig E.; Pless, Benjamin D.; and Bush, M. Elizabeth, 5,439,485, Cl. 607-119.000.
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- Ventrone, Sebastian T.: See—  
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- Verbo, Ulysse: See—  
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- Verifone, Inc.: See—  
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- Vermeulen, C. P. M.: See—  
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- Vernon, Geoffrey W.; Goodwin, James; Cleall, Andrew; and Bailey, Thomas W., to Thomas J. Lipson Co., Division of Conopco, Inc. Heat sealing of thread to a web, 5,439,529, Cl. 156-176.000.
- Vesica Medical, Inc.: See—  
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- Vevent, Jean-Paul: See—  
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- Vianco, Paul T.; and Rejent, Jerome A., to Sandia Corporation. Tin-lead-bismuth solders for electronics assembly, 5,439,639, Cl. 420-562.000.
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- Vijayaraghavan, Srinivasan: See—  
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- Vila Boluda, J. Manual, to Bendix Espana S.A. Device for a guiding sliding caliper for a disk-brake, 5,439,084, Cl. 188-73.440.
- Villacorta, Gilberto M.; Ahn, Kwang-Hyun; and Lippard, Stephen J., to Massachusetts Institute of Technology. Enantioselective addition of hydrocarbons to alpha,beta-unsaturated carbonyl compounds, 5,440,062, Cl. 556-33.000.
- Villamarin, Arturo A., to Dial Corp., The. Compositions and methods for treating hair using a mixture of polysiloxanes, 5,439,677, Cl. 424-70.120.
- Villeneuve, Pierre R.: See—  
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- Vinal, Albert W., to Thunderbird Technologies, Inc. High saturation current, low leakage current fermi threshold field effect transistor, 5,440,160, Cl. 257-327.000.
- Vincent, Benoit, to Taylor Made Golf Company, Inc. Golf club shaft with optimized distribution of flexibility, 5,439,219, Cl. 273-80.00B.
- Viola, Frank J., to United States Surgical Corporation. Cartridge for surgical fastener applying apparatus, 5,439,155, Cl. 227-176.000.
- Virbac, Inc.: See—  
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- Virving, Nils G., to Sunds Defibrator Industries Aktiebolag. Refiner segment, 5,439,183, Cl. 241-296.000.
- Visel, Friedrich: See—  
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- Viskase Corporation: See—  
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- VivoRx Pharmaceuticals, Inc.: See—  
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- Vladic, Daniel P.: See—  
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- VLSI Technology, Inc.: See—  
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- Voeat-Alpine Industrieanlagenbau GmbH: See—  
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- Vogt, Bettina; Patzschke, Hans-Peter; Lenhard, Werner; and Saetweber, Dietrich, to Herberts G.m.b.H. Method of producing multi-layer coatings, more particularly for lacquering of motor vehicles, having good adhesion between layers, 5,439,710, Cl. 427-407.100.
- Voigt, Peter: See—  
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- Voith Sulzer Papiermaschinen GmbH: See—  
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- Volk, Donald A. Illuminated lens case, 5,440,458, Cl. 362-84.000.
- Volkman, Jeffrey R., to Brown Printing Company. Printed document assembly apparatus including remotely controlled printing device, 5,439,340, Cl. 412-11.000.
- Volkswagen A.G.: See—  
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- Vollrath, Wolfgang, to Leica Mikroskopie und Systeme GmbH. Method for manufacturing ultraviolet microscope dry objectives and microscope objectives manufactured in accordance with this method, 5,440,422, Cl. 359-355.000.
- Voltek, Inc.: See—  
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- Volz, Richard F., Jr.: See—  
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- Von Hagen, Horst: See—  
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- Vos, Thomas H.: See—  
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- Vuillamy, Didier; Tires, Etienne; and Beurnin, Andre, to Societe Europeenne de Propulsion. Close combustion gas generator, 5,438,834, Cl. 60-753.000.
- W. P. T. Power Transmission Corporation: See—  
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- W. R. Grace & Co.-Conn.: See—  
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- Waarts, Robert G.: See—  
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- Wada, Hiroshi: See—  
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- Wada, Ichiro: See—  
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- WADA Metal of America Corp.: See—  
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- Wade, James A., to A. F. Green Industries, Inc. Method for insulating walls of furnace, 5,438,813, Cl. 52-747.130.
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- Wakami, Noboru: See—  
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- Waldner, Karen D.: See—  
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- Zelazny, Joseph S., 5,438,885, Cl. 73-864.710.
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Grinna, Lynn S., 5,439,807, Cl. 435-69.100.
- Xu, Hua: See—  
Littman, Dan; and Xu, Hua, 5,439,819, Cl. 435-240.200.
- Yabusaki, DeeAnn I.: See—  
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- Yacoub, Reza: See—  
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- Yaffe, Henry H.: See—  
Cohen, Leonard G.; Henry, Charles H.; Kazarinov, Rudolf F.; and Yaffe, Henry H., 5,440,416, Cl. 359-127.000.
- Yagi, Sakai: See—  
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- Yajima, Tamotsu: See—  
Koide, Kunihiko; and Yajima, Tamotsu, 5,439,579, Cl. 204-422.000.
- Yaku, Toru: See—  
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- Yamada, Masahiko; Onuki, Wataru; Okahara, Hirofumi; and Mochizuki, Nobuaki, to Nissan Motor Co., Ltd.; and Aichi Machine Industry Co., Ltd. Pulley device for continuously variable transmission. 5,439,419, Cl. 474-18.000.
- Yamada, Masato; Kawasaki, Makoto; and Tamura, Yutaka, to Shin-Etsu Handotai Kabushiki Kaisha. Methods of inspecting wafers for manufacturing light emitting elements. 5,440,384, Cl. 356-237.000.

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- Yamada, Shigeo: See—  
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- Yamada, Takahiro: See—  
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- Yamada, Yukio: See—  
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- Yamaguchi, Akira, to MEMC Electronic Materials, Inc. Device for suppressing particle splash onto a semiconductor wafer. 5,439,523, Cl. 118-503.000.
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- Yamaguchi, Hisashi: See—  
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- Yamaguchi, Takuro; Wada, Yoshinori; and Armstrong, Mark A., to Foster Electric Co., Ltd.; and Mitel Corporation. Telephone receiver with electrostatic discharge prevention. 5,440,630, Cl. 379-437.000.
- Yamaguchi, Yasuo: See—  
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- Yamaha Corporation: See—  
Okamoto, Tetsuo; and Katada, Naota, 5,440,070, Cl. 84-600.000.
- Suzuki, Yasutake; and Fujimori, Junichi, 5,440,639, Cl. 381-17.000.
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- Mori, Kazuaki, 5,438,754, Cl. 29-888.430.
- Yamaichi Metal Co., Ltd.: See—  
Watanabe, Kazuo; and Taki, Yoshihito, 5,439,501, Cl. 75-313.000.
- Yamaichi System Produce Co. Ltd.: See—  
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- Yamaki, Kazunori: See—  
Sekine, Shigeru; Yamaki, Kazunori; and Nishigaki, Nobutaka, 5,440,748, Cl. 395-750.000.
- Yamamoto, Akira: See—  
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- Yamamoto, Kohichi: See—  
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- Yamamoto, Makoto: See—  
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- Yamamoto, Masahiro: See—  
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- Yamamoto, Tetsuya: See—  
Ito, Kiichi; Tsunoi, Shinji; and Yamamoto, Tetsuya, 5,439,993, Cl. 526-93.000.
- Yamamoto, Tomohiko: See—  
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- Yamamoto, Yasushi: See—  
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- Yamanashi, Makoto; Jinno, Keishi; Watanabe, Tamio; Endo, Takayoshi; and Yagi, Sakai, to Yazaki Corporation. Connector. 5,439,397, Cl. 439-752.000.
- Yamane, Masayuki: See—  
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- Yamane, Yukio: See—  
Ono, Kazuya; and Yamane, Yukio, 5,440,397, Cl. 356-401.000.
- Yamanouchi, Junichi; Hooyu, Yoichi; and Urabe, Shigeharu, to Fuji Photo Film Co. Ltd. Silver halide photographic emulsion and photographic material containing the same. 5,439,787, Cl. 430-567.000.
- Yamaoka, Fumiaki; and Sasaki, Mitsuo, to Unisia Jecs Corporation. System for controlling damping force characteristic of shock absorber of vehicle. 5,440,488, Cl. 364-424.050.
- Yamaoka, Yukio; and Noma, Tetsuro, to Shinko Kosen Kogyo Kabushiki Kaisha. Steel wire coated with Fe-Zn-Al alloys and method for producing the same. 5,439,713, Cl. 427-433.000.
- Yamashita, Hiroshi; and Yasuzato, Tadao, to NEC Corporation. Phase shift mask and its inspection method. 5,439,767, Cl. 430-30.000.
- Yamashita, Muneharu; Tabata, Jun; Mizuno, Toshihiro; and Inoue, Jiro, to Murata Manufacturing Co. Ltd. Acceleration sensor having fault diagnosing device. 5,438,859, Cl. 73-1.00D.
- Yamashita, Naoki: See—  
Higuchi, Mitsuhiro; Mizoguchi, Shigeru; Yamashita, Naoki; and Adachi, Takayoshi, 5,438,711, Cl. 4-243.300.
- Yamashita, Nobuhiko; Tohyama, Junichi; Kataoka, Chiwa; and Miura, Kazunobu, to Osaka Gas Company Limited. Method for preparing aminoacyl- and misaminoacyl-tRNA. 5,439,811, Cl. 435-91.530.
- Yamashita, Seiji: See—  
Sanada, Yotaro; Ishimatsu, Noriaki; Watanabe, Makoto; and Yamashita, Seiji, 5,440,437, Cl. 360-104.000.
- Yamauchi, Mineo: See—  
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 5,439,872, Cl. 503-227.000.
- Yamazaki, Kazuo; Adegawa, Shigeru; Ogawa, Yoichi; Matsuda, Hideaki; and Kuriishi, Tadayuki, to SS Pharmaceutical Co., Ltd. 1,4-benzoxazine derivatives. 5,440,036, Cl. 544-105.000.
- Yamazaki, Masao; and Kitamura, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Display monitor including moire cancellation circuit. 5,440,353, Cl. 348-806.000.
- Yamazaki, Nobuo; Torihata, Minoru; and Maki, Shinji, to Kabushiki Kaisha Shinkawa. Non-contact type moving table. 5,439,341, Cl. 414-676.000.
- Yamazaki, Tetsuya; and Takahashi, Kousuke, to NEC Corporation. Token train retrieval device for simultaneously determining nest level and checking condition of retrieval based on the determining nest level. 5,440,733, Cl. 395-600.000.
- Yamazaki, Toru, to NEC Corporation. Heterojunction bipolar transistor having particular Ge distributions and gradients. 5,440,152, Cl. 257-197.000.
- Yamazaki, Yoshio: See—  
Sugano, Masashi; Yamazaki, Yoshio; Ikeda, Masaaki; and Izawa, Tadashi, 5,440,409, Cl. 358-501.000.
- Yamazoe, Hisamitsu; Kohama, Tokio; Mizutani, Shuji; and Agui, Toshiaki, to Nippondenso Co., Ltd. Vibration isolator. 5,439,204, Cl. 267-140.140.
- Yan, Guo: See—  
Makriyannis, Alexandros; Yan, Guo; and Abadji, Vasiliki, 5,440,052, Cl. 549-390.000.
- Yan, Junqi: See—  
Tran, Dich C.; Liu, Yiu T.; Lui, Stanley Y. W.; Kwong, Joseph Y.; and Yan, Junqi, 5,440,108, Cl. 235-381.000.
- Yanagawa, Hisaharu: See—  
Ueki, Ken; Shimizu, Takeo; and Yanagawa, Hisaharu, 5,440,656, Cl. 385-30.000.
- Yanagisawa, Masahiro: See—  
Haneda, Ichiro; Sakurai, Tatsuyoshi; Yanagisawa, Masahiro; Okuyama, Kohei; Niwa, Kazuo; and Fukagawa, Toshihiro, 5,439,080, Cl. 188-218.0XL.
- Yang, Chiung-hsiang. Multipurpose electric dryer. 5,438,763, Cl. 34-90.000.
- Yang, Ming-Tzong, to United Microelectronics Corporation. Method of thinning for EEPROM tunneling oxide device. 5,439,838, Cl. 437-43.000.
- Yang, Weikang: See—  
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- Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,440,605, Cl. 377-47.000.
- Yariv, Amnon: See—  
Rakuljic, George A.; and Yariv, Amnon, 5,440,669, Cl. 359-7.000.
- Yasutake, Masatoshi; and Nakamura, Nobutaka, to Seiko Instruments Inc. Scanning probe microscope. 5,440,121, Cl. 250-306.000.
- Yasutake, Masatoshi, to Seiko Instruments Inc. Surface analyzing and processing apparatus. 5,440,122, Cl. 250-443.100.
- Yasuzato, Tadao: See—  
Yamashita, Hiroshi; and Yasuzato, Tadao, 5,439,767, Cl. 430-30.000.
- Yates, Clinton R., to Production Control Units, Inc. Tube coupling unit. 5,439,258, Cl. 285-313.000.
- Yazaki Corporation: See—  
Lippert, Samuel A.; and Hill, Mark G., 5,439,759, Cl. 429-65.000.
- Sakai, Hitoshi; and Koyama, Katsumi, 5,439,385, Cl. 439-79.000.
- Yamanashi, Makoto; Jinno, Keishi; Watanabe, Tamio; Endo, Takayoshi; and Yagi, Sakai, 5,439,397, Cl. 439-752.000.
- Yee, Abraham: See—  
Carmichael, Tim; Padmanabhan, Gobi; Yee, Abraham; and Yeh, Stanley, 5,440,154, Cl. 257-206.000.
- Yee, Dan: See—  
Chaback, Joseph J.; Yee, Dan; Volz, Richard F., Jr.; Seidle, John P.; and Puri, Rajen, 5,439,054, Cl. 166-252.000.
- Yee, Ying K.: See—  
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying K., 5,440,035, Cl. 544-51.000.
- Yeh, Ming-Shia: See—  
Lin, Chin-Lung; Yeh, Ming-Shia; Tsao, Chin-Sheng; and Shiue, Pey-Hong, 5,440,713, Cl. 395-485.000.



- Yeh, Stanley: See—  
Carmichael, Tim; Padmanabhan, Gobi; Yee, Abraham; and Yeh, Stanley, 5,440,154, Cl. 257-206.000.
- Yen, Gai V.: See—  
Bezama, Raschid J.; Casey, Jon A.; Ecker, Mario E.; Farooq, Shaji; Frantz, Irene S.; Frase, Katharine G.; Gabriela, David H.; Herron, Lester W.; Knickerbocker, John U.; Knickerbocker, Sara H.; Natarajan, Govindarajan; Thomson, John; Ting, Yee-Ming; Tracy, Sharon L.; Troncillo, Robert M.; Sura, Vivek M.; Wall, Donald R.; and Yen, Gai V., 5,439,636, Cl. 419-3.000.
- Yeung, Clinton M.: See—  
Klein, Larry L.; Yeung, Clinton M.; and Li, Leping, 5,440,056, Cl. 549-510.000.
- Yi, Kong S.; Tenney, Linwood P.; Lane, Parley C., Jr.; Wessel, John V.; and Marchant, Nancy S., to B. F. Goodrich Company, The. Continuous process for making melt-processable optical grade ring-opened polycyclic (co)polymers in a single-stage multi-zoned reactor, 5,439,992, Cl. 526-73.000.
- Yoichi, Karono; Kubota, Masami; Yoshiki, Hiroyuki; and Taniguchi, Michio, to Tokyo Electron Ltd.; and Tokyo Electron Yamanashi and Daihen Corporation. Plasma processing apparatus comprising means for generating rotating magnetic field, 5,440,206, Cl. 315-111.410.
- Yokogawa, Fumihiko; and Hayashi, Hideki, to Pioneer Electronic Corporation. Digital signal reproducing apparatus for reproducing digital signals from a recording medium, 5,440,532, Cl. 369-32.000.
- Yokomura, Ryouji, to NEC Corporation. Frequency stabilizing circuit for a  $\pi/4$  shift QPSK signal receivers, 5,440,239, Cl. 327-160.000.
- Yokosawa, Hirokazu: See—  
Okada, Kinjiro; Shiraihi, Hiromasa; Yokosawa, Hirokazu; Takehana, Shinichi; and Kobayashi, Norio, 5,438,725, Cl. 15-97.100.
- Yokoshima & Company: See—  
Kamiyama, Takao; Yokoshima, Yasuhiro; and Endoh, Shigeru, 5,439,033, Cl. 138-98.000.
- Yokoshima, Yasuhiro: See—  
Kamiyama, Takao; Yokoshima, Yasuhiro; and Endoh, Shigeru, 5,439,033, Cl. 138-98.000.
- Yokota, Haruo; Kitakami, Hajime; Noguchi, Yasuo; and Akaboshi, Naoki, to Fujitsu Limited. Deadlock detecting system, 5,440,743, Cl. 195-450.000.
- Yokota, Tadahiko; Sakata, Hiroyuki; Hirai, Kiyomiki; and Takeuchi, Koji, to Ajinomoto Co., Inc. Acid anhydride-containing one package of epoxy resin composition, 5,439,977, Cl. 525-113.000.
- Yokoyama, Hideaki: See—  
Horikoshi, Toshio; Hiraoka, Junichiro; Fujita, Isamu; Tokoro, Tohru; Kodama, Yoshikatsu; and Yokoyama, Hideaki, 5,439,680, Cl. 424-157.100.
- Yokoyama, Kazumasa: See—  
Ohmura, Takao; Sumi, Akinori; Ohtani, Wataru; Fuhata, Naoto; Takehima, Kazuya; Kamide, Kaeko; Noda, Munehiro; Kondo, Masahide; Ishikawa, Syoichi; Oohara, Kazuhiro; and Yokoyama, Kazumasa, 5,440,018, Cl. 530-363.000.
- Yokoyama, Yoshio: See—  
Hieda, Takashi; and Yokoyama, Yoshio, 5,440,650, Cl. 382-112.000.
- Yoneda, Yoshiyuki: See—  
Tsuji, Kazuto; Yoneda, Yoshiyuki; and Kasei, Junichi, 5,440,170, Cl. 257-876.000.
- Yonehara, Takao: See—  
Sakaguchi, Kiyofumi; Yonehara, Takao; and Miyawaki, Mamoru, 5,439,843, Cl. 437-71.000.
- Yonekubo, Yoshitake; Nishimura, Kenichi; Naito, Hiato; and Hasegawa, Yoshimi, to Kayaba Industry Co., Ltd. Variable displacement pump with adjustment responsive to drive motor speed, 5,438,832, Cl. 60-449.000.
- Yoon, InBae. Multifunctional devices for use in endoscopic surgical procedures and methods therefor, 5,439,457, Cl. 604-358.000.
- York, Michael E., to Opex Corporation. Apparatus for extracting documents from envelopes, 5,439,118, Cl. 209-553.000.
- Yoshida, Hisaki: See—  
Mitsunaga, Kazumasa; Motomami, Kaoru; and Yoshida, Hisaki, 5,440,165, Cl. 257-408.000.
- Yoshida Kogyo K.K.: See—  
Horikawa, Yoichi; and Hakei, Tsutomu, 5,438,744, Cl. 29-408.000.
- Terada, Yasuharu; Suzuki, Tsuneo; Matsushima, Hideyuki; Horita, Yoshiyuki; and Izumi, Hiroaki, 5,438,736, Cl. 24-599.800.
- Yoshida, Miharu; and Hayaashi, Hiroko, to Seiko Epson Corporation. Black ink composition excellent in black, 5,439,517, Cl. 106-22.00K.
- Yoshida, Osamu: See—  
Arita, Soichi; Kato, Tetsuaki; and Yoshida, Osamu, 5,440,213, Cl. 318-568.110.
- Yoshida, Toyohiko, to Mitsubishi Denki Kabushiki Kaisha. Data processor having multistage store buffer for processing exceptions, 5,440,757, Cl. 395-800.000.
- Yoshida, Toyohiko: See—  
Ito, Mitsuru; Fujio, and Yoshida, Toyohiko, 5,440,704, Cl. 395-375.000.
- Yoshida, Yasumori: See—  
Ichikawa, Fumaki; Kobayashi, Mineo; Ohta, Masahiro; Yoshida, Yasumori; Obuchi, Shoji; and Itoh, Hiroyuki, 5,440,008, Cl. 528-361.000.
- Yoshida, Yoshio: See—  
Miyake, Takahiro; Yoshida, Yoshio; and Kurata, Yukio, 5,440,427, Cl. 359-566.000.
- Yoshida, Yuji; Arita, Koji; and Funakura, Masami, to Matsushita Electric Industrial Co., Ltd. Air conditioner and heat pump with tetra fluoroethane-containing working fluid, 5,438,849, Cl. 62-498.000.
- Yoshie, Yasunori; and Tsukui, Takashi, to NKK Corporation. Apparatus for manufacturing metal tube covered optical fiber cable and method therefor, 5,440,095, Cl. 219-121.630.
- Yoshikawa, Nobuhisa: See—  
Tahara, Tetsuya; Sugita, Kazushige; Ito, Kazuhiko; and Yoshikawa, Nobuhisa, 5,440,205, Cl. 315-94.000.
- Yoshiki, Hiroyuki: See—  
Yoichi, Karono; Kubota, Masami; Yoshiki, Hiroyuki; and Taniguchi, Michio, 5,440,206, Cl. 315-111.410.
- Yoshimori, Hiroyuki: See—  
Watanabe, Hitoaki; Paz De Araujo, Carlos A.; Yoshimori, Hiroyuki; Scott, Michael C.; Mihara, Takashi; Cuchiari, Joseph D.; and McMillan, Larry D., 5,439,845, Cl. 437-130.000.
- Yoshimura, Masaru: See—  
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- Yoshimura, Yuichiro: See—  
Kobayashi, Katsuyuki; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; and Tokioka, Masaki, 5,438,872, Cl. 73-597.000.
- Yoshioka, Hiroshi: See—  
Tsunozaki, Manabu; Ishii, Kyoko; Nozaki, Koichi; Yoshioka, Hiroshi; Koyama, Yoshihisa; Udo, Shinji; Aoyagi, Hidetomo; Miyake, Sinichi; Morino, Makoto; and Hoshida, Akihiko, 5,440,521, Cl. 365-230.030.
- Yoshioka, Kazumi; Ohta, Takeo; Uchida, Masami; and Furukawa, Shigeaki, to Matsushita Electric Industrial Co., Ltd. Optical recording medium and reflecting film for use therein, 5,439,752, Cl. 428-623.000.
- Yoshioka, Makoto: See—  
Akiyama, Ryota; Hasebe, Takayuki; and Yoshioka, Makoto, 5,440,631, Cl. 380-4.000.
- Yoshitomi Pharmaceutical Industries, Ltd.: See—  
Naka, Yoichi; Haga, Keiichi; and Hosoya, Masahiro, 5,439,905, Cl. 514-220.000.
- Yoshizuka, Haruo; and Takeda, Junichi, to Kabushiki Kaisha Ishikawa Seisakusho, Ltd. Corrugated cardboard box counting and discharging device, 5,439,344, Cl. 414-789.100.
- Young, John H. C.: See—  
Kjerka, Thomas M.; Thayer, Robert S.; Willard, G. Fred; Dunton, Thomas P.; and Young, John H. C., 5,439,718, Cl. 428-35.700.
- Young, Russell D.: See—  
Rohrbach, Roderick G.; Young, Russell D.; and Rohrbach, Timothy K., 5,440,477, Cl. 364-188.000.
- Young, William R.: See—  
Longway, Charles W. T.; and Young, William R., 5,440,506, Cl. 363-104.000.
- Youngworth, Donald M.: See—  
Lefkowitz, Sheldon; Youngworth, Donald M.; Gore, Gerald E.; and Roman, Harry T., 5,440,476, Cl. 364-167.010.
- Younkman, Lora B.: See—  
Akbar, Sheikh A.; Azad, Abdul M.; and Younkman, Lora B., 5,439,580, Cl. 204-425.000.
- Yozan Inc.: See—  
Shou, Guoliang; Yang, Weikang; Wongwirawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,440,156, Cl. 257-296.000.
- Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,440,605, Cl. 377-47.000.
- Yu, Cedric; and Wong, John, to William Beaumont Hospital. Method and apparatus for controlling a radiation treatment field, 5,438,991, Cl. 128-653.100.
- Yu, Dingwei T.: See—  
Lee, Sung J.; Konishi, Yoshitaka; Macina, Orest T.; Kondo, Kigen; and Yu, Dingwei T., 5,439,895, Cl. 514-63.000.
- Yu, Jack. Housing for ceiling fan, 5,439,350, Cl. 416-5.000.
- Yu, Stella S.: See—  
Djuric, Sievan W.; Docter, Stephen H.; and Yu, Stella S., 5,439,937, Cl. 514-563.000.
- Yu, Xueliang: See—  
Henz, Jurg; Abegglen, Hans; and Yu, Xueliang, 5,438,941, Cl. 112-90.000.
- Yuhara, Masanobu: See—  
Ijitsu, Kenji; Yuhara, Masanobu; and Ohta, Hidenobu, 5,440,696, Cl. 395-308.000.
- Yuki, Takayuki, to Rohm Co., Ltd. Telephone for inhibiting specific calls dialled by an audible tone generator, 5,440,622, Cl. 379-200.000.
- Yun, Jong-Yun, to Samsung Electronics Co., Ltd. Circuit and method for adjusting a data detecting level of a disk driving apparatus, 5,440,433, Cl. 360-46.000.
- Yurek, Gregory J.; and Vander Sande, John B., to Massachusetts Institute of Technology. Preparation of superconducting oxides by oxidizing a metallic alloy, 5,439,880, Cl. 505-492.000.
- Yutani, Yuji; and Tatemoto, Masayoshi, to Daikin Industries. Process for preparing polymer, 5,439,980, Cl. 525-276.000.
- Zabler, Erich; and Marek, Jiri, to Robert Bosch GmbH. Rotation rate sensor, 5,438,870, Cl. 73-504.020.
- Zabotto, Arlette; Griat, Jacqueline; Handjani, Rose-Marie; Vanlerberghe, Guy G.; and Ribier, Alian J., to L'Oreal. Cosmetic composition based on an aqueous dispersion of small lipid spheres, 5,439,672, Cl. 424-59.000.
- Zach, John S.: See—  
Briggs, Michael; Lowe, Gerald A.; Geething, Rick C.; Wagonfield, Patrick; and Zach, John S., 5,439,199, Cl. 251-320.000.
- Zadeh, Rohollah E., to Amp Plus, Inc. Fluorescent light fixture assembly, 5,440,471, Cl. 362-365.000.

- Zagnoni, Graziano: See—  
Scriba, Roberto; Zagnoni, Graziano; Ackerman, Michael H.; Galbo, James P.; and Winter, Roland A. E., 5,439,958, Cl. 524-102.000.
- Zakikhani, Mohsen: See—  
Archer, Adrian; and Zakikhani, Mohsen, 5,439,999, Cl. 526-278.000.
- Zapletal, Jiri, to Carroll, Douglas G.; and Zapletal, Jiri. Plasma arc torch with removable anode ring, 5,440,094, Cl. 219-121.520.
- Zappella, Pierino I.; and Fewer, William R., to Rockwell International Corporation. Transferable solder bumps for interconnect and assembly of MCM substrates, 5,440,239, Cl. 324-757.000.
- Zealey, Gavin: See—  
Loosmore, Sheena; Zealey, Gavin; Yacoub, Reza; and Klein, Michel, 5,439,810, Cl. 435-69.300.
- Zehrfeld, Jergen: See—  
Botcher, Axel; Doring, Manfred; and Zehrfeld, Jergen, 5,439,863, Cl. 502-152.000.
- Zeininger, Heinz: See—  
Schwalke, Udo; and Zeininger, Heinz, 5,439,831, Cl. 437-24.000.
- Zeida, Jaroslav, to Leybold Aktiengesellschaft. Device for locking a flat, preferably discoid substrate onto the substrate plate of a vacuum coating apparatus, 5,439,522, Cl. 118-500.000.
- Zelazny, Joseph S., to Xerox Corporation. Coarse particle sniffer, 5,438,885, Cl. 73-864.710.
- Zeller, Robert D.: See—  
Belisle, William W.; Catone, Robert A.; McCartney, John C.; and Zeller, Robert D., 5,440,466, Cl. 362-222.000.
- Zeller, Siegfried: See—  
Czermak, Karl; Milonis, Konstantin; Schenk, Johannes L.; and Zeller, Siegfried, 5,439,504, Cl. 75-444.000.
- Zen Giken Co., Ltd.: See—  
Tsukumo, Zenzaburo; and Tsukumo, Shinsuke, 5,439,185, Cl. 242-130.200.
- Zeneca Inc.: See—  
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying K., 5,440,035, Cl. 544-51.000.
- Zeneca Limited: See—  
de Fraine, Paul J.; Clough, John M.; Worthington, Paul A.; Pilkington, Brian L.; and Matthews, Ian R., 5,439,910, Cl. 514-256.000.
- Zernickel, Alexander; Doppling, Horst; and Scholien, Horst, to Ina Walzinger Schaeffler KG. Suspension strut bearing, 5,439,298, Cl. 384-537.000.
- Zetek plc: See—  
Finney, Adrian D.; and Casey, David N., 5,440,164, Cl. 257-378.000.
- Zevez, Inc.: See—  
Holden, James; and McNally, David J., 5,438,868, Cl. 73-290.00V.
- Zexel Corporation: See—  
Kao, Wei-Wen, 5,440,484, Cl. 364-424.010.
- Zhao, Jin: See—  
Khan, Riaz A.; Smith, Keith; Pelter, Andrew; and Zhao, Jin, 5,440,026, Cl. 536-115.000.
- Zhou, Stephen O.: See—  
Liao, Xiugao; Wang, Yading; Zhou, Stephen O.; and Richards, Thomas P., 5,439,950, Cl. 523-108.000.
- Ziemer, John H.: See—  
Srinivasan, Vijayaraghavan; Lockett, Michael J.; and Ziemer, John H., 5,438,836, Cl. 62-36.000.
- Zimlich, Joseph A., III, to Brown-Forman Corporation. Fiber-containing food product and process for producing it from a portion of by-product of alcohol production process, 5,439,701, Cl. 426-624.000.
- Zimmer, Rene J.: See—  
Agostini, Giorgio; Christiaens, Leon E. E.; Frank, Uwe E.; Martner, Thierry F. E.; Tadino, Vincent L. A.; Vael, Friedrich; and Zimmer, Rene J., 5,440,064, Cl. 556-427.000.
- Zimmerly, Robert D., to Tri-Clover, Inc. Sanitary gate valve with tapered valve plug, 5,439,024, Cl. 137-241.000.
- Zimmerman, Patrick: See—  
Kennedy, Brian S.; Zimmerman, Patrick; and Emerson, Alan B., 5,439,051, Cl. 166-50.000.
- Zimmerman, Paul J.: See—  
Karim-Panahi, Khosrow; Terhune, James H.; and Zimmerman, Paul J., 5,438,882, Cl. 73-862.324.
- Zimmerman, Stephen A.: See—  
Meggit, Adam E.; Brandt, Thomas J.; and Zimmerman, Stephen A., 5,440,329, Cl. 347-212.000.
- Zimmermann, Frank: See—  
Ramm, Norbert; and Zimmermann, Frank, 5,439,425, Cl. 477-74.000.
- Zinter, Richard L., Jr., to General Electric Company. Integrated data link concept for air traffic control applications, 5,440,544, Cl. 370-50.000.
- Zito, Ralph, to National Power PLC. Electrochemical energy storage and/or power delivery cell with pH control, 5,439,757, Cl. 429-51.000.
- Zivkovic, Milorad, to Mercedes-Benz AG. Support arrangement for radius arms, 5,439,242, Cl. 280-661.000.
- Zoom Telephonics, Inc.: See—  
Cann, Peter E., 5,440,619, Cl. 379-97.000.
- Zorbach, Bert: See—  
Althoff, Heinz-Jergen; Driedger, Guenter; Meder, Klaus; Schuh, Jergen; Stahl, Manfred; Viehmann, Karl; Weiss, Eberhard; Neumann, Jergen; and Zorbach, Bert, 5,440,487, Cl. 364-424.050.
- Zucker, Jerry. Scale control device and method, 5,439,566, Cl. 204-149.000.
- Zumsteg, Philip J.: See—  
Hoglund, Steven R.; Ober, Kerry E.; Zumsteg, Philip J.; Tuten, James M., III; Harnish, James R.; and Goetz, Jay R., 5,438,844, Cl. 62-155.000.
- Zutshi, Ram K.: See—  
Kapil, Randhir S.; Zutshi, Usha; Bedi, Kasturi L.; Singh, Gurbax; Johri, Ramesh K.; Dhar, Santosh K.; Kaul, Jawahar L.; Sharma, Subhash C.; Pahwa, Gurcharan S.; Kapoor, Naveen; Tickoo, Ashok K.; Tickoo, Manoj K.; Kaul, Uma; Singh, Surjeet; Zutshi, Ram K.; and Singh, Rajinder, 5,439,891, Cl. 514-31.000.
- Zutshi, Usha: See—  
Kapil, Randhir S.; Zutshi, Usha; Bedi, Kasturi L.; Singh, Gurbax; Johri, Ramesh K.; Dhar, Santosh K.; Kaul, Jawahar L.; Sharma, Subhash C.; Pahwa, Gurcharan S.; Kapoor, Naveen; Tickoo, Ashok K.; Tickoo, Manoj K.; Kaul, Uma; Singh, Surjeet; Zutshi, Ram K.; and Singh, Rajinder, 5,439,891, Cl. 514-31.000.
- Zvenyatsky, Boris: See—  
Shichman, Daniel; and Zvenyatsky, Boris, 5,439,479, Cl. 606-220.000.
- 3V Inc.: See—  
Raspanti, Giuseppe, 5,439,959, Cl. 524-100.000.
- 832276 Ontario Inc.: See—  
Landreville, Charles, 5,439,201, Cl. 256-65.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF AUGUST, 1995

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Dennison, Richard L., to Minnesota Mining and Manufacturing Company. Temperature control circuit having series connected fail-safe control. Re. 35,013, Cl. 219-501.000.
- Higuchi, Kanji: See—  
Takamura, Kozo; Sato, Yasuyuki; and Higuchi, Kanji, Re. 35,012, Cl. 313-141.000.
- Kaarmann, Hans: See—  
Wersing, Wolfram; Lubitz, Karl; Lerch, Reinhard; Kaarmann, Hans; and Vogt, Martina, Re. 35,011, Cl. 310-334.000.
- Kawasaki Steel Corporation: See—  
Yoshino, Kenji; Takemura, Kazuya; and Wakui, Tadahi, Re. 35,014, Cl. 525-423.000.
- Lerch, Reinhard: See—  
Wersing, Wolfram; Lubitz, Karl; Lerch, Reinhard; Kaarmann, Hans; and Vogt, Martina, Re. 35,011, Cl. 310-334.000.
- Lubitz, Karl: See—  
Wersing, Wolfram; Lubitz, Karl; Lerch, Reinhard; Kaarmann, Hans; and Vogt, Martina, Re. 35,011, Cl. 310-334.000.
- Minnesota Mining and Manufacturing Company: See—  
Dennison, Richard L., Re. 35,013, Cl. 219-501.000.
- Nipponendo Co., Ltd.: See—  
Takamura, Kozo; Sato, Yasuyuki; and Higuchi, Kanji, Re. 35,012, Cl. 313-141.000.
- Nordson Corporation: See—  
Price, Richard P., Re. 35,010, Cl. 222-1.000.
- Price, Richard P., to Nordson Corporation. Method of compensating for changes in the flow characteristics of a dispensed fluid to maintain the volume of dispensed fluid at a setpoint. Re. 35,010, Cl. 222-1.000.
- Sato, Yasuyuki: See—  
Takamura, Kozo; Sato, Yasuyuki; and Higuchi, Kanji, Re. 35,012, Cl. 313-141.000.
- Siemens Aktiengesellschaft: See—  
Wersing, Wolfram; Lubitz, Karl; Lerch, Reinhard; Kaarmann, Hans; and Vogt, Martina, Re. 35,011, Cl. 310-334.000.
- Takamura, Kozo; Sato, Yasuyuki; and Higuchi, Kanji, to Nipponendo Co., Ltd. Spark plug for internal combustion engines having an alloy layer between the electrodes and tip ends. Re. 35,012, Cl. 313-141.000.
- Takemura, Kazuya: See—  
Yoshino, Kenji; Takemura, Kazuya; and Wakui, Tadahi, Re. 35,014, Cl. 525-423.000.
- Vogt, Martina: See—  
Wersing, Wolfram; Lubitz, Karl; Lerch, Reinhard; Kaarmann, Hans; and Vogt, Martina, Re. 35,011, Cl. 310-334.000.
- Wakui, Tadahi: See—  
Yoshino, Kenji; Takemura, Kazuya; and Wakui, Tadahi, Re. 35,014, Cl. 525-423.000.
- Wersing, Wolfram; Lubitz, Karl; Lerch, Reinhard; Kaarmann, Hans; and Vogt, Martina, to Siemens Aktiengesellschaft. Ultrasound array having trapezoidal oscillator elements and a method and apparatus for the manufacture thereof. Re. 35,011, Cl. 310-334.000.
- Yoshino, Kenji; Takemura, Kazuya; and Wakui, Tadahi, to Kawasaki Steel Corporation. Composition of polyarylate, polyamide, polyethylene terephthalate and epoxy resin. Re. 35,014, Cl. 525-423.000.

## LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Ball, Laurence G.: See—  
Price, Macy J., Jr.; Ball, Laurence G.; and Wildhaber, Andrew W., B1 5,265,739, Cl. 211-162.000.
- Engineered Data Products Incorporated: See—  
Price, Macy J., Jr.; Ball, Laurence G.; and Wildhaber, Andrew W., B1 5,265,739, Cl. 211-162.000.
- Gonnelli, Robert R.: See—  
Gordon, Gary B.; and Gonnelli, Robert R., B1 5,153,833, Cl. 364-424.000.
- Gordon, Gary B.; and Gonnelli, Robert R., to Total Spectrum Manufacturing Inc. Robotic television-camera dolly system. B1 5,153,833, 8-8-95, Cl. 364-424.000.
- Hockerson, Stan. Stabilized athletic shoe. B1 4,322,895, 8-8-95, Cl. 36-129.000.
- Hughes Aircraft Company: See—  
Turner, Raymond L., B1 5,085,365, Cl. 228-223.000.
- Lee, Moon H. Juice extractor. B1 5,156,872, 8-8-95, Cl. 426-489.000.
- Price, Macy J., Jr.; Ball, Laurence G.; and Wildhaber, Andrew W., to Engineered Data Products Incorporated. Double density storage rack system for data tape cartridges. B1 5,265,739, 8-8-95, Cl. 211-162.000.
- Total Spectrum Manufacturing Inc.: See—  
Gordon, Gary B.; and Gonnelli, Robert R., B1 5,153,833, Cl. 364-424.000.
- Turner, Raymond L., to Hughes Aircraft Company. Water soluble soldering flux. B1 5,085,365, 8-8-95, Cl. 228-223.000.
- Wildhaber, Andrew W.: See—  
Price, Macy J., Jr.; Ball, Laurence G.; and Wildhaber, Andrew W., B1 5,265,739, Cl. 211-162.000.

## LIST OF DESIGN PATENTEEES

- Aberle, Ty: See—  
Kornfeld, Richard K.; Lombardi, Gina M.; Lee, John K. M.; Weber, Daniel H.; Aberle, Ty; Mergenthaler, Steven A.; Waldburger, David; Aronson, Michael L.; Curbun, Charles S.; and Gach, Lawrence, 361,065, Cl. D14-138.000.
- Acevedo, Mario G.: See—  
Walters, David S.; Salbeshian, Duane M., Sr.; Greenlee, Hugh T.; Cuffaro, Daniel F.; and Acevedo, Mario G., 361,073, Cl. D14-240.000.
- Adco Products Incorporated: See—  
Katz, Kenneth L., 360,977, Cl. D3-276.000.
- Akers, Melissa J.: See—  
Langhorn, Karsten H.; and Akers, Melissa J., 361,066, Cl. D14-142.000.
- Alberico, Mardell E. Stuffed toy doll. 361,106, 8-8-95, Cl. D21-171.000.
- Allred, Charles N. Lighting fixture for helicopters. 361,142, 8-8-95, Cl. D26-24.000.
- Alpha Enterprises, Inc.: See—  
Weisburn, James T.; and Gallagher, Christopher G., 361,011, Cl. D6-629.000.
- Aluminum Company of America: See—  
Clements, Roger F.; and Botterman, Ralph C., 361,052, Cl. D12-209.000.

## LIST OF DESIGN PATENTEEES

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- Moore, Sylvia S.; Gates, Thomas A.; and King, Daniel W., 361,138, Cl. D25-119.000.
- American Standard Inc.: See—  
Enthoven, Axel, 361,008, Cl. D6-574.000.
- Anders, Walter G.: See—  
Grosswiller, Leo J.; Anders, Walter G.; and Beck, Robert J., 361,194, Cl. D99-35.000.
- Apple Computer, Inc.: See—  
Stewart, James R.; and Parsey, Timothy J. L., 361,063, Cl. D14-107.000.
- Armstrong World Industries, Inc.: See—  
Bischel, Wesley T. K., 361,134, Cl. D25-55.000.
- Bischel, Wesley T. K., 361,135, Cl. D25-55.000.
- Aronson, Michael L.: See—  
Kornfeld, Richard K.; Lombardi, Gina M.; Lee, John K. M.; Weber, Daniel H.; Aberle, Ty; Mergenthaler, Steven A.; Waldburger, David; Aronson, Michael L.; Curbun, Charles S.; and Gach, Lawrence, 361,065, Cl. D14-138.000.
- Asahi Kogaku Kogyo Kabushiki Kaisha: See—  
Yamanaka, Toshimasa; and Kitera, Jun, 361,084, Cl. D18-50.000.
- Atamian, George C., to Educational Insights, Inc. Hand-held microscope. 361,078, 8-8-95, Cl. D16-131.000.
- Bach, Ulf-Eiel F.: See—  
Goldhaber, Richard P.; Brinda, Paul D.; and Bach, Ulf-Eiel F., 361,130, Cl. D24-169.000.
- Bailey, Catherine M., to Nike, Inc. Shoe upper. 360,973, 8-8-95, Cl. D2-969.000.
- Baribeau, Joseph L. Canopy for use on an outdoor grill. 361,014, 8-8-95, Cl. D7-402.000.
- Barry, Daniel C. Double socket cover. 361,056, 8-8-95, Cl. D13-156.000.
- Batson, Jay D. Book holder. 361,092, 8-8-95, Cl. D19-91.000.
- Bauer Kaba AG: See—  
Marthaler, Eduard, 361,031, Cl. D8-347.000.
- Beale, Roger L.: See—  
Collins, Frederick; Beale, Roger L.; and Grant, Sidney, 361,080, Cl. D16-225.000.
- Beck, Robert J.: See—  
Grosswiller, Leo J.; Anders, Walter G.; and Beck, Robert J., 361,194, Cl. D99-35.000.
- Beckman, William P. Stroller for an infant. 361,049, 8-8-95, Cl. D12-129.000.
- Beltempo, Maria E. Combined plush animal handbag set. 360,976, 8-8-95, Cl. D3-235.000.
- Bennett, James L., Jr. Cap with extended and foldable bill. 360,972, 8-8-95, Cl. D2-865.000.
- Benson, Paul D.: See—  
Seiler, John R.; and Benson, Paul D., 361,185, Cl. D34-05.000.
- Berg, A. Warren: See—  
Brehmer, Todd G.; Berg, A. Warren; and Podell, Allen F., 361,067, Cl. D14-238.000.
- Brehmer, Todd G.; Berg, A. Warren; and Podell, Allen F., 361,068, Cl. D14-238.000.
- Berol Corporation: See—  
Murphy, Kent W., 361,090, Cl. D19-75.000.
- Besette, Brian P.; and Guyette, William T., to Custom Controls, Inc. Ergonomic handle. 361,030, 8-8-95, Cl. D8-307.000.
- Better, Charles: See—  
Keller, Diane; Keller, Frank; and Better, Charles, 361,003, Cl. D6-449.000.
- Billings, Calvert W. Nail-tip setter. 361,156, 8-8-95, Cl. D28-57.000.
- Bioengineering AG: See—  
Meyer, Pio, 361,107, Cl. D21-191.000.
- Bischel, Wesley T. K., to Armstrong World Industries, Inc. Cover unit for ceiling rails. 361,134, 8-8-95, Cl. D25-55.000.
- Bischel, Wesley T. K., to Armstrong World Industries, Inc. Cover unit for ceiling rails. 361,135, 8-8-95, Cl. D25-55.000.
- Bizzarri, Giotto: See—  
Watkins, D. Barrett; Bizzarri, Giotto; and Romo, Luis M., 361,046, Cl. D12-92.000.
- Blauch, Robert S.: See—  
Whyte, Andrew C.; Fox, Trevor H.; Blauch, Robert S.; and Gallagher, William E., 361,053, Cl. D12-327.000.
- Bochnak, Bruce: See—  
Laubach, Fred H., III; Musch, Gordon F.; Bochnak, Bruce; Purdy, Thomas G.; and Camp, William P., Jr., 360,988, Cl. D4-138.000.
- Boehringer Mannheim Corporation: See—  
Collins, Rick L.; Gerber, Martin T.; Kennedy, Daniel L.; Lewis, Brett S.; Morrow, James D.; Sebastian, Peter L.; Stovick, David E.; and Thomeczek, Charles L., Jr., 361,129, Cl. D24-169.000.
- Botterman, Ralph C.: See—  
Clements, Roger F.; and Botterman, Ralph C., 361,052, Cl. D12-209.000.
- Bownes, Donna; and Kashani, Cameron. Bird feeder. 361,173, 8-8-95, Cl. D30-125.000.
- Brehmer, Todd G.; Berg, A. Warren; and Podell, Allen F., to Pacific Monolithics, Inc. Fixed-position antenna-mounting bracket assembly. 361,067, 8-8-95, Cl. D14-238.000.
- Brehmer, Todd G.; Berg, A. Warren; and Podell, Allen F., to Pacific Monolithics, Inc. Adjustable-angle antenna-mounting bracket assembly. 361,068, 8-8-95, Cl. D14-238.000.
- Brinda, Paul D.: See—  
Goldhaber, Richard P.; Brinda, Paul D.; and Bach, Ulf-Eiel F., 361,130, Cl. D24-169.000.
- Brunswick Bowling & Billiards: See—  
Janes, Daniel, 361,111, Cl. D21-232.000.
- Janes, Daniel, 361,112, Cl. D21-232.000.
- Janes, Daniel, 361,113, Cl. D21-232.000.
- Bukovitz, Richard K.: See—  
Laubach, Fred H., III; Bukovitz, Richard K.; and Camp, William P., Jr., 360,989, Cl. D4-138.000.
- Business to Business Innovations B.V.: See—  
Smeitink, Jan, 361,189, Cl. D34-26.000.
- Butts, Bradford F.: See—  
Wall, Eugene J.; Hiller, Bruce D.; and Butts, Bradford F., 361,070, Cl. D14-253.000.
- Calkins, John A.; Chiffers, John J.; and Moore, Leo C., to International Master Products Corporation. Tag. 361,094, 8-8-95, Cl. D20-26.000.
- Camp, William P., Jr.: See—  
Laubach, Fred H., III; Musch, Gordon F.; Bochnak, Bruce; Purdy, Thomas G.; and Camp, William P., Jr., 360,988, Cl. D4-138.000.
- Laubach, Fred H., III; Bukovitz, Richard K.; and Camp, William P., Jr., 360,989, Cl. D4-138.000.
- Carl, Paul A.; and Potter, Robert S. Combined dental flosser and toothpick. 361,157, 8-8-95, Cl. D28-64.000.
- Carter, Stanley R.: See—  
Moskovich, Robert; and Carter, Stanley R., 360,981, Cl. D4-104.000.
- Casio Computer Co., Ltd.: See—  
Ono, Junichi, 361,079, Cl. D16-202.000.
- Casuso Fuente, Francisco G., to Oficina De Investigacion AG Rupada, S.A. Iron. 361,184, 8-8-95, Cl. D32-70.000.
- Catey Co., Ltd.: See—  
Ueda, Takashi, 361,044, Cl. D10-98.000.
- Chen, Ting-Hsing, to Far Great Plastics Industrial Co., Ltd. Protective elbow cushion. 361,163, 8-8-95, Cl. D29-121.000.
- Cheng, Johnson. Kettle. 361,013, 8-8-95, Cl. D7-302.000.
- Chiffers, John J.: See—  
Calkins, John A.; Chiffers, John J.; and Moore, Leo C., 361,094, Cl. D20-26.000.
- Choi, Chung-Hing, to Hing Fat Toys Manufacturer Ltd. Toy sword. 361,104, 8-8-95, Cl. D21-145.000.
- Chuck, Anthony A. Hand operated opener for fold open type carton spouts. 361,024, 8-8-95, Cl. D8-40.000.
- Clark, Eileen, to Interlego AG. Toy building element. 361,101, 8-8-95, Cl. D21-108.000.
- Clements, Roger F.; and Botterman, Ralph C., to Aluminum Company of America. Vehicle wheel. 361,052, 8-8-95, Cl. D12-209.000.
- Coffman, Paul D. Bath brush. 360,982, 8-8-95, Cl. D4-102.000.
- Cole, Douglas L., to Mikron Industries. Window component extrusion. 361,140, 8-8-95, Cl. D25-124.000.
- Cole Sewell Corporation: See—  
Parkhurst, John M., 361,137, Cl. D25-103.000.
- Colgate-Palmolive Company: See—  
Moskovich, Robert; and Carter, Stanley R., 360,981, Cl. D4-104.000.
- Sherman, Adam; Moskovich, Robert; and Petronio, James, 360,983, Cl. D4-104.000.
- Collins, Frederick; Beale, Roger L.; and Grant, Sidney, to Medivance Instruments Limited. Transparency illuminator. 361,080, 8-8-95, Cl. D16-225.000.
- Collins, Rick L.; Gerber, Martin T.; Kennedy, Daniel L.; Lewis, Brett S.; Morrow, James D.; Sebastian, Peter L.; Stovick, David E.; and Thomeczek, Charles L., Jr., to Boehringer Mannheim Corporation. Combined blood coagulation measuring instrument and test strip. 361,129, 8-8-95, Cl. D24-169.000.
- Cooper Industries, Inc.: See—  
Jandrisits, Alice M.; and D'Ercoli, Giacinto C., 361,146, Cl. D26-83.000.
- Corbett, Thomas R. Hanging lamp. 361,151, 8-8-95, Cl. D26-90.000.
- Corbett, Thomas R. Hanging lamp. 361,152, 8-8-95, Cl. D26-90.000.
- Cuffaro, Daniel F.: See—  
Walters, David S.; Salbeshian, Duane M., Sr.; Greenlee, Hugh T.; Cuffaro, Daniel F.; and Acevedo, Mario G., 361,073, Cl. D14-240.000.
- Curbun, Charles S.: See—  
Kornfeld, Richard K.; Lombardi, Gina M.; Lee, John K. M.; Weber, Daniel H.; Aberle, Ty; Mergenthaler, Steven A.; Waldburger, David; Aronson, Michael L.; Curbun, Charles S.; and Gach, Lawrence, 361,065, Cl. D14-138.000.
- Custom Controls, Inc.: See—  
Besette, Brian P.; and Guyette, William T., 361,030, Cl. D8-307.000.
- Cytowic, Richard E., Executor: See—  
Tatum, Michael D.; and Purdom, Robert W., deceased, 361,000, Cl. D6-436.000.
- D&L Manufacturing Company, Inc.: See—  
Schoenke, Dean P., 361,176, Cl. D32-3.000.
- Dallman, Ernest R.; and Wehr, Franklin W., to Dallman Industrial Corporation. Automatic teller machine cabinet. 361,192, 8-8-95, Cl. D99-28.000.
- Dallman Industrial Corporation: See—  
Dallman, Ernest R.; and Wehr, Franklin W., 361,192, Cl. D99-28.000.
- Dama, Jane. Knee protector. 361,161, 8-8-95, Cl. D29-121.000.
- Dana Douglas Medical, Inc.: See—  
Macmillan, Douglas D., 361,050, Cl. D12-130.000.
- Dardahti, Shahriar. Two-sided storage rack. 361,012, 8-8-95, Cl. D6-629.000.
- Datcom Instrument Company, Inc.: See—  
Grilk, Henry G., 361,043, Cl. D10-85.000.



- Davenport, Robert E., Jr.: See—  
Thompson, Craig D.; and Davenport, Robert E., Jr., 361,086, Cl. D19-09.000.
- Davis, Herman, Jr. Toilet cleaner dispenser. 361,109, 8-8-95, Cl. D23-208.000.
- D'Ercoli, Giacinto C.: See—  
Jandrisits, Alice M.; and D'Ercoli, Giacinto C., 361,146, Cl. D26-61.000.
- De Waal, Peter. Electrical outlet box cover. 361,059, 8-8-95, Cl. D13-177.000.
- Diebold, Incorporated: See—  
Grosswiller, Leo J.; Anders, Walter G.; and Beck, Robert J., 361,194, Cl. D99-35.000.
- Direct Connect International: See—  
Schneider, Peter L., 361,108, Cl. D21-204.000.
- Domel, Douglas R.; and Dow, James C., to Harmonic Design, Inc. Remote control unit for operating window blinds. 361,058, 8-8-95, Cl. D13-168.000.
- Donghia Furniture: See—  
Hutton, John, 360,992, Cl. D6-349.000.  
Hutton, John, 360,997, Cl. D6-381.000.
- Dostkoci Manufacturing Company, Inc.: See—  
VanSkiver, Ralph, 361,175, Cl. D30-161.000.
- Doty, Roger F.; and Pickering, Mark A., to Maytag Corporation. Stove top. 361,015, 8-8-95, Cl. D7-407.000.
- Dougan, William B.; and Nesbitt, Murray R. Clip for hanging Christmas lights. 361,032, 8-8-95, Cl. D8-395.000.
- Dow, James C.: See—  
Domel, Douglas R.; and Dow, James C., 361,058, Cl. D13-168.000.
- Drape, Per; and Johansson, Lars. Coaster. 361,018, 8-8-95, Cl. D7-619.000.
- E/M Corporation: See—  
Jamison, Warren E., 361,077, Cl. D15-150.000.
- Educational Insights, Inc.: See—  
Atamian, George C., 361,078, Cl. D16-131.000.
- Eikosa Co., Ltd.: See—  
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- Wedell, Mark T., to Thomas & Betts Corporation. Quartz halogen flood light. 361,148, 8-8-95, Cl. D26-63.000.
- Wedell, Mark T., to Thomas & Betts Corporation. Combined quartz halogen flood light assembly and sensor housing. 361,149, 8-8-95, Cl. D26-63.000.
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- Whyte, Andrew C.; Fox, Trevor H.; Blaich, Robert S.; and Gallagher, William E., to United Technologies Corporation. Helicopter. 361,053, 8-8-95, Cl. D12-327.000.
- Willard, Bruce; and Holland, Jay, to Territory Ahead, The. Laptop computer case. 360,978, 8-8-95, Cl. D3-301.000.
- Wolf, Theo, to Kermi GmbH. Bathroom radiator. 361,125, 8-8-95, Cl. D23-330.000.
- Wolcraft GmbH: See—  
Noniewicz, Zbigniew, 360,980, Cl. D8-354.000.
- Wooster Brush Company, The: See—  
Laubach, Fred H., III; Musch, Gordon F.; Bochnak, Bruce; Purdy, Thomas G.; and Camp, William P., Jr., 360,988, Cl. D4-138.000.  
Laubach, Fred H., III; Bukovitz, Richard K.; and Camp, William P., Jr., 360,989, Cl. D4-138.000.
- WSC Windsurfing Chiemsee Produktions und Vertriebs GmbH: See—  
Eskimo, Mike, 360,990, Cl. D5-64.000.
- Yamamoto, Takashi: See—  
Kumagaya, Kennta; Yonezawa, Yutaka; Furuya, Jyun; Utsuki, Toshiyuki; Yamamoto, Takashi; Takahashi, Hiroshi; Tsukaguchi, Tamotsu; Koizumi, Shigeru; and Kishida, Fumio, 361,060, Cl. D14-100.000.
- Yamanaka, Toshimasa; and Kitera, Jun, to Azahi Kogaku Kogyo Kabushiki Kaisha. Printer. 361,084, 8-8-95, Cl. D18-50.000.
- Yan, Ju H. Magic game paper. 361,097, 8-8-95, Cl. D21-104.000.
- Yonezawa, Yutaka: See—  
Kumagaya, Kennta; Yonezawa, Yutaka; Furuya, Jyun; Utsuki, Toshiyuki; Yamamoto, Takashi; Takahashi, Hiroshi; Tsukaguchi, Tamotsu; Koizumi, Shigeru; and Kishida, Fumio, 361,060, Cl. D14-100.000.

## LIST OF PLANT PATENTEES

- Asada, Kensuke: See—  
Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Canada, Her Majesty the Queen in right of, as represented by the Minister of Agriculture: See—  
Sveida, Felicitas J., 9,232, Cl. 1.000.
- Conard-Pyle Company, The: See—  
Meiland, Alain A., 9,233, Cl. 4.000.
- Danziger - "Dan" Flower Farm: See—  
Dehan, Klara, 9,236, Cl. 87.600.
- Dehan, Klara, to Danziger - "Dan" Flower Farm. Impatiens plant named Twist. 9,236, 8-8-95, Cl. 87.600.
- Fruit Tree Research Station, Ministry of Agriculture, Forestry and Fisheries: See—  
Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Ikemiya, Hidekazu: See—  
Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Ishiuchi, Denji: See—  
Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Klemm, Siegfried. Geranium plant 'Klehsip'. 9,237, 8-8-95, Cl. 87.120.
- Matsumoto, Ryoji: See—  
Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Meiland, Alain A., to Conard-Pyle Company, The. Shrub climbing rose plant named 'Meitosier'. 9,233, 8-8-95, Cl. 4.000.
- Milestone Agriculture, Inc.: See—  
Tas, Wim P., 9,238, Cl. 88.300.
- Murata, Hirono: See—  
Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Oiyama, Iwao: See—  
Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Sveida, Felicitas J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of Agriculture. Shrub rose plant named 'Captain Samuel Holland'. 9,232, 8-8-95, Cl. 1.000.
- Takahara, Toshio: See—  
Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Tas, Wim P., to Milestone Agriculture, Inc. Maidenhair fern plant named 'Bronze Venus'. 9,238, 8-8-95, Cl. 88.300.
- Wyckoff, Gilbert R. Hybrid tea rose plant named 'Hawaiian Queen Martha'. 9,234, 8-8-95, Cl. 11.000.
- Yamada, Yoshio: See—  
Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.
- Yamamoto, Masashi: See—  
Okudai, Naomi; Oiyama, Iwao; Matsumoto, Ryoji; Takahara, Toshio; Yamamoto, Masashi; Ishiuchi, Denji; Asada, Kensuke; Ikemiya, Hidekazu; Murata, Hirono; and Yamada, Yoshio, 9,235, Cl. 45.000.

# CLASSIFICATION OF PATENTS

ISSUED AUGUST 8, 1995

NOTE.—First number, class; second number, subclass; third number, patent number

44	5,438,768	407	5,438,827	773	5,439,505	CLASS 108	662.06	5,438,999
129	B1 4,322,895	410	5,438,828	CLASS 11	5,438,891	44	5,438,936	5,438,997
131	5,438,769	445	5,438,830	56	5,438,892	64	5,438,937	5,439,000
CLASS 37		449	5,438,831	120	5,438,893	91	5,438,938	5,439,001
227	5,438,770	562	5,438,832	124.4	5,438,894	CLASS 111	692	5,439,002
348	5,438,771	753	5,438,833	177.2	5,438,895	115	5,438,940	5,439,003
406	5,438,772	CLASS 42	5,438,834	451	5,438,896	CLASS 112	705	5,439,004
436	5,438,774	25	5,438,835	CLASS 83	5,438,897	90	5,438,941	5,439,005
CLASS 4		36	5,438,836	76.1	5,438,898	102.5	5,438,942	5,439,006
243.3	5,438,711	50.1	5,438,837	146	5,438,899	261	5,438,943	5,439,007
493	5,438,712	55.5	5,438,838	471.3	5,438,900	CLASS 114	84.1	5,439,009
663	5,438,713	63	5,438,839	835	5,438,901	218	5,438,944	5,439,010
664	5,438,714	64	5,438,840	CLASS 84	5,438,902	238	5,438,945	5,439,011
CLASS 5		78	5,438,841	297 R	5,438,903	270	5,438,946	5,439,012
110	5,438,715	89	5,438,842	312 R	5,438,904	312	5,438,947	5,439,013
247	5,438,716	124	5,438,843	422.3	5,438,905	319	5,438,948	5,439,014
414	5,438,717	155	5,438,844	600	5,440,070	367	5,438,949	5,439,015
477	5,438,718	172	5,438,845	637	5,440,071	CLASS 116	7	5,439,527
485	5,438,719	238.7	5,438,846	645	5,440,072	222	5,438,950	5,439,528
505.1	5,438,720	498	5,438,848	CLASS 87	5,438,904	84	5,438,951	5,439,529
604	5,438,721	2	5,438,850	CLASS 89	5,438,905	223	5,438,952	5,439,530
618	5,438,722	3	5,438,851	1.816	5,438,906	CLASS 117	100	5,439,016
620	5,438,723	17.2	5,438,852	36.08	5,438,907	CLASS 118	126	5,439,017
CLASS 8		27	5,438,853	361	5,438,908	52	5,439,519	5,439,018
532	5,439,486	200	5,438,854	369.1	5,438,909	410	5,439,520	5,439,528
CLASS 12		38 A	5,438,855	CLASS 91	5,438,910	415	5,439,521	5,439,529
142 LC	5,438,724	69	5,438,856	CLASS 92	5,438,911	500	5,439,522	5,439,530
CLASS 15		279	5,438,857	5 R	5,438,912	501	5,439,523	5,439,531
97.1	5,438,725	492	5,438,858	98 R	5,438,913	723 E	5,439,524	5,439,532
105	5,438,726	493	5,438,859	CLASS 95	5,438,914	726	5,439,525	5,439,533
119.2	5,438,727	CLASS 71	5,439,497	19	5,439,506	CLASS 119	2	5,439,019
180	5,438,728	63	5,439,498	23	5,439,507	6.8	5,438,954	5,439,020
227	5,439,487	260	5,438,858	58	5,439,508	28	5,438,955	5,439,021
304	5,438,729	CLASS 72	5,438,859	166	5,439,509	57.92	5,438,956	5,439,022
CLASS 16		CLASS 73	5,438,860	273	5,439,510	69.5	5,438,957	5,439,023
114 R	5,438,730	1 D	5,438,861	CLASS 96	5,439,513	223	5,438,958	5,439,024
115	5,438,731	7	5,438,862	CLASS 99	5,438,914	248	5,438,959	5,439,025
325	5,438,732	40	5,438,863	CLASS 99	5,438,915	713	5,438,960	5,439,026
CLASS 19		49.2	5,438,864	327	5,438,916	CLASS 123	3	5,438,961
293	5,438,733	54.02	5,438,865	448	5,438,917	41.31	5,438,962	5,438,963
CLASS 24		149	5,438,866	476	5,438,918	54.4	5,438,964	5,438,965
170	5,438,734	180	5,438,867	483	5,438,919	184.55	5,438,966	5,438,967
335	5,438,735	204.25	5,438,868	499	5,438,920	198 E	5,438,968	5,438,969
599.8	5,438,736	290 V	5,438,869	CLASS 100	5,438,921	339.12	5,438,970	5,438,971
630	5,438,737	431	5,438,870	CLASS 101	5,438,922	446	5,438,972	5,438,973
704.1	5,438,738	504.05	5,438,871	116	5,438,923	549	5,438,974	5,438,975
CLASS 29		597	5,438,872	123	5,438,924	630	5,438,976	5,438,977
25.35	5,438,739	705	5,438,873	147	5,438,925	634	5,438,978	5,438,979
33 P	5,438,740	715	5,438,874	212	5,438,926	633	5,438,980	5,438,981
240	5,438,741	721	5,438,875	227	5,438,927	634	5,438,982	5,438,983
243.54	5,438,742	726	5,438,876	365	5,438,928	640	5,438,984	5,438,985
275	5,438,743	756	5,438,877	369	5,438,929	653.1	5,438,986	5,438,987
408	5,438,744	800	5,438,878	405	5,438,930	CLASS 126	5,438,988	5,438,989
525.1	5,438,745	861.65	5,438,879	CLASS 102	5,438,931	201.13	5,438,990	5,438,991
564.6	5,438,746	862.324	5,438,880	CLASS 104	5,438,932	202.14	5,438,992	5,438,993
603	5,438,747	862.57	5,438,881	CLASS 106	5,438,933	204.23	5,438,994	5,438,995
730	5,438,748	862.632	5,438,882	CLASS 108	5,438,934	205.24	5,438,996	5,438,997
752	5,438,749	864.62	5,438,883	168	5,438,935	207.14	5,438,998	5,438,999
825	5,438,750	865.8	5,438,884	199.3	5,438,936	207.18	5,438,999	5,439,000
829	5,438,751	CLASS 74	5,438,887	377.11	5,438,937	632	5,438,991	5,439,001
847	5,438,752	335	5,438,888	CLASS 109	5,438,938	633	5,438,992	5,439,002
857	5,438,753	459	5,438,889	CLASS 110	5,438,939	634	5,438,993	5,439,003
868	5,438,754	475	5,438,890	CLASS 112	5,438,940	640	5,438,994	5,439,004
888.43	5,438,755	501.5 R	5,438,891	CLASS 114	5,438,941	653.1	5,438,995	5,439,005
889	5,438,756	10.19	5,438,892	CLASS 116	5,438,942	661.01	5,438,996	5,439,006
889.2	5,438,757	232	5,438,893	CLASS 118	5,438,943	661.02	5,438,997	5,439,007
CLASS 30		246	5,438,894	CLASS 120	5,438,944	662.03	5,438,998	5,439,008
139	5,438,758	265	5,438,895	CLASS 122	5,438,945	CLASS 131	84.1	5,439,009
234	5,438,759	313	5,438,896	CLASS 124	5,438,946	CLASS 132	332	5,439,010
304	5,438,760	365	5,438,897	CLASS 126	5,438,947	CLASS 133	360	5,439,011
CLASS 33		421	5,438,898	CLASS 128	5,438,948	CLASS 134	73	5,439,012
451	5,438,761	444	5,438,899	CLASS 130	5,438,949	CLASS 135	76.5	5,439,013
734	5,438,762	CLASS 75	5,438,899	CLASS 132	5,438,950	CLASS 136	311	5,439,014
CLASS 34		10.19	5,438,899	CLASS 134	5,438,951	CLASS 137	7	5,439,527
61	5,438,773	232	5,438,899	CLASS 136	5,438,952	CLASS 138	86	5,439,528
90	5,438,763	246	5,438,900	CLASS 138	5,438,953	CLASS 139	100	5,439,016
343	5,438,764	265	5,438,901	CLASS 140	5,438,954	CLASS 140	126	5,439,017
456	5,438,765	313	5,438,902	CLASS 142	5,438,955	CLASS 141	143	5,439,018
602	5,438,766	365	5,438,903	CLASS 144	5,438,956	CLASS 142	200	5,439,528
CLASS 36		421	5,438,904	CLASS 146	5,438,957	CLASS 143	243	5,439,529
11.5	5,438,767	444	5,438,904	CLASS 148	5,438,958	CLASS 144	253	5,439,530
				CLASS 150	5,438,959	CLASS 145	258	5,439,531
				CLASS 152	5,438,960	CLASS 146	258	5,439,532
				CLASS 154	5,438,961	CLASS 147	258	5,439,533
				CLASS 156	5,438,962	CLASS 148	258	5,439,534
				CLASS 158	5,438,963	CLASS 149	258	5,439,535
				CLASS 160	5,438,964	CLASS 150	258	5,439,536
				CLASS 162	5,438,965	CLASS 151	258	5,439,537
				CLASS 164	5,438,966	CLASS 152	258	5,439,538
				CLASS 166	5,438,967	CLASS 153	258	5,439,539
				CLASS 168	5,438,968	CLASS 154	258	5,439,540
				CLASS 170	5,438,969	CLASS 155	258	5,439,541
				CLASS 172	5,438,970	CLASS 156	258	5,439,542
				CLASS 174	5,438,971	CLASS 157	258	5,439,543
				CLASS 176	5,438,972	CLASS 158	258	5,439,544
				CLASS 178	5,438,973	CLASS 159	258	5,439,545
				CLASS 180	5,438,974	CLASS 160	258	5,439,546
				CLASS 182	5,438,975	CLASS 161	258	5,439,547
				CLASS 184	5,438,976	CLASS 162	258	5,439,548
				CLASS 186	5,438,977	CLASS 163	258	5,439,549
				CLASS 188	5,438,978	CLASS 164	258	5,439,550
				CLASS 190	5,438,979	CLASS 165	258	5,439,551
				CLASS 192	5,438,980	CLASS 166	258	5,439,552
				CLASS 194	5,438,981	CLASS 167	258	5,439,553
				CLASS 196	5,438,982	CLASS 168	258	5,439,554
				CLASS 198	5,438,983	CLASS 169	258	5,439,555
				CLASS 200	5,438,984	CLASS 170	258	5,439,556
				CLASS 202	5,438,985	CLASS 171	258	5,439,557
				CLASS 204	5,438,986	CLASS 172	258	5,439,558
				CLASS 206	5,438,987	CLASS 173	258	5,439,559
				CLASS 208	5,438,988	CLASS 174	258	5,439,560
				CLASS 210	5,438,989	CLASS 175	258	5,439,561
				CLASS 212	5,438,990	CLASS 176	258	5,439,562
				CLASS 214	5,438,991	CLASS 177	258	5,439,563
				CLASS 216	5,438,992	CLASS 178	258	5,439,564
				CLASS 218	5,438,993	CLASS 179	258	5,439,565
				CLASS 220	5,438,994	CLASS 180	258	5,439,566
				CLASS 222	5,438,995	CLASS 181	258	5,439,567
				CLASS 224	5,438,996	CLASS 182	258	5,439,568
				CLASS 226	5,438,997	CLASS 183	258	5,439,569
				CLASS 228	5,438,998	CLASS 184	258	5,439,570
				CLASS 230	5,438,999	CLASS 185	258	5,439,571
				CLASS 232	5,439,000	CLASS 186	258	5,439,572
				CLASS 234	5,439,001	CLASS 187	258	5,439,573
				CLASS 236	5,439,002	CLASS 188	258	5,439,574
				CLASS 238	5,439,003	CLASS 189	258	5,439,



626.1	5,439,551	831	5,439,097	110	5,440,091	130.2	5,439,185	700	5,440,171	CLASS 290	
88	5,439,042	831	5,439,098	110	5,440,092	130.2	5,439,186	712	5,440,172	54	5,440,175
135	5,439,043	831	5,439,099	121.5	5,440,093	130.2	5,439,187	751	5,440,173	54	5,440,176
				121.52	5,440,094	130.2	5,439,188	770	5,440,174		
				121.63	5,440,095	130.2	5,439,189				
				130.21	5,440,096	130.2	5,439,190				
				130.5	5,440,097	130.2	5,439,191				
				131.6	5,440,098	130.2	5,439,192				
				131.7	5,440,099	130.2	5,439,193				
				131.7	5,440,100	130.2	5,439,194				
				131.7	5,440,101	130.2	5,439,195				
				131.7	5,440,102	130.2	5,439,196				
				131.7	5,440,103	130.2	5,439,197				
				131.7	5,440,104	130.2	5,439,198				
				131.7	5,440,105	130.2	5,439,199				
				131.7	5,440,106	130.2	5,439,200				
				131.7	5,440,107	130.2	5,439,201				
				131.7	5,440,108	130.2	5,439,202				
				131.7	5,440,109	130.2	5,439,203				
				131.7	5,440,110	130.2	5,439,204				
				131.7	5,440,111	130.2	5,439,205				
				131.7	5,440,112	130.2	5,439,206				
				131.7	5,440,113	130.2	5,439,207				
				131.7	5,440,114	130.2	5,439,208				
				131.7	5,440,115	130.2	5,439,209				
				131.7	5,440,116	130.2	5,439,210				
				131.7	5,440,117	130.2	5,439,211				
				131.7	5,440,118	130.2	5,439,212				
				131.7	5,440,119	130.2	5,439,213				
				131.7	5,440,120	130.2	5,439,214				
				131.7	5,440,121	130.2	5,439,215				
				131.7	5,440,122	130.2	5,439,216				
				131.7	5,440,123	130.2	5,439,217				
				131.7	5,440,124	130.2	5,439,218				
				131.7	5,440,125	130.2	5,439,219				
				131.7	5,440,126	130.2	5,439,220				
				131.7	5,440,127	130.2	5,439,221				
				131.7	5,440,128	130.2	5,439,222				
				131.7	5,440,129	130.2	5,439,223				
				131.7	5,440,130	130.2	5,439,224				
				131.7	5,440,131	130.2	5,439,225				
				131.7	5,440,132	130.2	5,439,226				
				131.7	5,440,133	130.2	5,439,227				
				131.7	5,440,134	130.2	5,439,228				
				131.7	5,440,135	130.2	5,439,229				
				131.7	5,440,136	130.2	5,439,230				
				131.7	5,440,137	130.2	5,439,231				
				131.7	5,440,138	130.2	5,439,232				
				131.7	5,440,139	130.2	5,439,233				
				131.7	5,440,140	130.2	5,439,234				
				131.7	5,440,141	130.2	5,439,235				
				131.7	5,440,142	130.2	5,439,236				
				131.7	5,440,143	130.2	5,439,237				
				131.7	5,440,144	130.2	5,439,238				
				131.7	5,440,145	130.2	5,439,239				
				131.7	5,440,146	130.2	5,439,240				
				131.7	5,440,147	130.2	5,439,241				
				131.7	5,440,148	130.2	5,439,242				
				131.7	5,440,149	130.2	5,439,243				
				131.7	5,440,150	130.2	5,439,244				
				131.7	5,440,151	130.2	5,439,245				
				131.7	5,440,152	130.2	5,439,246				
				131.7	5,440,153	130.2	5,439,247				
				131.7	5,440,154	130.2	5,439,248				
				131.7	5,440,155	130.2	5,439,249				
				131.7	5,440,156	130.2	5,439,250				
				131.7	5,440,157	130.2	5,439,251				
				131.7	5,440,158	130.2	5,439,252				
				131.7	5,440,159	130.2	5,439,253				
				131.7	5,440,160	130.2	5,439,254				
				131.7	5,440,161	130.2	5,439,255				
				131.7	5,440,162	130.2	5,439,256				
				131.7	5,440,163	130.2	5,439,257				
				131.7	5,440,164	130.2	5,439,258				
				131.7	5,440,165	130.2	5,439,259				
				131.7	5,440,166	130.2	5,439,260				
				131.7	5,440,167	130.2	5,439,261				
				131.7	5,440,168	130.2	5,439,262				
				131.7	5,440,169	130.2	5,439,263				
				131.7	5,440,170	130.2	5,439,264				

359	5,440,225	120	5,440,305	350	5,440,389	419.08	5,440,480	22.5	5,440,724	CLASS 304	
	CLASS 324	150	5,440,306	364	5,440,390	419.13	5,440,481	37.1	5,440,570	9	5,439,293
72	5,440,226	152	5,440,307	375	5,440,391	420	5,440,482	40.1	5,440,571	43	5,439,294
72.5	5,440,227				5,440,392	420	5,440,483	43	5,440,572	125	5,439,295
76.12	5,440,228	17	5,440,308	376	5,440,393	424.01	5,440,484	18	5,440,573	448	5,439,296
76.44	5,440,229	25	5,440,309	384	5,440,394	424.02	5,440,485	34	5,440,574	492	5,439,297
158.1	5,440,230	134	5,440,310		5,440,395	424.05	5,440,486	49	5,440,575	537	5,439,298
	5,440,231	132	5,440,311	394	5,440,396		5,440,487	50	5,440,576	542	5,439,299
247	5,440,232	189	5,440,312	401	5,440,397		5,440,488		5,440,577	625	5,439,300
252	5,440,233	352	5,440,313	CLASS 328	426.05	5,440,398	5,440,489	59	5,440,578	CLASS 305	
526	5,440,234	371	5,440,314	299	5,440,399	431.02	5,440,490	87	5,440,579	17	5,440,654
538	5,440,235			300	5,440,400	454	5,440,491	96	5,440,580	25	5,440,655
601	5,440,236			342	5,440,401	468	5,440,492		5,440,581	30	5,440,656
	5,440,237	702	5,440,315	335	5,440,402		5,440,493			71	5,440,657
636	5,440,238	786	5,440,316	340	5,440,403	470	5,440,494		CLASS 374	79	5,440,658
757	5,440,239	791	5,440,317	432	5,440,404	474.05	5,440,495	11	5,439,291	100	5,440,659
765	5,440,240	814	5,440,318	435	5,440,405	491	5,440,496	41	5,440,566	102	5,440,660
	5,440,241	833	5,440,319	444	5,440,406	516	5,440,497		CLASS 375	102	5,440,661
		915	5,440,320	467	5,440,407	551.01	5,440,498	200	5,440,597	115	5,440,662
33	5,440,242			468	5,440,408	559	5,440,499	227	5,440,582	CLASS 306	
	5,440,243	1	5,440,321	501	5,440,409	580	5,440,500	233	5,440,583	314	5,440,667
37	5,440,244	58	5,440,322	502	5,440,410	708.1	5,440,501	240	5,440,596	327	5,440,668
38	5,440,245	100	5,440,323	CLASS 329		724.1	5,440,502	242	5,440,598		
	5,440,246	102	5,440,324	7	5,440,669	736	5,440,503	261	5,440,585	CLASS 307	
	5,440,247	145	5,440,325	42	5,440,411			327	5,440,586	2.41	5,440,669
39	5,440,248	156	5,440,326	56	5,440,412	45	5,440,505	332	5,440,587	2.45	5,440,670
71	5,440,249			73	5,440,413	104	5,440,506	341	5,440,588	22	5,440,671
81	5,440,250	46	5,440,327	122	5,440,414	127	5,440,507	344	5,440,589	25	5,440,672
97				126	5,440,415	154	5,440,508	347	5,440,590	51	5,440,673
	CLASS 327			127	5,440,416	185	5,440,509	354	5,440,591	82.18	5,440,674
3	5,440,251	26	5,440,330	134	5,440,417	189.05	5,440,511		5,440,592	109	5,440,675
34	5,440,178	32	5,440,331	177	5,440,418	190	5,440,512	377	5,440,593	123	5,440,676
47	5,440,252	42	5,440,332	210	5,440,419	194	5,440,513		5,440,594	140	5,440,677
69	5,440,253	87	5,440,333	341	5,440,420		5,440,514		5,440,595	143	5,440,678
79	5,440,254	173	5,440,334	344	5,440,421	201	5,440,515	435	5,440,596	154	5,440,679
81	5,440,255	212	5,440,329	355	5,440,422	202	5,440,516	439	5,440,599	155	5,440,680
94	5,440,256			365	5,440,423	218	5,440,517	463	5,440,600	158	5,440,681
100	5,440,257			495	5,440,424	226	5,440,518		CLASS 377	161	5,440,682
112	5,440,258	6	5,440,334	512	5,440,425	230.03	5,440,521	8	5,440,601	162	5,440,683
160	5,440,259	13	5,440,335	559	5,440,426	230.05	5,440,522	20	5,440,602	163	5,440,684
278	5,440,260			566	5,440,427	230.06	5,440,523	28	5,440,603	164	5,440,685
333	5,440,261	144	5,440,336	630	5,440,428		5,440,524	47	5,440,604		
544	5,440,262	180	5,440,337	649	5,440,429	97	5,439,286		CLASS 378	181	5,440,686
546	5,440,263	189	5,440,338	683	5,440,430	130	5,439,287	98	5,440,606	182.02	5,440,687
553	5,440,264	190	5,440,340	704	5,440,431	137	5,439,288	98.2	5,440,607	183.19	5,440,688
	CLASS 328	256	5,440,341	784	5,440,432	207	5,439,289	199	5,440,608	185.08	5,440,689
300	5,440,265	294	5,440,342		5,440,433	241	5,439,290		CLASS 379	200.02	5,440,690
307	5,440,266	316	5,440,343	32	5,440,434	52	5,440,525	21	5,440,609	200.08	5,440,691
308	5,440,267	405	5,440,344	46	5,440,435	63	5,440,526	24	5,440,610		
	5,440,268	411	5,440,345	65	5,440,436	80	5,440,527	27	5,440,611	200.15	5,440,692
318	5,440,269	420	5,440,346	96.5	5,440,437	113	5,440,528	60	5,440,612	250	5,440,693
	CLASS 330	466	5,440,347	99.12	5,440,438	13	5,440,529	67	5,440,613	264	5,440,694
107	5,440,270	593	5,440,348	104	5,440,439			88	5,440,614	284	5,440,695
252	5,440,271	638	5,440,349	106	5,440,440	44.18	5,440,531	95	5,440,615	308	5,440,696
253	5,440,272	699	5,440,350	132	5,440,441	44.27	5,440,532		5,440,616	375	5,440,701
267	5,440,273	729	5,440,351	135	5,440,442	44.28	5,440,533		5,440,617		
		750	5,440,352		5,440,443	44.410	5,440,534	97	5,440,618	401	5,440,702
	CLASS 331	806	5,440,353	CLASS 361	5,440,444	48	5,440,537	100	5,440,619	403	5,440,703
1 A	5,440,274			18	5,440,445			112	5,440,620	412	5,440,704
4	5,440,275	52	5,440,354	62	5,440,446	13	5,440,530	112	5,440,621	417	5,440,705
117 FE	5,440,276	122	5,440,355	93	5,440,447			200	5,440,622	418	5,440,706
176	5,440,277	123	5,440,356	155	5,440,448			202	5,440,623	419	5,440,707
	CLASS 332	158	5,440,357	220	5,440,449			218	5,440,624	421.1	5,440,708
103	5,440,278	199	5,440,358	227	5,440,450	32	5,440,532	353	5,440,625	433	5,440,709
	CLASS 333	203	5,440,359	301.5	5,440,451	44.18	5,440,533	437	5,440,626	435	5,440,710
26	5,440,279	239	5,440,360	302	5,440,452	44.27	5,440,534		5,440,627	441	5,440,711
81 R	5,440,280			304	5,440,453	44.28	5,440,535		5,440,628	444	5,440,712
126	5,440,281	56	5,440,361	305	5,440,454	44.410	5,440,536	4	5,440,629	481	5,440,713
185	5,440,282			306	5,440,455			20	5,440,630	485	5,440,714
262	5,440,283	103	5,440,362	307	5,440,456			24	5,440,631	492	5,440,715
	CLASS 335			308	5,440,457			25	5,440,632	500	5,440,716
78	5,440,285	81	5,440,363	309	5,440,458	13	5,440,538	46	5,440,633		
202	5,440,284	173.1	5,440,364	310	5,440,459	16.1	5,440,539		5,440,634	550	5,440,717
	CLASS 336	298	5,440,365	311	5,440,460	18	5,440,540		5,440,635	600	5,440,718
160	5,440,286	301	5,440,366	312	5,440,461	24	5,440,541		5,440,636		
	CLASS 337	402	5,440,367	313	5,440,462	30	5,440,542		5,440,637	412	5,440,719
168	5,440,287	415	5,440,368	314	5,440,463	50	5,440,543		5,440,638	417	5,440,720
		432	5,440,369	315	5,440,464				5,440,639	418	5,440,721
	CLASS 340			316	5,440,465				5,440,640	419	5,440,722
328	5,440,193	55	5,440,370	317	5,440,466				5,440,641	420	5,440,723
463	5,440,288	203	5,440,371	318	5,440,467				5,440,642	421	5,440,724
550	5,440,289	204	5,440,372	319	5,440,468				5,440,643	422	5,440,725
552	5,440,290	210	5,440,373	320	5,440,469				5,440,644	423	5,440,726
562	5,440,291	219	5,440,374	321	5,440,470				5,440,645	424	5,440,727
567	5,440,292	221	5,440,375	322	5,440,471				5,440,646	425	5,440,728
568	5,440,293	245	5,440,376	323	5,440,472				5,440,647	426	5,440,729
569	5,440,294	251	5,440,377	324	5,440,473				5,440,648	427	5,440,730
572	5,440,295	271	5,440,378	325	5,440,474				5,440,649	428	5,440,731
573	5,440,296			326	5,440,475				5,440,650	429	5,440,732
686	5,440,297			327	5,440,476				5,440,651	430	5,440,733
825.44	5,440,298	309	5,440,381	328	5,440,477				5,440,652	431	5,440,734
825.51	5,440,299	317	5,440,382	329	5,440,478				5,440,653	432	5,440,735
825.54	5,440,300			330	5,440,479				5,440,654	433	5,440,736
870.11	5,440,301			331	5,440,480				5,440,655	434	5,440,737
870.31	5,440,302	124	5,440,383	332	5,440,481				5,440,656	435	5,440,738
901	5,440,303	237	5,440,384	333	5,440,482				5,440,657	436	5,440,739
		240	5,440,385	334	5,440,483				5,440,658	437	5,440,740
	CLASS 341	243	5,440,386	335	5,440,484				5,440,659	438	5,440,741
100	5,440,304	251	5,440,387	336	5,440,485				5,440,660	439	5,440,742
		346	5,440,388	337	5,440,486				5,440,661	440	5,440,743
				338	5,440,487	</					

## CLASSIFICATION OF PATENTS

750	5,439,748	CLASS 422	66.7	5,439,723	206	5,439,421	323	5,439,922
800	5,440,749			95	5,439,725	242	5,439,422	5,439,923
	5,440,750	5	5,439,641	91.53	5,439,811	245	5,439,423	5,439,924
	5,440,751	22	5,439,642	109	5,439,812			5,439,925
	5,440,752	25	5,439,643	136	5,439,813	CLASS 477		5,439,926
	5,440,753	62	5,439,644	172.3	5,439,814	46	5,439,424	5,439,927
	5,440,754	64	5,439,645	141	5,439,815	74	5,439,425	5,439,928
	5,440,755	82.11	5,439,646	199	5,439,816	125	5,439,426	5,439,929
	5,440,756	96	5,439,647	209	5,439,817	130	5,439,427	5,439,930
	5,440,757	99	5,439,648	222	5,439,818	175	5,439,428	5,439,931
873	5,440,694	108	5,439,649	240.2	5,439,819	207	5,439,429	5,439,932
		179	5,439,650	240.4	5,439,820			5,439,933
		179	5,439,651	252.32	5,439,821	CLASS 482		5,439,934
124.05	5,439,301	179.3	5,439,652	290	5,439,822	13	5,439,430	5,439,935
124.07	5,439,302	261	5,439,653	320.1	5,439,823	53	5,439,432	5,439,936
141	5,439,303	292	5,439,654		5,439,824		5,439,433	5,439,937
492	5,439,304	297	5,439,655	CLASS 436				5,439,938
				18	5,439,825	CLASS 483		5,439,939
76	5,439,305	21.1	5,439,656	50	5,439,826	1	5,439,434	5,439,940
179	5,439,306	54	5,439,657	66	5,439,827	14	5,439,431	5,439,941
187	5,439,307	243.07	5,439,658	74	5,439,828			5,439,942
191	5,439,308	245.1	5,439,659	118	5,439,829	41	5,439,435	5,439,943
316	5,439,309	263	5,439,660	134	5,439,830			
321	5,439,310	273	5,439,661	151	5,439,831	CLASS 493		5,439,945
		277	5,439,662	153.1	5,439,832		5,439,436	5,439,946
		277	5,439,663	154	5,439,833	CLASS 501		5,439,947
		277	5,439,664	154	5,439,834			5,439,948
10	5,439,311	567.1	5,439,665	154	5,439,835	12	5,439,851	
12	5,439,312		5,439,666	154	5,439,836	12	5,439,852	
75	5,439,313	1.49	5,439,667	154	5,439,837	12	5,439,853	
133.05	5,439,314	1.85	5,439,668	154	5,439,838	12	5,439,854	
		9.361	5,439,669	154	5,439,839	12	5,439,855	
		9.37	5,439,670	154	5,439,840	12	5,439,856	
60.5	5,439,315	45	5,439,671	154	5,439,841	12	5,439,857	
114	5,439,316	56	5,439,672	154	5,439,842	12	5,439,858	
128	5,439,317	59	5,439,673	154	5,439,843	12	5,439,859	
	5,439,318		5,439,674	154	5,439,844	12	5,439,860	
152	5,439,319	70.12	5,439,675	154	5,439,845	12	5,439,861	
154	5,439,320		5,439,676	154	5,439,846	12	5,439,862	
195.1	5,439,321		5,439,677	154	5,439,847	12	5,439,863	
	5,439,322	70.31	5,439,678	154	5,439,848	12	5,439,864	
	5,439,323	70.6	5,439,679	154	5,439,849	12	5,439,865	
102	5,439,324	93.45	5,439,680	154	5,439,850	12	5,439,866	
102	5,439,325	104.64	5,439,681	154	5,439,851	12	5,439,867	
103	5,439,326	157.1	5,439,682	154	5,439,852	12	5,439,868	
		185.1	5,439,683	154	5,439,853	12	5,439,869	
11	5,439,327	400	5,439,684	154	5,439,854	12	5,439,870	
		400	5,439,685	154	5,439,855	12	5,439,871	
		422	5,439,686	154	5,439,856	12	5,439,872	
1 R	5,439,328	430	5,439,687	154	5,439,857	12	5,439,873	
	5,439,329	450	5,439,688	154	5,439,858	12	5,439,874	
	5,439,330	451	5,439,689	154	5,439,859	12	5,439,875	
8	5,439,331	468	5,439,690	154	5,439,860	12	5,439,876	
84	5,439,332	489	5,439,691	154	5,439,861	12	5,439,877	
		490	5,439,692	154	5,439,862	12	5,439,878	
		490	5,439,693	154	5,439,863	12	5,439,879	
		490	5,439,694	154	5,439,864	12	5,439,880	
136	5,439,333	497	5,439,695	154	5,439,865	12	5,439,881	
230	5,439,334		5,439,696	154	5,439,866	12	5,439,882	
259	5,439,335		5,439,697	154	5,439,867	12	5,439,883	
			5,439,698	154	5,439,868	12	5,439,884	
			5,439,699	154	5,439,869	12	5,439,885	
			5,439,700	154	5,439,870	12	5,439,886	
			5,439,701	154	5,439,871	12	5,439,887	
			5,439,702	154	5,439,872	12	5,439,888	
			5,439,703	154	5,439,873	12	5,439,889	
			5,439,704	154	5,439,874	12	5,439,890	
			5,439,705	154	5,439,875	12	5,439,891	
			5,439,706	154	5,439,876	12	5,439,892	
			5,439,707	154	5,439,877	12	5,439,893	
			5,439,708	154	5,439,878	12	5,439,894	
			5,439,709	154	5,439,879	12	5,439,895	
			5,439,710	154	5,439,880	12	5,439,896	
			5,439,711	154	5,439,881	12	5,439,897	
			5,439,712	154	5,439,882	12	5,439,898	
			5,439,713	154	5,439,883	12	5,439,899	
			5,439,714	154	5,439,884	12	5,439,900	
			5,439,715	154	5,439,885	12	5,439,901	
			5,439,716	154	5,439,886	12	5,439,902	
			5,439,717	154	5,439,887	12	5,439,903	
			5,439,718	154	5,439,888	12	5,439,904	
			5,439,719	154	5,439,889	12	5,439,905	
			5,439,720	154	5,439,890	12	5,439,906	
			5,439,721	154	5,439,891	12	5,439,907	
			5,439,722	154	5,439,892	12	5,439,908	
			5,439,723	154	5,439,893	12	5,439,909	
			5,439,724	154	5,439,894	12	5,439,910	
			5,439,725	154	5,439,895	12	5,439,911	
			5,439,726	154	5,439,896	12	5,439,912	
			5,439,727	154	5,439,897	12	5,439,913	
			5,439,728	154	5,439,898	12	5,439,914	
			5,439,729	154	5,439,899	12	5,439,915	
			5,439,730	154	5,439,900	12	5,439,916	
			5,439,731	154	5,439,901	12	5,439,917	
			5,439,732	154	5,439,902	12	5,439,918	
			5,439,733	154	5,439,903	12	5,439,919	
			5,439,734	154	5,439,904	12	5,439,920	
			5,439,735	154	5,439,905	12	5,439,921	
			5,439,736	154	5,439,906	12	5,439,922	
			5,439,737	154	5,439,907	12	5,439,923	
			5,439,738	154	5,439,908	12	5,439,924	
			5,439,739	154	5,439,909	12	5,439,925	
			5,439,740	154	5,439,910	12	5,439,926	
			5,439,741	154	5,439,911	12	5,439,927	
			5,439,742	154	5,439,912	12	5,439,928	
			5,439,743	154	5,439,913	12	5,439,929	
			5,439,744	154	5,439,914	12	5,439,930	
			5,439,745	154	5,439,915	12	5,439,931	
			5,439,746	154	5,439,916	12	5,439,932	
			5,439,747	154	5,439,917	12	5,439,933	
			5,439,748	154	5,439,918	12	5,439,934	
			5,439,749	154	5,439,919	12	5,439,935	
			5,439,750	154	5,439,920	12	5,439,936	
			5,439,751	154	5,439,921	12	5,439,937	
			5,439,752	154	5,439,922	12	5,439,938	
			5,439,753	154	5,439,923	12	5,439,939	
			5,439,754	154	5,439,924	12	5,439,940	
			5,439,755	154	5,439,925	12	5,439,941	
			5,439,756	154	5,439,926	12	5,439,942	
			5,439,757	154	5,439,927	12	5,439,943	
			5,439,758	154	5,439,928	12	5,439,944	
			5,439,759	154	5,439,929	12	5,439,945	
			5,439,760	154	5,439,930	12	5,439,946	
			5,439,761	154	5,439,931	12	5,439,947	
			5,439,762	154	5,439,932	12	5,439,948	
			5,439,763	154	5,439,933	12	5,439,949	
			5,439,764	154	5,439,934	12	5,439,950	
			5,439,765	154	5,439,935	12	5,439,951	
			5,439,766	154	5,439,936	12	5,439,952	
			5,439,767	154	5,439,937	12	5,439,953	
			5,439,768	154	5,439,938	12	5,439,954	
			5,439,769	154	5,439,939	12	5,439,955	
			5,439,770	154	5,439,940	12	5,439,956	
			5,439,771	154	5,439,941	12	5,439,957	
			5,439,772	154	5,439,942	12	5,439,958	
			5,439,773	154	5,439,943	12	5,439,959	
			5,439,774	154	5,439,944	12	5,439,960	
			5,439,775	154	5,439,945	12	5,439,961	
			5,439,776	154	5,439,946	12	5,439,962	
			5,439,777	154	5,439,947	12	5,439,963	
			5,439,778	154	5,439,948	12	5,439,964	
			5,439,779	154	5,439,949	12	5,439,965	
			5,439,780	154	5,439,950	12	5,439,966	
			5,439,781	154	5,43			



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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

01 :	5,438,824	5,438,947	5,439,686	5,440,308	5,440,707	5,440,599
	5,439,081	5,438,949	5,439,692	5,440,313	5,440,710	5,440,617
	5,439,109	5,438,959	5,439,704	5,440,319	5,440,715	5,440,642
	5,439,312	5,438,968	5,439,764	5,440,326	5,440,719	5,440,727
	5,439,497	5,438,974	5,439,793	5,440,327	5,440,720	5,439,593
	5,440,014	5,438,976	5,439,797	5,440,333	5,440,721	5,439,623
04 :	5,438,743	5,438,984	5,439,818	5,440,337	5,440,734	5,439,744
	5,438,877	5,438,996	5,439,819	5,440,351	5,440,735	5,439,813
	5,438,908	5,438,998	5,439,825	5,440,361	5,440,746	5,439,852
	5,439,130	5,439,001	5,439,829	5,440,388	5,440,749	5,439,855
	5,439,224	5,439,004	5,439,833	5,440,405	5,440,752	5,439,877
	5,439,362	5,439,014	5,439,841	5,440,407	5,440,755	5,439,947
	5,439,393	5,439,017	5,439,842	5,440,428	5,440,757	5,440,043
	5,439,538	5,439,025	5,439,860	5,440,436	5,440,758	5,440,067
	5,439,571	5,439,038	5,439,881	5,440,440	5,440,759	5,439,380
	5,439,753	5,439,042	5,439,885	5,440,444	5,440,760	5,438,714
	5,440,106	5,439,153	5,439,936	5,440,449	5,440,797	5,438,745
	5,440,231	5,439,188	5,439,939	5,440,450	5,438,918	5,438,804
	5,440,249	5,439,190	5,439,942	5,440,453	5,439,069	5,438,880
	5,440,256	5,439,212	5,439,950	5,440,463	5,439,198	5,438,895
	5,440,265	5,439,214	5,439,978	5,440,464	5,439,540	5,438,899
	5,440,292	5,439,226	5,440,015	5,440,468	5,439,652	5,438,958
	5,440,310	5,439,233	5,440,016	5,440,470	5,439,727	5,438,977
	5,440,325	5,439,240	5,440,017	5,440,471	5,440,159	5,439,108
	5,440,334	5,439,256	5,440,021	5,440,474	5,440,321	5,439,162
	5,440,446	5,439,289	5,440,023	5,440,477	5,440,335	5,439,189
	5,440,562	5,439,316	5,440,057	5,440,482	5,440,480	5,439,211
	5,440,624	5,439,322	5,440,071	5,440,484	5,440,623	5,439,216
	5,440,627	5,439,323	5,440,079	5,440,505	5,440,736	5,439,217
	5,440,686	5,439,332	5,440,081	5,440,508	5,440,745	5,439,230
	5,440,724	5,439,342	5,440,108	5,440,518	5,265,739	5,439,236
05 :	5,439,027	5,439,355	5,440,133	5,440,523	5,438,708	5,439,254
	5,439,215	5,439,372	5,440,139	5,440,524	5,438,742	5,439,311
06 :	5,438,722	5,439,379	5,440,154	5,440,526	5,438,783	5,439,320
	5,438,747	5,439,391	5,440,162	5,440,556	5,438,874	5,439,346
	5,438,764	5,439,440	5,440,167	5,440,557	5,438,939	5,439,347
	5,438,787	5,439,447	5,440,182	5,440,560	5,439,075	5,439,365
	5,438,791	5,439,451	5,440,185	5,440,576	5,439,102	5,439,405
	5,438,795	5,439,453	5,440,197	5,440,578	5,439,103	5,439,478
	5,438,796	5,439,455	5,440,214	5,440,591	5,439,141	5,439,488
	5,438,807	5,439,463	5,440,228	5,440,597	5,439,155	5,439,531
	5,438,843	5,439,467	5,440,230	5,440,598	5,439,348	5,439,618
	5,438,854	5,439,483	5,440,239	5,440,600	5,439,474	5,439,622
	5,438,866	5,439,485	5,440,243	5,440,610	5,439,479	5,439,645
	5,438,869	5,439,528	5,440,244	5,440,616	5,439,929	5,439,690
	5,438,876	5,439,577	5,440,245	5,440,643	5,440,052	5,439,756
	5,438,879	5,439,583	5,440,246	5,440,658	5,440,115	5,439,762
	5,438,882	5,439,597	5,440,247	5,440,660	5,440,118	5,439,821
	5,438,891	5,439,600	5,440,254	5,440,669	5,440,143	5,439,941
	5,438,894	5,439,608	5,440,262	5,440,677	5,440,235	5,440,054
	5,438,905	5,439,632	5,440,270	5,440,682	5,440,284	5,440,069
	5,438,906	5,439,649	5,440,289	5,440,698	5,440,390	5,440,130
	5,438,919	5,439,653	5,440,291	5,440,705	5,440,396	5,440,299

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	5,440,479	5,439,013	5,440,741	5,439,265	5,439,381	5,439,654
	5,440,506	5,439,050	5,438,719	5,439,280	5,439,382	5,439,658
	5,440,693	5,439,210	5,438,720	5,439,630	5,439,416	5,439,667
	5,440,740	5,439,252	5,438,734	5,440,025	5,439,449	5,439,682
	5,438,978	5,439,257	5,438,762	5,440,094	5,439,492	5,439,691
	5,438,992	5,439,266	5,438,789	5,440,153	5,439,543	5,439,740
	5,439,045	5,439,417	5,438,873	5,440,636	5,439,555	5,439,742
	5,439,098	5,439,637	5,438,884	5,440,691	5,439,602	5,439,750
	5,439,110	5,439,798	5,438,944	5,440,709	5,439,604	5,439,901
	5,439,122	5,439,817	5,438,991	5,440,744	5,439,605	5,439,954
	5,439,173	5,439,888	5,439,089	5,438,709	5,439,636	5,439,965
	5,439,220	5,439,899	5,439,091	5,438,746	5,439,643	5,439,974
	5,439,255	5,439,923	5,439,123	5,438,792	5,439,707	5,440,061
	5,439,263	5,439,931	5,439,129	5,438,803	5,439,731	5,440,068
	5,439,363	5,440,218	5,439,133	5,438,845	5,439,766	5,440,090
	5,439,450	5,440,251	5,439,143	5,438,861	5,439,779	5,440,184
	5,439,518	5,440,270	5,439,202	5,439,012	5,439,781	5,440,199
	5,439,734	5,438,715	5,439,237	5,439,032	5,439,786	5,440,297
	5,439,814	5,439,021	5,439,241	5,439,074	5,439,794	5,440,385
	5,439,992	5,439,151	5,439,248	5,439,118	5,439,808	5,440,398
	5,440,072	5,439,200	5,439,249	5,439,154	5,439,871	5,440,458
	5,440,135	5,439,238	5,439,267	5,439,160	5,439,903	5,440,466
	5,440,142	5,439,527	5,439,271	5,439,395	5,439,952	5,440,478
	5,440,229	5,440,078	5,439,273	5,439,429	5,439,955	5,440,499
	5,440,301	5,440,086	5,439,275	5,439,432	5,439,969	5,440,574
	5,440,324	5,440,150	5,439,279	5,439,433	5,440,000	5,438,790
	5,440,632	5,438,842	5,439,281	5,439,439	5,440,001	5,438,813
	5,440,666	5,438,850	5,439,286	5,439,445	5,440,010	5,438,896
	5,439,933	5,438,980	5,439,295	5,439,448	5,440,020	5,439,053
15	5,438,773	5,439,689	5,439,299	5,439,465	5,440,111	5,439,054
16	5,439,052	5,440,038	5,439,368	5,439,469	5,440,177	5,439,055
	5,439,526	5,440,100	5,439,420	5,439,493	5,440,233	5,439,057
	5,439,551	5,440,193	5,439,428	5,439,500	5,440,277	5,439,059
	5,439,835	5,438,716	5,439,430	5,439,556	5,440,282	5,439,331
	5,440,240	5,439,104	5,439,472	5,439,607	5,440,330	5,439,409
	5,440,241	5,439,142	5,439,506	5,439,609	5,440,342	5,439,867
	5,440,517	5,439,542	5,439,617	5,439,610	5,440,343	5,439,983
17	5,440,519	5,439,701	5,439,677	5,439,663	5,440,347	5,439,398
	5,438,706	5,440,644	5,439,759	5,439,665	5,440,354	5,439,466
	5,438,727	5,438,825	5,439,803	5,439,684	5,440,357	5,439,884
	5,438,730	5,439,072	5,440,011	5,439,776	5,440,363	5,440,110
	5,438,731	5,439,634	5,440,136	5,439,780	5,440,365	5,440,127
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	361,092	361,096	361,146		361,035	361,004		361,141
05 :	361,110	361,106	361,174		361,036	361,082		361,141
	361,007	361,122	361,183		361,057	360,986		361,141
06 :	361,195	361,132	361,193		361,086	360,988		361,181
	360,972	361,136	360,977	18 :	361,137	360,989	48 :	361,008
	360,973	361,156	361,015		361,162	360,991		361,151
	360,975	360,974	361,075	29 :	361,103	361,011		361,151
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	361,006	361,033	361,192	30 :	361,023	361,052		361,030
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	361,016	361,053	361,093	31 :	361,157	361,095		361,105
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	361,021	360,970	361,105		361,098	361,177		361,186
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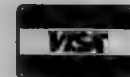
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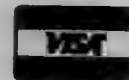
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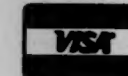
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